Traffic Impact Study

875 Kingston Road West

September 23, 2022 — Project # 10577
Sphere Developments (Kingston) LP

TYLin

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1 Introduction

1.1 Scope and Objective

T.Y. Lin International Canada Inc. (TYLin) was retained by Sphere Developments to complete a Traffic Impact Study inclusive of a Parking Justification Study in support of the proposed mixed-use development to be located at 875 Kingston Road West within the City of Pickering ("the City") and within the Region of Durham ("the Region"). The site is proposed to consist of two buildings (an East Tower and West Tower) with a podium and combined underground parking area. In total, 342 vehicle parking spaces are proposed to be provided to serve the 337 residential units and 629.9 m^2 GFA of commercial space. The development proposes the use of stacked parking systems within the second underground parking level.

The study consists of the following:

- The future traffic operations for the weekday AM and PM peak hour considering the background traffic growth and relevant background developments
- As discussed with the City and Region, the traffic network will be studied for the 2027 horizon year as well as the 2032 horizon year
- A summary of the expected impact on the operations for both the future background and total traffic conditions
- A review of the site plan's geometry to confirm conformance with relevant design standards
- Review of the proposed internal site circulation for the applicable design vehicles.
- A review of the proposed parking supply and supplementary justification
- A TDM plan detailing all initiatives recommended to support reductions to single-occupant private vehicle trips and promote a shift to transit and active transportation modes is provided. A breakdown of all TDM initiatives is provided.

The purpose of this study is to determine the traffic volumes anticipated to be generated by the proposed development during the weekday AM and PM peak periods; to assess the impact of this traffic on the existing and future roadway network, recommend improvements to accommodate the projected traffic if any are needed, and confirm that the site plan network is consistent with City and Regional standards.

A detailed scope was submitted by TYLin to the City of Pickering, Region of Durham, and Ministry of Transportation of Ontario ("the MTO") for review and comment. Correspondence with the review agencies are included in **Appendix A**.

2 Site Characteristics

2.1 Study Environment

The subject property is located in the City of Pickering, south of Kingston Road at its intersection with Fairport Road and between Kingston Road and Provincial Highway 401. A portion of the site is occupied by lands under the control of the TRCA. Under the "Kingston Mixed Corridor and Brock Mixed Node Intensification Areas Plan, the site is located with the "Whites Precinct Intensification Area". The proposed site surrounding road network are illustrated in **Figure 2-1**.

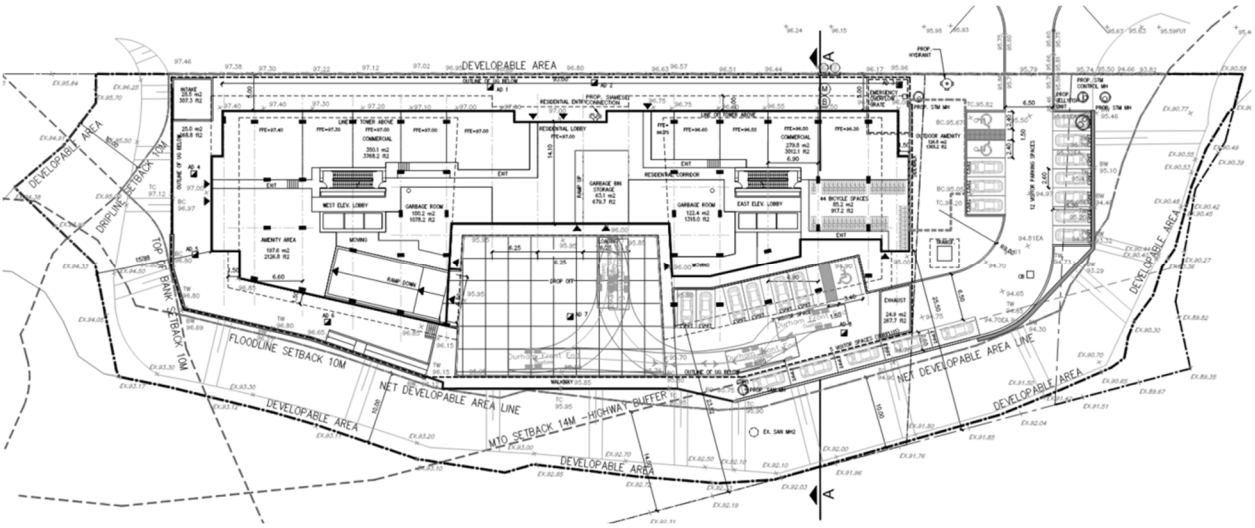
Figure 2-1 Site Location

2.2 Development Context

The proposed development is to consist of two buildings (an East Tower and West Tower) with a podium and combined underground parking area. The development proposes the use of stacked

parking systems within the second underground parking level. In total, 342 vehicle parking spaces are proposed to be provided (19 at-grade, 69 P1, and 254 P2) to serve the 337 residential units and 629.9 m^2 GFA of commercial space. Access to the site is proposed to be via a single full-moves driveway to Kingston Road West at the existing signalized intersection with Fairport Road. The proposed site plan showing the proposed development and site accesses is shown in **Figure 2-1** and in full in **Appendix B**.

Figure 2-2 Site Plan



2.3 Study Area Intersections

The following study area intersections have been included:

- Kingston Road at Fairport Road/Future Site Access
- Kingston Road at Highway 401 On/Off-Ramp

3 Existing Conditions

3.1 Road Network

The following existing roads are included in the transportation network and are classified under the Region's 2017 Transportation Master Plan.

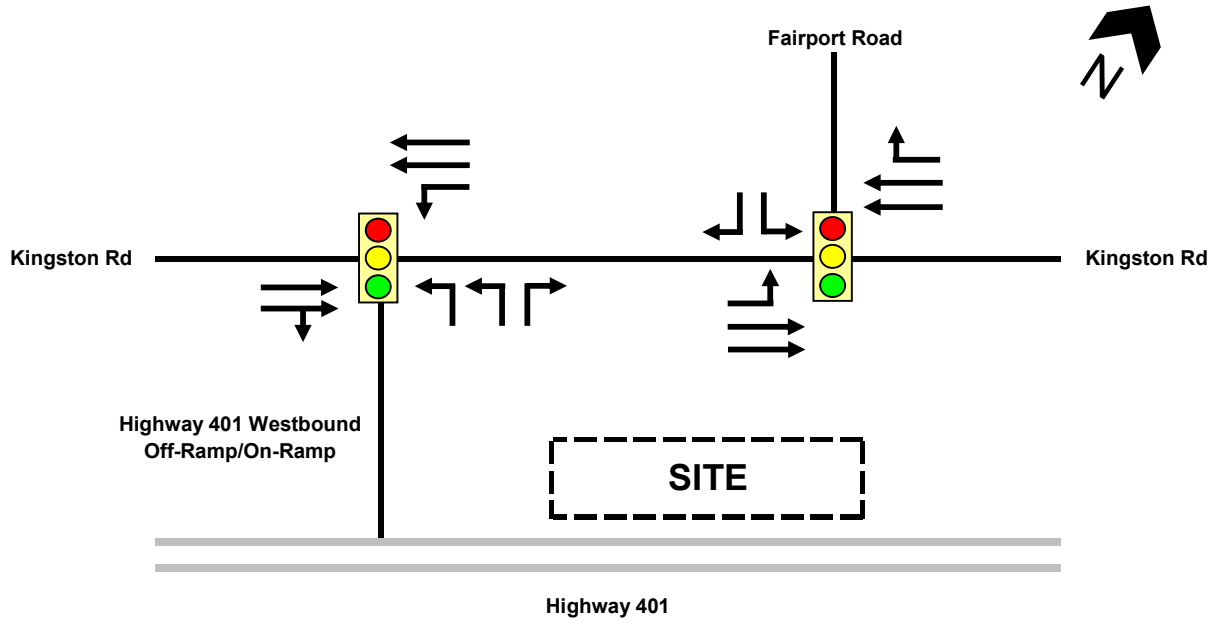
Kingston Road (Regional Highway 2) is an east-west major arterial roadway under the jurisdiction of Durham Region. Within the Region, Kingston Road West runs from the Rouge River in the west to Salem Road in the east, and continues as Kingston Road East from Salem Road (Regional Road 41) to Lake Ridge Road (Regional Road 23) in the west. Within the vicinity of the study area, it operates with a five-lane undivided cross-section with two eastbound lanes, two westbound lanes, and one two-way left turn lane. The roadway has a 60 km/h posted speed limit within the study area. Sidewalks are provided on both sides of the roadway west of the Highway 401 On/Off-Ramp, and on the north side of east of Fairport Road; a paved shoulder also exists on both sides of the roadway west of Fairport Road.

Highway 401 Westbound On/Off Ramp is a four-lane north-south roadway under the jurisdiction of the Province of Ontario that acts as a right-in/right-out interchange from/to Highway 401 Westbound Collectors (Exit 394) to Whites Road (Regional Road 38) via Kingston Road West. The roadway has a 50 km/h suggested speed limit. The on-ramp has a length of approximately 400 metres. It is noted that the nearest Highway 401 Eastbound On/Off ramp is located approximately 800m west of the site via Whites Road N.

Fairport Road is a north-south Class 'C' arterial roadway under the jurisdiction of the City. Within the City, Fairport Road extends from Kingston Road West in the south to Third Concession Road in the north. Within the study area, it operations with a two-lane undivided cross-section with a posted speed limit of 40 km/h. Sidewalks exist on both sides of the roadway, while bike lanes are provided north of the study area.

A lane configuration diagram is provided in **Figure 3-1**.

Figure 3-1 Existing Lane Configuration



3.2 TRANSIT NETWORK

Within the study area, the subject site is currently served by GO Regional Transit and Durham Region Transit (DRT) services. It is also noted that the future Durham-Scarborough BRT line is planned for Kingston Road (as further discussed in **Section 4.5.1**), and will be reflected in the future analysis scenarios as confirmed with the Region.

3.2.1 GO Regional Transit

As of June 2022, there are two GO Bus Transit Routes operating within the study area: Route 92/92A (Oshawa/Yorkdale), and Route 41 (Hamilton/Pickering).

GO Route 41 is a regional bus route which operates east-west from Hamilton GO Station in the west to Pickering GO station in the east. Within the study area, the route operates along Kingston Road with a stop at Kingston Road and Fairport Road which operates with approximately 25-minute frequency during peak periods.

GO Route 92/92A is a regional bus route which operates east-west from Yorkdale Bus Terminal in the west to Oshawa GO station in the east. Within the study area, the route operates along Kingston Road with a stop at Kingston Road and Fairport Road which operates with approximately 15-minute frequency during peak periods.

Outside of the study area, Pickering GO station is approximately 3 kilometres from the site and can be access by either regional or local transit.

3.2.2 Durham Region Transit

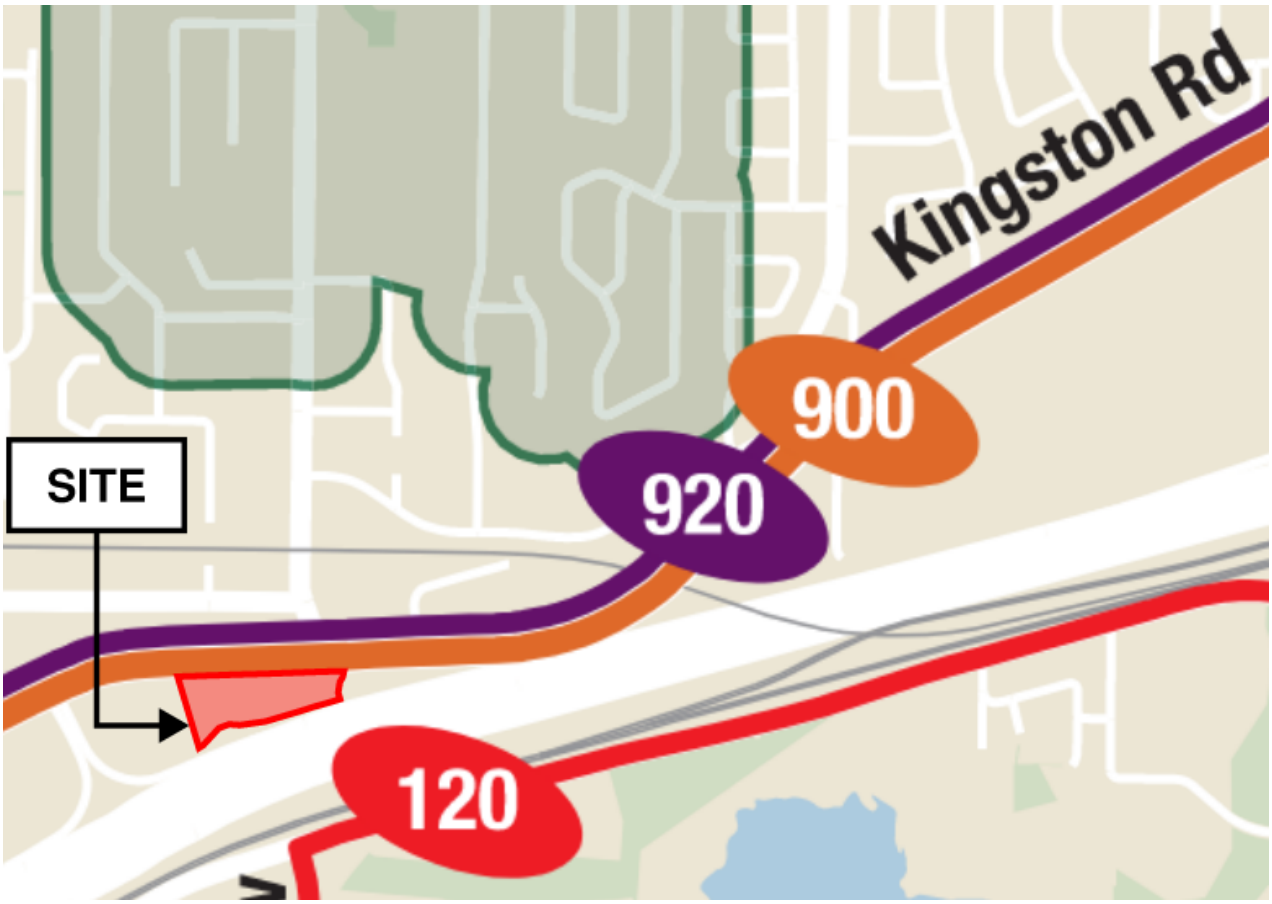
As of June 2022, there are two Durham Region Transit routes operating along Kingston Road within the study area: Route 900 Pulse, and Route 920. Stops for both routes are located along Kingston Road at the Highway 401 On/Off-Ramps and at Fairport Road.

