

Municipality of Clarington

Courtice Employment Lands and Southwest Courtice Secondary Plan

Transportation Existing Conditions, Opportunities and Constraints

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Table of Contents

1	Study Area.....	1
2	Existing Conditions	2
2.1	Study Area Road Network.....	2
2.2	Study Area Intersections.....	3
2.3	Transit.....	6
2.3.1	Pedestrian Facilities	7
2.3.2	Cycling Facilities.....	7
2.3.3	Trails	9
2.4	Existing Network Operations.....	9
2.4.1	Methodology.....	9
2.4.2	Data Analysis	9
3	Planned Area Network Changes.....	13
3.1	Freeways and Interchanges.....	13
3.1.1	What’s Previously Planned.....	13
3.1.2	Accommodating a New Interchange.....	14
3.1.3	Concept Design and Evaluation	15
3.1.4	Opportunities and Direction Forward	17
3.2	Arterial & Collector Road Network.....	17
3.2.1	Prior Network Planning.....	17
3.2.2	Network Opportunities and Constraints	18
	<i>Grade Separation at Prestonvale Road</i>	<i>20</i>
3.3	Provincial and Regional Transit Facilities.....	21
3.3.1	GO Transit Trail Service Expansion.....	22
3.3.2	BRT on Highway 407/Highway 418	24
3.3.3	BRT on Highway 2	24
3.4	Active Transportation.....	25

List of Tables

Table 1:	Existing Bus Routes Headways.....	6
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Table 2: Existing Intersection Operations 11

List of Figures

Figure 1: Study Area 1

Figure 2: Study Area Bus Route Map..... 6

Figure 3: Trulls Road Cross Section (Google StreetView) 7

Figure 4: Cycling Facilities - Clarington TMP..... 8

Figure 5: Dedicated Bike Lanes on Prestonvale Road (Google StreetView)..... 8

Figure 6: Existing Turning Movement Volumes 10

Figure 7 - Existing and Future Study Area Road Network 18

Figure 8: Potential Re-Alignment and Grade Separation of Prestonvale Road.....20

Figure 9: 2041 Frequent Transit Network – Metrolinx.....22

Figure 10: Bowmanville Rail Expansion Options Under Review (Presented by Metrolinx 2019)23

Figure 11: Planned Network Changes - Clarington TMP25

Figure 12: Planned Active Network Changes - Clarington TMP26

List of Appendices

- Appendix A: Turning Movement Count Data
- Appendix B: Existing Conditions Synchro Output Data
- Appendix C: Future Interchange Options

1 Study Area

The study area focuses on a portion of the Southwest Courtice secondary plan area and the adjacent Courtice Employment Lands secondary plan area.

The study area includes the lands bound by Townline Road in the west, Highway 401 (HWY 401) to the south, a portion of Bloor Street to the north, and Courtice Road and the future Highway 418 (HWY 418) to the east. The following **Figure 1** depicts the local context within the Municipality of Clarington.

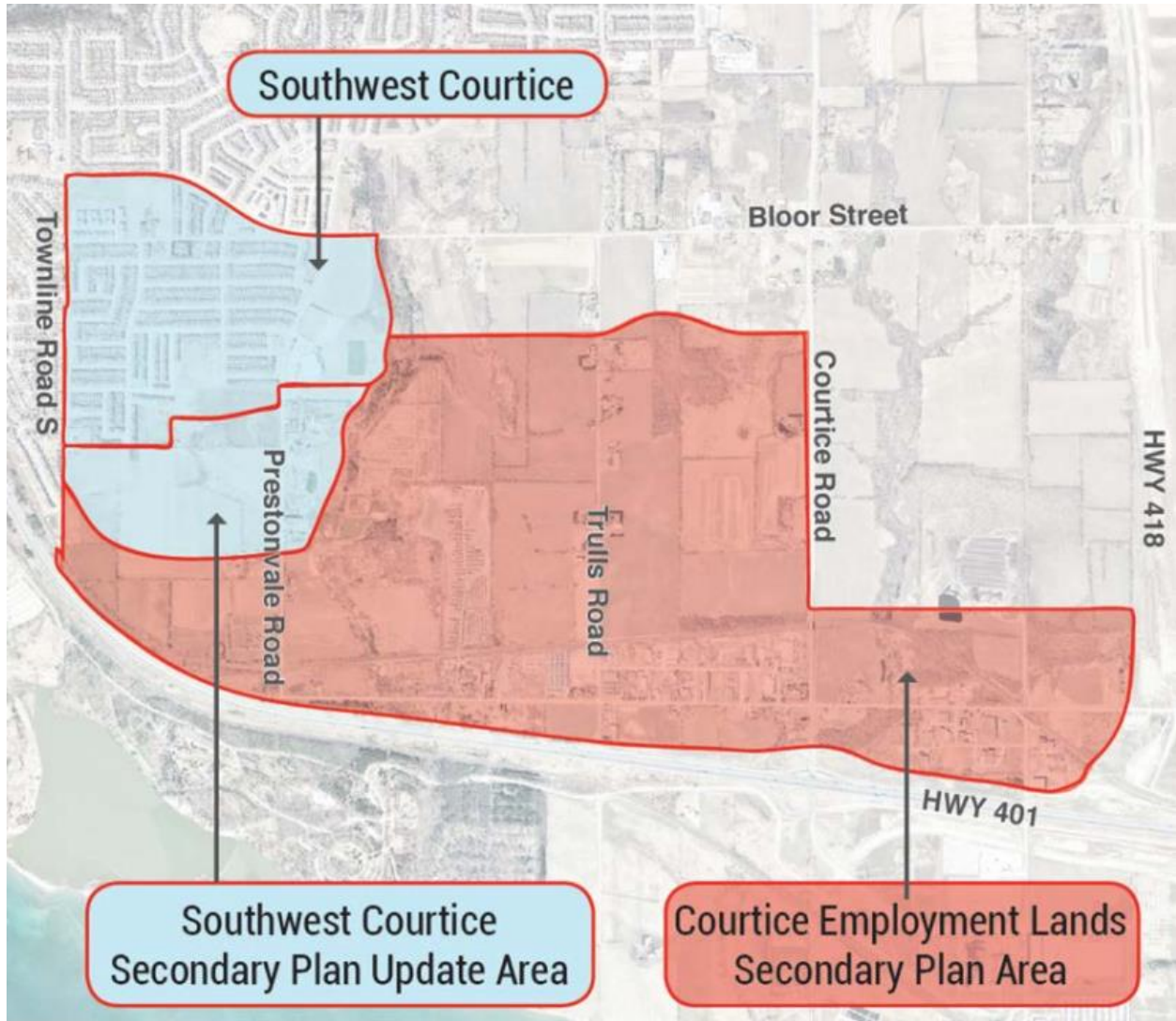


Figure 1: Study Area

2 Existing Conditions

2.1 Study Area Road Network

This section provides a brief summary of major roadways within the study area, which are under a combination of jurisdictions, including the Region of Durham, the Municipality of Clarington, and the Ministry of Transportation (MTO).

HWY 401 is a provincial freeway that extends from the Ontario/Quebec boarder in the northeast to Windsor, ON in the southwest (through Toronto). Within the study area, HWY 401 has a six-lane divided cross section, a posted speed limit of 100 km/h and an interchange to/from HWY 401 is provided via Courtice Road.

Bloor Street is a 2 lane east-west arterial roadway (Regional Road #22), which extends from Maple Grove Road in the east to Townline Road in the west, where it continues west as 'Bloor Street E'. The posted speed limit within the study area is 70 km/h between Maple Grove Road and Courtice Road; 60 km/h between Courtice Road and Trulls Road; 70 km/h between Trulls Road and Prestonvale Road; and is 50 km/h west of Prestonvale Road, within the study area.

Baseline Road is a 2 lane east-west arterial roadway between Trulls Road and Lambs Road, and between Prestonvale Road and Trulls Road, Baseline Road is classified as a local roadway. The posted speed limit within the study area is 60 km/h west of Courtice Road and 70 km/h east of Courtice Road.

Courtice Road is a 2 lane north-south arterial road (Regional Road #34) with a posted speed limit of 80 km/h on the south of Bloor Street and Courtice Road intersection; However, based on Google maps street view, the speed limit changes to 70 km/h north of Bloor Street and Baseline Road intersection. In addition, the posted speed limit changes to 60 km/h in the north after the intersection with Bloor Street, and to 50 km/h in the south beyond Baseline Road intersection approaching Highway 401 ramps. In the north, Courtice Road extends from Taunton Road and terminates at Energy Drive in the south after crossing Highway 401. Courtice Road provides on/off ramps to/from HWY 401 approximately 240 meters south of Baseline Road.

Trulls Road is a 2 lane north-south arterial road with a posted speed limit of 50 km/h. In the north, Trulls Road extends from Taunton Road (in the Town of Hampton, ON) and terminates at Baseline Road in the south.

Prestonvale Road is a 2 lane north-south roadway, which extends from Durham Highway (HWY 2) in the north to Baseline Road in the south. Between Bloor Street and Baseline Road, Prestonvale Road is classified as an arterial roadway, and north of Bloor Street, Prestonvale Road is classified as a collector roadway. The posted speed limit along Prestonvale Road is 50 km/h from Durham Highway to approximately 800 m south of Bloor Street (i.e. when Prestonvale Road is within the urban area, the posted speed limit is 50 km/h and when it is within a rural area, the posted speed limit is 60 km/h).

Townline Road is a 2 lane north-south collector road that extends from the CP rail line in the south to Cherrydown Drive in the north. The speed limit along Townline Road is not posted; however, based on the Ontario Highway Traffic Act, the speed limit is understood to be 50 km/h.

2.2 Study Area Intersections

Courtice Road at Baseline Road is a four-legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and a single lane is provided for through/right-turn movements, also in all directions.

No pedestrian crosswalks are provided at this location.



Courtice Road at Bloor Street is a four-legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and auxiliary right-turn lanes are provided for the northbound and southbound approaches. A single lane is provided for through movements in all directions, with eastbound and westbound through movements shared with right-turns.

Crosswalks with pedestrian actuated signals are provided for all crossing directions at this location.



Trulls Road at Baseline Road is a four-legged intersection with STOP control provided on the minor approaches, where northbound and southbound movements are required to stop along Trulls Road. No pedestrian crosswalks are provided at this location.

No pedestrian crosswalks are provided at this location.



Trulls Road at Bloor Street is an offset four-legged STOP controlled intersection, with northbound and southbound movements are required to stop along Trulls Road.

No pedestrian crosswalks are provided at this location.



Prestonvale Road at Baseline Road is a three-legged STOP controlled intersection, with eastbound vehicles along Baseline Road required to stop only.

No Pedestrian crosswalks are provided at this location.



Prestonvale Road at Bloor Street is a four-legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and a single lane is provided for through/right-turn movements, also in all directions.

Crosswalks with pedestrian actuated signals are provided for all crossing directions at this location.



Meadowglade/Rosswell Drive Road at Bloor Street is a four-legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and a single lane is provided for through/right-turn movements, also in all directions.

Crosswalks with pedestrian actuated signals are provided for all crossing directions at this location.



Townline Road at Bloor Street is a four-legged signalized intersection. Auxiliary left-turn lanes are provided in all directions, and auxiliary right-turn lanes are provided in the eastbound and southbound directions. A single lane is provided for through movements shared with right turns in the westbound and northbound directions.

Crosswalks with pedestrian actuated signals are provided for all crossing directions at this location.



Courtice Road at HWY 401 WB on/off-ramps provides access/egress to HWY 401 westbound as a four-legged intersection with STOP control provided on the westbound approach only. The east and west legs of this intersection operate as One-Way in the westbound direction only. A single lane is provided for all possible movements.

No pedestrian crosswalks are provided at this location.



Courtice Road at HWY 401 EB on/off-ramps provides access/egress to HWY 401 eastbound as a four-legged intersection with STOP control provided on the eastbound approach only.

It should be noted that the intersection was under construction at the time of writing this report.



2.3 Transit

Durham Region Transit operates two bus routes in Courtice (Route #411 and #922), which connects the Courtice community with the Oshawa Centre Terminal and the existing Oshawa Go Station. The headways for the existing routes (i.e. the departing time between successive buses) are summarized in **Table 1** and the existing route map is depicted as **Figure 2**.

Table 1: Existing Bus Routes Headways

Route	Days Operating	Weekday/ Evening	Saturday/ Evening	Sunday/ Evening
#411 South Courtice	All Days	30 min/ 30 min	30 min/ 60 min	60 min/ 60 min
#922 Bloor Townline	Mon-Fri	30 min/ 30 min	N/A	N/A

Bus stops within the study area are located on Grandview Drive, Townline Road, Bloor Street, Roswell Drive, Prestonvale Road and Southfield Ave, and are spaced approximately 150 m to 300 m apart.

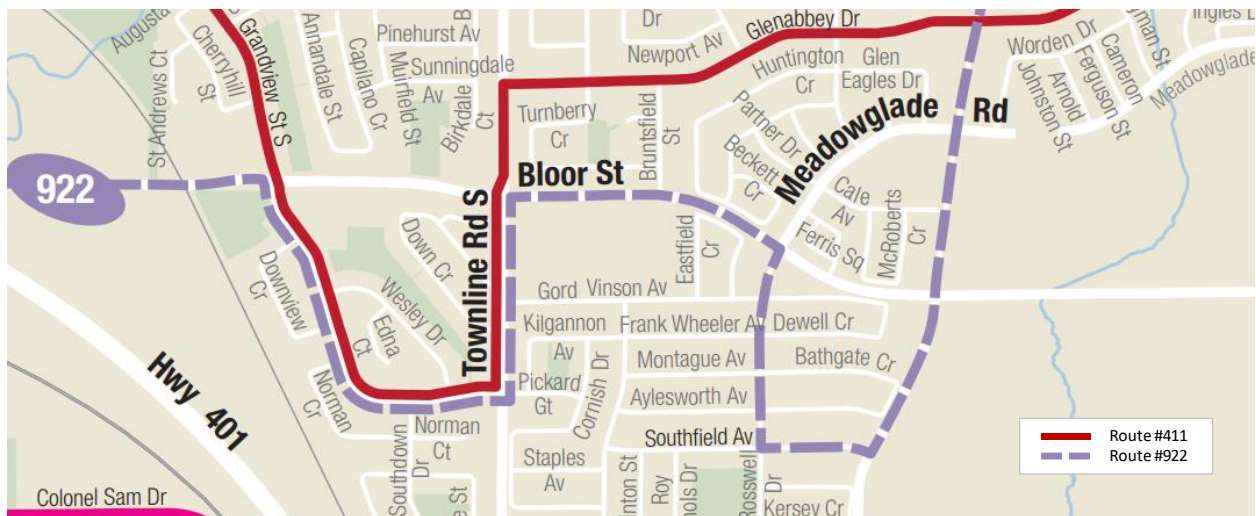


Figure 2: Study Area Bus Route Map

In addition, a GO Transit Park’n Ride is provided on Courtice Road and the GO Transit bus Route #92 provides service to/from the existing Oshawa GO Station and the Courtice Park’n Ride lot. Bus service to/from the Park’n Ride lot operates during weekday peak periods only and on approximate 30 minutes headways. It should be noted that the location of the Park’n Ride lot is the location of a future GO Transit Station, where commuter rail is anticipated to be provided by 2024¹.

Active transportation facilities were reviewed to gain an understanding of existing pedestrian and cycling facilities within the study area. With respect to the municipality of Clarington’s Transportation Master Plan (CTMP), it is acknowledged that there is a need to promote an

¹ <https://www.durhamregion.com/news-story/8319675-go-s-lakeshore-east-expansion-breaking-ground-in-courtice/>

increased role for pedestrian, cycling, and transit modes and transportation demand management (TDM) measures to reduce the existing high-level of reliance on the private automobile.

2.3.1 Pedestrian Facilities

Sidewalks are generally provided along both sides of arterial and collector roadways, and along one side of local roadways, within study area where roadway have an urban cross section. It should be noted that some network gaps exist where development has yet to be constructed (e.g. the south side of Bloor Street, between Towline Road and Bruntsfield Street) and select local neighbourhood streets have a sidewalk provided along one side. As development builds-out and the study area becomes urbanized, it is anticipated that sidewalks will be provided along both sides of arterial and collector roadways.

Along roadways with rural cross sections within the study area of the Courtice Expansion Lands, pedestrians are limited to unpaved granular shoulders. It should be noted that some study area roadways have very narrow shoulders, or no shoulders. The following **Figure 3** depicts a cross section of Trulls Road with no pedestrian facilities.



Figure 3: Trulls Road Cross Section (Google StreetView)

2.3.2 Cycling Facilities

Within the study area, dedicated cycling facilities are considered to be fairly limited. Currently, the only dedicated cycling facilities include curbside on road cycling lanes, provided in both directions along Prestonvale Road between Bloor Street and the south driveway connection to/from the South Courtice Arena (approximately 250 m south of Sourthfield Avenue). The following **Figure 4** is an excerpt from the Clarington TMP, identifying the location of existing cycling facilities and **Figure 5** depicts the existing cross section that includes on road bike lanes on Prestonvale Road.



Figure 4: Cycling Facilities - Clarington TMP



Figure 5: Dedicated Bike Lanes on Prestonvale Road (Google StreetView)

2.3.3 Trails

Located just outside the study area, there is an existing network of pathways (i.e. the Waterfront Trail) that generally provides east-west connectivity for active modes, south of HWY 401. This is depicted in the previous Figure 4. There are currently no trails within the Courtice Expansion Lands.

2.4 Existing Network Operations

2.4.1 Methodology

The following sections outline the intersection capacity analysis completed for existing conditions using the intersection capacity analysis software Synchro (v9), study area intersections were assessed in terms of vehicle delay, 95th percentile queues, a volume-to-capacity ratio (v/c) and a corresponding Level of Service (LOS).

It should be noted that the overall performance of a *signalized* intersection is calculated as a weighted v/c ratio and assigned a corresponding LOS, with critical movements assigned a LOS based on their respective v/c ratio. The overall performance of an *unsignalized* intersection is a LOS output from Synchro, which is based on an Intersection Capacity Utilization (ICU) method, and critical movements are assigned a LOS based on delay.

2.4.2 Data Analysis

Vehicle and pedestrian turning movement counts (TMCs) were collected at study area intersections on typical weekdays during the years 2016 (Highway 401 Ramp), 2018 (Bloor@Townline, Bloor@Meadowglade), and 2019 (remaining intersections), which capture both AM and PM peak periods. **Figure 6** depicts weekday peak TMCs, which are used for analysis purposes and full TMC data is provided as **Appendix A**.

Intersection operational analysis was undertaken for the five (5) signalized and two (2) unsignalized intersections within the study area. Signal timing plans were provided by the Region of Durham and used in this analysis of existing conditions.

The existing study area intersection performance analysis is summarized in **Table 2** and the detailed Synchro output results is provided as **Appendix B**.

Due to daily variations, there are inevitably volume imbalances within the study area. One anomaly that should be noted is the imbalances on Bloor Street between Meadowglade and Prestonvale. An additional 94 vehicles have been added to the eastbound through of Bloor/Prestonvale, to balance the volume. With the additional volume, the directional split and turning movement ratio of Bloor/Prestonvale remains consistent with the counts in the previous years.