DRT Pulse 900 is a bus rapid transit route which operates east-west along Highway 2 in Durham Region, connecting from Centennial College Morningside Campus (Scarborough, Toronto) in the west to Downtown Oshawa (King Street/Bond St and Ritson Road) in the east. The route operates with 10-minute frequency during weekday peak periods between Pickering Parkway Terminal and the eastern terminus. West of Pickering Parkway terminal (including where the study area is located), service is limited to 30-minute frequency.

DRT Route 920 is a local transit route which operates general east-west in Durham Region, connecting from McCowan Station (Scarborough, Toronto) in the west to Harmony Terminal (Oshawa) in the east. The route operates with 30-minute frequency throughout the day.

The DRT services near the subject site are shown in with schedules included in **Appendix C**.

Figure 3-2 Durham Regional Transit Services



3.3 Pedestrian & Cycling Network

Within the study area, pedestrian facilities are provided as follows:

- On Kingston Road, sidewalks are provided on both sides of the roadway west of the Highway 401 On/Off-Ramp, and on the north side of east of Fairport Road. Beyond this, sidewalk gaps exist in the study area on Kingston Road between Fairport Road and the Highway 401 on/Off-ramp (both sides), and east of Fairport Road (south side only).
- A paved shoulder also exists on both sides of the Kingston west of Fairport Road.
- On Fairport Road, sidewalks exist on both sides of the roadway,

Within the study area, cycling facilities are provided as follows:

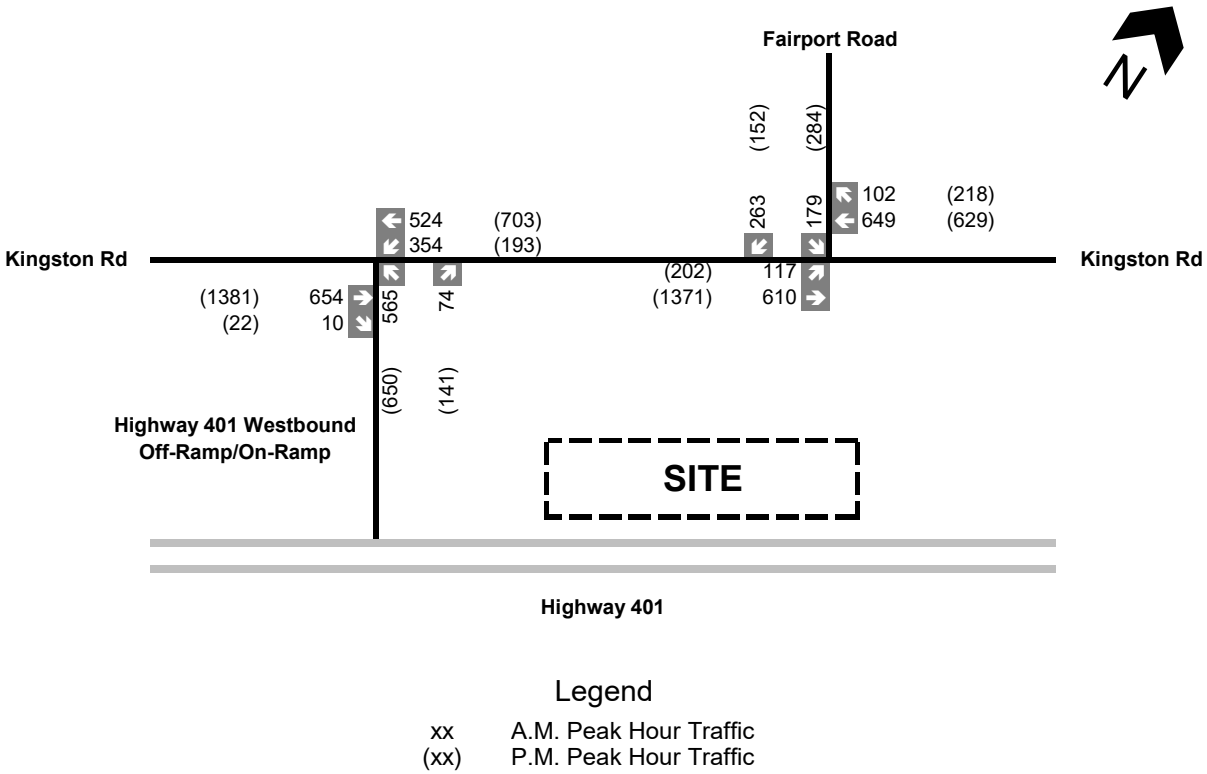
- There are no designated cycling facilities along Kingston Road. The paved shoulder west of Fairport Road, however, may act as a cycling facility.
- Cycling lanes are provided on Fairport Road approximately 110 metres north of its intersection with Kingston Road, with no designated facility in between.

3.4 Existing Traffic Volumes

Existing turning movement count data was supplied from the Durham Region Traffic Volume Counts website for all study intersections. The latest data available was from 2019 prior to the COVID-19 pandemic, therefore, to maintain a conservative analysis, no modification factor was applied to account for the pandemic. Based on discussion with the Region, no growth was applied to 2019 turning movement counts and are considered as existing for the purposes of analysis.

The baseline traffic volumes are presented in **Figure 3-3**.

Figure 3-3 Existing Traffic Volumes



Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

3.5 Site Visit Observations

As requested by the Region, a site visit was performed to confirm existing conditions. The visit was conducted by TYLin on June 16, 2022 and included observation of traffic conditions (including queuing) during the PM peak period, environmental conditions, and infrastructure at the study intersections. It is noted that during the site visit, there was one collision that occurred at the Highway 401 Westbound Off-Ramp in the northbound right-turn lane, however this was observed to be cleared within an hour and did not pose a significant impact to the overall transportation network operations.

Additionally, all queues were observed to be cleared within a minimum of two cycles and did not pose any impacts to the adjacent through lanes.

4 Future Horizon Traffic

4.1 Study Horizon Years

Based on pre-consultation with the reviewing agencies, a 2027 horizon year was be considered for all study area intersections and represents the full-build out. Additionally, the 2032 horizon year was considered as an additional five-year post-build out horizon.

4.2 Background Corridor Growth

A 1% per annum growth rate (compounded annually) was applied to the existing volumes to derive future background corridor growth volumes. The 1% growth rate was based on growth rates adopted for several nearby traffic studies as requested by respective reviewing agencies. Growth was applied to through volumes on Kingston Road and all movements to/from the Highway 401 On/Off-Ramp. Five years of growth were applied to the existing volumes to derive the 2027 background volumes, while ten years of growth were applied to derive the 2032 background volumes.

4.3 Background Developments

Based on discussions with the reviewing agencies, the following background developments listed in **Table 4-1** were included in the future background volumes. These developments were included in the 2027 and 2032 background horizon.

Table 4-1 Background Developments

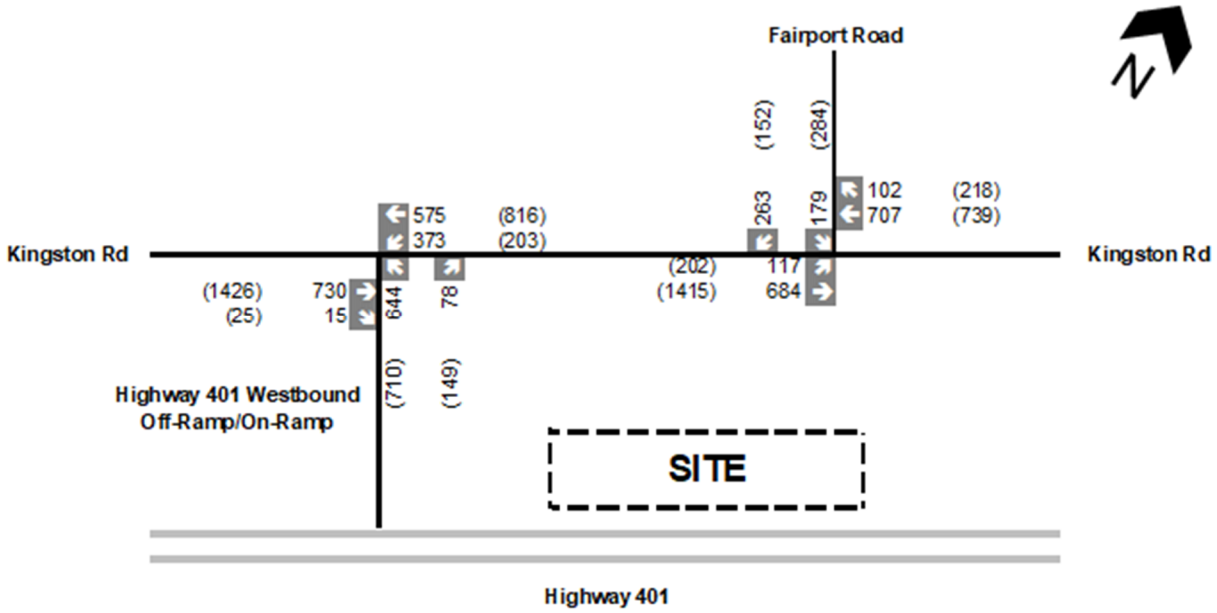
Number	Development (Study, Author, Date)	Description
1	760-770 Kingston Road (TIS Update, Stantec, May 2019)	82 stacked townhouse dwelling units
2	603-643 & 645-699 Kingston Road Mixed-Use Development (Urban Transportation Considerations Report, BA Group, April 2020)	2,884 residential units (six high-rise towers, two mid-rise towers, four townhouse blocks), 2,232 m^2 retail, 4,448 m^2 office, 3,997 m^2 parkland
3	1473 Whites Road N	14-storey residential apartment with 227 units
4	698 Kingston Road	Gas station with 8 pump islands, convenience store, 323 m^2 restaurant with drive-through facility

The site traffic volumes from each background development are included in **Appendix D**.

4.4 Future Background Traffic Volumes

The 2027 future background weekday AM and PM peak hour traffic volumes include the baseline 2022 volumes plus five years of growth and the background development traffic, and are presented in **Figure 4-1.** The 2032 future background weekday AM and PM peak hour traffic volumes include the baseline 2022 volumes plus ten years of growth and the background development traffic, and are presented in **Figure 4-2**.

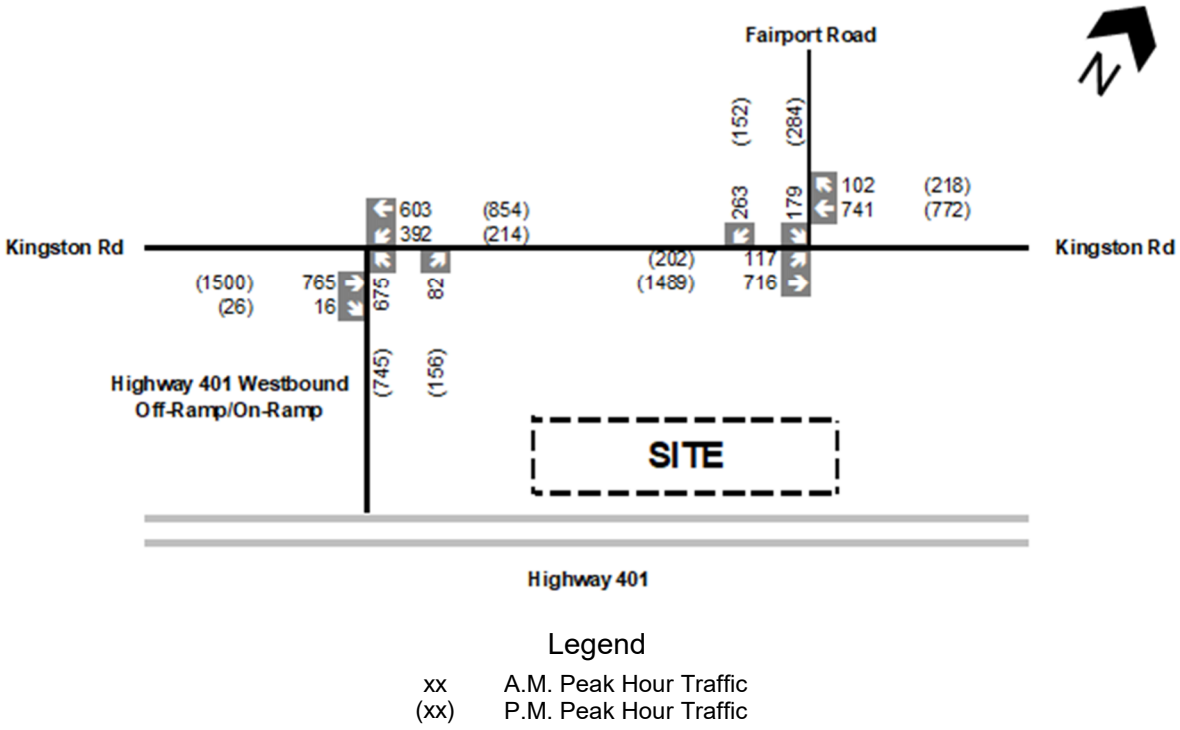
Figure 4-1 Future Background (2027) Volumes



Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

Figure 4-2 Future Background (2032) Volumes



4.5 Future Transportation Infrastructure Improvements

As part of the Kingston Mixed Corridor and Brock Mixed Node Intensification Areas Plan, the study area is subject to several future transportation infrastructure improvements for all modes.

4.5.1 Transit Improvements

The Durham-Scarborough Bus Rapid Transit (DSBRT) project was issued by Metrolinx, with a Notice to Proceed with the transit project issued in April 2022. The transit project consists of 36 kilometres of BRT which will serve the municipalities of Oshawa, Whitby, Ajax, and Pickering in Durham Region, and connect to the area of Scarborough in the City of Toronto while providing connection to regional and local transit networks. Within the study area, the BRT system will run primarily along Kingston Road in BRT-only median lanes, with a stop proposed at Kingston Road at Fairport Road (far side stops in both directions).

4.5.2 Active Transportation Improvements

Under the Durham Region Transportation Master Plan (2017), it is recommended that the Region "continue to promote high quality walking and cycling connections to major transit facilities, in cooperation with the area municipalities." Furthermore, under the 2021 Pickering Integrated Transportation Master Plan (ITMP), it is recommended to "routinely incorporate active

transportation infrastructure into capital projects" to infill gaps in the pedestrian and cycling network.

Under the Regional Cycling Plan (2021), the section of Kingston Road within the study area will be included as part of the 2040 Primary Cycling Network, with a cycle track proposed within the area to connect with the rest of the Primary Cycling Network. Construction of the cycle track is slated as a short-term infill project to be completed between 2022 to 2029. Fairport Road and its existing cycling lanes are to be included as part of the local Secondary Cycling Network.

Based on the preliminary design of the Durham-Scarborough BRT, existing sidewalk gaps along Kingston Road are to be filled by sidewalks as part of the BRT construction. The aforementioned cycle tracks are also included in the preliminary design of the BRT system.

4.5.3 Road Network Improvements

Widening of Kingston Road is anticipated between 2022 and 2024 in order to accommodate the proposed Durham-Scarborough BRT system. Two additional BRT-only lanes are anticipated along Kingston Road within the study area, with no additional travel lanes to be added. No additional geometric improvements are anticipated at Fairport Road or at the Highway 401 On-Off/Ramp.

It is noted that with the addition of the centre median BRT-only lanes, left-turns are prohibited across the median along Kingston Road. However, as the subject site includes an access located at a full-moves intersection, re-assignment of the subject site traffic is not required. The site access will form the south leg of the Kingston Road at Fairport Road intersection and will have one receiving lane and one shared left-through-right northbound lane. A turn lane for westbound traffic along Kingston Road at Fairport Road would allow for U-turns as well as future westbound left-turning traffic into the site. The existing eastbound through curb lane would be designated as shared through-right, and the existing southbound right turn lane designated as a southbound shared through-right. The future lane configuration including the subject site and excluding the BRT-only lanes is shown in **Figure 4-3**.

The preliminary design of DSBRT system in the vicinity of the study area is provided in **Figure 4-4**.

Figure 4-3 Future Lane Configuration

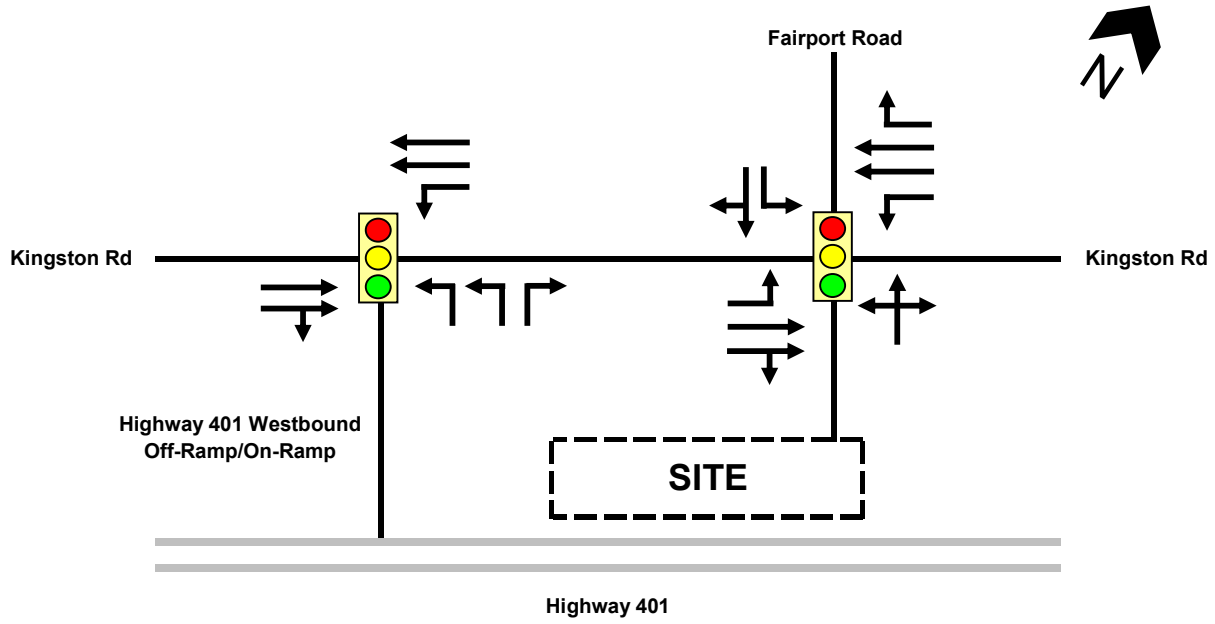


Figure 4-4 Future Durham-Scarborough Bus Rapid Transit Preliminary Design

5 Site Generated Traffic

5.1 Site Trip Generation

Site trip generation as estimated according to the Institute of Transportation Engineers (ITE) 11th Edition Trip Generation manual. According to the latest concept plan, the development proposal is comprised of two 17-storey towers connected by a 5-storey podium and includes 337 residential units and 670.10 m^2 GFA of commercial space. Based on the development proposal, ITE Land Use Codes **222** (Multi-family High-rise Residential) and **822** (Strip Retail Plaza under 40,000 square feet) were used to estimate weekday peak hour automobile trips for the development. The automobile trips were then converted to person trips based on an assumed auto-driver rate of 95% as per the ITE Trip Generation Handbook 3rd Edition, and a local mode split was applied to derive the net auto site trips generated by the subject site.

Based on the proximity to future bus rapid transit services in the area, an assumed modal split of 30% for non-auto modes (including transit) was applied to the site generated volumes. Mixed-use internal capture reductions were also applied based on the methodology from NCHRP Project 8-51 to account for internal trips between the residential and retail uses. No pass-by trips reductions were applied to the site due to the size of the retail component and intended land use.

Table 5-1 summarizes the estimated total trip generation of the development.

Table 5-1 Site Trip Generation

Land Use	Parameters	Peak Hour Trip Generation					
		Weekday AM			Weekday PM		
		In	Out	Total	In	Out	Total
LUC 222 Multi-Family (High-Rise): 337 Units	Fitted Curve Equation	T = 0.22 (X) + 18.85			Ln(T) = 0.89 Ln(X) - 0.02		
	Trip Distribution	34%	66%	-	56%	44%	-
	Gross Auto Trips	32	61	93	62	49	111
	Person Trip Conversion Rate	1.05			1.05		
	Gross Person Trips	33	65	98	66	51	117
	Non-Auto Mode Split Reduction (30%)	-10	-19	-29	-17	-14	-31
	Multi-Use (Internal Capture) Reduction	-1	-1	-2	-8	-3	-11
	Net Auto Trips	22	45	67	41	34	75
LUC 822 Strip Retail Plaza (<40,000 ft^2) 7.213 k ft^2	Fitted Curve Equation	Ln(T) = 0.66 Ln(X) + 1.84			Ln(T) = 0.71 Ln(X) + 2.72		
	Trip Distribution	60%	40%	-	50%	50%	-
	Gross Auto Trips	14	9	23	31	31	62
	Person Trip Conversion Rate	1.05			1.05		
	Gross Person Trips	14	10	24	33	32	65
	Non-Auto Mode Split Reduction (30%)	-4	-3	-7	-9	-7	-16
	Multi-Use (Internal Capture) Reduction	-1	-1	-2	-3	-8	-11
	Net Auto Trips	9	6	15	21	17	38
Total Gross Auto Trips		46	70	116	93	80	173
Total Gross Person Trips		47	75	122	99	83	182
Non-Auto Mode Split Reduction (30%)		-14	-22	-36	-26	-21	-47
Multi-Use (Internal Capture) Reduction		-2	-2	-4	-11	-11	-22
Total Non-Auto Trip Reduction		-16	-24	-40	-37	-32	-69
Total Net Auto Site Trips		**31**	**51**	**82**	**62**	**51**	**113**

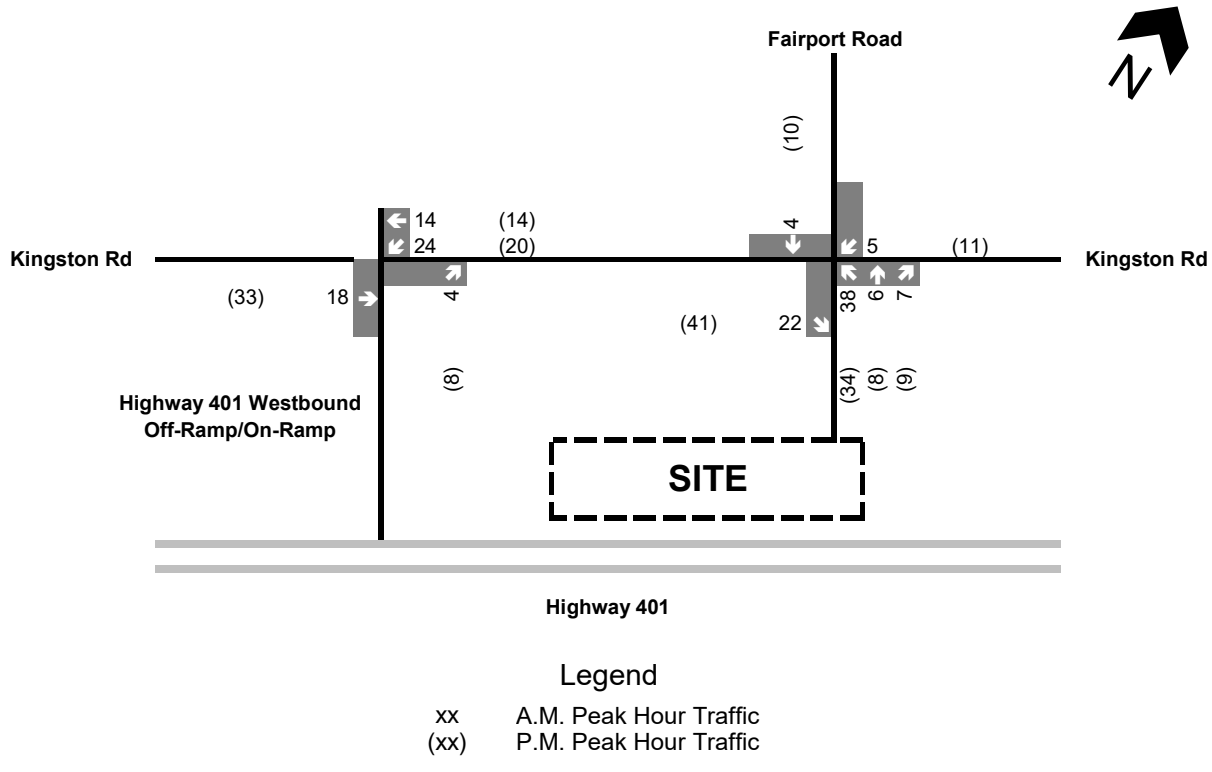
A total of 82 net auto site trips, consisting of 31 inbound and 51 outbound trips, are predicted to be generated by the subject site during the AM peak hour. During the PM peak hour, 62 inbound and 51 outbound net auto site trips are predicted, totaling 113 trips.

Due to the ancillary nature of the retail development, it is expected that the pass-by trips for the retail plaza would not have a significant impact on the overall distribution or traffic operations of the network.

5.2 Site Trip Distribution and Assignment

The distribution of site traffic was derived from 2016 Transportation Tomorrow Survey (TTS) summary data for the Traffic Analysis Zones (TAZ) 1046, 1047, **1048** (subject site zone), 1049, and 1050 in Planning District (PD) 20 (Pickering) and assigned to the road network accordingly. Separate distributions were identified for residential and retail trips as these land uses typically have different travel patterns. The distributions used for the residential and retail trips are presented in **Appendix E**. **Figure 5-1** illustrates the combined total site traffic assigned to the local road network for the future horizons.

Figure 5-1 Site Traffic



Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

6 Future Total Traffic Volumes

The future total traffic volumes during the weekday peak hours for the 2027 and 2032 planning horizons were derived by combining the projected future background traffic with the corresponding estimate of the site generated traffic.

Figure 6-1 summarizes the future total traffic volumes at the 2027 planning horizon during the weekday AM and PM peak hours. **Figure 6-2** summarizes the future total traffic volumes at the 2032 planning horizon during the weekday AM and PM peak hours.