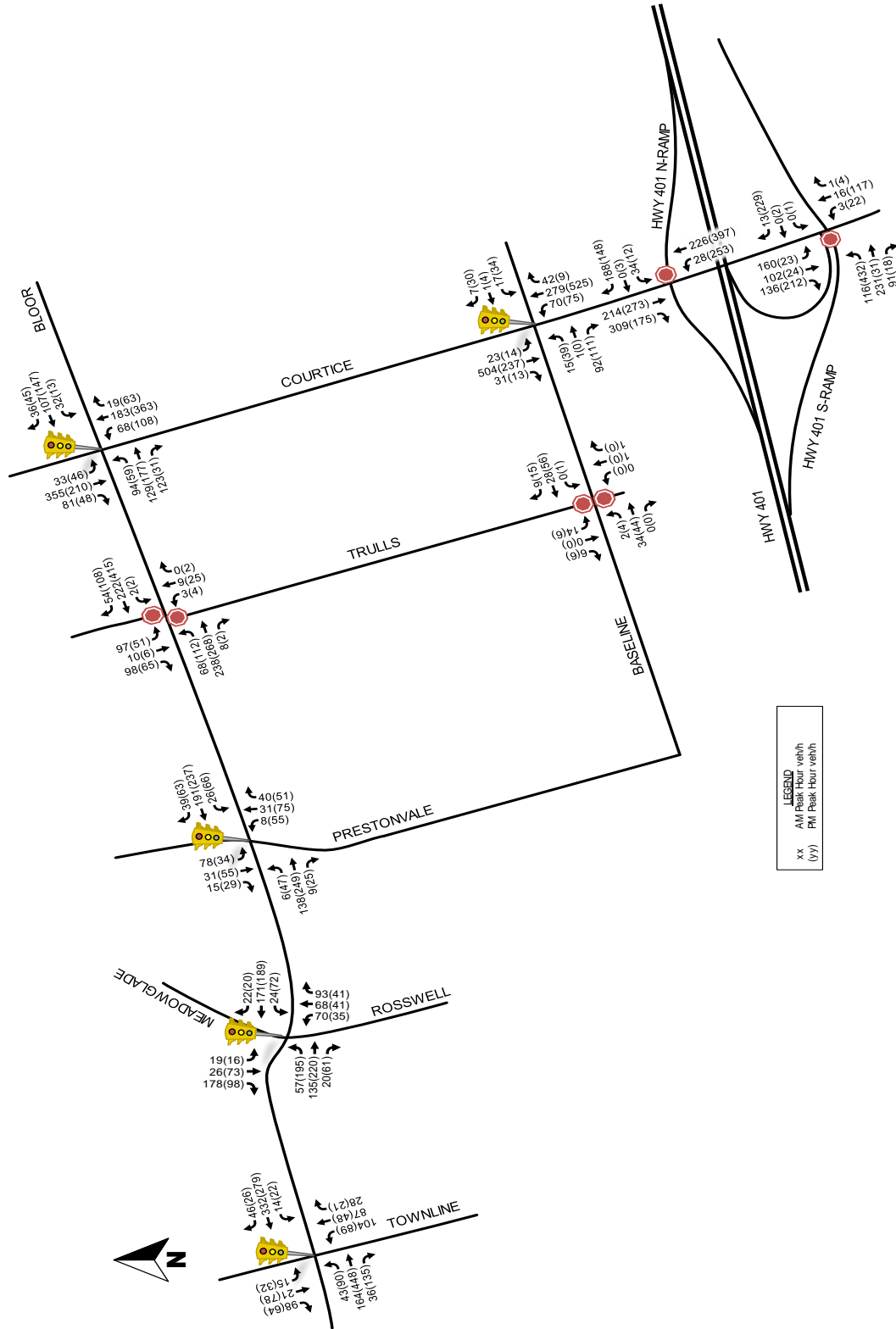


Figure 6: Existing Turning Movement Volumes

Table 2: Existing Intersection Operations

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Townline Road/Bloor Street - Actuated-Coordinated Signal									
EB	1 L	0.07	4.9	A	6	0.13	4.9	A	10
	1 T	0.13	4.6	A	16	0.36	5.7	A	46
	1 R	0.03	1.4	A	2	0.12	1.3	A	6
WB	1 L	0.02	5.9	A	m2.8	0.04	5.1	A	4
	1 T/R	0.31	5.9	A	35	0.25	4.9	A	25
NB	1 L	0.42	28.5	A	25	0.39	28.7	A	23
	1 T/R	0.33	20.0	A	22	0.21	18.4	A	15
SB	1 L	0.07	21.3	A	6	0.14	23.3	A	10
	1 T	0.06	21.1	A	7	0.24	24.5	A	19
	1 R	0.27	6.9	A	11	0.20	7.7	A	9
Overall		0.30	10.2	A	-	0.34	8.8	A	-
Rosswell Road/Meadowglade Road/Bloor Street - Actuated-Coordinated Signal									
EB	1 L	0.13	12.4	A	10	0.23	9.1	A	15
	1 T/R	0.25	11.7	A	23	0.39	9.4	A	28
WB	1 L	0.10	13.0	A	11	0.16	11.0	A	13
	1 T/R	0.29	14.0	A	35	0.24	10.5	A	28
NB	1 L	0.10	10.1	A	10	0.09	15.5	A	9
	1 T/R	0.22	7.0	A	19	0.22	12.4	A	21
SB	1 L	0.03	9.4	A	4	0.05	15.0	A	6
	1 T/R	0.17	3.2	A	9	0.26	8.7	A	19
Overall		0.23	9.9	A	-	0.31	10.2	A	-
Prestonvale Road/Bloor Street - Actuated-Coordinated Signal									
EB	1 L	0.03	2.0	A	1	0.03	2.4	A	m1.6
	1 T/R	0.18	2.3	A	7	0.21	2.2	A	9
WB	1 L	0.03	3.7	A	3	0.08	3.6	A	6
	1 T/R	0.19	3.6	A	18	0.21	3.4	A	20
NB	1 L	0.08	23.7	A	7	0.19	26.7	A	12
	1 T/R	0.22	14.3	A	13	0.35	19.6	A	20
SB	1 L	0.31	28.5	A	18	0.21	27.3	A	13
	1 T/R	0.19	18.9	A	13	0.28	21.4	A	18
Overall		0.21	8.0	A	-	0.22	8.6	A	-
Trulls Road/Bloor Street - Unsignalized									
EB	1 L/T/R	0.05	2.2	A	1	0.08	3.0	A	2
WB	1 L/T/R	0.00	0.1	A	0	0.01	0.2	A	0
NB	1 L/T/R	0.04	14.7	A	1	0.15	14.6	A	4
SB	1 L/T/R	0.37	16.7	A	14	0.33	17.2	A	11
Overall		0.56	5.2	A	-	0.63	5.1	B	-
Courtice Road/Bloor Street - Semi Act-Uncoord Signal									
EB	1 L	0.30	20.7	A	21	0.22	19.9	A	15
	1 T/R	0.51	17.7	A	40	0.45	21.4	A	39
WB	1 L	0.14	18.2	A	9	0.05	17.1	A	5
	1 T/R	0.30	16.3	A	25	0.41	19.4	A	35
NB	1 L	0.14	9.2	A	13	0.18	8.6	A	17
	1 T	0.19	8.7	A	26	0.38	9.8	A	50
	1 R	0.02	0.4	A	1	0.07	3.3	A	6
SB	1 L	0.06	8.5	A	7	0.10	8.3	A	9
	1 T	0.38	10.5	A	53	0.22	8.5	A	28

Movement	Lanes	AM Peak Hour				PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
	1 R	0.10	3.7	A	8	0.06	2.6	A	4
Overall		0.39	12.6	A	-	0.38	12.6	A	-
Trulls Road/Baseline Road - Unsignalized									
EBT	1 L/T/R	0.00	0.4	A	0	0.00	0.6	A	0
WBT	1 L/T/R	0.00	0.0	A	0	0.00	0.1	A	0
NBT	1 L/T/R	0.00	9.0	A	0	0.00	0.0	A	0
SBT	1 L/T/R	0.02	8.9	A	1	0.01	9.0	A	0
Overall		0.18	2.2	A	-	0.15	1.1	A	-
Courtice Road/Baseline Road - Semi Act-Uncoord Signal									
EB	1 L	0.01	16.0	A	2	0.22	19.0	A	19
	1 T/R	0.21	8.2	A	13	0.30	10.3	A	20
WB	1 L	0.11	16.4	A	11	0.31	20.4	A	24
	1 T/R	0.12	11.3	A	12	0.14	13.1	A	13
NB	1 L	0.25	9.4	A	12	0.12	7.6	A	10
	1 T/R	0.34	8.1	A	32	0.62	12.5	B	92
SB	1 L	0.05	6.4	A	4	0.09	7.8	A	5
	1 T/R	0.55	11.0	A	63	0.30	8.3	A	36
Overall		0.45	9.9	A	-	0.51	12.0	A	-
Courtice Road/Hwy 401 WB - Unsignalized									
WB	1 L/T/R	0.34	13.1	A	12	0.40	18.6	A	15
NB	1 T/L	0.03	1.2	A	1	0.24	5.5	A	8
SB	1 T/R	0.32	0.0	A	0	0.28	0.0	A	0
Overall		0.58	3.2	A	-	0.84	5.2	D	-
Courtice Road/Hwy 401 EB - Unsignalized									
EB	1 L	0.30	17.4	A	10	1.06	90.8	F	118
	1 T/R	0.72	29.6	C	45	0.08	11.1	A	2
WB	1 T/L	0.00	0.0	A	0	0.01	12.4	A	0
	1 R	0.01	0.0	A	0	0.26	10.3	A	8
NB	1 L/T/R	0.00	1.0	A	0	0.02	1.3	A	0
SB	1 L/T/R	0.11	4.0	A	3	0.02	0.8	A	0
Overall		0.56	15.1	A	-	0.58	38.2	A	-

As shown in **Table 2**, all movements at signalized intersections are operating with an overall v/c ratio of 0.51 or better (i.e. with a LOS 'A' or better). With regard to 95th percentile queues, the existing storage at signalized intersections are noted as being sufficient (i.e. vehicle queues are not spilling back into and blocking adjacent through lanes).

All movements at unsignalized intersections are operating with a v/c ratio below 0.62, (i.e. with a LOS 'B' or better), except for Courtice Road and HWY 401 EB on-/off-ramp during the PM peak, which is operating with an LOS of 'F' due to the heavy eastbound left-turn movement. All 95th percentile queues are within available storage length except for the eastbound left turn movement at Courtice Road and the Hwy 401 EB on-/off-ramps which has a queue of 118 metres.

3 Planned Area Network Changes

3.1 Freeways and Interchanges

The study area is wrapped around by the Provincial highway system – with Highway 401 immediately to the south, Highway 418 (tolled) currently under construction immediately to the east and Highway 407 (tolled) further to the north. By definition, access to these restricted access facilities is limited. The only access to the Provincial highway system directly serving the study area is the Highway 401/Courtice Road interchange which is currently under reconstruction to accommodate new Highway 418. This diamond style interchange is not the typical Partial Cloverleaf (Parclo) style interchange that the Ministry of Transportation favours and therefore has a limited capacity. The restricted geometry of this configuration is in part due to the immediately adjacent rail lines north and south of the highway, which reduce the options for integrating the interchange with the local road network.

As the Courtice area develops and traffic growth occurs mainly oriented to and from the west, access to the freeway system will become more critical. For most of the development area, traffic will have to go east to Courtice Road before proceeding west – a sense of going backwards to go forwards. Alternatively, traffic can use Bloor Street to access the Harmony Road interchange which itself has capacity limitations or go travel north on Highway 418 to access the toll highway some 8 kilometres away. There is a 5.5 kilometre gap between the Harmony Road and Courtice Road interchanges which is roughly twice the spacing of interchanges through most of the rest of Durham Region.

Additionally, the study area road system lacks east-west connectivity west Townline Road into Oshawa, with only Bloor Street and Highway 401 providing connectivity. This is largely a function of the alignment of Highway 401 and the adjacent railway, which preclude opportunities for additional continuous east-west collector roads south of Bloor Street in Oshawa. This will limit options for additional traffic from the study area to access the Harmony Road interchange.

3.1.1 What's Previously Planned

Previous studies have considered the need for another interchange in this area, the more recent of these studies are summarized below:

Study	Year	Discussion
Ministry of Transportation TESR “Highway 401 Rehabilitation and Long-term Widening Needs from Brock Road to Courtice Road”	2015	The TESR concludes that an additional interchange between Harmony Road and Courtice Road is not required to accommodate future traffic requirements when widening HWY 401 to 10 lanes. It is not clear whether the report took into account development in the Courtice Secondary Plan area. The technical feasibility of a potential interchange was also reviewed, and the report notes that there are potentially significant profile and grading issues due to the proximity of the railroads. However, the report does not come to a firm conclusion with respect to technical feasibility. The report then states that “recommendations from this study do not preclude a separate EA study to be undertaken by others to examine the need and justification for new interchanges at these locations.” (page 231)
Clarington Transportation Master Plan (TMP)	2016	The TMP identifies a new Highway-401 interchange at Prestonvale Road as a long-term road network improvement (table ES-2).
Durham Region Official Plan	2017	The Official Plan identifies a future interchange at the intersection of Prestonvale Road and Baseline Road. The Plan also proposes an interchange that connects to Bloor Street through a proposed type-C arterial. The interchange would be located between the existing Harmony Road interchange and Townline Road.
Durham Region Transportation Master Plan	2017	Based on the above Highway-401 TESR, Durham’s TMP recommends deleting the “future interchange designation and future Type C arterial road connection” for the Highway 401/Colonel Sam Drive interchange from the Region’s Official Plan maps. However, the TMP has also confirmed the need for an interchange in the vicinity of Prestonvale Road, shown on TMP Maps “4A” and “4B”. The regional Official Plan has amended in 2018 to incorporate this recommendation.
Background Report to the Durham Region TMP, Road Network Development Report	2018	The report notes that a new interchange at Prestonvale has been proposed but does not offer an opinion as to whether this interchange is justified. The report does not include this interchange in the “2031 proposed road network” or in improvement recommendations beyond 2031.

3.1.2 Accommodating a New Interchange

While the scope of this Secondary Plan study cannot confirm the need for a new interchange or determine a preferred design, it is necessary to examine which new interchange options may be most feasible so that the planning of the internal road system can consider how this network could connect to a new interchange. For this study, two (2) potential interchange locations were examined in relation to the potential road network: (a) at the proposed Secondary Plan East-West Arterial Road in the vicinity of Townline Road; and (b) near the intersection of Prestonvale Road and Baseline Road. Potential implementation options for both interchange locations are a full interchange (providing all movements) and a partial interchange (providing movements only to and from Greater Toronto Area to the west).

Additional ramps to accommodate movements from / to the east appear not to be required given the proximity of the Courtice-Road interchange and given the propensity for travel to and from the direction of Toronto. The added complexity and land required also makes easterly ramps less feasible. Therefore, this memo focuses on a partial interchange to satisfy the main direction of travel demand. Connectivity to roads on the south side of Highway 401 is in principle possible for the interchange location (a), but was not further considered, as it does not appear to be required on basis that the lands south of Highway 401 is largely occupied by Darlington Provincial Park and McLaughlin Bay/Second Marsh Wildlife Reserves making ramp construction difficult. A second rail line south of Highway 401 also provides an added complication.

The following design criteria were assumed for freeway ramps. But note that a minimum curve radius of 130m may not be acceptable for very long ramps that effectively operate as roadways.

- Configuration = Single-lane exit / entrance terminals
- Freeway design speed = 120 km/h
- $K_{\text{crest}} = 95$
- $K_{\text{sag}} = 36$
- $e_{\text{max}} = 0.06$
- $R_{\text{min}} = 130\text{m}$
- $A = 85\text{m}$
- Lane width = 4.75m

The concept design also assumes that Highway 401 will be widened from 6 to 10 lanes (as outlined in MTO's 2015 TESR) and as per general policy, that the core / collector system will be extended to this location (although it is currently not proposed). Highway widening of 14.5m for each travel direction was assumed.

3.1.3 Concept Design and Evaluation

Since technical feasibility and (consequently) commercial viability are the main issues with the proposed interchange locations, the approach taken in this memo is to evaluate the technically least challenging interchange configuration first. Therefore, a concept design was prepared for a partial interchange at the proposed Secondary Plan East-West Arterial Road in the vicinity of Townline Road, which provides only movements to and from Toronto without connectivity to Colonel Sam Drive south of Highway 401. It should be noted that, a new Class Environmental Assessment would be required for new interchanges.

Option (a) - Interchange at Proposed East-West Arterial Road

The key challenges at this location are as follows:

- The close proximity of the Canadian National Railway (CNR) to the south of Highway 401 limits opportunities to create align the off-ramp such that the length of the grade separation for crossing the freeway is minimized.
- The proximity of the railway also limits opportunities for implementing the ramp profile with an embankment. A very significant portion of the profile will have to be implemented with a retained-soil structure and/or a bridge structure.

- The off-ramp will have to go over the Canadian Pacific Railway (CPR) to the north of Highway 401. However, the railway is situated such that it is benched into an existing slope/embankment, and vertical clearance requirements for rail grade separations are higher (greater) than for highway overpass bridge structures.

For the eastbound off-ramp it was assumed that it will pass over both the highway and the CPR, while the on-ramp was assumed to pass under the railroad. The concept design includes the profile for the off-ramp. Total structure length for the highway and railroad crossing is approximately 160m. However, given the geometric constraints the total structure length (consisting of retained-soil and bridge structures) is estimated as approximately 550m. At the freeway a vertical clearance of between 10 and 12 metres will result from the elevations required to clear the railway as well.

The profile of the westbound on-ramp will be easier to implement. The ramp is proposed to pass under the CPR (i.e. approximately 15m below the roadway elevation to the east of the railway). There will be an elevation difference of approximately 3m between the ramp (at the rail grade separation) and Highway 401 resulting in sag. There are constructability concerns with this ramp profile as the railroad cannot be closed during construction. In addition, drainage of the sag in the ramp profile at the location the rail grade separation is a potential issue. Furthermore, it is likely that the on-ramp's termination taper will be on the outside of a horizontal curve (on Highway 401), which is undesirable. A ramp over the CPR option could be considered however, construction length would be much greater, requiring the ramp to be extended further west to achieve a grade low enough to meet the highway elevation resulting in potential interactions with the Harmony Road interchange.

It should be noted that ramps from / to the east would be even more difficult to implement given the right-of-way constraints and the horizontal curvature of Highway 401 just east of the potential interchange location.

Option (b) - Interchange near Intersection of Prestonvale Road and Baseline Road

An interchange to connect to Prestonvale Road and Baseline Road would be much more challenging to implement. The off-ramp's bridge structure to cross Highway 401 would be even longer (probably at least 260m). A rail grade separation at Prestonvale Road would be required, and the intersection of Prestonvale Road, Baseline Road and the off-ramp would be at (almost) the same elevation as Prestonvale Road at the rail grade separation (i.e. option (a)).

However, the on-ramp would be easier to implement, as a rail grade separation would not be required. The second concept design indicates the approximate implementation limits for all impacted roadways.

Option (b) modified – with no connection to Prestonvale Road

In this option, Prestonvale Road would be closed at the CN Rail line with no connection to Baseline Road. This would reduce the vertical clearance required over the Highway 401, as the rail line does not have to be crossed. In turn, this this means total implementation length of this ramp is reduced. However, the length of the bridge structure would remain the same.

The traffic benefits of such an option are questionable given that the only north-south connection would then be via Trulls Road thereby providing little connectivity within the Secondary Plan area.

3.1.4 Opportunities and Direction Forward

The concept design and analysis undertaken shows that an interchange at either of the potential locations would be technically challenging requiring very significant structural elements. Constructability would be a concern and the cost very high – which would likely have to be born by the municipality and/or development community. Further discussion on the feasibility/affordability of a partial interchange is required – MTO involvement is also required to ensure buy-in on any modifications to their highway.

Based on a high level assessment for this Secondary Plan study, it was determined that **Option b modified** (highway access to Baseline Road only) was the most feasible and it also allows planning of the Secondary Plan arterial and collector road without requiring a large amount of land to be set aside for an interchange. Therefore, the Secondary Plan can proceed with the knowledge that a future interchange is not precluded.

Given the significant potential costs associated with the new interchange options discussed above there may also be continued value in exploring opportunities to continue to improve the Courtice Road interchange. Potential improvements could include more direct connectivity for southbound traffic accessing the westbound Highway on-ramp and expanding the underpass to accommodate additional northbound traffic on Courtice Road at the terminus of the eastbound Highway 401 off-ramp. Underpass improvements would also entail significant cost.

Concept drawings for **Options a** and **b** are included as **Appendix C**.

3.2 Arterial & Collector Road Network

3.2.1 Prior Network Planning

Schedule J2 of the Clarington Official Plan (2018) identifies a future Type B Arterial road running east west through the Southwest Courtice area and Courtice Employment Lands. This future Type B arterial provides continuous east-west connectivity from the south terminus of Townline Road easterly to Courtice Road and is situated (in a north-south direction) approximately half-way between existing Baseline Road and existing Bloor Street. The future Type B Arterial includes intersections with existing north-south arterial roads (Prestonvale Road and Trulls Road) as well a crossing over Robinson Creek and potential intersection with future collector roads. The Municipality has confirmed that the Regional capital improvements will include temporary signal for this intersection in the near future. The ultimate intersection control recommends a roundabout at this location. In the near future, the Region is intending to expand Bloor Street to three lanes between Prestonvale Road and Courtice Road. Within the study area, the Clarington Official Plan identifies the extension of Fenning Drive and north-south road west of Robinson Creek as potential future collector roads. The Official Plan also identifies a potential east-west collector road south of Bloor Street on the Boundary of the study area.

Planning for this road is being advanced as part of the adjacent Southeast Courtice secondary plan study.

Figure 7 illustrates the existing study area road network as well as the additional new links to be considered through this study along with key opportunities and constraints, which are discussed in more detail in the following sections.