Figure 6-1 Future Total (2027) Traffic Volumes

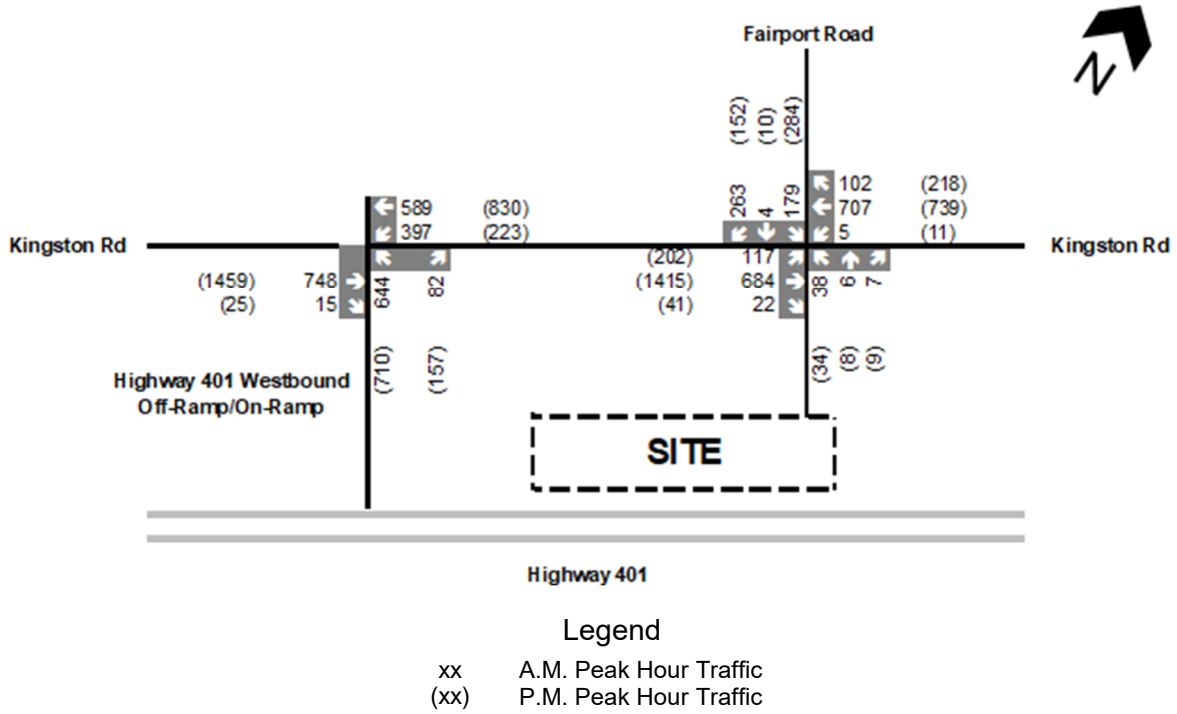
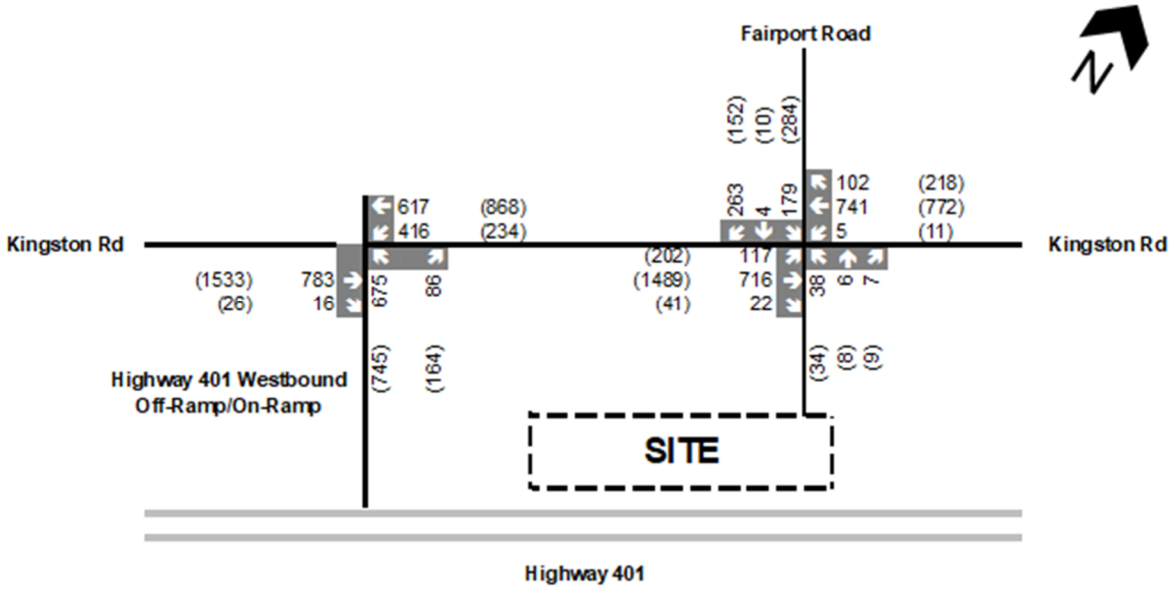


Figure 6-2 Future Total (2032) Traffic Volumes



Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

7 Traffic Capacity Analysis

The capacity analysis identifies how well the intersections and access driveways are operation and how they are expected to operate in the future. The analysis contained in this report utilized the Highway Capacity Manual (HCM) 2000 techniques within the Synchro Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queueing characteristics are reported as the predicted 50th/95th percentile queue for each turning movement.

In accordance with Durham Region TIS Guidelines the analysis includes the identification of critical movements at signalized intersections within the study area. Critical movements are defined as movements where LOS is E or worse for urban areas; a critical v/c ratio of 0.90 was selected. The 95th percentile queue lengths that are bolded are predicted to extend beyond available storage of a dedicated turn lane or extend beyond an upstream intersection and/or major access point.

In addition to the Durham Region TIS Guidelines, the MTO has separate definitions for critical movements at signalized intersection ramps under their jurisdiction:

- For ramp terminals, a v/c ratio for ramp approaches with a value greater than 0.75 would be deemed critical and considered for geometric improvement.
- Movements with a v/c ratio greater than 0.85 are deemed to be "critical" in terms of operations. Movements that experience a v/c ratio of 0.85 or greater would be consideration for geometric improvement.

The following tables summarize the Synchro/HCM capacity and queuing results for the study intersections during the weekday a.m. and p.m. peak hours under baseline (2021) and future background and future total (2022) traffic conditions. Detailed Synchro reports are attached in **Appendix F.**

7.1 EXISTING CONDITIONS

The traffic capacity analysis results for the intersections in the study area are summarized in Table 7-1 for both the weekday a.m. and p.m. peak hours under existing traffic conditions. A -2.0 second lost time adjustment was applied to all protected left-turn movements as a calibration measure as several movements were found to be near capacity under existing conditions.

Table 7-1 Baseline Capacity Analysis

Intersection	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Kingston Road at Fairport Road (Signalized)	*Overall*	*0.41*	*21*	*C*	-	*0.66*	*23*	*C*	-
	EBL [75]	0.25	12	B	18/41	0.40	11	B	26/37
	EBT	0.28	15	B	71/98	0.61	21	C	178/205
	WBT	0.35	11	B	37/62	0.36	15	B	42/68
	WBR	0.11	9	A	5/15	0.21	14	B	10/28

Intersection	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
	[20]								
	SBL [20]	0.71	56	**E**	**43/63**	0.80	56	**E**	**65/88**
	SBR	0.20	44	D	0/23	0.11	37	D	0/15
Kingston Road at Highway 401 Westbound On/Off-Ramp (Westbound Exit 394) (signalized)	*Overall*	*0.57*	*22*	*C*	-	***0.86***	*30*	*C*	-
	EBTR	0.45	21	C	54/87	**0.86**	29	C	159/193
	WBL [55]	**0.71**	11	B	43/53	**0.85**	33	D	30/**64**
	WBTR	0.30	6	A	33/33	0.36	9	A	57/12
	NBL [400]	**0.76**	45	D	67/80	**0.92**	44	**E**	86/118
	NBR [45]	0.06	35	C	0/11	0.21	37	D	7/26

Under existing conditions, the intersection of Kingston Road at Fairport Road is expected to be operating well overall and within capacity, with only the southbound left experiencing critical LOS. The queues for the southbound left movement extend beyond the available storage in both peak hours, which is in line with existing observations for the intersection. However, based on the site visit conducted by TYLIN, the southbound left-turn queues are expected to be serviced within each cycle. Additionally, the southbound travel lane is wide enough (pavement width of nearly 6 metres) to support a longer functional storage without obstructing southbound right-turning vehicles.

At the 401 Westbound On/Off-Ramp intersection, the intersection is expected to be operating critically in the p.m. peak hour. The westbound left and northbound left movement have critical v/c ratios in both peak hours and are near capacity, and the eastbound left has a critical v/c in the p.m. peak hour. The 95th percentile queue for the westbound left exceeds the available storage in the p.m. peak hour, though all 50th percentile queues are within the available storage, including at the ramp terminals. It should be noted that the westbound-left extends from a two-way left-turn lane, and therefore has a larger storage than indicated. Given the predicted existing critical performance of the Highway 401 ramp terminals, geometric improvements should be considered to improve operations for the interchange. However, for the purpose of conservative analysis in this study, no further geometric improvements to the ramps have been considered to determine the operations of the interchange without improvements.

Overall, under existing conditions, the study network is expected to operate within capacity and with minor queuing concerns. Based on the site visit, all queues were observed to be cleared within a minimum of two cycles.

7.2 Future Background Conditions

7.2.1 2027 Future Background

With the introduction of the planned BRT improvements to Kingston Road by the future 2027 horizon, the following modifications and optimizations were performed and carried forward to all future scenarios:

- Lane configurations and storage lengths were modified based on the provided preliminary design for the BRT, including the removal of the westbound-right lane at Kingston Road at Fairport Road.
- All exclusive phases for eastbound and westbound left-turn movements on Kingston Road were changed from permitted-protected to fully protected.
- Pedestrian clearance, amber, and all-red times were modified to account for changes in intersection dimensions, based on Ontario Traffic Manual (OTM) Book 12.
- A separate BRT priority phase was not included as it was expected that the BRT would operate during the east-west through phases on Kingston Road.

The following optimizations were undertaken for the future background 2027 horizon:

- Signal timing splits were optimized.
- The peak hour factor for the Kingston Road and Highway 401 On/Off-Ramp intersection was increased to 1.00 in the p.m. peak hour.

The traffic capacity analysis results for the study area intersections under 2027 future background conditions are summarized in **Table 7-2** for both the weekday AM and PM peak hours.

Table 7-2 Future Background 2027 Capacity Analysis

Intersection	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Kingston Road at Fairport Road (Signalized)	*Overall*	*0.57*	*22*	*C*	-	*0.71*	*26*	*C*	-
	EBL [230]	0.58	69	**E**	32/47	0.74	57	**E**	51/64
	EBT	0.32	1	A	4/9	0.63	15	B	87/117
	WBTR	0.51	18	B	63/103	0.63	25	C	87/123
	SBL [20]	0.72	56	**E**	**43/63**	0.80	56	**E**	**65/88**
	SBR	0.20	44	D	0/23	0.11	37	D	0/15
Kingston Road at Highway 401 Westbound On/Off-Ramp (Westbound Exit 394) (signalized)	*Overall*	***0.82***	*42*	*D*	-	***0.83***	*32*	*C*	-
	EBTR	0.69	36	D	83/15	0.83	29	C	153/187
	WBL [245]	**0.95**	77	**E**	98/157	**0.78**	59	**E**	34/62
	WBTR	0.34	17	B	39/81	0.38	9	A	23/49
	NBL [400]	**0.87**	53	**E**	78/102	**0.90**	56	**E**	83/114
	NBR [45]	0.10	35	D	3/16	0.20	37	D	7/24

Under 2027 future background conditions, the intersection of Kingston Road at Fairport Road is expected to be operating well overall, with only the southbound left and eastbound left experiencing critical LOS. As under existing conditions, the southbound left queues are significant. TYLin suggests that City/Region consider modifying the storage of the exclusive southbound left turn lane when the intersection is reconstructed.

At the 401 Westbound On/Off-Ramp intersection, the intersection is expected to be operating critically in both peak hours. As under existing conditions, the westbound left and northbound left movement have critical v/c ratios and LOS in both peak hours. All queues are within the available storage under future conditions. Given the predicted critical performance of the Highway 401 ramp terminals, geometric improvements should be considered to improve operations for the interchange.

Overall, under future background 2027 conditions, the study network is expected to operate within capacity, with minor queuing concerns and significant delays for several movements.

7.2.2 2032 Future Background

The lane geometry for the 2032 future background scenario is unchanged from the 2027 background scenario. The following optimizations were implemented for the horizon:

- Signal timing splits were optimized.
- The peak hour factor for the Kingston Road and Highway 401 On/Off-Ramp intersection was increased to 1.00 in both peak hours.

The traffic capacity analysis results for the study area intersections under 2032 future background conditions are summarized in **Table 7-3** for both the weekday AM and PM peak hours.

Table 7-3 Future Background 2032 Capacity Analysis

Intersection	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Kingston Road at Fairport Road (Signalized)	*Overall*	*0.59*	*22*	*C*	-	*0.73*	*26*	*C*	-
	EBL [230]	0.58	69	**E**	33/48	0.74	55	**E**	51/60
	EBT	0.33	2	A	6/11	0.66	16	B	98/123
	WBTR	0.53	18	B	68/111	0.66	25	C	92/129
	SBL [20]	0.72	56	**E**	**45/66**	0.80	56	**E**	**65/88**
	SBR	0.21	44	D	0/23	0.11	37	D	0/15
Kingston Road at Highway 401 Westbound On/Off-Ramp (Westbound Exit 394) (signalized)	*Overall*	***0.82***	*42*	*D*	-	***0.89***	*36*	*D*	-
	EBTR	0.68	36	D	*88/111*	**0.89**	34	C	168/210
	WBL [245]	**0.95**	76	**E**	102/155	**0.85**	72	**E**	40/73
	WBTR	0.33	17	B	38/79	0.40	10	A	25/53
	NBL [400]	**0.86**	52	D	84/118	**0.93**	60	**E**	88/123
	NBR [45]	0.10	35	D	4/17	0.22	36	D	8/27

Under 2032 future background conditions, the intersection of Kingston Road at Fairport Road is expected to be operating well overall, with only the southbound left and eastbound left experiencing critical LOS. As under existing conditions, the southbound left queues are significant.

As with 2027, TYLin suggests that City/Region consider modifying the storage of the exclusive southbound left turn lane when the intersection is reconstructed.