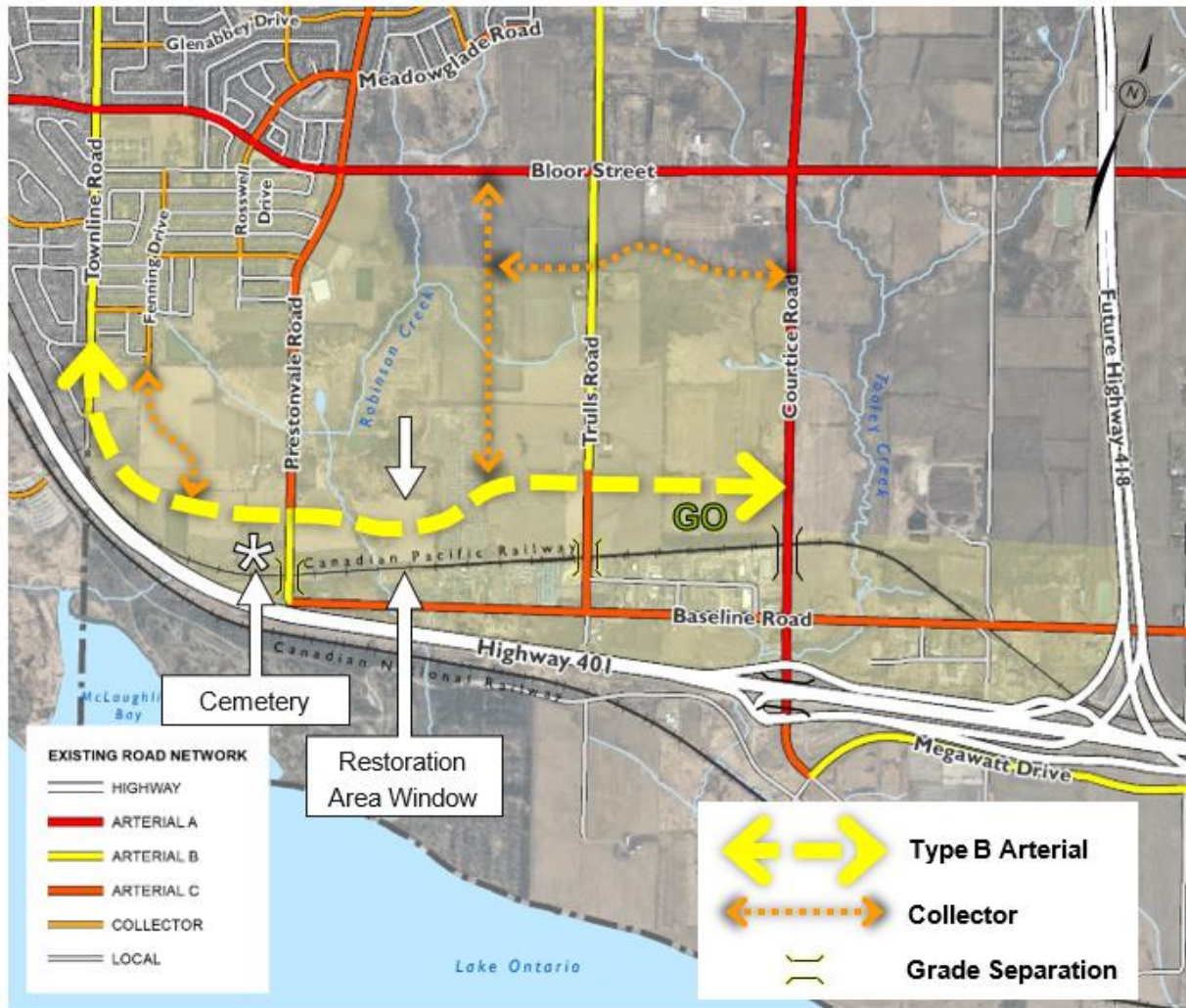


Figure 7 - Existing and Future Study Area Road Network

It should be noted that, a new Class Environmental Assessment (Phase 3 and 4) would be required for Type B arterial roads. It should be also noted that, as identified in Region’s Arterial Corridor Guidelines, future schools are not permitted to have access to the Regional arterial roads. Schools are recommended to be accessed via local road network.

3.2.2 Network Opportunities and Constraints

New East-West Type B Arterial Road

From a transportation design perspective, the potential alignment of the future east-west Type B Arterial is influenced by a number of constraints including:

- Providing an overall horizontal alignment that is consistent with typical design criteria for an urbanized road with a 60 km/h post speed limit and a 70 km/h design speed.
- Transitioning from the north-south alignment of Townline Road to the east-west alignment of the future Type B Arterial road with a horizontal curve that allows for continuity between the two roads rather than introducing an intersection.
- Avoiding encroachment into the existing and future lands of the St. Wolodymyr and St. Olha Ukrainian Cemetery (the Cemetery) located on the west side of Prestonvale Road north of the CP corridor.
- A preference to provide a 90-degree (right angle) intersection at Prestonvale Road.
- Crossing the Robinson Creek valley within the identified restoration area on the east side of the creek and avoiding wildlife habitat area located north of the restoration area.
- A preference to provide a 90-degree (right angle) intersection at Trulls Road.
- Connecting to Courtice Road on an alignment that parallels the north side of the potential future GO Station site and provides intersection spacing of approximately 600 m from Baseline Road.

Fenning Drive – Collector Road Extension

The extension of Fenning Drive southerly from its current terminus to intersect with the future Type B Arterial road will be necessary to provide collector road corridor through the future residential lands in Southwest Courtice that is continuous with the road network within existing development further north. From a road network perspective, the location and geometry of the future extension of Fenning Drive will primarily be influenced by the requirement to intersect the future Type B Arterial Road at a location that allows for appropriate sightlines along the curved alignment of the arterial road.

New North-South Collector East of Robinson Creek

The need for a future north-south collector road through the employment lands east of Robinson Creek will be influenced by the nature of the future development in this area. Currently, the area between Robinson Creek and Trulls Road is occupied primarily by two large agricultural parcels (19 ha and 23 ha). If these parcels are developed into large-scale or space intensive employment uses the need for internal roads will be limited; as sufficient access will likely be achievable from Trulls Road and/or the future east-west Type B Arterial Road.

If the existing properties are divided into smaller parcels for development, then a collector road may be required to provide frontage and access to the adjacent arterial roads. If a future north-south collector road is required by the development pattern the configuration should be such that the need for entrances onto Trulls Road would be limited. The alignment should also be such that it would facilitate a connection to Bloor Street at a location where the future extension of Hayman Street would intersect and also provide adequate spacing relative to the Trulls Road intersection.

Grade Separations

Immediately north of Baseline Road each of the north-south roads in the study area must cross the CP rail corridor. Currently, only Courtice Road has a grade separated crossing, with an existing bridge carrying Courtice Road over the railway. Both Prestonvale Road and Trulls Road cross the CP corridor at existing level crossings. The Clarington Official Plan has identified future grade separated crossings to accommodate the arterial function of both roadways.

Grade Separation at Prestonvale Road

A number of constraints complicate the provision of a grade separated crossing on Prestonvale Road. At Prestonvale Road the CP corridor is located close to both Baseline Road and Highway 401, with the railway only 110 m north of Baseline Road and 135 m north Highway 401. As such there is limited space to develop the south approach to a future grade separation. Additionally, the existing entrances and gateway features for the Cemetery are located on Prestonvale Road immediately north of the CP. The development of a north approach to a future grade separation would impact these entrances.

Both factors suggest that the Prestonvale Road would have to be realigned to the east of its current location to establish a grade separated crossing of the CP tracks. Realigning Prestonvale Road to the east would allow a local road connection to the Cemetery entrances to be maintained north of the railway. South of the railway realignment of Prestonvale Road would create additional length over which to develop the bridge approach at reasonable grade (i.e. 5% or less similar to Courtice Road) and lead to the introduction of a large radius curve at the transition between Prestonvale Road and Baseline Road.

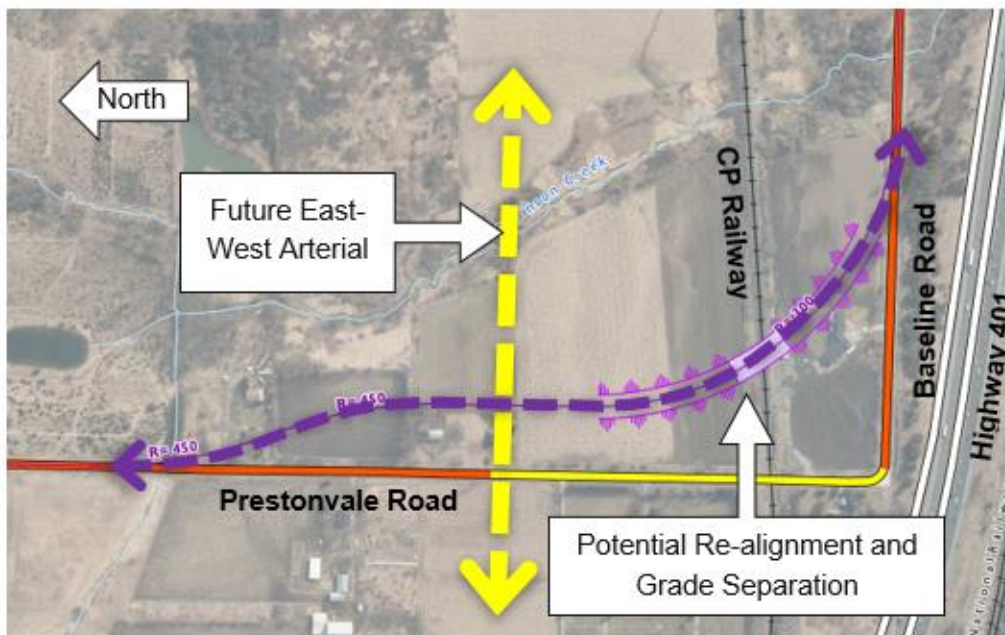


Figure 8: Potential Re-Alignment and Grade Separation of Prestonvale Road

Grade Separation at Trulls Road

East of Prestonvale Road the CP corridor diverges north away from Baseline Road, such that at Trulls Road the separation between the railway and Baseline Road is 215 m. This distance provides additional length to develop a bridge approach south of the railway. However, the grade of the southern approach will be in the order 7.5% and will require the closure of Cigas Road east Trulls Road and will likely require that the existing undeveloped properties on the west side of Trulls Road be accessed from Baseline Road rather than directly from Trulls Road.

To achieve a more reasonable road grade on the southern approach some consideration could be given to raising the profile of Baseline Road, which will result in its own potential complexities with respect access and drainage along Baseline Road. Widening of the existing right-of-way to accommodate the approach embankments will also likely be required. Property impacts to the exiting development on the east side of Trulls Road could potentially be mitigated by shifting the alignment of Trulls Road slightly to the west.

3.3 Provincial and Regional Transit Facilities

Metrolinx introduced the *2041 Regional Transportation Plan (RTP)* in 2018 to provide a *blueprint for an integrated, multi-modal regional transportation system* in the Greater Toronto and Hamilton Area (GTHA). The *2041 RTP* was built on the success of The Big Move, identified, and updated a number of transit priorities. A number of these priorities have the potential to influence mobility and growth in the Courtice area. These included:

- Project 97 – GO Rail project: Lakeshore East 15 min GO Service Extension (to Downtown Oshawa GO)
- Project 98 – LRT/BRT project: Simcoe BRT/LRT (Downtown Oshawa GO – Highway 407)
- Project 99 – Priority Bus/Priority Streetcar project: Highway 2 Priority Bus (Simcoe St. – Martin Rd.)
- Project 100 – GO Rail project: Lakeshore East Two-Way, All-Day GO Service (Downtown Oshawa GO- Martin Rd.)

Figure 9 depicts the 2041 Frequent Rapid Transit Network for the regional rapid transit and highway networks in the eastern portion of the GTHA with the Courtice area identified.

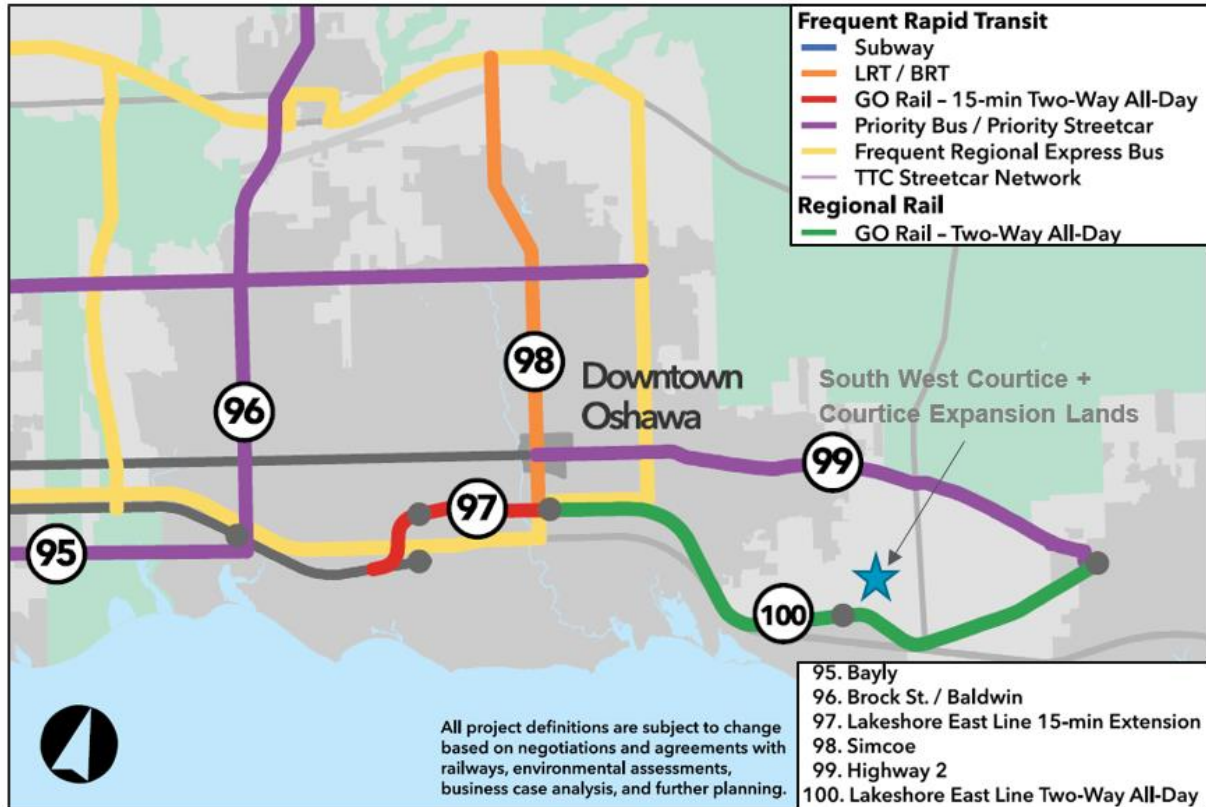


Figure 9: 2041 Frequent Transit Network – Metrolinx

3.3.1 GO Transit Trail Service Expansion

Building on the priorities established in *The Big Move*, planning for the expansion GO rail service to Bowmanville began with the completion of Environmental Project Report (TRP) in 2011. The 2011 TRP recommend the extension of GO rail service to Bowmanville along the Canadian Pacific (CP) railway corridor north of Highway 401.

In 2017 Metrolinx’s continued planning for the expansion initiated the preparation of an addendum to the TRP. Materials presented in April 2018 continued to focus on a route along the CP railway corridor that would provide morning and evening peak service. This route involved a crossing over Highway 401 (just west of the existing Oshawa GO Station) and a connection to CP corridor near Thornton Road. West of Thornton Road the route included two stations in Oshawa and two new stations in Clarington, one in the Courtice employment lands near Courtice Road and another in Bowmanville near Waverley Road (now Bowmanville Avenue).

In 2018, as part of the early works projects, Metrolinx constructed a park-and-ride facility on a 12.12ha site at the previously identified station location in the Courtice employment lands (on the northside of the CP corridor just west of Courtice Road). GO bus service to Oshawa from the Courtice Road park-and-ride facility commencing in February of 2019.

In the May of 2019 Metrolinx, embarked on a business case analysis of 4 options for the provision of all-day of all-day service. The four options presented included two routes primarily on the CP alignment north of Highway 401, one route on the Canadian National (CN) railway alignment south of Highway 401 and one route on a combination of the CP and CN alignments with a crossing over Highway 401 near Townline Road at the Oshawa/Clarington boundary. The CN alignment option, located entirely south of Highway 401, did not include a station in Courtice and relocated the future Bowmanville Station to the south side of Highway 401. The other three options continued to include a station in the Courtice employment lands at Courtice Road.

STUDY AREA

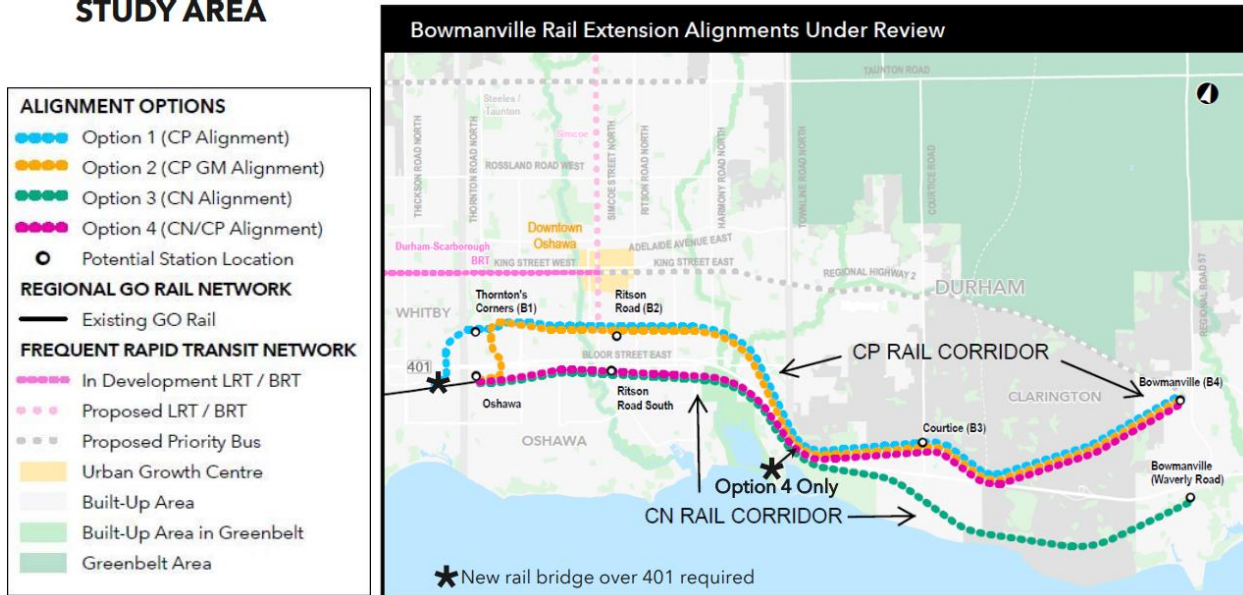


Figure 10: Bowmanville Rail Expansion Options Under Review (Presented by Metrolinx 2019)

Information presented at the public meetings held by Metrolinx in May 2019 indicated that the funding envelope for the Bowmanville expansion project was \$550 million and that current cost estimates for the original route (Option1) ranged from \$721 million to \$1.2 billion based on requirements for upgrades within CP’s corridor.² Accordingly, Metrolinx indicated that preliminary estimates suggest that Option 3 and Option 4, which partially or entirely use the CN corridor remain within the funding envelope.

The options currently under consideration have the potential to significantly impact the mobility opportunities that could support growth in the study area. Option 3, which does not include a GO Transit station in Courtice would reduce the quality of connectivity for residents in the Southwest Courtice area commuting west to and from the GTHA. Additionally, the potential lack regional rail connectivity will also reduce the feasibility of establish a transit hub within the within the Courtice Employment Lands to support higher densities and a mix of uses.

² <https://www.durhamregion.com/news-story/9395151-durham-pushing-metrolinx-to-stick-to-original-plan-for-bowmanville-go-extension-via-oshawa/>

Option 4, which combines the use of the CP and CN corridors includes a crossing over Highway 401 in the vicinity of Townline, also has the potential to impact transportation planning within the study area to a lesser degree. Specifically, the configuration of the highway crossing may require the protection of lands in the vicinity of the CP corridor at Townline Road and could potentially overlap with lands to be protected for a potentially future interchange and may create additional vertical profile constraints for future interchange ramps.

In Feb 20, 2020, option 2 was chosen to pursue by the Metrolinx Board of Directors, as a more balanced option of ridership, benefit and overall project cost.

3.3.2 BRT on Highway 407/Highway 418

A transitway has been set aside for future implementation on a right-of-way paralleling Highway 407 extending from the 403-407-QEW interchange in Burlington all the way to the 407-35/115 interchange in Clarington. This includes both the privately operated 407 ETR as well as the recently-opened and still under construction publicly-operated 407 East. Transitway provisions also extend to Highways 412 and 418, which connect the 407 East to the 401.

Prior to construction of a separate transitway, there is an option for GO Transit to operate an express bus service along these highways from the Courtice area into Toronto when development and hence demand is sufficient.

3.3.3 BRT on Highway 2

The Durham Region Long Term Transit plan identifies Highway 2 as a higher order corridor where transit service would be especially fast, frequent and include elements such as right-of-way separation, transit priority, and potential for different vehicle technology including light rail.

The first phase of BRT implementation, known as DRT Pulse, began service June 29, 2013, operating on the Ontario Highway 2 corridor between Downtown Oshawa and the University of Toronto Scarborough campus. A DRT type of service is shown for the Courtice area lands in the future.

A further advancement of rapid transit would see the Highway 2 BRT eventually replaced with light rail transit all the way east to Courtice Road in Clarington, and west into Scarborough in Toronto.

An early preliminary design of the BRT has recently been prepared for the Durham-Scarborough Bus Rapid Transit Corridor that stretches from downtown Oshawa to the Scarborough Town Centre, not extending to Courtice at this time.

Again, as development occurs, it is likely that regional bus service in mixed traffic would be possible in the interim.

The following **Figure 11** is an excerpt from the Clarington TMP, depicting planned study area network changes.

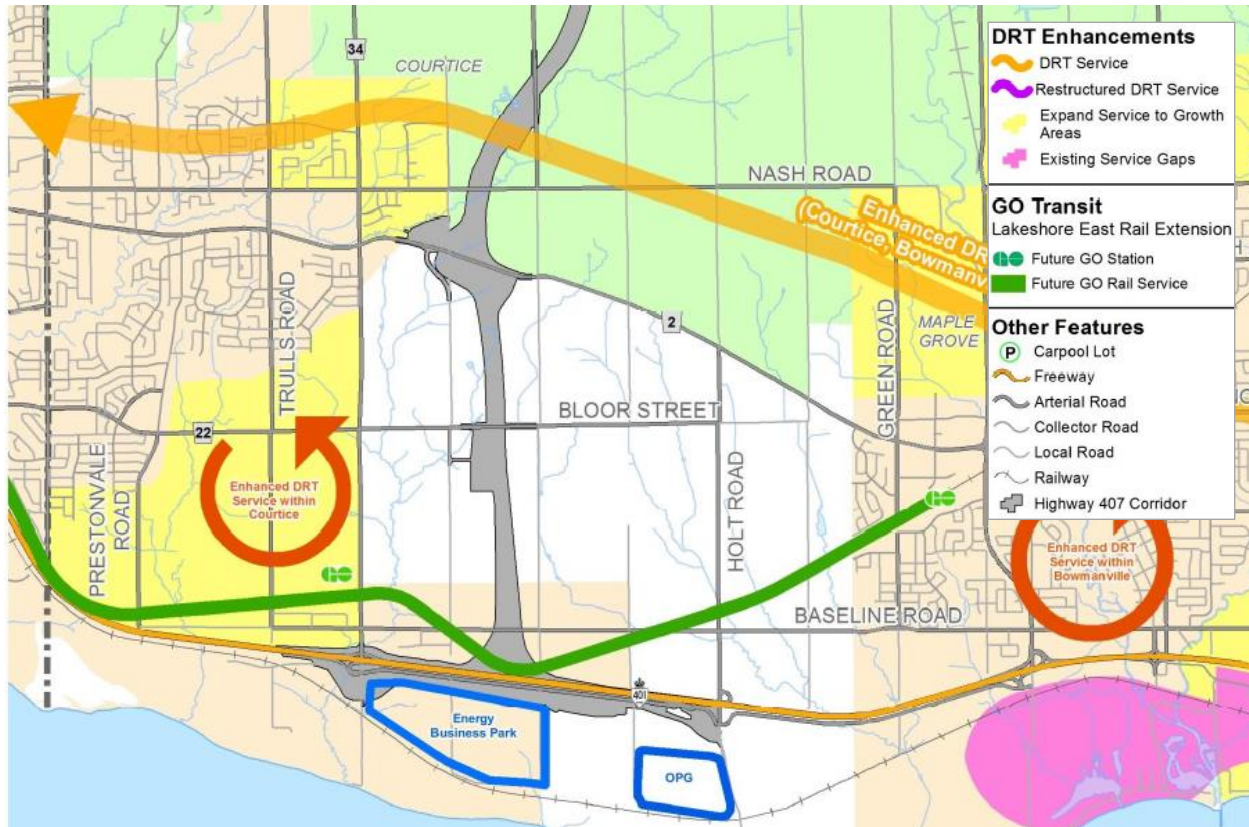


Figure 11: Planned Network Changes - Clarington TMP

3.4 Active Transportation

The Clarington TMP recommended an Active Transportation System consisting of interconnected on-road facilities and off-road trails. Regional cycling facilities were recommended on Bloor Street and Trulls Road in the study area. A recreational network was recommended for the natural corridors contained in the study area. This network will need to be confirmed and refined in this Secondary Planning process. Supporting policy measures were also developed to increase the attractiveness, awareness, and visibility of active transportation in Clarington. Policy recommendations include marketing strategies to promote use of Clarington’s active transportation facilities and the development of an Active Transportation Plan.

The following **Figure 13** is an excerpt from the Clarington TMP, depicting planned study area active network changes.

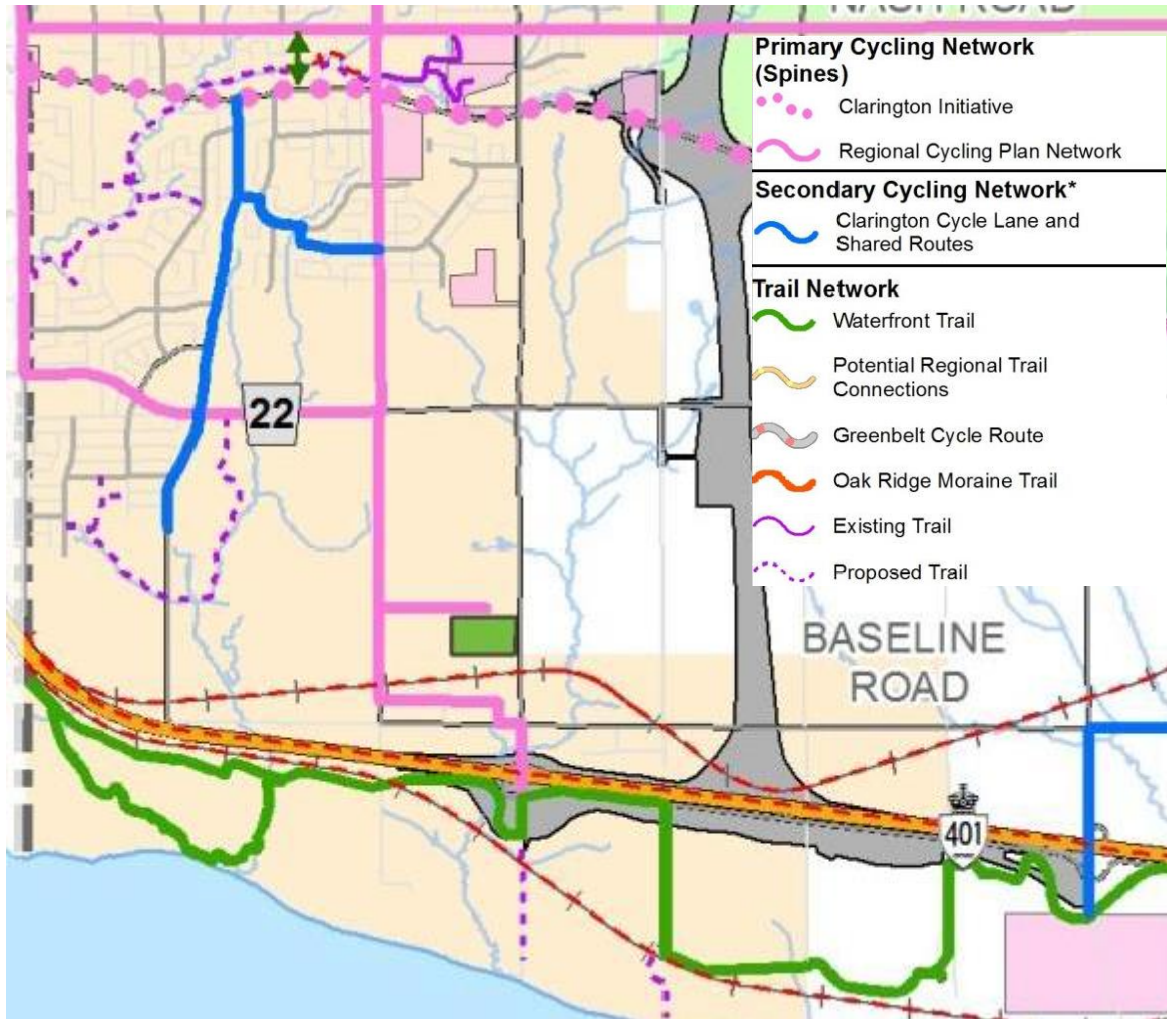


Figure 12: Planned Active Network Changes - Clarington TMP

Local Active Transportation connections to a future GO Rail station will be important while also considering connections across the Highway 401 corridor to ensure connectivity with the Energy Park employment lands, Darlington Provincial Park and a future community park all located south of Highway 401. Existing watercourse crossing under Highway 401 are constrained with opportunities to accommodate active transportation facilities likely to be limited. This would suggest value in considering either a dedicated active transportation overpass or integrating active transportation facilities into future improvements at the Courtice Road interchange.

A

Appendix A: Turning Movement Count Data

If you require this information to be in an accessible format, please contact the Municipality's Accessibility Coordinator at 905-623-3379 ext. 2131.

TMC Tabular Report

Bloor St (R.R.22) @ Prestonvale Rd

TMC No: 0228200000 Intersection ID: 6821 Count ID: 35702017870 Count Date: 05/16/2019, Thu

AM Peak 08:15		0.75 0.81 0.42		17% 28% 24%		3 11 16		15 28 85		Ped. 0	
Ped. 0		←		↖		↗		→		↘	
0.53		29%		6		15		180		7%	
0.60		19%		27		118		18		14%	
0.63		10%		1		9		198		0.58	
PHF	Trucks %	Trucks	Cars	55	11	20	30	7	19%	0.51	0
Ped. 0		↖		↗		→		↘		↙	

MD Peak 12:45		0.84 0.86 0.53		11% 8% 6%		3 2 15		24 22 82		Ped. 1	
Ped. 1		←		↖		↗		→		↘	
0.80		19%		6		26		146		19%	
0.85		19%		25		104		19		14%	
0.94		13%		2		13		143		0.69	
PHF	Trucks %	Trucks	Cars	54	20	31	23	6	21%	0.60	0
Ped. 0		↖		↗		→		↘		↙	

PM Peak 17:15		0.86 0.86 0.77		7% 18% 12%		2 10 4		27 45 151		Ped. 0	
Ped. 0		←		↖		↗		→		↘	
0.78		19%		9		38		194		18%	
0.81		17%		42		207		50		24%	
0.71		20%		4		16		279		0.83	
PHF	Trucks %	Trucks	Cars	111	42	63	42	9	18%	0.64	0
Ped. 0		↖		↗		→		↘		↙	

Total Count 2 hours*		12% 20% 16%		26 72 52		194 281 629		187 225 187		Ped. 2	
Ped. 20		←		↖		↗		→		↘	
23%		50		170		1150		234		18%	
17%		213		1041		184		50		21%	
16%		22		117		1503		315		0.83	
PHF	Trucks %	Trucks	Cars	582	135	225	187	50	21%	0.64	0
Ped. 0		↖		↗		→		↘		↙	

TMC 15 Min Report

Bloor St (R.R.22) @ Trulls Rd

TMC No: 0228300000 Intersection ID: 6576 Count ID: 35702017315 Count Date: 05/16/2018, Wed

Time	NORTH APPROACH									EAST APPROACH									SOUTH APPROACH									WEST APPROACH									Total										
	Cars	Trucks	Heavies	Ped	Cars	Trucks	Heavies	Ped	Cars	Trucks	Heavies	Ped	Cars	Trucks	Heavies	Ped	Cars	Trucks	Heavies	Ped																											
Period 1																																															
06:15	19	5	16	0	0	0	0	0	0	0	0	0	10	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4	18	0	0	0	0	0	0	0	0	0	77	
06:30	20	6	8	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	
06:45	29	6	11	0	0	0	0	0	0	0	0	0	2	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	
07:00	30	6	14	0	0	0	0	0	0	0	0	0	19	1	0	3	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99	
07:15	23	4	9	0	0	0	0	0	0	0	0	0	11	3	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81		
07:30	40	2	13	0	0	0	0	0	0	0	0	0	18	6	0	3	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132		
07:45	22	4	12	1	0	0	0	0	0	0	0	0	1	40	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137		
08:00	24	6	19	0	0	2	0	0	0	0	0	0	45	10	0	3	4	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175		
08:15	13	3	15	2	2	1	0	0	0	0	0	0	59	20	0	0	1	0	0	0	0	0	0	0	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	231		
08:30	26	4	15	1	0	0	0	0	0	0	0	0	1	56	11	0	0	0	0	0	0	0	0	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167		
08:45	14	6	18	0	0	0	0	0	0	0	0	0	1	31	2	0	1	2	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113		
09:00	14	1	18	0	0	0	0	0	0	0	0	0	26	5	0	1	0	0	0	0	0	0	0	1	4	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104		
09:15	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*		
Period 2																																															
11:45	10	3	11	0	0	0	0	0	0	0	0	0	23	8	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	
12:00	7	1	7	0	0	0	0	0	0	0	0	0	32	7	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	
12:15	4	4	8	0	1	2	0	0	0	0	0	0	20	5	0	1	0	0	0	0	0	0	0	3	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	
12:30	3	4	11	0	0	0	0	0	0	0	0	0	2	34	8	0	2	0	0	0	0	0	0	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	
12:45	13	2	9	0	0	2	0	0	0	0	0	0	26	10	0	0	0	0	0	0	0	0	0	1	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	
13:00	8	3	6	1	0	0	0	0	0	0	0	0	1	38	9	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106		
13:15	5	2	13	0	0	0	0	0	0	0	0	0	22	8	0	1	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91		
13:30	6	5	10	0	0	0	0	0	0	0	0	0	17	9	0	0	1	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95		
Period 3																																															
13:45	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	
14:00	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	
15:15	7	3	10	1	2	3	0	0	0	0	0	0	1	26	19	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	142
15:30	11	3	13	0	1	0	0	0	0	0	0	0	32	22	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155	
15:45	9	0	9	1	0	1	0	0	0	0	0	0	40	19	0	0	1	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	163	
16:00	13	1	16	0	1	0	0	0	0	0	0	0	27	19	0	1	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	
16:15	13	4	21	1	1	0	0	0	0	0	0	0	1	34	28	0	1	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	182	
16:30	7	4	18	0	1	1	0	0	0	0	0	0	53	24	1	1	0	0	0	0	0	0	0	2	5	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	
16:45	9	8	19	0	3	2	0	0	0	0	0	0	4	45	28	0	3	2	0	0	0	0	1	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211	
17:00	9	6	15	1	0	0	0	0	0	0	0	0	2	46	31	1	1	1	0	0	0	0	0	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	208	
17:15	8	3	23	1	0	0	0	0	0	0	0	0	40	31	0	2	1	0	0	0	0	0	0	2	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	196	
17:30	25	0	15	0	0	0	0	0	0	0	0	0	46	31	0	1	0	0	0	0	0	0	0	2	6	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	203	
17:45	24	0	19	0	0	0	0	0	0	0	0	0	36	29	0	0	0	0	0	0	0	0	0	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184		
18:00	19	4	23	0	0	0	0	0	0	0	0	0	39	18	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	186		
18:15	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*		
18:30	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*	0*		

TMC Tabular Report

Courtice Rd (R.R. 34) @ Baseline Rd

TMC No: 0340100000 Intersection ID: 7626 Count ID: 29612016168 Count Date: 06/16/2016, Thu

AM Peak 07:45		Ped.		0		0.68		0.80		0.52		0.80		0.52		0.80		0.52	
←	20	123	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.50	0%	0	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.56	11%	3	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.70	25%	19	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	Ped.		0		0.59		0.91		0.86		0.59		0.91		0.86	
↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔

MD Peak 12:45		Ped.		0		0.43		0.83		0.72		0.83		0.72		0.83		0.72	
←	27	87	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.71	6%	1	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.75	7%	2	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.79	23%	14	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	Ped.		0		0.74		0.87		0.74		0.87		0.74		0.87	
↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔

PM Peak 16:30		Ped.		0		0.46		0.37		0.70		0.37		0.70		0.37		0.70	
←	45	81	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.49	5%	4	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.41	20%	13	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
0.41	31%	28	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	Ped.		0		0.55		0.86		0.65		0.55		0.86		0.65	
↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔

Total Count -5 hours*		Ped.		0		22%		12%		21		250		2583		2584		2584	
←	283	639	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
6%	11	178	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
13%	33	230	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
30%	180	424	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	Ped.		1		310		2245		250		221		221		221	
↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔

TMC Tabular Report

Bloor St (R.R.22) @ Courtice Rd (R.R.34)

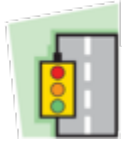
TMC No: 022800000 Intersection ID: 6352 Count ID: 35702017786 Count Date: 10/10/2018, Wed

AM Peak 07:30		Ped. ↕		Ped. ↕		Ped. ↕	
0.41	0.75	0.81	0.75	0.41	0.81	0.75	0.41
4%	3%	8%	3%	4%	8%	3%	4%
3	13	29	13	3	29	13	3
78	300	326	300	78	326	300	78
	Cars	Trucks	Trucks %	PHF			
←	13	243	↔	↔	↔	↔	↔
0.52	3%	3	91	↔	↔	↔	↔
0.77	2%	2	127	↔	↔	↔	↔
0.75	0%	0	123	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	PHF	Trucks %	Trucks	Cars
			479				16
			62				173
			31				10
			↔				16%
			↔				5%
			↔				0.97
			↔				0.68
			↔				0.79
			↔				0
			↔				Ped. ↕
			↔				1

MD Peak 12:00		Ped. ↕		Ped. ↕		Ped. ↕	
0.88	0.81	0.88	0.81	0.88	0.81	0.88	0.81
2%	8%	13%	8%	2%	13%	8%	2%
1	12	25	12	1	25	12	1
41	184	165	184	41	165	184	41
	Cars	Trucks	Trucks %	PHF			
←	4	148	↔	↔	↔	↔	↔
0.63	5%	2	38	↔	↔	↔	↔
0.73	1%	1	78	↔	↔	↔	↔
0.80	0%	0	45	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	PHF	Trucks %	Trucks	Cars
			251				39
			34				128
			28				10
			↔				20%
			↔				7%
			↔				0.91
			↔				0.82
			↔				0.88
			↔				0
			↔				Ped. ↕
			↔				0

PM Peak 16:45		Ped. ↕		Ped. ↕		Ped. ↕	
0.86	0.77	0.91	0.77	0.86	0.91	0.77	0.86
4%	2%	5%	2%	4%	5%	2%	4%
2	8	11	8	2	11	8	2
46	459	199	459	46	199	459	46
	Cars	Trucks	Trucks %	PHF			
←	5	298	↔	↔	↔	↔	↔
0.55	0%	0	59	↔	↔	↔	↔
0.89	0%	0	177	↔	↔	↔	↔
0.65	0%	0	31	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	PHF	Trucks %	Trucks	Cars
			242				62
			107				366
			12				7
			↔				1%
			↔				2%
			↔				2%
			↔				0.85
			↔				0.75
			↔				0.66
			↔				0
			↔				Ped. ↕
			↔				0

Total Count 1 hours*		Ped. ↕		Ped. ↕		Ped. ↕	
4%	3%	8%	3%	4%	8%	3%	4%
14	75	161	75	14	161	75	14
349	2177	1734	2177	349	1734	2177	349
	Cars	Trucks	Trucks %	PHF			
←	44	1590	↔	↔	↔	↔	↔
2%	9	379	↔	↔	↔	↔	↔
1%	11	934	↔	↔	↔	↔	↔
1%	6	479	↔	↔	↔	↔	↔
PHF	Trucks %	Trucks	Cars	PHF	Trucks %	Trucks	Cars
			2409				285
			182				42
			↔				13%
			↔				4%
			↔				3%
			↔				0
			↔				Ped. ↕
			↔				1