At the 401 Westbound On/Off-Ramp intersection, the intersection is expected to be operating critically in both peak hours. As under existing conditions, the westbound left and northbound left movement have critical v/c ratios and LOS in both peak hours and the eastbound through-right movement has a critical v/c and LOS in the p.m. peak hour. All queues are within the available storage under 2032 background conditions. Given the predicted critical performance of the Highway 401 ramp terminals, geometric improvements should be considered to improve operations for the interchange.

Overall, under future background 2032 conditions, the study network is expected to operate within capacity with several movements being near capacity, significant delays for several movements, and minor queuing concerns.

7.3 Future Total Conditions

The future total road network is made up of the future background traffic combined with the subject site traffic. The addition of the site access will form the fourth and south leg of the intersection of Kingston Road at Fairport Road. In addition to the geometric modifications considered above, the following modifications were included:

- A northbound shared left-through-right lane was considered for the intersection of Kingston Road and Fairport Road
- A shared westbound U-left turn lane was included.
- The southbound right-turn lane was modified to a shared southbound through-right lane.

7.3.1 2027 Future Total

The following optimizations were undertaken for the future total 2027 scenario:

- Signal timing splits were optimized.
- The peak hour factor for the Kingston Road and Highway 401 On/Off-Ramp intersection was increased to 1.00 in the p.m. peak hour.

The traffic capacity analysis results for the study area intersections under 2027 future total conditions are summarized in **Table 7-4** for both the weekday AM and PM peak hours. The predicted capacity results of the two subject site accesses are also included.

Table 7-4 2027 Future Total Capacity Analysis

Intersection	Movement [Storage (m)]	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Kingston Road at Fairport Road/Future Site Access (Signalized)	*Overall*	*0.60*	*23*	*C*	-	*0.80*	*31*	*C*	-
	EBL [230]	0.61	74	**E**	32/45	0.77	61	**E**	51/62
	EBT	0.37	2	A	5/10	0.74	22	C	94/122

Intersection	Movement [Storage (m)]	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
	WBL	0.16	60	**E**	1/6	0.26	61	**E**	3/9
	WBTR	0.54	20	C	70/106	0.67	28	C	97/123
	NBLTR	0.34	42	D	10/21	0.12	33	C	7/17
	SBL [20]	0.72	54	D	**42/62**	0.88	65	**E**	**64/104**
	SBTR	0.21	40	D	1/22	0.14	34	C	2/18
Kingston Road at Highway 401 Westbound On/Off-Ramp (Westbound Exit 394) (signalized)	*Overall*	***0.84***	*44*	*D*	-	***0.86***	*34*	C	-
	EBTR	0.72	38	D	85/108	**0.86**	31	C	159/195
	WBL [245]	**0.99**	81	**F**	108/170	**0.85**	69	**E**	42/75
	WBTR	0.34	19	B	48/86	0.39	9	A	27/52
	NBL [400]	**0.87**	53	**D**	78/102	**0.90**	56	**E**	83/114
	NBR [45]	0.10	36	D	3/16	0.21	37	D	7/25

Under 2027 future total conditions, operations are expected to be similar to those under 2027 future background conditions with slightly higher v/c ratios. The intersection of Kingston Road at Fairport Road is expected to be operating well overall, with only the eastbound left and westbound left experiencing critical LOS. As under existing conditions, the southbound left queues are significant. TYLin suggests that City/Region consider modifying the storage of the exclusive southbound left turn lane when the intersection is reconstructed. The site access intersection is expected to operate well, within capacity and acceptable delays.

At the 401 Westbound On/Off-Ramp intersection, the intersection is expected to be operating critically in both peak hours, similar to future background 2027 conditions. With the addition of site traffic, v/c ratios are expected to increase slightly but remain within capacity (though the westbound left is shown to be approaching capacity. The westbound left and northbound left movement have critical v/c ratios and LOS in both peak hours and the eastbound through-right movement has a critical v/c in the p.m. peak hour. All queues are within the available storage under future conditions. Given the predicted critical performance of the Highway 401 ramp terminals, geometric improvements should be considered to improve operations for the interchange.

Overall, under future total 2027 conditions with the addition of the subject site traffic, the study network is expected to operate within capacity, with minor queuing concerns and significant delays for several movements. The addition of site traffic has minor impact to the network operations compared to the future background 2027 conditions.

7.3.2 2032 Future Total

The lane geometry for the 2032 future total scenario is unchanged from the 2027 future total scenario. The following optimizations were implemented for the horizon:

- Signal timing splits were optimized.

– The peak hour factor for the Kingston Road and Highway 401 On/Off-Ramp intersection was increased to 1.00 in both peak hours.

The traffic capacity analysis results for the study area intersections are summarized in **Table 7-5** for both the weekday AM and PM peak hours under 2032 future total traffic conditions.

Table 7-5 2032 Future Total Capacity Analysis

Intersection	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		v/c	Delay (s)	LOS	Queue (m)	v/c	Delay (s)	LOS	Queue (m)
Kingston Road at Fairport Road/Future Site Access (Signalized)	*Overall*	*0.61*	*23*	*C*	-	*0.82*	*32*	*C*	-
	EBL [230]	0.61	73	**E**	32/45	0.77	59	**E**	51/59
	EBT	0.39	2	A	6/12	0.78	23	C	104/126
	WBL	0.16	60	**E**	1/6	0.26	61	**E**	3/9
	WBR	0.57	21	C	74/112	0.70	29	C	103/129
	NBLTR	0.34	42	D	10/21	0.12	33	C	7/17
	SBL [20]	0.72	54	D	**42/62**	0.88	65	**E**	**64/104**
	SBTR	0.21	40	D	1/22	0.14	34	C	2/18
Kingston Road at Highway 401 Westbound On/Off-Ramp (Westbound Exit 394) (signalized)	*Overall*	***0.84***	*44*	*D*	-	***0.91***	*38*	***D***	-
	EBTR	0.72	38	D	85/108	**0.92**	37	**D**	175/229
	WBL [245]	**0.98**	80	**E**	106/169	**0.91**	81	**F**	46/87
	WBTR	0.34	19	B	49/89	0.41	10	B	31/57
	NBL [400]	**0.86**	52	D	77/101	**0.93**	60	**E**	88/123
	NBR [45]	0.10	35	D	3/16	0.23	37	D	9/27

Under 2032 future total conditions, operations are expected to be similar to those under 2032 future background conditions. The intersection of Kingston Road at Fairport Road is expected to be operating well overall, with only the eastbound left and westbound left experiencing critical LOS. As under existing conditions, the southbound left queues are significant. TYLin suggests that City/Region consider modifying the storage of the exclusive southbound left turn lane when the intersection is reconstructed. Once again, the site access intersection is expected to operate well, within capacity and acceptable delays.

At the 401 Westbound On/Off-Ramp intersection, the intersection is expected to be operating critically in both peak hours, similar to future background 2027 conditions. With the addition of site traffic, v/c ratios are expected to increase, and the intersection is found to be approaching capacity in the p.m. peak hour. The westbound left and northbound left movement have critical v/c near capacity ratios and LOS in both peak hours and the eastbound through-right movement is approaching capacity and has critical LOS in the p.m. peak hour. All queues are within the available storage under future conditions. Given the predicted critical performance of the Highway 401 ramp terminals, geometric improvements should be considered to improve operations for the interchange.

Overall, under future total 2032 conditions with the addition of the subject site traffic, the study network is expected to operate within capacity, with several movements at the Highway 401 interchange intersection approaching capacity with minor queuing concerns and significant delays for several movements. The addition of site traffic has some impact to the network operations compared to the future background 2032 conditions, but overall will operate acceptably.

Based on the above analysis, it is expected that the introduction of the subject site traffic to the study network will have relatively little impact on future operations in both the 2027 and 2032 horizon years. The network is expected to operate acceptably but approaching capacity in the future, either with or without the site traffic. As a result, TYLin suggests ensuring that focus is placed on transportation demand management initiatives in order to mitigate the vehicular travel demands of the subject site. Furthermore, the above results indicate that a single access as currently proposed is acceptable and a secondary access is not required.

8 Parking Review

8.1 VEHICLE PARKING

8.1.1 Vehicle Parking Requirement

Currently, the subject lands are governed by a site-specific By-Law 6718/07 to amend By-Law 3036.

Table 8-1 details the required parking supply based on By-Law 6718/07.

Table 8-1 Vehicle Parking Requirements as per By-Law 6718/07

Land Use	Minimum Parking Rate	Units/ Density	Minimum Required Parking Supply
Multiple dwelling vertical uses (residential)	1 space/unit	337	337
Residential Visitor	0.25 spaces/unit	337	84
Commercial	4.5 spaces/100 m2	629.9	28
Total Minimum Required Parking Supply			**449**

The site-specific by-law prescribes a residential parking rate of 1 space per unit, visitor parking rate of 0.25 spaces per unit and retail rate of 4.5 spaces per 100 m^2 of commercial GFA. The total required vehicle parking supply is 449 spaces.

8.1.2 Proposed Vehicle Parking Supply

8.1.2.1 Proposed Parking Composition and Rate

The subject site is proposed to be a mixed-use development which consists of 337 dwelling units split between two towers and 629.9 m^2 GFA of ground floor retail space.

The site proposes to provide a total supply of 342 spaces comprised of 270 residential spaces and 72 visitor/retail spaces. The proposed visitor/retail parking spaces will be located at grade and in underground Level 1 and residential parking spaces will be provided in underground level 1 and underground Level 2. The site proposes to provide all the parking spaces on underground Level 2 via a stacked vehicle parking system, which is explained in detail in **Section 8.1.4**.

Table 8-2 summarizes the proposed parking supply, excluding the 5 surplus spaces within the MTO boundary.

Table 8-2 Vehicle Parking Provided

Floor	Total Spaces
At grade	19
Underground 1	69
Underground 2	254
Total Provided	342

The proposed residential parking supply represents a deficiency of 107 parking spaces compared to the rate prescribed in By-Law 6718/07. **Section 8.1.3** will provide detailed justification for the reduction of the proposed supply.

8.1.3 Parking Supply Justification

8.1.3.1 New Municipal Parking Requirements

Based on the historic nature of the in-effect site specific by-law, and the city-wide parking rate update currently underway, TYLin proposes to consider the parking requirements under the City of Pickering's Zoning By-law 7553/17 for Pickering City Centre, dated February 2018. TYLin believes the use of these more contemporary rates better reflects the characteristics of the subject site including its location along the Kingston Road corridor, and its proximity to Pickering City Centre. Specifically, the subject site is located just 1.5 km west of the western boundary of City Centre, west of Liverpool Road and within the Kingston Road Corridor and Specialty Retailing Node Intensification Plan.

The parking rates for Pickering City Centre as per By-law 7553/17 is summarized in

Table 8-3.

Table 8-3 Vehicle Parking Requirements as per By-Law 7553/17

Land Use	Minimum Parking Rate	Units/ Density	Minimum Required Parking Supply	Proposed Parking Supply
Apartment Dwelling	0.8 space/unit	337	269	270
Visitor	0.15 spaces/unit	337	50	72
Retail	3.5 spaces/100 m2	629.9	22	
Total			**341**	**342**

The residential parking as per By-law 7553/17 requires 269 parking spaces which would be exceeded by one space with the proposed supply. The combined visitor and retail parking requirement per By-law 7553/17 would be 72 parking spaces, and through shared parking is expected to be satisfied by the proposed 72 visitor/retail parking spaces.

The commercial parking supply is considered adequate for the needs of the site due to the low overall GFA and ancillary nature of the retail land use. The businesses located within the site will generally serve the residents living within the building itself, and those within walking/cycling

distance, and therefore will generate much less parking demand than the prescribed rate. Additionally, shared parking between the commercial land use and the residential visitor parking would allow for flexibility between peak parking demands.

The City is currently undertaking a Zoning By-law Review of the six existing parent zoning by-laws, with the goal to update and consolidate policies and guidelines in a single by-law. The review is currently in first draft and was submitted May 2022. The first draft of the Comprehensive Zoning By-Law proposes the same residential and visitor parking rates for City Centre of 0.80 and 0.15 spaces/unit respectively, and further lowers the retail parking rate to 2.5 spaces per 100 m^2 of GFA.

The draft By-law recommendations from *Discussion Paper 7: Parking, Active Transportation and Loading* also state the following:

- Align minimum parking requirements on a tier approach with lowest parking rates for City Centre and highest parking rates in the general area
- Align minimum parking requirements across land uses
- Consider the tier of Commercial parking requirements that should apply to the Kingston Road Corridor and Specialty Retailing Node
- Reduce the minimum parking requirements for apartments outside the City Centre and consider reduction for other dwelling types

Furthermore, in January 2022 the City initiated the Official Plan Amendment 38 (OPA 38): Kingston Mixed Corridor and Brock Mixed Node which is currently under review with the Region of Durham. The official plan amendment outlines policies that would enable the intensification and redevelopment of the Kingston Road corridor. The policy recommendations regarding parking include:

- Reduced minimum parking standards are encouraged to reflect the area's compact, high-density urban form and shift towards a pedestrian and transit-oriented environment

TYLin believes that the proposed parking supply at the subject site aligns with the recommendations of both OPA 38 and the draft comprehensive zoning by-laws, and would be sufficient to support the site's parking needs. The rates are considered appropriate based on the proximity of the site to the City Centre, its location within the intensification corridor, and the modest retail presence of the site.

8.1.3.2 Vehicle Ownership Trends

Factors such as gas prices, cost of car ownership, rideshare and car-share options have all contributed to a downward trend in parking demand. Planning policy which seeks to integrate land uses and develop centres and corridors allowing multiple opportunities to live, work and play supported by transit have also facilitated reduced demands for parking and car ownership in downtown and urban locations.