Ontario Traffic Inc.
TRAFFIC MONITORING  SERVICES & PRODUCTS

Project #19233 - CIMA+

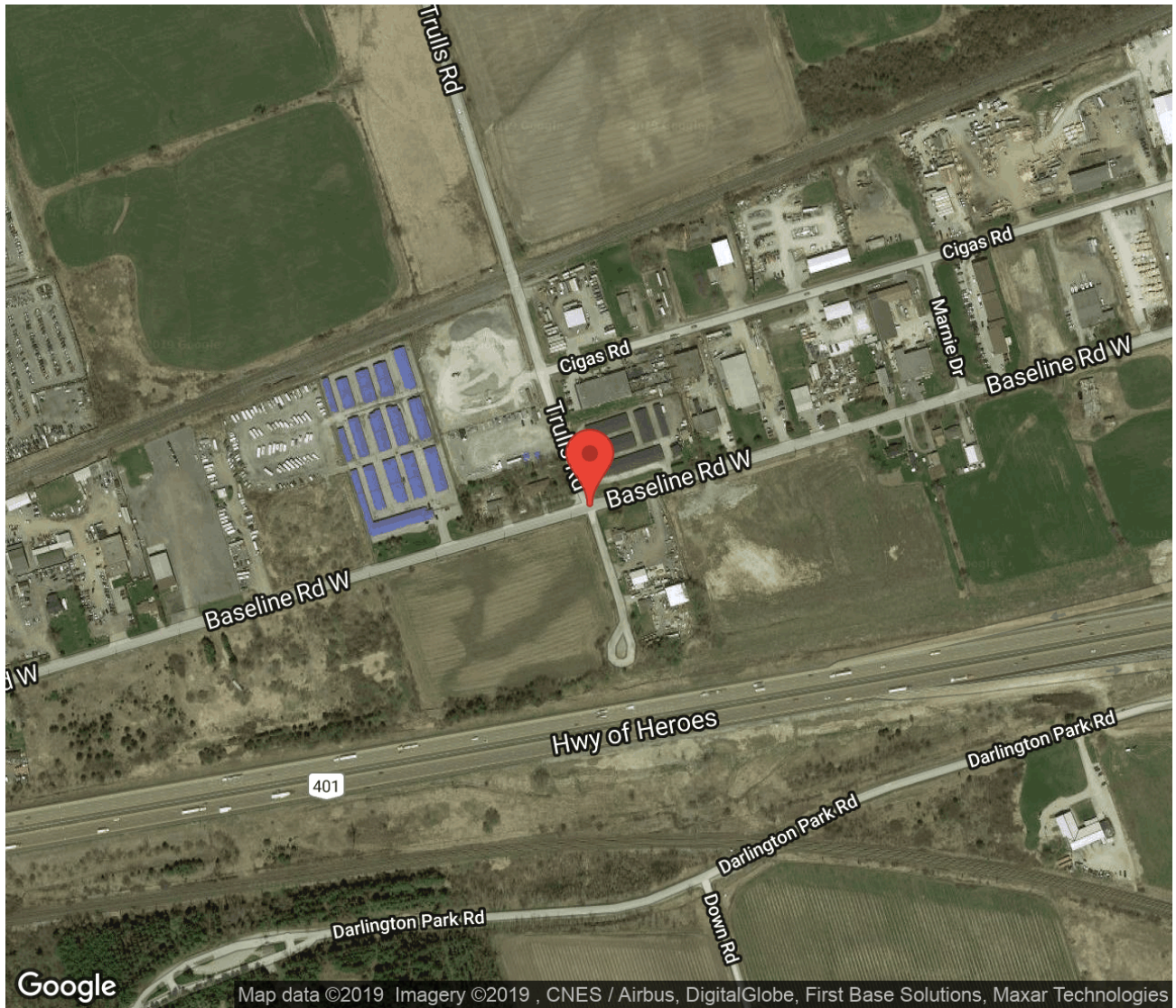
Intersection Count Report

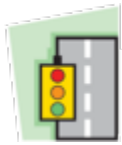
Intersection:	Baseline Rd W & Trulls Rd
Municipality:	Clarington
Count Date:	Jun 25, 2019
Site Code:	1923300001
Count Categories:	Cars, Trucks, Pedestrians
Count Period:	07:30-09:30, 16:00-18:00
Weather:	Clear
Surveyor Name:	Igor Bondarenko



Traffic Count Map

Intersection: Baseline Rd W & Trulls Rd
Municipality: Clarington
Count Date: Jun 25, 2019





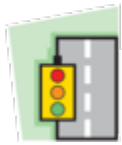
Ontario Traffic Inc.
TRAFFIC MONITORING + SERVICES & PRODUCTS

Traffic Count Summary

Intersection: Baseline Rd W & Trulls Rd
Municipality: Clarington
Count Date: Jun 25, 2019

Baseline Rd W - Traffic Summary

Hour	North Approach Totals						South Approach Totals					
	Includes Cars, Trucks						Includes Cars, Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:30 - 08:00	5	0	3	0	0	0	0	1	1	0	0	0
08:00 - 09:00	12	0	5	0	0	0	0	0	0	0	0	0
09:00 - 10:00	5	0	1	0	0	0	0	0	0	0	0	0
BREAK												
16:00 - 17:00	7	0	5	0	0	1	1	0	1	0	0	1
17:00 - 18:00	6	0	6	0	0	0	0	0	0	0	0	0
GRAND TOTAL	35	0	20	0	0	1	1	1	2	0	0	1



Ontario Traffic Inc.
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Traffic Count Summary

Intersection: Baseline Rd W & Trulls Rd
Municipality: Clarington
Count Date: Jun 25, 2019

Trulls Rd - Traffic Summary

Hour	East Approach Totals						West Approach Totals					
	Includes Cars, Trucks						Includes Cars, Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:30 - 08:00	0	10	8	0	0	0	0	17	0	0	0	2
08:00 - 09:00	0	31	6	0	0	0	2	32	0	0	0	0
09:00 - 10:00	1	21	5	0	0	0	0	15	0	0	0	0
BREAK												
16:00 - 17:00	1	41	6	0	0	0	0	38	0	0	0	1
17:00 - 18:00	1	56	15	0	0	0	4	44	0	0	0	0
GRAND TOTAL	3	159	40	0	0	0	6	146	0	0	0	3

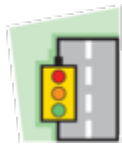


Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

North Approach - Baseline Rd W

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:30	2	0	2	0	4	0	0	0	0	0	0
07:45	3	0	1	0	4	0	0	0	0	0	0
08:00	3	0	1	0	4	1	0	0	0	1	0
08:15	4	0	2	0	6	1	0	0	0	1	0
08:30	2	0	0	0	2	0	0	1	0	1	0
08:45	1	0	1	0	2	0	0	0	0	0	0
09:00	2	0	0	0	2	1	0	0	0	1	0
09:15	1	0	1	0	2	1	0	0	0	1	0
SUBTOTAL	18	0	8	0	26	4	0	1	0	5	0



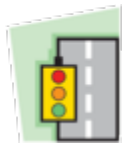
Ontario Traffic Inc.
TRAFFIC MONITORING + SERVICES & PRODUCTS

Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
Municipality: Clarington
Count Date: Jun 25, 2019

North Approach - Baseline Rd W

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	3	0	1	0	4	0	0	1	0	1	0
16:15	0	0	0	0	0	0	0	0	0	0	0
16:30	1	0	1	0	2	1	0	1	0	2	0
16:45	1	0	0	0	1	1	0	1	0	2	1
17:00	0	0	0	0	0	0	0	1	0	1	0
17:15	3	0	2	0	5	0	0	0	0	0	0
17:30	2	0	1	0	3	0	0	0	0	0	0
17:45	0	0	2	0	2	1	0	0	0	1	0
SUBTOTAL	10	0	7	0	17	3	0	4	0	7	1
GRAND TOTAL	28	0	15	0	43	7	0	5	0	12	1



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd

Municipality: Clarington

Count Date: Jun 25, 2019

South Approach - Baseline Rd W

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:30	0	0	0	0	0	0	1	1	0	2	0
07:45	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	0	0	0	0	1	1	0	2	0



Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

South Approach - Baseline Rd W

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	0	0	0	0	0	0	0	0	0	0	1
16:15	0	0	1	0	1	1	0	0	0	1	0
16:30	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	1	0	1	1	0	0	0	1	1
GRAND TOTAL	0	0	1	0	1	1	1	1	0	3	1



Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

East Approach - Trulls Rd

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:30	0	6	3	0	9	0	0	0	0	0	0
07:45	0	4	4	0	8	0	0	1	0	1	0
08:00	0	11	0	0	11	0	0	1	0	1	0
08:15	0	6	0	0	6	0	1	0	0	1	0
08:30	0	4	1	0	5	0	0	1	0	1	0
08:45	0	9	2	0	11	0	0	1	0	1	0
09:00	0	9	1	0	10	0	2	2	0	4	0
09:15	1	10	2	0	13	0	0	0	0	0	0
SUBTOTAL	1	59	13	0	73	0	3	6	0	9	0



Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

East Approach - Trulls Rd

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	0	6	2	0	8	0	1	1	0	2	0
16:15	1	10	0	0	11	0	3	0	0	3	0
16:30	0	9	3	0	12	0	1	0	0	1	0
16:45	0	10	0	0	10	0	1	0	0	1	0
17:00	0	11	5	0	16	1	0	3	0	4	0
17:15	0	17	1	0	18	0	2	0	0	2	0
17:30	0	9	2	0	11	0	1	2	0	3	0
17:45	0	15	1	0	16	0	1	1	0	2	0
SUBTOTAL	1	87	14	0	102	1	10	7	0	18	0
GRAND TOTAL	2	146	27	0	175	1	13	13	0	27	0



Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

West Approach - Trulls Rd

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:30	0	6	0	0	6	0	1	0	0	1	0
07:45	0	8	0	0	8	0	2	0	0	2	2
08:00	0	7	0	0	7	0	0	0	0	0	0
08:15	2	9	0	0	11	0	1	0	0	1	0
08:30	0	8	0	0	8	0	0	0	0	0	0
08:45	0	7	0	0	7	0	0	0	0	0	0
09:00	0	7	0	0	7	0	1	0	0	1	0
09:15	0	6	0	0	6	0	1	0	0	1	0
SUBTOTAL	2	58	0	0	60	0	6	0	0	6	2

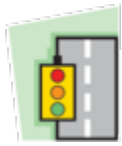


Traffic Count Data

Intersection: Baseline Rd W & Trulls Rd
 Municipality: Clarington
 Count Date: Jun 25, 2019

West Approach - Trulls Rd

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	0	7	0	0	7	0	2	0	0	2	0
16:15	0	7	0	0	7	0	1	0	0	1	0
16:30	0	6	0	0	6	0	3	0	0	3	0
16:45	0	11	0	0	11	0	1	0	0	1	1
17:00	2	9	0	0	11	0	2	0	0	2	0
17:15	1	11	0	0	12	0	0	0	0	0	0
17:30	0	7	0	0	7	0	3	0	0	3	0
17:45	0	10	0	0	10	1	2	0	0	3	0
SUBTOTAL	3	68	0	0	71	1	14	0	0	15	1
GRAND TOTAL	5	126	0	0	131	1	20	0	0	21	3



Peak Hour Diagram

Specified Period

From: 07:30:00
To: 09:30:00

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Baseline Rd W & Trulls Rd
Site ID: 1923300001
Count Date: Jun 25, 2019

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Trulls Rd runs E/W

North Approach

	Out	In	Total
	18	9	27
	2	3	5
Totals	20	12	32

Baseline Rd W

	0	0	2	0
	6	0	12	0
Totals	6	0	14	0

← ↓ → ↻

East Approach

	Out	In	Total
	34	42	76
	3	7	10
Totals	37	49	86

Trulls Rd

		Totals	
0	0	0	↻
0	2	2	↑
4	30	34	→
0	0	0	↓

Peds: 0

Trulls Rd

Totals		
0	0	0
9	7	2
28	27	1
0	0	0

Peds: 2

Peds: 0

Peds: 0

West Approach

	Out	In	Total
	32	33	65
	4	1	5
Totals	36	34	70

Totals	0	1	1	0
	0	0	0	0
	0	1	1	0

← ↑ → ↻

South Approach

	Out	In	Total
	0	0	0
	2	0	2
Totals	2	0	2

Baseline Rd W

- Cars

- Trucks

Comments



Peak Hour Summary

Intersection: Baseline Rd W & Trulls Rd
 Count Date: Jun 25, 2019
 Period: 07:30 - 09:30

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Baseline Rd W						South Approach Baseline Rd W						East Approach Trulls Rd						West Approach Trulls Rd						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:30	2	0	2	0	0	4	0	1	1	0	0	2	0	6	3	0	0	9	0	7	0	0	0	7	22
07:45	3	0	1	0	0	4	0	0	0	0	0	0	0	4	5	0	0	9	0	10	0	0	2	10	23
08:00	4	0	1	0	0	5	0	0	0	0	0	0	0	11	1	0	0	12	0	7	0	0	0	7	24
08:15	5	0	2	0	0	7	0	0	0	0	0	0	0	7	0	0	0	7	2	10	0	0	0	12	26
Grand Total	14	0	6	0	0	20	0	1	1	0	0	2	0	28	9	0	0	37	2	34	0	0	2	36	95
Approach %	70	0	30	0	-	-	0	50	50	0	-	-	0	75.7	24.3	0	-	-	5.6	94.4	0	0	-	-	
Totals %	14.7	0	6.3	0	-	21.1	0	1.1	1.1	0	-	2.1	0	29.5	9.5	0	-	38.9	2.1	35.8	0	0	-	37.9	
PHF	0.7	0	0.75	0	0	0.71	0	0.25	0.25	0	0	0.25	0	0.64	0.45	0	0	0.77	0.25	0.85	0	0	0	0.75	0.91
Cars	12	0	6	0	-	18	0	0	0	0	-	0	0	27	7	0	-	34	2	30	0	0	-	32	84
% Cars	85.7	0	100	0	-	90	0	0	0	0	-	0	0	96.4	77.8	0	-	91.9	100	88.2	0	0	-	88.9	88.4
Trucks	2	0	0	0	-	2	0	1	1	0	-	2	0	1	2	0	-	3	0	4	0	0	-	4	11
% Trucks	14.3	0	0	0	-	10	0	100	100	0	-	100	0	3.6	22.2	0	-	8.1	0	11.8	0	0	-	11.1	11.6
Peds					0	-					0	-					0	-					2	-	2
% Peds					0	-					0	-					0	-					100	-	



Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 17:00:00
To: 18:00:00

Intersection: Baseline Rd W & Trulls Rd
Site ID: 1923300001
Count Date: Jun 25, 2019

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Trulls Rd runs E/W

North Approach

	Out	In	Total
	10	12	22
	2	7	9
Totals	12	19	31

Baseline Rd W

	1	0	1	0
	5	0	5	0
Totals	6	0	6	0

← ↓ ↘ ↻

East Approach

	Out	In	Total
	61	42	103
	11	8	19
Totals	72	50	122

Trulls Rd

		Totals	
0	0	0	↻
1	3	4	↑
7	37	44	→
0	0	0	↓

Peds: 0

Trulls Rd

Totals		
0	0	0
15	9	6
56	52	4
1	0	1

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
	40	57	97
	8	5	13
Totals	48	62	110

Totals	0	0	0	0
	0	0	0	0
	0	0	0	0

← ↑ → ↻

South Approach

	Out	In	Total
	0	0	0
	0	1	1
Totals	0	1	1

Baseline Rd W

- Cars

- Trucks

Comments



Peak Hour Summary

Intersection: Baseline Rd W & Trulls Rd
 Count Date: Jun 25, 2019
 Period: 16:00 - 18:00

Peak Hour Data (17:00 - 18:00)

Start Time	North Approach Baseline Rd W						South Approach Baseline Rd W						East Approach Trulls Rd						West Approach Trulls Rd						Total Vehicl es
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
17:00	0	0	1	0	0	1	0	0	0	0	0	0	1	11	8	0	0	20	2	11	0	0	0	13	34
17:15	3	0	2	0	0	5	0	0	0	0	0	0	0	19	1	0	0	20	1	11	0	0	0	12	37
17:30	2	0	1	0	0	3	0	0	0	0	0	0	0	10	4	0	0	14	0	10	0	0	0	10	27
17:45	1	0	2	0	0	3	0	0	0	0	0	0	0	16	2	0	0	18	1	12	0	0	0	13	34
Grand Total	6	0	6	0	0	12	0	0	0	0	0	0	1	56	15	0	0	72	4	44	0	0	0	48	132
Approach %	50	0	50	0	-	-	0	0	0	0	-	-	1.4	77.8	20.8	0	-	8.3	91.7	0	0	-	-		
Totals %	4.5	0	4.5	0	-	9.1	0	0	0	0	-	0	0.8	42.4	11.4	0	54.5	3	33.3	0	0	-	36.4		
PHF	0.5	0	0.75	0	0	0.6	0	0	0	0	0	0	0.25	0.74	0.47	0	0.9	0.5	0.92	0	0	0	0.92	0.89	
Cars	5	0	5	0	-	10	0	0	0	0	-	0	0	52	9	0	61	3	37	0	0	-	40	111	
% Cars	83.3	0	83.3	0	-	83.3	0	0	0	0	-	0	0	92.9	60	0	84.7	75	84.1	0	0	-	83.3	84.1	
Trucks	1	0	1	0	-	2	0	0	0	0	-	0	1	4	6	0	11	1	7	0	0	-	8	21	
% Trucks	16.7	0	16.7	0	-	16.7	0	0	0	0	-	0	100	7.1	40	0	15.3	25	15.9	0	0	-	16.7	15.9	
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic, Inc.
 17705 Leslie St., Unit 6
 Newmarket, Ontario L3Y 3E3
 Tel: (905) 898-7711 Fax: (905) 898-3664

Site Code: 1
 Station ID: M3
 Baseline Rd W 200m east of Prestonvale Rd
 Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

EB

Start Time	15	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
06/25/1																		
9	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	80	80
01:00	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	56	57
02:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	64	64
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	2	0	1	3	0	0	0	0	0	6	72	81
05:00	0	0	0	0	0	1	3	8	6	5	0	0	0	0	0	23	71	81
06:00	0	1	1	0	0	2	4	10	16	3	3	0	0	0	0	40	71	79
07:00	0	0	0	0	0	0	3	9	12	9	2	1	0	0	0	36	76	86
08:00	0	0	2	0	0	0	1	9	13	5	3	0	0	0	0	33	72	82
09:00	1	0	0	0	2	1	4	4	10	10	5	2	0	0	0	39	75	89
10:00	0	0	0	1	0	0	5	6	7	3	0	0	0	0	0	22	69	78
11:00	0	0	1	0	0	2	3	4	7	5	0	0	0	0	0	22	70	81
12 PM	0	0	0	0	1	0	4	10	10	5	3	0	0	1	0	34	74	83
13:00	0	0	0	0	0	1	5	9	8	2	0	0	0	0	0	25	69	77
14:00	0	0	0	0	0	1	4	5	8	2	1	1	1	0	0	23	75	81
15:00	0	0	1	0	0	0	4	2	8	4	1	1	0	0	0	21	72	82
16:00	0	0	0	1	0	1	2	5	9	7	1	0	0	0	0	26	73	83
17:00	0	0	0	0	0	1	7	10	14	10	2	1	0	0	0	45	74	84
18:00	0	0	2	0	0	0	1	6	12	6	2	0	1	0	0	30	73	83
19:00	0	0	0	1	0	4	5	8	7	1	0	0	1	0	0	27	67	76
20:00	0	0	0	1	1	0	1	13	6	6	1	0	0	0	0	29	71	82
21:00	0	0	0	0	0	1	6	6	4	5	1	0	0	0	0	23	71	82
22:00	0	0	0	0	0	1	0	6	3	0	0	0	0	0	0	10	67	72
23:00	0	0	0	0	0	0	1	3	1	0	0	1	0	0	0	6	71	72
Total	1	1	7	4	4	17	67	134	163	92	25	7	3	1	0	526		
Percent	0.2%	0.2%	1.3%	0.8%	0.8%	3.2%	12.7%	25.5%	31.0%	17.5%	4.8%	1.3%	0.6%	0.2%	0.0%			
AM Peak	09:00	06:00	08:00	10:00	09:00	06:00	10:00	06:00	06:00	09:00	09:00	09:00						
Vol.	1	1	2	1	2	2	5	10	16	10	5	2						
PM Peak			18:00	16:00	12:00	19:00	17:00	20:00	17:00	17:00	12:00	14:00	14:00	12:00				
Vol.			2	1	1	4	7	13	14	10	3	1	1	1				

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Site Code: 1
 Station ID: M3
 Baseline Rd W 200m east of Prestonvale Rd

Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

EB

Start Time	1	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
06/26/1																		
9	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	72	72
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	64	64
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4	72	80
05:00	0	0	0	0	0	1	2	4	3	4	2	0	0	0	0	16	74	83
06:00	0	1	0	0	0	1	3	13	13	5	2	0	0	0	0	38	71	80
07:00	0	0	0	0	0	0	4	15	23	7	1	0	0	0	0	50	73	79
08:00	0	0	0	0	0	0	5	9	21	4	0	1	0	0	0	40	73	79
09:00	0	0	0	0	0	1	2	7	8	7	2	0	0	0	0	27	75	84
10:00	0	0	0	0	0	0	8	10	11	1	0	1	0	0	0	31	70	76
11:00	0	0	0	0	0	2	2	6	8	3	1	0	0	0	0	22	72	80
12 PM	0	0	0	0	0	0	4	18	12	1	0	0	0	0	0	35	70	75
13:00	0	0	0	0	1	0	4	8	5	2	1	0	0	0	0	21	69	76
14:00	0	0	0	0	0	0	6	7	6	5	1	0	0	0	0	25	71	81
15:00	0	0	0	0	1	0	3	3	10	5	2	2	0	0	0	26	76	84
16:00	0	0	0	0	0	0	2	10	12	8	2	0	0	0	0	34	75	84
17:00	0	0	0	1	1	2	8	6	11	6	2	0	1	0	0	38	71	82
18:00	0	1	0	0	0	1	2	4	7	4	1	1	1	0	0	22	74	83
19:00	0	0	0	0	0	0	7	3	4	2	0	1	0	0	0	17	69	75
20:00	0	0	0	0	0	0	2	6	7	2	1	0	0	0	0	18	73	78
21:00	0	0	0	0	0	3	2	2	2	1	1	0	0	1	0	12	71	88
22:00	0	0	0	0	0	2	2	3	1	0	0	0	0	0	0	8	63	66
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	0	2	0	1	3	13	69	136	165	69	19	6	2	1	0	486		
Percent	0.0%	0.4%	0.0%	0.2%	0.6%	2.7%	14.2%	28.0%	34.0%	14.2%	3.9%	1.2%	0.4%	0.2%	0.0%			
AM Peak		06:00					11:00	10:00	07:00	07:00	07:00	05:00	08:00					
Vol.		1					2	8	15	23	7	2	1					
PM Peak		18:00		17:00	13:00	21:00	17:00	12:00	12:00	16:00	15:00	15:00	17:00	21:00				
Vol.		1		1	1	3	8	18	12	8	2	2	1	1				
Total	1	3	7	5	7	30	136	270	328	161	44	13	5	2	0	1012		