The declining trend in vehicle ownership in the site area was noted in a TIS by WSP dated March 2021 for a mixed-use retail and residential development located at 1899 Brock Road approximately

3.5 km northeast of the subject site. A TTS analysis was performed reviewing the vehicle ownership for apartments in the area over the period 2001 to 2016. It was found that 46% of individuals do not own their own vehicle and the number of vehicles per apartment was trending down from 0.79 vehicles per unit in 2001 to 0.42 vehicles per unit in 2016. The relevant excerpts from the March 2021 TIS can be found in **Appendix G**.

The site will be able to take advantage of this trend by unbundling parking spaces from the residential units and having parking spaces rented separately. This allows for a more equitable distribution of parking spaces by need, so only units with vehicles would rent parking and generates a financial incentive for residents who do not require parking spaces.

The findings show that apartment dwellings in the area own on average 0.42 vehicles each, a rate which appears to be trending downward across the region. This suggests that the residential parking demand for the subject site may be significantly lower than the proposed supply supporting the proposed parking rate.

8.1.3.3 Transit-Oriented Impacts

As detailed in **Section 3.2** and **Section 4.5.1**, the site will be served by GO transit and the DSBRT which will encourage alternate travel modes to single-occupant-vehicles for future residents.

The site fronts directly on to Kingston Road which is a major east-west corridor through the City and the planned route for the DSBRT. The future DSBRT has a stop planned at Kingston Road and Fairport Road which will provide residents with higher level transit less than a one-minute walk from the site. The BRT will connect Toronto, Pickering, Ajax, Whitby, and Oshawa with service approximately every five minutes allowing for convenient, low-cost trips both locally within Pickering and across the eastern GTA. The DSBRT will also allow residents to travel in less than 10 minutes to Pickering City Centre which allows for most daily errands to be completed without the need for a vehicle.

Additionally, GO Transit also uses the Kingston Road corridor with a stop at Kingston Road and Fairport Road for bus routes 42 and 91 less than a one-minute walk from the site. Pickering GO Station is only 2 km away which provides further connection to the greater GO Transit network across the GTA. Both bus routes operate with frequencies shorter than 30-minutes at peak hour providing a practical regional option for residents.

The subject site will further encourage the adoption of transit by providing real time travel information and developing a financial incentive plan. Real time travel information such as transit schedules, delays, and weather can be shared via a TV in a centralized location such as the lobby. This allows travelers to better plan their trips and makes transit more convenient. A financial incentive plan generally takes the form of a pre-loaded PRESTO card or monthly transit pass that allows residents to take transit at a reduced cost. This is very helpful for the adoption of transit as it provides residents a way to try transit and experience the benefits in their day-to-day schedule. The exact value, provision of the transit subsidy, and which residents will be eligible would be up to the discretion of the owner.

The proximity to GO and DSBRT services will provide residents with direct access to high frequency

rapid transit service and connections to higher order public transit connections. The availability of multiple transit options reduces the need for car ownership by residents and by extension on-site parking facilities.

8.1.3.4 Active Transportation Connectivity

As detailed in **Section 3.3** and **Section 4.5.2** extensive active transportation infrastructure is planned for the study area which will allow for cycling and walking to be comfortable and practical. Sidewalks and cycle tracks will be provided on both sides of Kingston Road and Fairport Road which will allow residents to safely walk and cycle to the local amenities around the site. As the corridor continues to develop and intensify, additional amenities will enter the area and allow for more and more daily activities to be accomplished without the need for a vehicle.

The site itself will provide several active transportation facilities to encourage the adoption and continual usage of active transportation. 178 long term bicycle parking spaces will be provided at grade and within both underground parking levels providing secure, weather protected storage areas for residents who may not want to store their bicycle in their unit. Additionally, a bicycle repair station is proposed in the underground level 1 to provide residents access to a repair stand and basic tools. Access to repair facilities encourages bicycling adoption by promoting bicycle maintenance and removing the financial burden of sourcing tools and repair services. Walking is also encouraged with the configuration of the building by placing the residential entrance facing the sidewalk while placing parking and drop off to the rear of the building. The landscaping and street furniture such as water fountains and gathering tables at the side of the building also work to make the site more appealing to walk to and from.

It is expected that the modest retail space will be a personal service establishment, attracting local patrons predominantly via foot traffic or cycling. The low likelihood of vehicle trips to and from this retail space subsequently reduces the need for retail visitor parking spaces and supports the reduced parking rate. Additionally, twelve short term bicycle parking spaces will be provided at grade to encourage visitors and shoppers to arrive by bike.

8.1.3.5 Approved Comparable Development

A review of other developments with similar transportation contexts was conducted from the City of Pickering current development proposals webpage and through discussion with City staff during pre-consultation. In particular, the parking supply of a mixed-use development at 1899 Brock Road was assessed. 1899 Brock Road is located approximately 0.8 km from the east edge of the Pickering City Centre zone and within the Kingston Road Intensification area.

The 1899 Brock Road development proposes to provide 959 spaces for 922 residential units and 1920 m^2 of retail GFA. Relevant excerpts of the TIS can be found in **Appendix G**.

The 1899 Brock Road proposes to provide parking rates similar to the subject site while being located at a similar distance from Pickering City Centre and within the Kingston Road Intensification area. The subject site has the additional benefit of a smaller retail GFA and being directly along the DSBRT, which reduces travel time to the City Centre without a personal vehicle. The 1899 Brock Road development was approved by City Council on June 6, 2022, showing that the subject site's

parking rates should be considered acceptable to the City.

8.1.4 Stacked Parking Technology

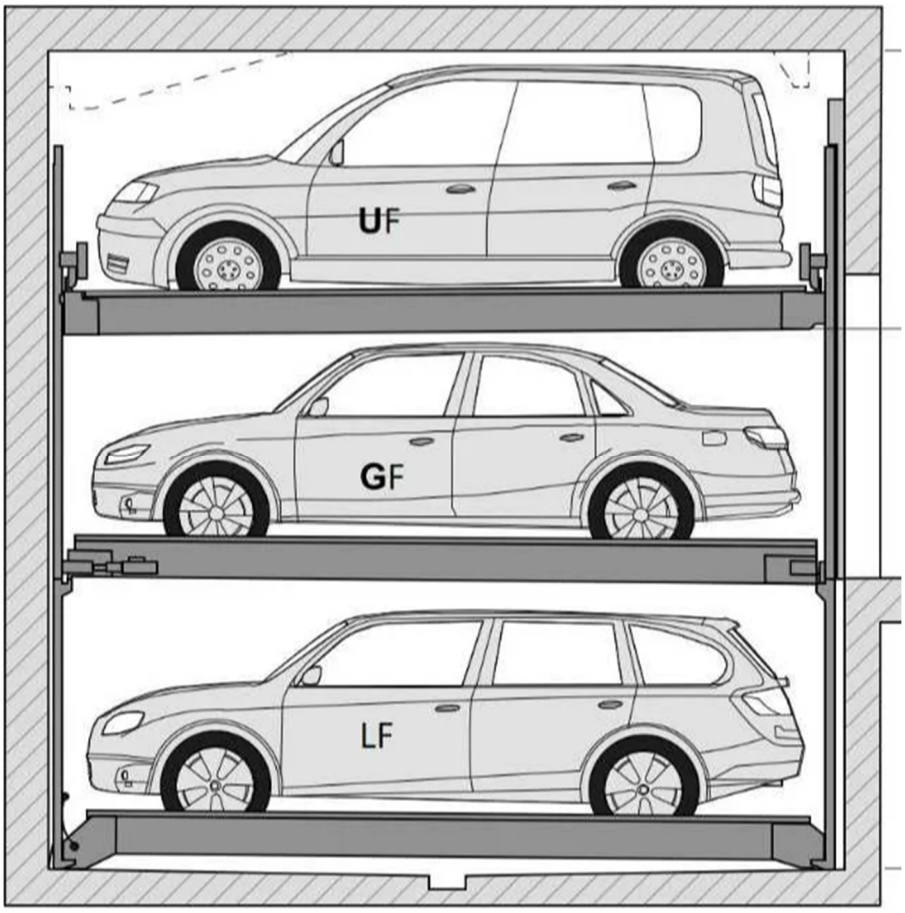
Based on the conceptual plans and discussions with the Client, it is our understanding that a stacked vehicle parking is to be implemented as part of this development. These stacked parking spaces would operate independently of each other and would operate using semi-automatic systems within the underground Level 2 parking area.

Stacked parking systems are generally implemented in residential and commercial buildings to save space and increase parking capacity within constrained underground car parks or parking garages. The systems also lower the overall cost of providing underground vehicle parking, improving residential affordability. The proposed development at 875 Kingston Road will feature the use of a tri-level semi-automatic parking system, specifically model *TrendVario 6300* by service provider *Klaus Multiparking*.

It is recommended that training be mandatory all residents who utilize the stacked parking, and would be provided by information or staff from the service provider.

The entrance to the TrendVario 6300 spaces would be at the same level as the main thoroughfare. For maximum operating safety, the access level is secured from the entire system by gates which also protect the vehicles from theft and vandalism. The system accommodates three vehicles, one above the other, with access located in the middle row. **Figure 8-1** illustrates the configuration of the parking system.

Figure 8-1 TrendVario 6300 Parking Configuration



Source: Klaus Multiparking

The parking spaces are moved vertically and horizontally: down into a pit (lower floor, LF) or up to the third parking level (upper floor, UF). When a resident uses the parking system to park their car, they can request a space via the SmartChip, SmartPortable or SmartApp (fob, remote, app, respectively), and an available space is moved into the middle row position (ground floor, GF) for resident access. This process is similarly completed for retrieving a parked car. Despite the additional vertical spatial requirements, the stacked system can accommodate more cars within the same floor area, with up to 29 vehicle parking spaces provided per 10-space-wide parking section.

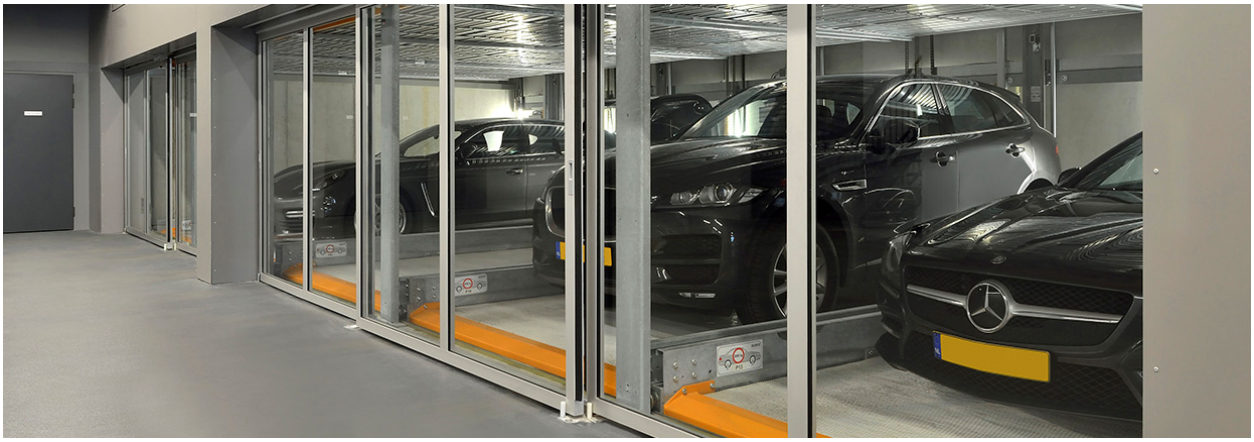
Based on vehicle parking dimensions available from the service provider, each stacked parking space would accommodate the following maximum vehicle dimensions and specifications:

- Height: 215 cm
- Length: 530 cm
- Width 270 cm
- Weight: 3,000 kg

Figure 8-2 and Figure 8-3 provide a visualization of how the proposed stacked parking system is designed and operated.

Figure 8-2 TrendVario 6300 Parking Configuration Rendering

Figure 8-3 TrendVario 6300 Parking Ground Floor



Source: Klaus Multiparking

Each of the stacked parking spaces would be accessible independently via the SmartChip, SmartPortable or SmartApp and would not impede access to any other vehicle. **Therefore, these stacked parking spaces would each be considered as a standard parking space to support the site's parking demand.**

The proposed stacked parking system spaces will be distributed to residents who would receive proper training in accordance with the manufacturer and confirm that their vehicle size meets the specifications. A video demonstration of how the stacked parking operations would work can be viewed at the following link: https://multiparking.com/en/products/59/trendvario-6300/

Considering the parking stackers operate independently of each other, with up to 29 spaces each, and calling spaces to park/retrieve vehicles takes a couple of minutes per resident, no major queuing issues are expected to arise.

Local examples:

Other municipalities and projects where the stacked vehicle parking have been implemented by the proposed service provider, Klaus Multiparking, are provided in **Table 8-4** below:

Table 8-4 Stacked Parking Provided by Klaus Multiparking in Ontario

Location	Builder	Model Number & Parking Supply
One King West Hotel and Residences Toronto, ON	Harry Stinson Ellis Don Stanford Downey Architect	SingleVario 2061 56 spaces
St. Regis Toronto (formerly Trump) Toronto, ON	Talon Developments Brookfield Multiplex Zeidler Architecture	SingleVario 2061 140 spaces
2221 Yonge Condos Toronto, ON	Tower Hill Development Toddglen Construction Quadrangle Architects	SingleVario 2061 212 spaces
One Six Nine LOFTS Toronto, ON	Lamb Development Harhay Construction Core Architects	Multibase G63 24 spaces
Beach Hill Condos Toronto, ON	Carlyle Communities TMG Builders RAW Design	Multibase G63 42 spaces
Terrasse Condos Toronto, ON	Sunrise Gate Homes Fusioncorp RAW Design	TrendVario 4300 32 spaces
LeBreton Flats Ottawa, ON	Claridge Homes Hanganu Architects	TrendVario 4200 52 spaces

Stacked parking solutions are becoming increasingly common in Ontario for their convenience and cost savings. Klaus Multiparking, the chosen supplier for the subject site, is an experienced vendor in the implementation of these systems in the region, which will set a reliable precedent for future stacked parking systems within the City of Pickering.