15th Percentile : 61 KPH
 50th Percentile : 73 KPH
 85th Percentile : 84 KPH
 95th Percentile : 91 KPH

Stats
 10 KPH Pace Speed : 70-79 KPH
 Number in Pace : 396
 Percent in Pace : 39.1%
 Number of Vehicles > 60 KPH : 874
 Percent of Vehicles > 60 KPH : 86.4%
 Mean Speed(Average) : 72 KPH

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Site Code: 1
 Station ID: M3
 Baseline Rd W 200m east of Prestonvale Rd
 Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

WB	Start Time	1	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
06/25/1	9	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	5	73	73
	01:00	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	4	65	71
	02:00	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	4	78	81
	03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	48	48
	04:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2	72	80
	05:00	0	0	0	0	1	0	6	1	1	0	0	0	0	0	0	9	59	71
	06:00	0	0	0	0	0	1	2	4	2	1	0	0	0	0	0	10	67	72
	07:00	0	0	0	1	1	1	6	3	6	1	0	0	0	0	0	19	65	75
	08:00	0	0	0	0	2	7	6	4	5	1	1	0	0	0	0	26	63	74
	09:00	0	1	0	1	2	2	2	13	8	5	2	0	1	0	0	37	69	81
	10:00	0	0	2	0	1	8	7	9	6	1	1	0	0	0	0	35	62	74
	11:00	1	0	0	0	2	6	10	18	15	4	0	0	0	0	0	56	66	77
	12 PM	0	0	1	1	0	3	12	15	9	3	1	0	0	0	0	45	66	76
	13:00	0	0	0	0	2	4	8	14	8	4	1	0	0	0	0	41	67	78
	14:00	1	0	0	0	0	7	9	13	10	5	0	0	1	0	0	46	66	78
	15:00	1	1	0	3	2	7	16	12	22	3	3	1	0	0	0	71	65	77
	16:00	0	0	0	0	0	4	7	17	16	10	2	1	0	0	0	57	72	82
	17:00	0	0	0	0	1	4	11	24	26	6	3	0	1	0	0	76	71	79
	18:00	0	0	0	0	0	1	6	14	13	6	1	1	0	0	0	42	72	81
	19:00	1	1	0	4	3	6	8	10	3	0	0	1	1	0	0	38	58	70
	20:00	0	0	1	0	0	6	8	8	9	5	1	1	0	0	0	39	68	80
	21:00	0	2	0	0	2	4	6	4	7	3	0	0	0	0	0	28	62	77
	22:00	0	0	0	0	0	2	10	9	0	1	0	0	0	0	0	22	63	69
	23:00	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	5	70	79
	Total	4	5	4	10	19	75	143	198	170	64	16	6	4	0	0	718		
	Percent	0.6%	0.7%	0.6%	1.4%	2.6%	10.4%	19.9%	27.6%	23.7%	8.9%	2.2%	0.8%	0.6%	0.0%	0.0%			
	AM Peak	11:00	09:00	10:00	07:00	08:00	10:00	11:00	11:00	11:00	09:00	09:00	02:00	09:00					
	Vol.	1	1	2	1	2	8	10	18	15	5	2	1	1					
	PM Peak	14:00	21:00	12:00	19:00	19:00	14:00	15:00	17:00	17:00	16:00	15:00	15:00	14:00					
	Vol.	1	2	1	4	3	7	16	24	26	10	3	1	1					

Ontario Traffic, Inc.
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Site Code: 1
 Station ID: M3
 Baseline Rd W 200m east of Prestonvale Rd

Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

WB

Start Time	1	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
06/26/1																		
9	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	6	66	79
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	40	41
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2	64	72
05:00	0	0	0	0	1	2	2	2	1	0	0	0	0	0	0	8	60	65
06:00	0	0	0	0	0	0	6	4	3	0	2	0	0	0	0	15	67	74
07:00	0	0	0	0	0	5	4	8	8	6	0	0	0	0	0	31	69	80
08:00	0	0	0	0	2	2	7	3	11	3	1	1	0	0	0	30	69	79
09:00	0	0	0	0	1	2	6	14	6	1	0	0	0	0	0	30	66	73
10:00	0	0	0	1	0	2	8	11	5	0	0	0	0	0	0	27	64	72
11:00	1	0	1	0	0	2	7	11	12	5	3	0	1	0	0	43	69	82
12 PM	0	0	0	1	0	5	14	12	15	5	0	0	0	0	0	52	67	77
13:00	0	0	0	0	4	3	7	5	10	5	0	0	0	0	0	34	66	79
14:00	0	0	0	1	0	3	9	13	18	4	3	1	0	0	0	52	70	79
15:00	0	0	0	1	0	2	16	16	29	7	5	0	0	0	0	76	71	80
16:00	0	0	0	0	0	0	19	22	23	7	2	0	0	1	0	74	71	79
17:00	0	1	0	0	1	5	24	25	43	11	1	1	0	0	0	112	70	79
18:00	0	0	0	0	0	1	8	14	5	3	3	1	0	0	0	35	71	87
19:00	0	0	0	0	1	2	11	11	5	5	0	1	0	0	0	36	68	80
20:00	0	0	0	0	0	4	8	16	11	1	1	1	0	0	0	42	68	76
21:00	0	0	1	1	0	2	5	10	5	1	0	0	0	0	0	25	64	73
22:00	0	0	0	0	1	0	9	14	8	4	0	0	0	0	0	36	68	78
23:00	0	0	0	0	0	1	2	4	6	1	0	0	0	0	0	14	70	76
Total	1	1	2	5	14	44	174	216	226	70	21	6	1	1	0	782		
Percent	0.1%	0.1%	0.3%	0.6%	1.8%	5.6%	22.3%	27.6%	28.9%	9.0%	2.7%	0.8%	0.1%	0.1%	0.0%			
AM Peak	11:00		11:00	10:00	02:00	07:00	10:00	09:00	11:00	07:00	11:00	08:00	11:00					
Vol.	1		1	1	2	5	8	14	12	6	3	1	1					
PM Peak		17:00	21:00	12:00	13:00	12:00	17:00	17:00	17:00	17:00	15:00	14:00		16:00				
Vol.		1	1	1	4	5	24	25	43	11	5	1		1				
Total	5	6	6	15	33	119	317	414	396	134	37	12	5	1	0	1500		

15th Percentile : 57 KPH
 50th Percentile : 68 KPH
 85th Percentile : 79 KPH
 95th Percentile : 87 KPH

Stats
 10 KPH Pace Speed : 64-73 KPH
 Number in Pace : 514
 Percent in Pace : 34.3%
 Number of Vehicles > 60 KPH : 1119
 Percent of Vehicles > 60 KPH : 74.6%
 Mean Speed(Average) : 68 KPH

Ontario Traffic, Inc.
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Site Code: 1
 Station ID: M3
 Baseline Rd W 200m east of Prestonvale Rd
 Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

EB, WB	1	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
Start Time	15	23	31	39	47	55	63	71	79	88	96	104	112	120	9999			
06/25/1																		
9	0	0	0	0	0	0	0	2	3	2	0	0	0	0	0	7	74	80
01:00	0	0	0	0	0	2	3	1	1	0	0	0	0	0	0	7	60	71
02:00	0	0	0	0	0	0	1	1	0	2	0	1	0	0	0	5	77	81
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	48	48
04:00	0	0	0	0	0	0	2	1	1	4	0	0	0	0	0	8	74	82
05:00	0	0	0	0	1	1	9	9	7	5	0	0	0	0	0	32	68	78
06:00	0	1	1	0	0	3	6	14	18	4	3	0	0	0	0	50	69	79
07:00	0	0	0	1	1	1	9	12	18	10	2	1	0	0	0	55	72	83
08:00	0	0	2	0	2	7	7	13	18	6	4	0	0	0	0	59	68	80
09:00	1	1	0	1	4	3	6	17	18	15	7	2	1	0	0	76	72	87
10:00	0	0	2	1	1	8	12	15	13	4	1	0	0	0	0	57	64	76
11:00	1	0	1	0	2	8	13	22	22	9	0	0	0	0	0	78	67	78
12 PM	0	0	1	1	1	3	16	25	19	8	4	0	0	1	0	79	69	80
13:00	0	0	0	0	2	5	13	23	16	6	1	0	0	0	0	66	68	78
14:00	1	0	0	0	0	8	13	18	18	7	1	1	2	0	0	69	69	80
15:00	1	1	1	3	2	7	20	14	30	7	4	2	0	0	0	92	67	79
16:00	0	0	0	1	0	5	9	22	25	17	3	1	0	0	0	83	72	84
17:00	0	0	0	0	1	5	18	34	40	16	5	1	1	0	0	121	72	82
18:00	0	0	2	0	0	1	7	20	25	12	3	1	1	0	0	72	73	82
19:00	1	1	0	5	3	10	13	18	10	1	0	1	2	0	0	65	61	73
20:00	0	0	1	1	1	6	9	21	15	11	2	1	0	0	0	68	69	81
21:00	0	2	0	0	2	5	12	10	11	8	1	0	0	0	0	51	66	80
22:00	0	0	0	0	0	3	10	15	3	1	0	0	0	0	0	32	65	70
23:00	0	0	0	0	0	0	2	5	2	1	0	1	0	0	0	11	71	73
Total	5	6	11	14	23	92	210	332	333	156	41	13	7	1	0	1244		
Percent	0.4%	0.5%	0.9%	1.1%	1.8%	7.4%	16.9%	26.7%	26.8%	12.5%	3.3%	1.0%	0.6%	0.1%	0.0%			
AM Peak	09:00	06:00	08:00	07:00	09:00	10:00	11:00	11:00	11:00	09:00	09:00	09:00	09:00					
Vol.	1	1	2	1	4	8	13	22	22	15	7	2	1					
PM Peak	14:00	21:00	18:00	19:00	19:00	19:00	15:00	17:00	17:00	16:00	17:00	15:00	14:00	12:00				
Vol.	1	2	2	5	3	10	20	34	40	17	5	2	2	1				

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 Date Start: 25-Jun-19
 Date End: 26-Jun-19
 Date Start: 25-Jun-19

EB, WB	1	16	24	32	40	48	56	64	72	80	89	97	105	113	121	Total	Average (Mean)	85th Percent
Start Time	15	23	31	39	47	55	63	71	79	88	96	104	112	120	9999			
06/26/1																		
9	0	0	0	0	1	1	1	1	2	1	0	0	0	0	0	7	66	73
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	3	48	64
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	2	1	1	2	0	0	0	0	0	6	71	80
05:00	0	0	0	0	1	3	4	6	4	4	2	0	0	0	0	24	70	81
06:00	0	1	0	0	0	1	9	17	16	5	4	0	0	0	0	53	70	80
07:00	0	0	0	0	0	5	8	23	31	13	1	0	0	0	0	81	72	80
08:00	0	0	0	0	2	2	12	12	32	7	1	2	0	0	0	70	72	79
09:00	0	0	0	0	1	3	8	21	14	8	2	0	0	0	0	57	70	80
10:00	0	0	0	1	0	2	16	21	16	1	0	1	0	0	0	58	67	76
11:00	1	0	1	0	0	4	9	17	20	8	4	0	1	0	0	65	70	82
12 PM	0	0	0	1	0	5	18	30	27	6	0	0	0	0	0	87	68	77
13:00	0	0	0	0	5	3	11	13	15	7	1	0	0	0	0	55	68	79
14:00	0	0	0	1	0	3	15	20	24	9	4	1	0	0	0	77	71	81
15:00	0	0	0	1	1	2	19	19	39	12	7	2	0	0	0	102	73	82
16:00	0	0	0	0	0	0	21	32	35	15	4	0	0	1	0	108	72	81
17:00	0	1	0	1	2	7	32	31	54	17	3	1	1	0	0	150	70	79
18:00	0	1	0	0	0	2	10	18	12	7	4	2	1	0	0	57	72	84
19:00	0	0	0	0	1	2	18	14	9	7	0	2	0	0	0	53	68	80
20:00	0	0	0	0	0	4	10	22	18	3	2	1	0	0	0	60	69	78
21:00	0	0	1	1	0	5	7	12	7	2	1	0	0	1	0	37	66	76
22:00	0	0	0	0	1	2	11	17	9	4	0	0	0	0	0	44	67	76
23:00	0	0	0	0	0	1	2	4	6	1	0	0	0	0	0	14	70	76
Total	1	3	2	6	17	57	243	352	391	139	40	12	3	2	0	1268		
Percent	0.1%	0.2%	0.2%	0.5%	1.3%	4.5%	19.2%	27.8%	30.8%	11.0%	3.2%	0.9%	0.2%	0.2%	0.0%			
AM Peak	11:00	06:00	11:00	10:00	02:00	07:00	10:00	07:00	08:00	07:00	06:00	08:00	11:00					
Vol.	1	1	1	1	2	5	16	23	32	13	4	2	1					
PM Peak		17:00	21:00	12:00	13:00	17:00	17:00	16:00	17:00	17:00	15:00	15:00	17:00	16:00				
Vol.		1	1	1	5	7	32	32	54	17	7	2	1	1				
Total	6	9	13	20	40	149	453	684	724	295	81	25	10	3	0	2512		

15th Percentile : 58 KPH
 50th Percentile : 70 KPH
 85th Percentile : 81 KPH
 95th Percentile : 88 KPH

Stats 10 KPH Pace Speed : 70-79 KPH
 Number in Pace : 896
 Percent in Pace : 35.7%
 Number of Vehicles > 60 KPH : 1993
 Percent of Vehicles > 60 KPH : 79.3%
 Mean Speed(Average) : 70 KPH

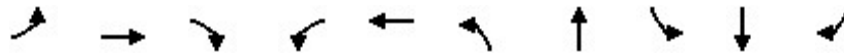
B

Appendix B: Existing Conditions Synchro Output Data

If you require this information to be in an accessible format, please contact the Municipality's Accessibility Coordinator at 905-623-3379 ext. 2131.

Lanes, Volumes, Timings
1: Townline Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	43	164	36	14	332	104	87	15	21	98
Future Volume (vph)	43	164	36	14	332	104	87	15	21	98
Lane Group Flow (vph)	45	173	38	15	397	109	121	16	22	103
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2			6		8		4	
Permitted Phases	2		2	6		8		4		4
Detector Phase	2	2	2	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	33.0	33.0	33.0	33.0	33.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	33.6	33.6	33.6	33.6	33.6	36.4	36.4	36.4	36.4	36.4
Total Split (%)	48.0%	48.0%	48.0%	48.0%	48.0%	52.0%	52.0%	52.0%	52.0%	52.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.8	3.8	3.8	3.8	3.8
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.9
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	51.8	51.8	51.8	51.8	51.8	14.0	14.0	14.0	14.0	14.0
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.07	0.13	0.03	0.02	0.31	0.42	0.33	0.07	0.06	0.27
Control Delay	4.9	4.6	1.4	5.9	5.9	28.5	20.0	21.3	21.1	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	4.6	1.4	5.9	5.9	28.5	20.0	21.3	21.1	6.9
LOS	A	A	A	A	A	C	B	C	C	A
Approach Delay		4.2			5.9		24.0		10.8	
Approach LOS		A			A		C		B	
Queue Length 50th (m)	1.6	6.6	0.0	0.5	15.2	13.3	10.9	1.8	2.5	0.0
Queue Length 95th (m)	5.9	16.3	2.4	m2.8	34.5	25.0	22.4	6.0	7.2	10.5
Internal Link Dist (m)		272.5			655.7		231.9		201.0	
Turn Bay Length (m)	35.0		75.0	60.0		40.0		35.0		60.0
Base Capacity (vph)	664	1304	1122	845	1284	608	805	545	819	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.13	0.03	0.02	0.31	0.18	0.15	0.03	0.03	0.14

Intersection Summary

Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0.7 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 56.6%	ICU Level of Service B
Analysis Period (min) 15	

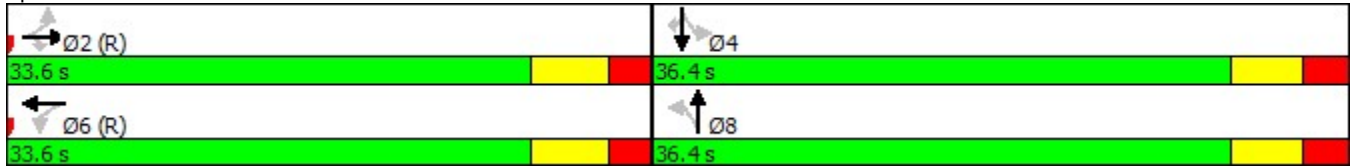
Lanes, Volumes, Timings

1: Townline Road & Bloor Street

03/16/2020

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

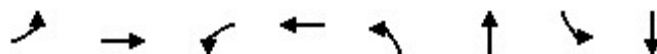
Splits and Phases: 1: Townline Road & Bloor Street



Lanes, Volumes, Timings

2: Rosswell Road/Meadowglade Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	52	138	42	165	57	105	17	14
Future Volume (vph)	52	138	42	165	57	105	17	14
Lane Group Flow (vph)	55	174	44	199	60	185	18	137
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		4		8
Permitted Phases	2		6		4		8	
Detector Phase	2	2	6	6	4	4	8	8
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	29.0	29.0	29.0	29.0	27.0	27.0	27.0	27.0
Total Split (s)	31.5	31.5	31.5	31.5	38.5	38.5	38.5	38.5
Total Split (%)	45.0%	45.0%	45.0%	45.0%	55.0%	55.0%	55.0%	55.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.4	-2.4	-2.4	-2.4	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	27.5	27.5	27.5	27.5	34.6	34.6	34.6	34.6
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.49	0.49	0.49	0.49
v/c Ratio	0.13	0.25	0.10	0.29	0.10	0.22	0.03	0.17
Control Delay	12.4	11.7	13.0	14.0	10.1	7.0	9.4	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	11.7	13.0	14.0	10.1	7.0	9.4	3.2
LOS	B	B	B	B	B	A	A	A
Approach Delay		11.9		13.9		7.8		3.9
Approach LOS		B		B		A		A
Queue Length 50th (m)	4.6	12.8	4.2	18.8	4.1	8.2	1.2	1.0
Queue Length 95th (m)	10.1	22.8	11.1	34.6	10.1	18.6	4.2	9.0
Internal Link Dist (m)		655.7		365.9		97.0		199.8
Turn Bay Length (m)	30.0		30.0		30.0		30.0	
Base Capacity (vph)	418	686	439	687	583	854	556	816
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.10	0.29	0.10	0.22	0.03	0.17

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 20.3 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.29

Intersection Signal Delay: 9.9

Intersection LOS: A

Intersection Capacity Utilization 63.7%

ICU Level of Service B

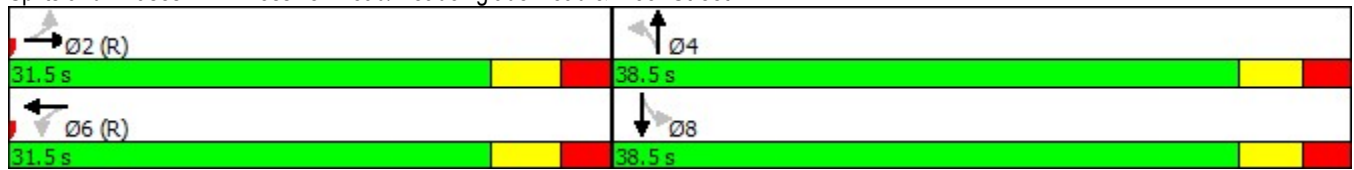
Analysis Period (min) 15

Lanes, Volumes, Timings

2: Rosswell Road/Meadowglade Road & Bloor Street

03/16/2020

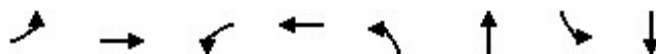
Splits and Phases: 2: Rosswell Road/Meadowglade Road & Bloor Street