8.2 ACCESSIBLE PARKING

As part of the overall vehicle parking supply, accessible parking spaces are to be provided on-site in the proposed development for persons with disabilities, in accordance with the City of Pickering's Zoning By-law 6604/05. The By-law states that for a parking supply of 301-350 spaces, 4 Type A spaces and 5 Type B spaces are required. Type A spaces have minimum dimensions of 3.4 m x 5.3 m while Type B spaces have minimum dimensions of 2.4 m x 5.3 m. **Table 8-5** summarizes the proposed accessible parking supply.

Table 8-5 Accessible Parking Provided

Floor	Total
At Grade	3
Underground 1	4
Underground 2	2
Total Provided	**9**

The site proposes to provide 9 accessible parking spaces which meets the requirement based on Zoning By-law 6604/05.

8.3 Bicycle Parking

Bicycle parking spaces will also be provided by the proposed development for residents and visitors to the subject site. The site-specific zoning by-law does not reference any bicycle parking requirements so to be consistent with the vehicle parking, the Pickering City Centre bicycle parking rates obtained from By-law 7553/17 are referenced below.

Table 8-6 summarizes the required and proposed bicycle parking supply.

Table 8-6 Bicycle Parking Required as per By-law 7553/17

Land Use	Minimum Bicycle Parking Rate	Units/ Density	Minimum Required Bicycle Parking	Proposed Bicycle Parking Supply
Residential	0.5 spaces per unit	337 Units	168	178
Retail	The greater of 2 or 1.0 spaces per 1000 m^2 GFA	629.9 GFA	2	12
Total Bicycle Parking Supply			**170**	**190**

The site would be required to provide 170 parking spaces for bicycles with 168 residential spaces and 2 retail spaces. The site proposes to provide a total of 190 bicycle parking spaces with 178 residential spaces and 12 retail spaces. The residential bicycle parking spaces will be indoors with 44 at grade, 69 on underground Level 1, and 65 on underground Level 2. Retail/visitor bicycle parking spaces will be provided outdoors to the east of the building in front of the retail parking using bike rings.

The proposed development exceeds both the residential and retail bicycle parking requirement and is therefore supportive of active transportation for this site. It would also ensure adequate supply for a growing demand of cyclists.

9 Access and Site Circulation Review

9.1 Site Access Functional Design

Site access will be provided via the south leg of the Kingston Road at Fairport Road intersection. As requested by the Region, a functional design for the site access has been included in **Appendix M**. As noted previous, based on the traffic capacity analysis, a single site access as currently proposed is acceptable and a secondary site access is not required.

9.2 Site Circulation Review

Vehicle maneuvering diagrams have been prepared for the proposed site. This includes a review of waste collection, passenger vehicles and fire route access. The vehicle maneuvering diagrams are provided in **Appendix M**.

9.2.1 Waste Collection Vehicles

Waste collection vehicle turning movements were simulated using a typical Durham Front End Waste Collection Truck. Truck turning movements indicate that the selected waste collection vehicle can circulate the loading area of site (including loading docks) without conflict by performing a front-in and back-out maneuver as shown in **Appendix M**. The size of the waste collection truck is to the size of other loading vehicles and is expected to demonstrate adequate loading maneuvers for the site.

9.2.2 Passenger Vehicle

Passenger vehicle turning movements were simulated using a Transportation Association of Canada (TAC) passenger vehicle, where simultaneous circulation for passenger vehicles were performed. Based on TYLin's review of the site plan (surface, U1, and U2 levels), all aisle and parking space dimensions were either met or exceeded as shown in **Appendix M**.

9.2.3 Fire Route Access

Emergency fire truck vehicles were simulated using a typical Durham Aerial Fire Truck vehicle. Turning movement indicate that the selected fire truck vehicle can circulate throughout the site as shown in the vehicle movement diagram in **Appendix M**. Additionally, all drive aisles meet the required fire route dimensions in accordance with the Ontario Building Code 3.2.5.6.

10 Transportation Demand Management

Transportation Demand Management (TDM) refers to various measures that are undertaken to encourage non-auto modes of travel and to reduce single occupant vehicle (SOV) traffic. These have direct impacts to both parking and trip-related aspects of the site. TDM measures can be categorized into five categories and are listed as follows:

1. Introduction of Alternative Travel Modes
2. Core Commuter Information and Assistance
3. Financial Incentives
4. Supporting Infrastructure
5. TDM Program Support

10.1 Introduction of Alternative Travel Modes

The introduction of new modes of travel to current single-occupant vehicle drivers can be accomplished by utilizing various marketing and communication strategies. For the residential land uses, this can be accomplished through raising awareness of the availability for alternate travel modes for residents. It is recommended that TDM marketing material be provided to all residents, and that any updates to transit / active transportation infrastructure be posted in at locations with significant pedestrian foot-traffic or provided at the sale of the residential unit.

Marketing material should be prepared and provided by City, Region, and DRT staff to ensure that the information provided is up to date. It is also important that the documents be visually appealing to be more approachable. This will help to target and encourage non-driver modes of transportation from the earliest point in the process.

Outreach events are another method to promoting TDM measures. It is recommended that an outreach event be hosted for residents of the site following a minimum of 50% occupancy. City, Region, and DRT staff should be invited to attend the event to answer any questions from residents or employees and provide information on the existing infrastructure and planned infrastructure improvements. Future outreach events can also be planned to promote any new TDM measures and facilities. The event can be held within the building's amenities, a nearby public park, school or community centre.

Due to the COVID-19 pandemic, in-person events would be dependent upon local restrictions and therefore virtual events are also common. Should the registered attendance of a TDM outreach event, in-person or virtually, be considered insufficient to justify attendance of City / Regional / DRT staff, the TDM marketing material can be mailed to each household.

10.2 Core Commuter Information and Assistance

In addition to marketing and communicating the availability of alternative travel modes, it is important to ensure that those seeking to change their travel behaviours have the tools and information to facilitate this change. Information on the available transit routes and bus stops, and

active transportation network should be readily available for anyone looking to travel to or from the site. Improving the ease of access to information of alternative travel modes increases the willingness for behavioural change amongst commuters. It is recommended that carpool ride-matching tool such as www.ridesharing.com and carpool networking be promoted at the TDM outreach event for commuters to meet and find other commuters looking to carpool together.

The information should be prepared by the City, Region, and DRT and distributed at the TDM outreach event.

10.3 Financial Incentives

It is understood that one of the primary factors in behavioural change is monetary compensation. The purpose of providing financial incentives is to promote this change in behaviour and incentivize commuters with trying out new alternate travel modes. This financial support can come in the form of subsidized transit passes or other future subsidies (such as rideshares). It is recommended that a pre-loaded PRESTO card, be provided for each residential unit purchased in the first year of occupancy. The exact amount and provision of the pre-loaded PRESTO card is subject to the discretion of the Owner. The pre-loaded PRESTO card can be distributed at the TDM outreach event, mailed to each household individually or provided during the purchase and signing of each unit.

Additionally, it is recommended that residential parking spaces be unbundled from the residential units. This separates the ownership of the parking space from the residential unit, and allows for a reduced or absence of vehicle ownership.

10.4 Supporting Infrastructure

Physical infrastructure is necessary to support transit and active transportation modes. The infrastructure should be developed and improved for both the site as well as the City and Region. For the proposed development, some examples of supportive infrastructure include:

- Sheltered transit stops;
- Pedestrian sidewalks;
- Benches and other streetscape furniture;
- Cycling facilities (shared or dedicated bicycle paths); and
- Multi-Use Paths.

10.5 TDM Program Support

The TDM programs can be further supported through the involvement with a Transportation Management Associations (TMA). TMA's can provide support to TDM programs through the provision of promotional material, coordination of programs and events, and recommendations on the appropriate measures to be implemented. This is especially important for any "walk-to-school" programs to encourage students to have a positive mindset towards active transportation.

Facilitating the implementation and management of these TDM programs can be accomplished through the effective employment or assignment of a TDM coordinator. The role of the TDM coordinator is to implement, manage and monitor the TDM measures in place for the development. It is recommended that a TDM coordinator be assigned by the City or Region to ensure the success of the TDM plan for the area.

In addition to implementation of these programs, it is important to monitor both the success and the opportunities for improvement for the TDM measures. It is recommended that a baseline survey be conducted at the full build-out of the development to identify residential and staff travel behaviours. A follow-up monitoring survey should then be conducted every two years to measure the effectiveness of the TDM programs and provide recommendations for improvements. The provision of the monitoring survey, follow-up surveys and future TDM programs would be at the discretion of the TDM coordinator.

10.6 TDM Measure Checklist

Based on the above TDM classifications, a checklist has been developed in **Table 1** which summarizes the proposed TDM measure, a brief description and the entity(s) which would be responsible for maintaining and organizing the program.

The TDM checklist has been included in **Table 10-1**.

Table 10-1 TDM Measure Checklist

Category	TDM Strategy	Description	Responsibility
Introduction of Alternative Travel Modes	Information Brochures	Provide brochures with information on transit routes & stops, active transportation infrastructure and TDM programs within the development. Information should be provided by City, Region, and DRT staff and distributed at a TDM outreach event, by mail, or digitally.	All
	Marketing Materials	Marketing material should be made visually attractive and function as both promotion and information of TDM programs and events.	All
	TDM Themed Community Events	TDM themed event should be considered to encourage non-SOV travel as well as improving community involvement. Events could include "Walk to School" or "Bike to Work" events and would be organized by a TDM coordinator assigned by the City or Region.	All
	TDM Outreach Events	A specific outreach event should be held to reach out to new residents and employees of the development. The TDM outreach event would function as a platform for City, Region, and DRT Staff to answer questions and provide information on the available and upcoming transit / AT infrastructure. The event would also provide a good location to distribute any TDM material such as subsidized transit passes and TDM Information Brochures.	All
Core Commuter Information / Assistance	Carpool Ride Matching Platforms and Events	Promote online carpool ride matching platforms such as www.ridesharing.com or host carpool networking events to provide safe and efficient methods for carpool drivers and passengers to connect.	All
Financial Incentives	Subsidized Transit Passes	Provide a pre-loaded PRESTO card for all residential units purchased within the first year of occupancy. The exact amount and provision of the subsidized transit pass is subject to the discretion of the Owner.	Owner
	Unbundle Parking Supply	Unbundle parking spaces from the residential unit and have parking spaces	Owner

Category	TDM Strategy	Description	Responsibility
		rented separately from a residential unit. This allows for a more equitable distribution of parking spaces by need, so only units with vehicles would rent parking and attracts residents who do not require parking spaces.	
Supporting Infrastructure	Sheltered Transit Stops	Provide sheltered facilities at transit stops to promote transit usage. Sheltered facilities should provide information on transit routes and protection from the weather. Additional transit stops and services should also be considered as required.	Durham Region Transit
	Real Time Transit Information	Provide information on transit schedules, weather, fare, and routes in a central location to allow residents to more conveniently plan their travels	Owner
	Pedestrian Connection	Provide appropriate pedestrian connections to encourage and facilitate active transportation. This will also provide the necessary connections to transit stops.	All
	Cycling Facilities / Trails / Multi-Use Paths	Provide cycling accessible facilities to expand the cycling network and improve accessibility for its users.	All
	Bicycle Repair Stand	Provide stand with basic tools and repair information to make bike ownership and maintenance easier	Owner
Program Support	TDM Coordinator / Transportation Management Association	A TDM coordinator or TMA would implement, manage and monitor the TDM programs identified in this plan. Coordinating TDM programs across the land uses would improve the effectiveness.	City & Region
	Monitoring Survey	Conduct TDM monitoring surveys to track changes in travel patterns and the success of the implemented TDM programs. It is recommended to conduct a baseline survey with residents when the site is fully occupied and conduct follow-up surveys once every two years. The provision of the monitoring survey is subject to the discretion of the TDM Coordinator.	TDM Coordinator

11 Conclusions and Recommendations

The conclusions and recommendations for the analysis associated with the proposed development are as follows:

- The study area network is expected to operate well in the 2027 and 2032 future background horizons. All intersections are expected to operate within capacity.
- The subject site is expected to generate a total of 31 inbound and 51 outbound trips during the AM peak hour and 62 inbound and 51 outbound trips during the PM peak hour.
- Based on the future total traffic volumes, the site is expected to have a minimal impact on the overall operations. All intersections would continue to operate well within capacity and wit acceptable levels of service and delay.
- The proposed site expected to operate similar to the Pickering City Centre with the proximity to the DSBRT and City Centre itself. Therefore, it is recommended that the City Centre by-law vehicle and parking rates would be applicable for this site, and would be sufficient to service the anticipated demand.
- The proposed stacked parking system has been detailed in **Section 8.1.2** of this study and indicates the functionality and ability for the parking spaces to operate as individual spaces for the purposes of parking supply. These stacked parking systems are becoming increasingly common across Ontario.
- There are no issues with the site's proposed access or internal layout based on the assessed design vehicles and relevant standards. A single site access as currently proposed is acceptable and a secondary site access is not required.
- The proposed Transportation Demand Management plan is to be considered by the Owner as well as the City & Region in order to reduce single occupant vehicle trips as well as improve the overall health and flow of transportation throughout the site.

Appendix A:
Pre-Consultation Correspondence

Jessica Deng

From: Doug Robertson <Doug.Robertson@Durham.ca>
Sent: Wednesday, June 15, 2022 9:54 AM
To: Alan Xaykongsa; Singh, Christian (MTO); Zahoor, Nadeem
Cc: Amar Lad; Jonathan Law; Michael Dowdall; Lynda Motschenbacher
Subject: RE: 875 Kingston Road W (Pickering) - TIS Terms of Reference (Input Requested)
Attachments: Transportation Impact Study Guidelines OCT 2011 with 2020 Figs.pdf; 12562934 Roll Plan_PMK-PM-1-2.pdf

Hi Alan,

I have reviewed your proposed Terms of Reference, and my comments are as follows:

1. Your study must comply with the Region's Traffic Impact Study Guidelines (attached), including the requirements for Synchro analysis (Chapter 9 in the Design Specifications for Traffic Control Devices, Pavement Marking, Signage and Roadside Protection).