Lanes, Volumes, Timings

3: Prestonvale Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	21	211	26	198	16	27	65	36
Future Volume (vph)	21	211	26	198	16	27	65	36
Lane Group Flow (vph)	22	238	27	253	17	69	68	57
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	28.0	24.0	24.0	24.0	24.0
Total Split (s)	44.8	44.8	44.8	44.8	25.2	25.2	25.2	25.2
Total Split (%)	64.0%	64.0%	64.0%	64.0%	36.0%	36.0%	36.0%	36.0%
Yellow Time (s)	4.9	4.9	4.9	4.9	3.8	3.8	3.8	3.8
All-Red Time (s)	1.6	1.6	1.6	1.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-2.2	-2.2	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4
Total Lost Time (s)	4.3	4.3	4.2	4.2	3.7	3.7	3.7	3.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	53.5	53.5	53.5	53.5	12.2	12.2	12.2	12.2
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.17	0.17	0.17	0.17
v/c Ratio	0.03	0.18	0.03	0.19	0.08	0.22	0.31	0.19
Control Delay	2.0	2.3	3.7	3.6	23.7	14.3	28.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	2.3	3.7	3.6	23.7	14.3	28.5	18.9
LOS	A	A	A	A	C	B	C	B
Approach Delay		2.3		3.6		16.1		24.1
Approach LOS		A		A		B		C
Queue Length 50th (m)	0.3	3.6	0.8	7.8	2.0	3.3	8.4	4.5
Queue Length 95th (m)	1.2	6.5	3.3	18.4	6.7	12.6	18.2	12.9
Internal Link Dist (m)		365.9		1040.0		384.9		233.8
Turn Bay Length (m)	35.0		25.0		30.0		30.0	
Base Capacity (vph)	811	1336	824	1319	390	522	385	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.18	0.03	0.19	0.04	0.13	0.18	0.11

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 58.1 (83%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.31

Intersection Signal Delay: 8.0

Intersection LOS: A

Intersection Capacity Utilization 40.1%

ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings
3: Prestonvale Road & Bloor Street

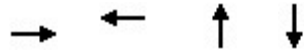
03/16/2020

Splits and Phases: 3: Prestonvale Road & Bloor Street



Lanes, Volumes, Timings
 4: Trulls Road & Bloor Street

03/16/2020



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	194	204	8	19
Future Volume (vph)	194	204	8	19
Lane Group Flow (vph)	276	274	15	181
Sign Control	Free	Free	Stop	Stop

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 56.4%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis

4: Trulls Road & Bloor Street

03/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	62	194	7	2	204	54	5	8	2	89	19	64
Future Volume (Veh/h)	62	194	7	2	204	54	5	8	2	89	19	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	65	204	7	2	215	57	5	8	2	94	20	67
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	272			211			662	614	208	591	588	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			211			662	614	208	591	588	244
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			98	98	100	76	95	92
cM capacity (veh/h)	1291			1360			318	386	833	395	399	795
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	276	274	15	181								
Volume Left	65	2	5	94								
Volume Right	7	57	2	67								
cSH	1291	1360	386	486								
Volume to Capacity	0.05	0.00	0.04	0.37								
Queue Length 95th (m)	1.3	0.0	1.0	13.6								
Control Delay (s)	2.2	0.1	14.7	16.7								
Lane LOS	A	A	B	C								
Approach Delay (s)	2.2	0.1	14.7	16.7								
Approach LOS			B	C								
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			56.4%	ICU Level of Service						B		
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Courtice Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	94	129	32	107	68	183	19	33	355	81
Future Volume (vph)	94	129	32	107	68	183	19	33	355	81
Lane Group Flow (vph)	99	265	34	151	72	193	20	35	374	85
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	25.0	25.0	25.0	25.0	25.0	25.0
Minimum Split (s)	27.1	27.1	27.1	27.1	32.4	32.4	32.4	32.4	32.4	32.4
Total Split (s)	37.1	37.1	37.1	37.1	42.4	42.4	42.4	42.4	42.4	42.4
Total Split (%)	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	5.4	5.4	5.4	5.4	5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	1.7	1.7	1.7	1.7	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.1	-2.1	-2.3	-2.3	-2.5	-2.5	-2.5	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	4.8	4.8	4.9	4.9	4.9	5.2	5.2	5.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	18.9	18.9	19.1	19.1	37.7	37.7	37.7	37.4	37.4	37.4
Actuated g/C Ratio	0.28	0.28	0.29	0.29	0.57	0.57	0.57	0.56	0.56	0.56
v/c Ratio	0.30	0.51	0.14	0.30	0.14	0.19	0.02	0.06	0.38	0.10
Control Delay	20.7	17.7	18.2	16.3	9.2	8.7	0.4	8.5	10.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	17.7	18.2	16.3	9.2	8.7	0.4	8.5	10.5	3.7
LOS	C	B	B	B	A	A	A	A	B	A
Approach Delay		18.5		16.7		8.2			9.2	
Approach LOS		B		B		A			A	
Queue Length 50th (m)	10.0	20.1	3.3	12.4	3.8	10.5	0.0	1.8	23.3	0.8
Queue Length 95th (m)	21.1	39.8	9.3	25.2	12.5	26.2	0.6	7.0	52.7	7.6
Internal Link Dist (m)		773.1		785.8		1514.9			436.6	
Turn Bay Length (m)	35.0		30.0		50.0		20.0	60.0		20.0
Base Capacity (vph)	565	830	426	841	503	999	873	630	991	872
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.32	0.08	0.18	0.14	0.19	0.02	0.06	0.38	0.10

Intersection Summary

Cycle Length: 79.5

Actuated Cycle Length: 66.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 12.6

Intersection LOS: B

Intersection Capacity Utilization 83.4%

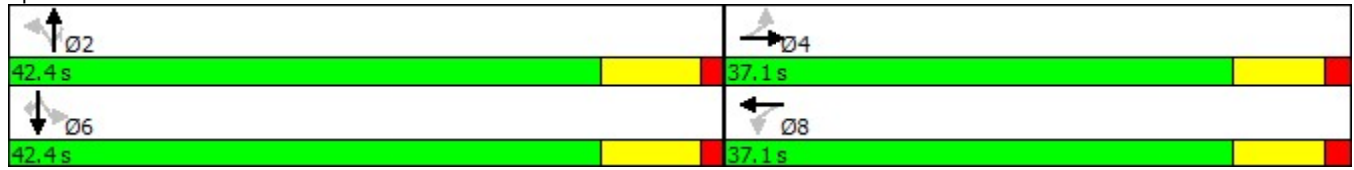
ICU Level of Service E

Analysis Period (min) 15

Lanes, Volumes, Timings
5: Courtice Road & Bloor Street

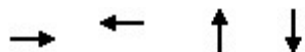
03/16/2020

Splits and Phases: 5: Courtice Road & Bloor Street



Lanes, Volumes, Timings
 6: Trulls Road & Baseline Road

03/16/2020



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	34	28	1	0
Future Volume (vph)	34	28	1	0
Lane Group Flow (vph)	38	38	2	21
Sign Control	Free	Free	Stop	Stop

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 18.2% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

6: Trulls Road & Baseline Road

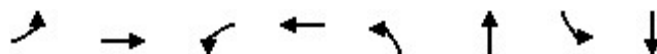
03/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	34	0	0	28	9	0	1	1	14	0	6
Future Volume (Veh/h)	2	34	0	0	28	9	0	1	1	14	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	36	0	0	29	9	0	1	1	15	0	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	38			36			80	78	36	75	74	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	38			36			80	78	36	75	74	34
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	98	100	99
cM capacity (veh/h)	1572			1575			903	811	1037	912	816	1040
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	38	38	2	21								
Volume Left	2	0	0	15								
Volume Right	0	9	1	6								
cSH	1572	1575	910	945								
Volume to Capacity	0.00	0.00	0.00	0.02								
Queue Length 95th (m)	0.0	0.0	0.1	0.5								
Control Delay (s)	0.4	0.0	9.0	8.9								
Lane LOS	A		A	A								
Approach Delay (s)	0.4	0.0	9.0	8.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			18.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
7: Courtice Road & Baseline Road

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	27	39	35	89	300	25	530
Future Volume (vph)	2	27	39	35	89	300	25	530
Lane Group Flow (vph)	2	108	41	65	94	356	26	578
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	12.0	12.0	12.0	12.0	15.0	15.0	15.0	15.0
Minimum Split (s)	21.0	21.0	21.0	21.0	23.0	23.0	23.0	23.0
Total Split (s)	28.3	28.3	28.3	28.3	42.3	42.3	42.3	42.3
Total Split (%)	40.1%	40.1%	40.1%	40.1%	59.9%	59.9%	59.9%	59.9%
Yellow Time (s)	6.7	6.7	6.7	6.7	5.8	5.8	5.8	5.8
All-Red Time (s)	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.1	-2.1	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Total Lost Time (s)	6.2	6.2	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	14.4	14.4	14.7	14.7	28.8	28.8	28.8	28.8
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.60	0.60	0.60	0.60
v/c Ratio	0.01	0.21	0.11	0.12	0.25	0.34	0.05	0.55
Control Delay	16.0	8.2	16.4	11.3	9.4	8.1	6.4	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	8.2	16.4	11.3	9.4	8.1	6.4	11.0
LOS	B	A	B	B	A	A	A	B
Approach Delay		8.3		13.2		8.4		10.8
Approach LOS		A		B		A		B
Queue Length 50th (m)	0.1	1.8	2.6	2.3	4.8	18.3	1.2	36.7
Queue Length 95th (m)	1.6	13.1	10.5	11.5	12.4	32.4	3.9	62.5
Internal Link Dist (m)		802.4		231.2		220.3		278.4
Turn Bay Length (m)	30.0		30.0		30.0		30.0	
Base Capacity (vph)	592	779	574	796	496	1378	751	1393
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.14	0.07	0.08	0.19	0.26	0.03	0.41

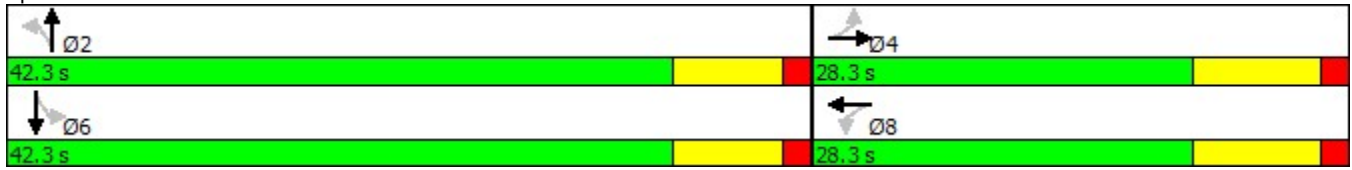
Intersection Summary

Cycle Length: 70.6
 Actuated Cycle Length: 48.2
 Natural Cycle: 50
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 9.9
 Intersection Capacity Utilization 66.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Lanes, Volumes, Timings
7: Courtice Road & Baseline Road

03/16/2020

Splits and Phases: 7: Courtice Road & Baseline Road



Lanes, Volumes, Timings
 8: Courtice Road & Hwy 401 WB

03/16/2020



Lane Group	WBT	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	0	226	214
Future Volume (vph)	0	226	214
Lane Group Flow (vph)	234	267	550
Sign Control	Stop	Free	Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 58.2% ICU Level of Service B

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

8: Courtice Road & Hwy 401 WB

03/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Volume (veh/h)	0	0	0	34	0	188	28	226	0	0	214	309
Future Volume (Veh/h)	0	0	0	34	0	188	28	226	0	0	214	309
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	36	0	198	29	238	0	0	225	325
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)											244	
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	882	684	388	684	846	238	550			238		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	805	583	251	583	765	238	433			238		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	90	100	75	97			100		
cM capacity (veh/h)	197	367	702	369	288	801	1003			1329		
Direction, Lane #	WB 1	NB 1	SB 1									
Volume Total	234	267	550									
Volume Left	36	29	0									
Volume Right	198	0	325									
cSH	679	1003	1700									
Volume to Capacity	0.34	0.03	0.32									
Queue Length 95th (m)	12.3	0.7	0.0									
Control Delay (s)	13.1	1.2	0.0									
Lane LOS	B	A										
Approach Delay (s)	13.1	1.2	0.0									
Approach LOS	B											
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			58.2%			ICU Level of Service				B		
Analysis Period (min)			15									

Lanes, Volumes, Timings
 9: Courtice Road & Hwy 401 EB

03/16/2020



Lane Group	EBL	EBT	WBR	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	116	231	13	16	102
Future Volume (vph)	116	231	13	16	102
Lane Group Flow (vph)	122	339	14	21	418
Sign Control		Stop		Free	Free

Intersection Summary





















Control Type: Unsignalized

Intersection Capacity Utilization 55.8% ICU Level of Service B

Analysis Period (min) 15

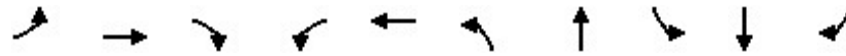
HCM Unsignalized Intersection Capacity Analysis
 9: Courtice Road & Hwy 401 EB

03/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	231	91	0	0	13	3	16	1	160	102	136
Future Volume (Veh/h)	116	231	91	0	0	13	3	16	1	160	102	136
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	122	243	96	0	0	14	3	17	1	168	107	143
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	538	538	178	756	610	18	250			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	538	538	178	756	610	18	250			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	39	89	100	100	99	100			89		
cM capacity (veh/h)	411	401	864	139	366	1061	1316			1599		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	122	339	0	14	21	418						
Volume Left	122	0	0	0	3	168						
Volume Right	0	96	0	14	1	143						
cSH	411	473	1700	1061	1316	1599						
Volume to Capacity	0.30	0.72	0.00	0.01	0.00	0.11						
Queue Length 95th (m)	9.8	45.3	0.0	0.3	0.1	2.8						
Control Delay (s)	17.4	29.6	0.0	8.4	1.1	3.6						
Lane LOS	C	D	A	A	A	A						
Approach Delay (s)	26.4		8.4		1.1	3.6						
Approach LOS	D		A									
Intersection Summary												
Average Delay			15.1									
Intersection Capacity Utilization			55.8%		ICU Level of Service				B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Townline Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	90	448	135	22	279	89	48	32	78	64
Future Volume (vph)	90	448	135	22	279	89	48	32	78	64
Lane Group Flow (vph)	95	472	142	23	321	94	73	34	82	67
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2			6		8		4	
Permitted Phases	2		2	6		8		4		4
Detector Phase	2	2	2	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	33.0	33.0	33.0	33.0	33.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.8	3.8	3.8	3.8	3.8
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4	-2.4
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9	3.9
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)	52.2	52.2	52.2	52.2	52.2	13.5	13.5	13.5	13.5	13.5
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.13	0.36	0.12	0.04	0.25	0.39	0.21	0.14	0.24	0.20
Control Delay	4.9	5.7	1.3	5.1	4.9	28.7	18.4	23.3	24.5	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	5.7	1.3	5.1	4.9	28.7	18.4	23.3	24.5	7.7
LOS	A	A	A	A	A	C	B	C	C	A
Approach Delay		4.7			4.9		24.2		18.1	
Approach LOS		A			A		C		B	
Queue Length 50th (m)	3.5	21.5	0.0	0.9	12.5	11.5	6.0	4.0	9.7	0.0
Queue Length 95th (m)	10.4	46.4	5.5	3.5	25.2	22.5	15.0	10.3	19.2	8.8
Internal Link Dist (m)		272.5			655.7		234.1		201.0	
Turn Bay Length (m)	35.0		75.0	60.0		40.0		35.0		60.0
Base Capacity (vph)	741	1317	1155	609	1302	551	760	555	784	703
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.36	0.12	0.04	0.25	0.17	0.10	0.06	0.10	0.10

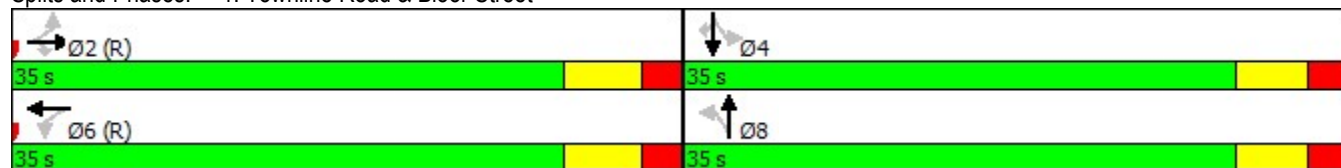
Intersection Summary

Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0.7 (1%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
1: Townline Road & Bloor Street

03/16/2020

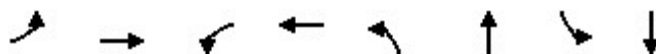
Splits and Phases: 1: Townline Road & Bloor Street



Lanes, Volumes, Timings

2: Rosswell Road/Meadowglade Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	126	286	67	183	35	90	21	71
Future Volume (vph)	126	286	67	183	35	90	21	71
Lane Group Flow (vph)	133	354	71	215	37	137	22	170
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		4		8
Permitted Phases	2		6		4		8	
Detector Phase	2	2	6	6	4	4	8	8
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	29.0	29.0	29.0	29.0	27.0	27.0	27.0	27.0
Total Split (s)	40.6	40.6	40.6	40.6	29.4	29.4	29.4	29.4
Total Split (%)	58.0%	58.0%	58.0%	58.0%	42.0%	42.0%	42.0%	42.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.6
Lost Time Adjust (s)	-2.4	-2.4	-2.4	-2.4	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	3.9	3.9	3.9	3.9
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max
Act Effct Green (s)	36.6	36.6	36.6	36.6	25.5	25.5	25.5	25.5
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.36	0.36	0.36	0.36
v/c Ratio	0.23	0.39	0.16	0.24	0.09	0.22	0.05	0.26
Control Delay	9.1	9.4	11.0	10.5	15.5	12.4	15.0	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	9.4	11.0	10.5	15.5	12.4	15.0	8.7
LOS	A	A	B	B	B	B	B	A
Approach Delay		9.3		10.6		13.1		9.4
Approach LOS		A		B		B		A
Queue Length 50th (m)	7.5	18.0	5.3	15.5	3.3	9.2	1.9	6.8
Queue Length 95th (m)	14.7	27.8	12.7	28.3	9.2	20.8	6.3	19.2
Internal Link Dist (m)		655.7		365.9		104.1		199.8
Turn Bay Length (m)	30.0		30.0		30.0		30.0	
Base Capacity (vph)	567	911	449	914	405	636	430	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.39	0.16	0.24	0.09	0.22	0.05	0.26

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 16.1 (23%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 65.5%

ICU Level of Service C

Analysis Period (min) 15

Lanes, Volumes, Timings

2: Rosswell Road/Meadowglade Road & Bloor Street

03/16/2020

Splits and Phases: 2: Rosswell Road/Meadowglade Road & Bloor Street



Lanes, Volumes, Timings
3: Prestonvale Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	25	230	60	216	37	62	40	57
Future Volume (vph)	25	230	60	216	37	62	40	57
Lane Group Flow (vph)	26	278	63	284	39	108	42	85
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	20.0	20.0	20.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	28.0	28.0	28.0	28.0	24.0	24.0	24.0	24.0
Total Split (s)	44.1	44.1	44.1	44.1	25.9	25.9	25.9	25.9
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.9	4.9	4.9	4.9	3.8	3.8	3.8	3.8
All-Red Time (s)	1.6	1.6	1.6	1.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-2.2	-2.2	-2.3	-2.3	-2.4	-2.4	-2.4	-2.4
Total Lost Time (s)	4.3	4.3	4.2	4.2	3.7	3.7	3.7	3.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	54.0	54.0	54.1	54.1	11.6	11.6	11.6	11.6
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.17	0.17	0.17	0.17
v/c Ratio	0.03	0.21	0.08	0.21	0.19	0.35	0.21	0.28
Control Delay	2.4	2.2	3.6	3.4	26.7	19.6	27.3	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	2.2	3.6	3.4	26.7	19.6	27.3	21.4
LOS	A	A	A	A	C	B	C	C
Approach Delay		2.2		3.4		21.5		23.3
Approach LOS		A		A		C		C
Queue Length 50th (m)	0.5	5.2	1.9	8.3	4.8	8.0	5.2	7.4
Queue Length 95th (m)	m1.6	9.4	6.0	19.5	12.2	20.1	12.8	18.1
Internal Link Dist (m)		365.9		1040.0		386.5		233.8
Turn Bay Length (m)	35.0		25.0		30.0		30.0	
Base Capacity (vph)	798	1340	803	1330	392	555	379	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.21	0.08	0.21	0.10	0.19	0.11	0.15

Intersection Summary

Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 42.7 (61%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 8.6	Intersection LOS: A
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

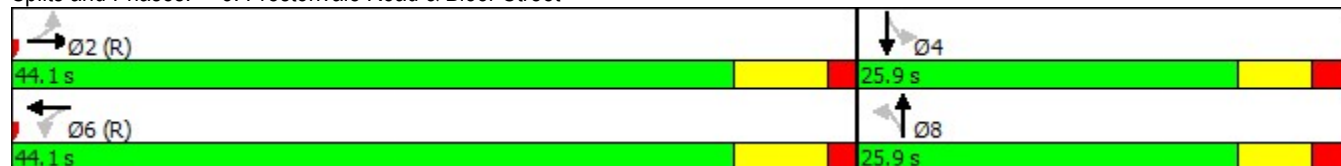
Lanes, Volumes, Timings

3: Prestonvale Road & Bloor Street

03/16/2020

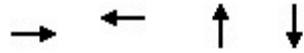
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Prestonvale Road & Bloor Street



Lanes, Volumes, Timings
 4: Trulls Road & Bloor Street

03/16/2020



Lane Group	EBT	WBT	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	234	191	18	25
Future Volume (vph)	234	191	18	25
Lane Group Flow (vph)	355	333	67	145
Sign Control	Free	Free	Stop	Stop

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 62.9%	ICU Level of Service B
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis

4: Trulls Road & Bloor Street

03/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	99	234	5	8	191	118	8	18	38	35	25	78
Future Volume (Veh/h)	99	234	5	8	191	118	8	18	38	35	25	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	104	246	5	8	201	124	8	19	40	37	26	82
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	325			251			830	798	248	785	738	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	325			251			830	798	248	785	738	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			99			96	93	95	86	92	89
cM capacity (veh/h)	1235			1314			226	291	790	261	314	776
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	355	333	67	145								
Volume Left	104	8	8	37								
Volume Right	5	124	40	82								
cSH	1235	1314	442	439								
Volume to Capacity	0.08	0.01	0.15	0.33								
Queue Length 95th (m)	2.2	0.1	4.2	11.4								
Control Delay (s)	3.0	0.2	14.6	17.2								
Lane LOS	A	A	B	C								
Approach Delay (s)	3.0	0.2	14.6	17.2								
Approach LOS			B	C								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			62.9%	ICU Level of Service		B						
Analysis Period (min)			15									

Lanes, Volumes, Timings
5: Courtice Road & Bloor Street

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	59	177	13	147	108	363	63	46	210	48
Future Volume (vph)	59	177	13	147	108	363	63	46	210	48
Lane Group Flow (vph)	62	219	14	202	114	382	66	48	221	51
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4		8		2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	8	8	2	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	12.0	12.0	12.0	25.0	25.0	25.0	25.0	25.0	25.0
Minimum Split (s)	27.1	27.1	27.1	27.1	32.4	32.4	32.4	32.4	32.4	32.4
Total Split (s)	37.1	37.1	37.1	37.1	42.4	42.4	42.4	42.4	42.4	42.4
Total Split (%)	46.7%	46.7%	46.7%	46.7%	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%
Yellow Time (s)	5.4	5.4	5.4	5.4	5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	1.7	1.7	1.7	1.7	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.1	-2.1	-2.3	-2.3	-2.5	-2.5	-2.5	-2.2	-2.2	-2.2
Total Lost Time (s)	5.0	5.0	4.8	4.8	4.9	4.9	4.9	5.2	5.2	5.2
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	18.2	18.2	18.4	18.4	37.6	37.6	37.6	37.3	37.3	37.3
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.57	0.57	0.57	0.57	0.57	0.57
v/c Ratio	0.22	0.45	0.05	0.41	0.18	0.38	0.07	0.10	0.22	0.06
Control Delay	19.9	21.4	17.1	19.4	8.6	9.8	3.3	8.3	8.5	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	21.4	17.1	19.4	8.6	9.8	3.3	8.3	8.5	2.6
LOS	B	C	B	B	A	A	A	A	A	A
Approach Delay		21.1		19.3		8.8			7.5	
Approach LOS		C		B		A			A	
Queue Length 50th (m)	6.1	21.5	1.3	18.3	6.1	23.5	0.5	2.5	12.3	0.0
Queue Length 95th (m)	14.8	39.2	5.0	34.6	16.7	49.7	5.9	8.5	28.1	4.3
Internal Link Dist (m)		773.1		785.8		1514.9			436.6	
Turn Bay Length (m)	35.0		30.0		50.0		20.0	60.0		20.0
Base Capacity (vph)	510	851	494	851	626	1010	882	498	1002	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.26	0.03	0.24	0.18	0.38	0.07	0.10	0.22	0.06

Intersection Summary

Cycle Length: 79.5

Actuated Cycle Length: 65.7

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 12.6

Intersection LOS: B

Intersection Capacity Utilization 80.1%

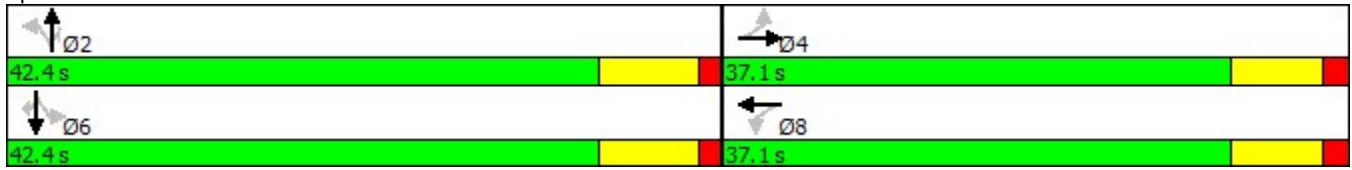
ICU Level of Service D

Analysis Period (min) 15

Lanes, Volumes, Timings
5: Courtice Road & Bloor Street

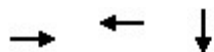
03/16/2020

Splits and Phases: 5: Courtice Road & Bloor Street



Lanes, Volumes, Timings
 6: Trulls Road & Baseline Road

03/16/2020



Lane Group	EBT	WBT	SBT
Lane Configurations			
Traffic Volume (vph)	44	56	0
Future Volume (vph)	44	56	0
Lane Group Flow (vph)	50	76	12
Sign Control	Free	Free	Stop

















Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 15.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis

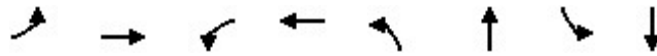
6: Trulls Road & Baseline Road

03/16/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	44	0	1	56	15	0	0	0	6	0	6
Future Volume (Veh/h)	4	44	0	1	56	15	0	0	0	6	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	46	0	1	59	16	0	0	0	6	0	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	75			46			129	131	46	123	123	67
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			46			129	131	46	123	123	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	99
cM capacity (veh/h)	1524			1562			837	757	1023	849	765	997
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	50	76	0	12								
Volume Left	4	1	0	6								
Volume Right	0	16	0	6								
cSH	1524	1562	1700	917								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.3								
Control Delay (s)	0.6	0.1	0.0	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.6	0.1	0.0	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			15.0%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
7: Courtice Road & Baseline Road

03/16/2020



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	78	64	103	45	70	544	28	300
Future Volume (vph)	78	64	103	45	70	544	28	300
Lane Group Flow (vph)	82	163	108	71	74	660	29	328
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	12.0	12.0	12.0	12.0	15.0	15.0	15.0	15.0
Minimum Split (s)	28.3	28.3	28.3	28.3	39.3	39.3	39.3	39.3
Total Split (s)	28.3	28.3	28.3	28.3	42.3	42.3	42.3	42.3
Total Split (%)	40.1%	40.1%	40.1%	40.1%	59.9%	59.9%	59.9%	59.9%
Yellow Time (s)	6.7	6.7	6.7	6.7	5.8	5.8	5.8	5.8
All-Red Time (s)	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	-2.1	-2.1	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3
Total Lost Time (s)	6.2	6.2	6.0	6.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	15.6	15.6	15.8	15.8	32.4	32.4	32.4	32.4
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.62	0.62	0.62	0.62
v/c Ratio	0.22	0.30	0.31	0.14	0.12	0.62	0.09	0.30
Control Delay	19.0	10.3	20.4	13.1	7.6	12.5	7.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	10.3	20.4	13.1	7.6	12.5	7.8	8.3
LOS	B	B	C	B	A	B	A	A
Approach Delay		13.2		17.5		12.0		8.3
Approach LOS		B		B		B		A
Queue Length 50th (m)	6.3	5.0	8.5	3.4	3.4	44.4	1.3	17.0
Queue Length 95th (m)	18.9	20.1	24.2	13.4	10.2	92.2	5.4	36.1
Internal Link Dist (m)		802.4		231.2		220.3		278.4
Turn Bay Length (m)	30.0		30.0		30.0		30.0	
Base Capacity (vph)	548	757	508	752	727	1280	390	1296
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.22	0.21	0.09	0.10	0.52	0.07	0.25

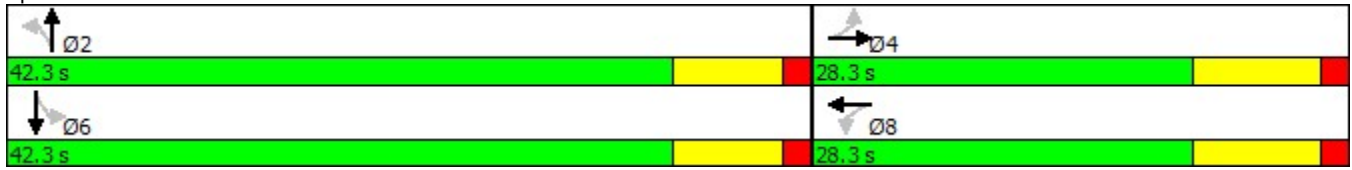
Intersection Summary

Cycle Length: 70.6	
Actuated Cycle Length: 52.6	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 86.5%	ICU Level of Service E
Analysis Period (min) 15	

Lanes, Volumes, Timings
7: Courtice Road & Baseline Road

03/16/2020

Splits and Phases: 7: Courtice Road & Baseline Road



Lanes, Volumes, Timings
 8: Courtice Road & Hwy 401 WB

03/16/2020



Lane Group	WBT	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	3	397	273
Future Volume (vph)	3	397	273
Lane Group Flow (vph)	172	684	471
Sign Control	Stop	Free	Free

Intersection Summary

Control Type: Unsignalized	
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis

8: Courtice Road & Hwy 401 WB

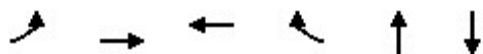
03/16/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Volume (veh/h)	0	0	0	12	3	148	253	397	0	0	273	175
Future Volume (Veh/h)	0	0	0	12	3	148	253	397	0	0	273	175
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	13	3	156	266	418	0	0	287	184
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1486	1329	379	1329	1421	418	471			418		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1486	1329	379	1329	1421	418	471			418		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	88	97	75	76			100		
cM capacity (veh/h)	61	117	668	107	103	635	1091			1141		
Direction, Lane #												
	WB 1	NB 1	SB 1									
Volume Total	172	684	471									
Volume Left	13	266	0									
Volume Right	156	0	184									
cSH	434	1091	1700									
Volume to Capacity	0.40	0.24	0.28									
Queue Length 95th (m)	14.9	7.7	0.0									
Control Delay (s)	18.6	5.5	0.0									
Lane LOS	C	A										
Approach Delay (s)	18.6	5.5	0.0									
Approach LOS	C											
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			83.8%	ICU Level of Service			E					
Analysis Period (min)			15									

Lanes, Volumes, Timings
 9: Courtice Road & Hwy 401 EB

03/16/2020



Lane Group	EBL	EBT	WBT	WBR	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	432	31	2	229	117	24
Future Volume (vph)	432	31	2	229	117	24
Lane Group Flow (vph)	455	52	3	241	150	272
Sign Control		Stop	Stop		Free	Free

Intersection Summary

Control Type: Unsignalized

Intersection Capacity Utilization 58.3% ICU Level of Service B

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

9: Courtice Road & Hwy 401 EB

03/16/2020



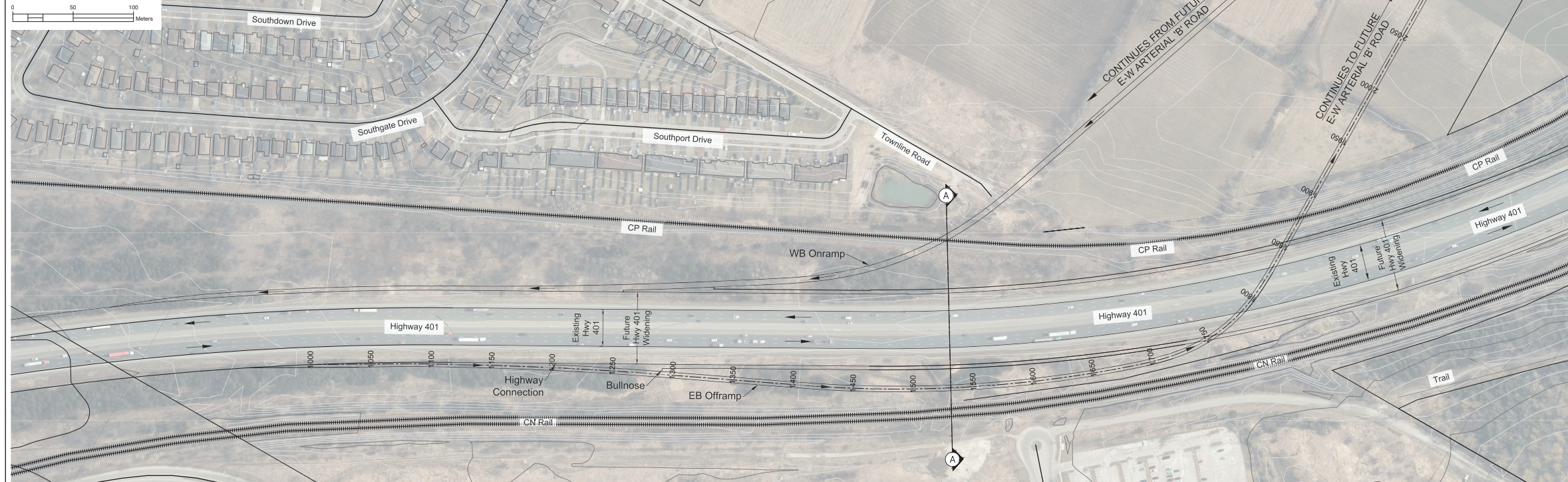
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	432	31	18	1	2	229	22	117	4	23	24	212
Future Volume (Veh/h)	432	31	18	1	2	229	22	117	4	23	24	212
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	455	33	19	1	2	241	23	123	4	24	25	223
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	356	358	136	391	467	125	248			127		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	356	358	136	391	467	125	248			127		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	98	100	100	74	98			98		
cM capacity (veh/h)	430	550	912	517	477	926	1318			1459		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	455	52	3	241	150	272						
Volume Left	455	0	1	0	23	24						
Volume Right	0	19	0	241	4	223						
cSH	430	643	490	926	1318	1459						
Volume to Capacity	1.06	0.08	0.01	0.26	0.02	0.02						
Queue Length 95th (m)	117.7	2.1	0.1	8.3	0.4	0.4						
Control Delay (s)	90.8	11.1	12.4	10.3	1.3	0.8						
Lane LOS	F	B	B	B	A	A						
Approach Delay (s)	82.7		10.3		1.3	0.8						
Approach LOS	F		B									
Intersection Summary												
Average Delay			38.2									
Intersection Capacity Utilization			58.3%		ICU Level of Service					B		
Analysis Period (min)			15									

C

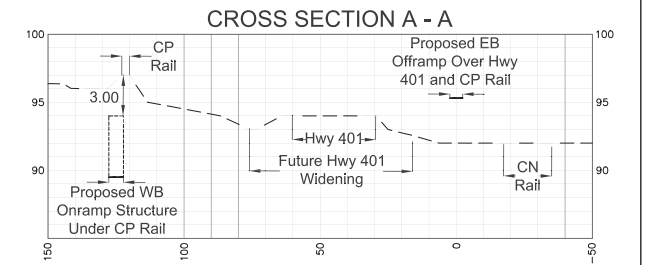
Appendix C: Future Interchange Options

If you require this information to be in an accessible format, please contact the Municipality's Accessibility Coordinator at 905-623-3379 ext. 2131.

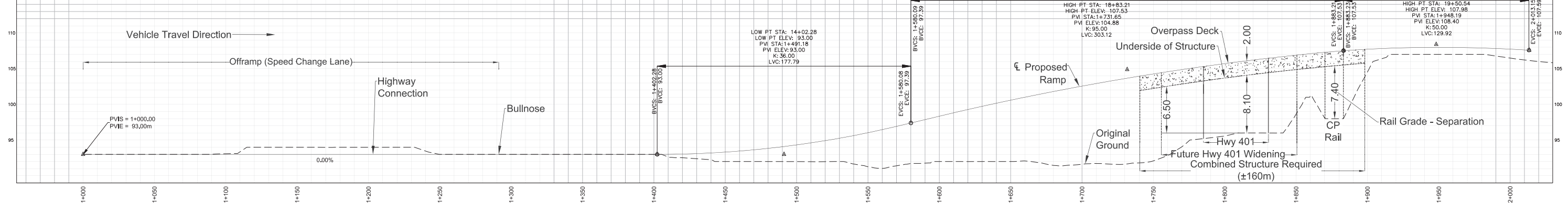
PLAN VIEW



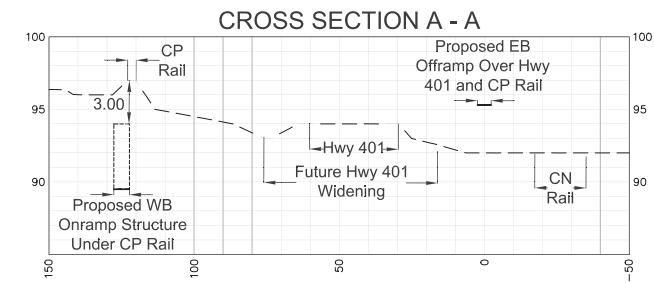
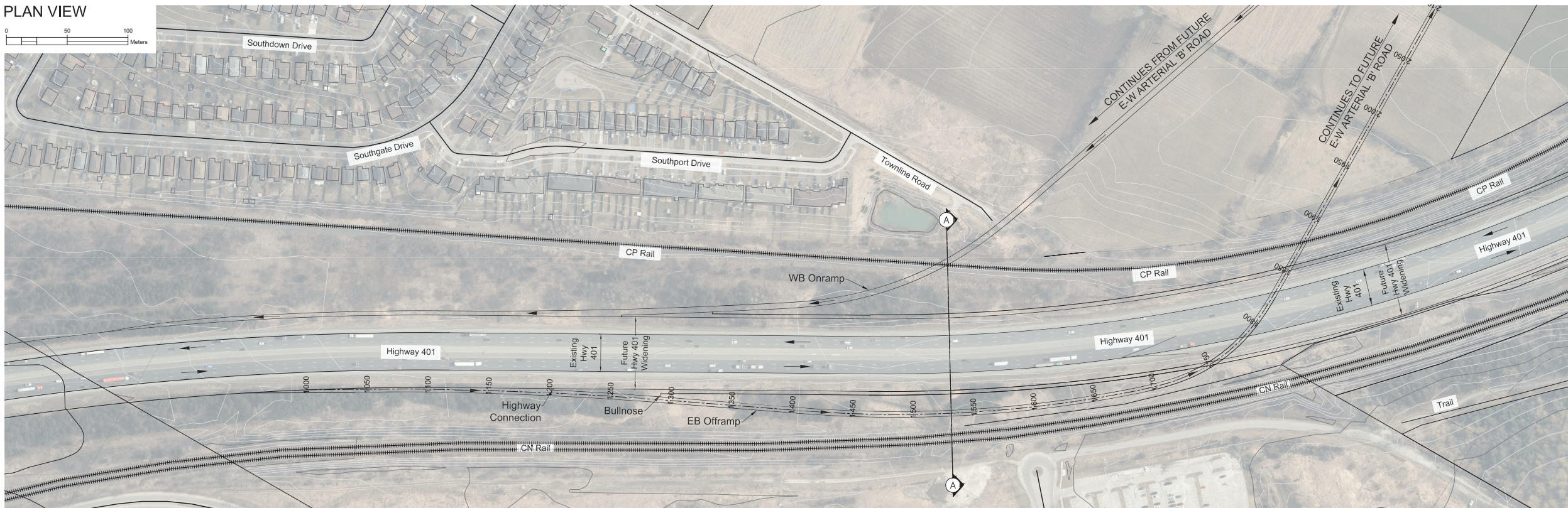
**OPTION 'A'
PARTIAL INTERCHANGE AT
PROPOSED EAST-WEST
ARTERIAL ROAD**



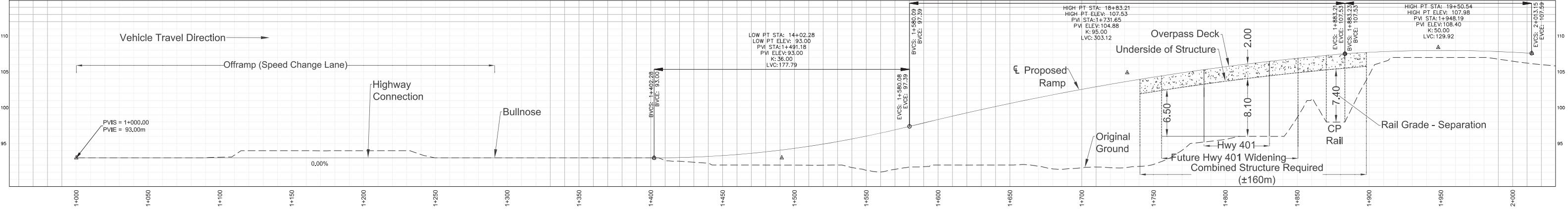
PROFILE OF EAST BOUND OFF-RAMP



OPTION 'A' PARTIAL INTERCHANGE AT PROPOSED EAST-WEST ARTERIAL ROAD



PROFILE OF EAST BOUND OFF-RAMP



**OPTION 'B'
PARTIAL INTERCHANGE
NEAR PRESTONVALE ROAD
AND BASELINE ROAD**



CIMA+

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Burlington, ON L7N 3G7

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cima.ca