2. The most current intersection turning movement counts, ATR counts and AADT data available from the Region can be downloaded from our web site through the interactive traffic counts map. Other traffic data, including signal timings, are available for purchase from our Traffic Engineering & Operations Division (traffic@durham.ca 905-666-8116).

3. The available 2019 counts at the two study area intersections may be used without adjustment, as there has generally been little to no growth in traffic volumes since then. New counts may also be used if they are collected prior to the end of the school year.

4. The Region requires assessment of existing conditions, build-out, and build-out + 5 years horizons. With the stated assumption that build-out of the development will take approximately five years, the proposed horizon years are acceptable.

5. The proposed 1% per year growth rate is acceptable to estimate future background growth for the above-noted horizon years. The City of Pickering can provide information on any nearby developments that should be assumed as part of the future background traffic estimates.

6. Exclusive median bus lanes will be built on Kingston Road though this area as part of the Durham-Scarborough Bus Rapid Transit (BRT) project. Metrolinx recently completed the TPAP for this project, and detailed design for the initial segments is in progress. Your study area is within one of the initial segments for implementation (Steeple Hill to Merriton), and construction is expected to start in 2023. The 30% design pavement marking plan for your study area is attached, and all future year scenarios should assume this configuration for Kingston Road (CAD files available on request). With implementation of the BRT, all left turns at signalized intersections will operate protected only. Pedestrian walk and clearance times should be adjusted to account for the additional road width as per the Region's signal timing standards.

7. The access to the proposed development will form the fourth leg of the Kingston Road/Fairport Road intersection. Note that the existing intersection is being shifted slightly west to improve its alignment as shown on the attached plan. The development access must be aligned directly opposite Fairport Road. Your study must recommend the appropriate lane configuration for the site access, but note that northbound/southbound left turn lanes will be required. A functional design plan of the intersection is to be included in the Traffic Impact Study.

8. The study is to include a site visit to observe existing infrastructure, operations, and safety conditions/issues for all travel modes. Key observations are to be included in the report. Observations of existing traffic operations, including extent of queues, should be referenced to validate the existing conditions Synchro analysis.

9. The study must address transit, active transportation, and travel demand management, including identification of existing and planned facilities and services, and recommendations for the infrastructure, services, and programs that should be implemented to reduce the proposed development's trip generation and promote the use of non-auto travel modes by the future occupants. The recommendations are to be site specific and identify who would be responsible for initial implementation and on-going operation (as applicable).

10. Cycle tracks will be constructed on both sides of Kingston Road as part of the BRT project, as shown on the attached plan.

Please contact Lynda Motschenbacher (copied on this email) or me if you have any questions on the above.

Regards,
Doug

Doug Robertson, M.A.Sc., P.Eng., PTOE | Senior Project Manager
Works Department | Transportation Infrastructure Division
The Regional Municipality of Durham
Doug.Robertson@durham.ca | 905-668-7711 extension 3733 | durham.ca
My pronouns are he/him.

From: Alan Xaykongsa <alan.xaykongsa@tylin.com>
Sent: June 8, 2022 11:35 AM
To: Singh, Christian (MTO) <Christian.Singh@ontario.ca>; Doug Robertson <Doug.Robertson@Durham.ca>; Zahoor, Nadeem <nzahoor@pickering.ca>
Cc: Amar Lad <amar.lad@tylin.com>; Jonathan Law <jonathan.law@tylin.com>; Michael Dowdall <michael.dowdall@tylin.com>
Subject: 875 Kingston Road W (Pickering) - TIS Terms of Reference (Input Requested)

Good morning Christian, Doug, and Nadeem,

TYLin has been retained to complete a Traffic Impact Study (TIS) for the proposed mixed-use development located at 875 Kingston Road West, in the City of Pickering ("the City"), in the Region of Durham ("Durham

Appendix B:
Site Plan

875 Kingston Road

17 storey development with 5 floors of podium, two towers (a total of 12 storeys above podium)

Summary

	m2	ft2	Ha
Site Area	5,291.90	56,962	0.529
Total Units	**337**		
UPH	636.82		

	m2	ft2
Total GFA (including comm.)	**36,332.38**	**391,082**
Commercial GFA	629.90	6,780
excludable	9,994.38	
FINAL GFA (including comm.)	**26,338.00**	
Total FSI	**4.98**	
Building Height (Top of Roof)	**54.05**	

PODIUM

Floors	GFA		Allowable Exclusions of GFA As Per The Definition				FINAL GFA		UNITS			
			Exclusions		Required Amenity				Studio	1B/1B+D	2B/2B+D	Total
	m2	ft2	m2	ft2	m2	ft2	m2	ft2	300-400 sf	450-700sf	750-850 sf	
UG2	3931.90	42323	3719.70	40039	0.00	0	212.20	2284	0	0	0	0
UG1	3931.90	42323	3793.90	40838	0.00	0	138.00	1485	0	0	0	0
1	1,819.10	19,581	462.10	4,974	0.00	0	1357.00	14,607	0	0	0	0
2	2,218.00	23,875	74.00	797	62.00	667	2082.00	22,411	4	19	8	31
3	2,218.00	23,875	74.00	797	62.00	667	2082.00	22,411	4	19	8	31
4	2,218.00	23,875	74.00	797	62.00	667	2082.00	22,411	4	19	8	31
5	2,218.00	23,875	74.00	797	60.00	646	2084.00	22,432	4	16	10	30
Total	**18,554.90**	**199,725**	**8271.70**	**89,037**	**246.00**	**2,648**	**10037.20**	**108,040**	**16**	**73**	**34**	**123**
									13.01%	59.35%	27.64%	100.00%
									25.00%	**45.00%**	**40.00%**	

EAST TOWER

Floors	GFA		Allowable Exclusions of GFA As Per The Definition				FINAL GFA		UNITS			
			Exclusions		Required Amenity				Studio	1B/1B+D	2B/2B+D	Total
	m2	ft2	m2	ft2	m2	ft2	m2	ft2	300-400 sf	450-700sf	750-850 sf	
6	748.70	8,059	37.00	398	12.00	129	699.70	7,532	0	4	2	6
7	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
8	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
9	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
10	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
11	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
12	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
13	799.30	8,604	37.00	398	20.00	215	742.30	7,990	0	6	4	10
14	799.30	8,604	37.00	398	20.00	215	742.30	7,990	0	6	4	10
15	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
16	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
17	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
MPH	80.34	865	80.34	865	0.00	0	0.00	0	0	0	0	0
Total	**8,888.74**	**95,678**	**524.34**	**5,644**	**214.00**	**2,303**	**8,150**	**87,731**	**0**	**55**	**52**	**107**
									0.00%	51.40%	48.60%	100.00%
									15.00%	**45.00%**	**40.00%**	

WEST TOWER

Floors	GFA		Allowable Exclusions of GFA As Per The Definition				FINAL GFA		UNITS			
			Exclusions		Required Amenity				Studio	1B/1B+D	2B/2B+D	Total
	m2	ft2	m2	ft2	m2	ft2	m2	ft2	300-400 sf	450-700sf	750-850 sf	
6	748.70	8,059	37.00	398	12.00	129	699.70	7,532	0	4	2	6
7	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
8	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
9	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
10	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
11	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
12	748.70	8,059	37.00	398	20.00	215	691.70	7,445	0	6	4	10
13	799.30	8,604	37.00	398	20.00	215	742.30	7,990	0	6	4	10
14	799.30	8,604	37.00	398	20.00	215	742.30	7,990	0	6	4	10
15	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
16	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
17	656.30	7,064	37.00	398	14.00	151	605.30	6,515	0	1	6	7
MPH	80.34	865	80.34	865	0.00	0	0.00	0	0	0	0	0
Total	**8,888.74**	**95,678**	**524.34**	**5,644**	**214.00**	**2,303**	**8,150**	**87,731**	**0**	**55**	**52**	**107**
									0.00%	51.40%	48.60%	100.00%
									15.00%	**45.00%**	**40.00%**	

TOTAL

BUILDINGS	FINAL GFA		Allowable Exclusions of GFA As Per The Definition				FINAL GFA		UNITS			
			Exclusions		Required Amenity				Studio	1B/1B+D	2B/2B+D	Total
	m2	ft2	m2	ft2	m2	ft2	m2	ft2	300-400 sf	450-700sf	750-850 sf	
PODIUM	18,554.90	199,724.94	8,271.70	89,036.58	246.00	2,647.94	10,037.20	108,040.42	16	73	34	123
EAST TOWER	8,888.74	95,678.40	524.34	5,644.00	214.00	2,303.50	8,150.40	87,730.91	0	55	52	107
WEST TOWER	8,888.74	95,678.40	524.34	5,644.00	214.00	2,303.50	8,150.40	87,730.91	0	55	52	107
Total	**36,332.38**	**391,081.74**	**9,320.38**	**100,324.57**	**674.00**	**7,254.94**	**26,338.00**	**283,502.23**	**16**	**183**	**138**	**337**
							4.75%	54.30%	40.95%	100.00%		
							15.00%	**45.00%**	**40.00%**			

Total Amenity Requied

Total Indoor Amenity	674.00	7,255
Total Outdoor Amenity	674.00	7,255

Total Amenity Provided

Total Indoor Amenity	674.20	7,257
Total Outdoor Amenity	782.70	8,425

Parking Required

Units	Units	Ratio	Spaces
Units	337	0.8	269
Visitors	337	0.15	50
	Area		
Commercial	629.9	0.035	22
Total Parking Required	N/A	N/A	**341**

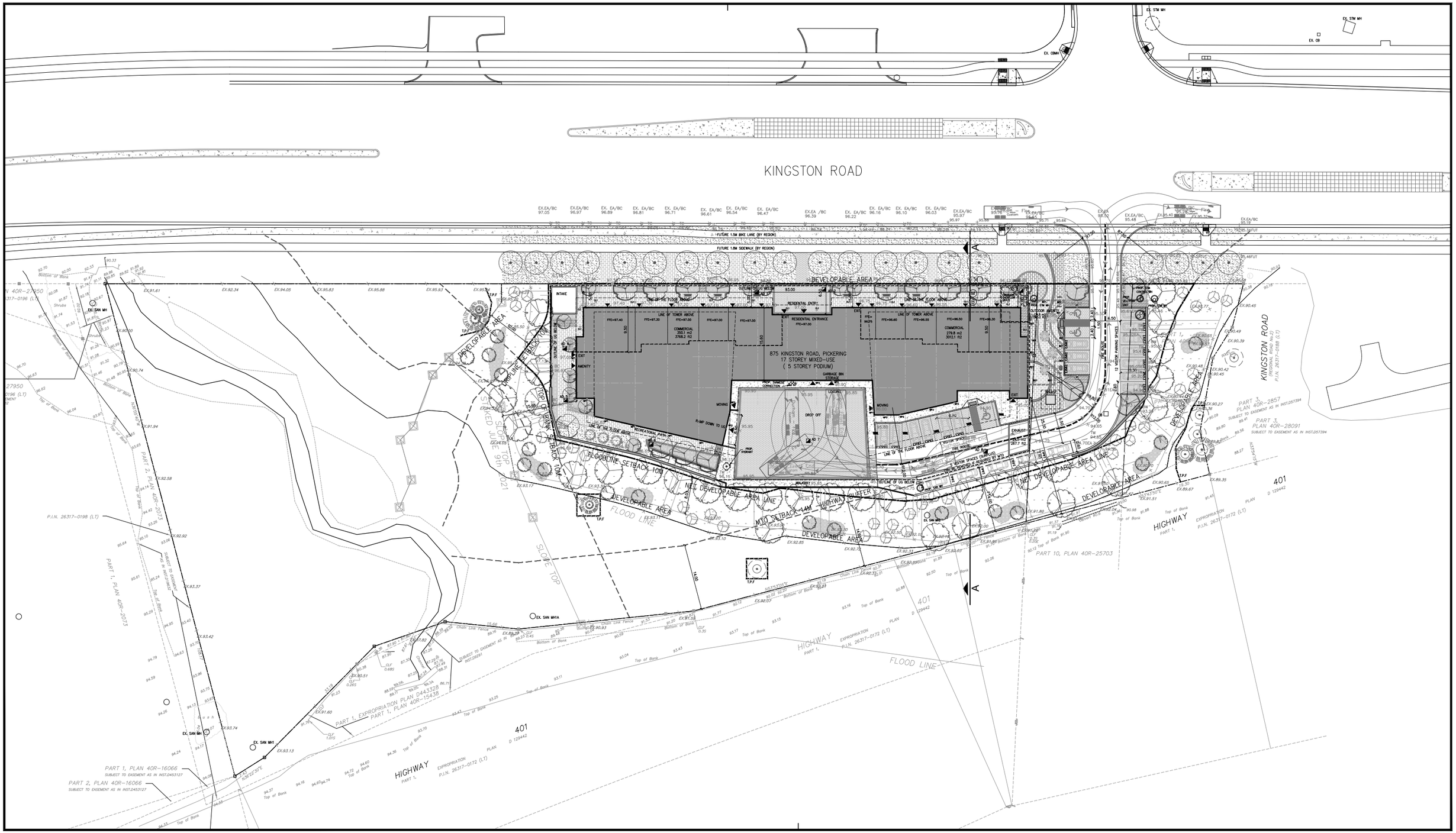
Parking Provided

Floor	Spaces
GRADE*	19
UG1	69
UG2	254
Total Spaces Provided	**342**

* 5 surplus parking spaces provided as well

Bicycle Parking Provided

Floor	Spaces
Ground Floor	44
UG1	69
UG2	65
Total	**178**
Ratio per unit	**0.53**



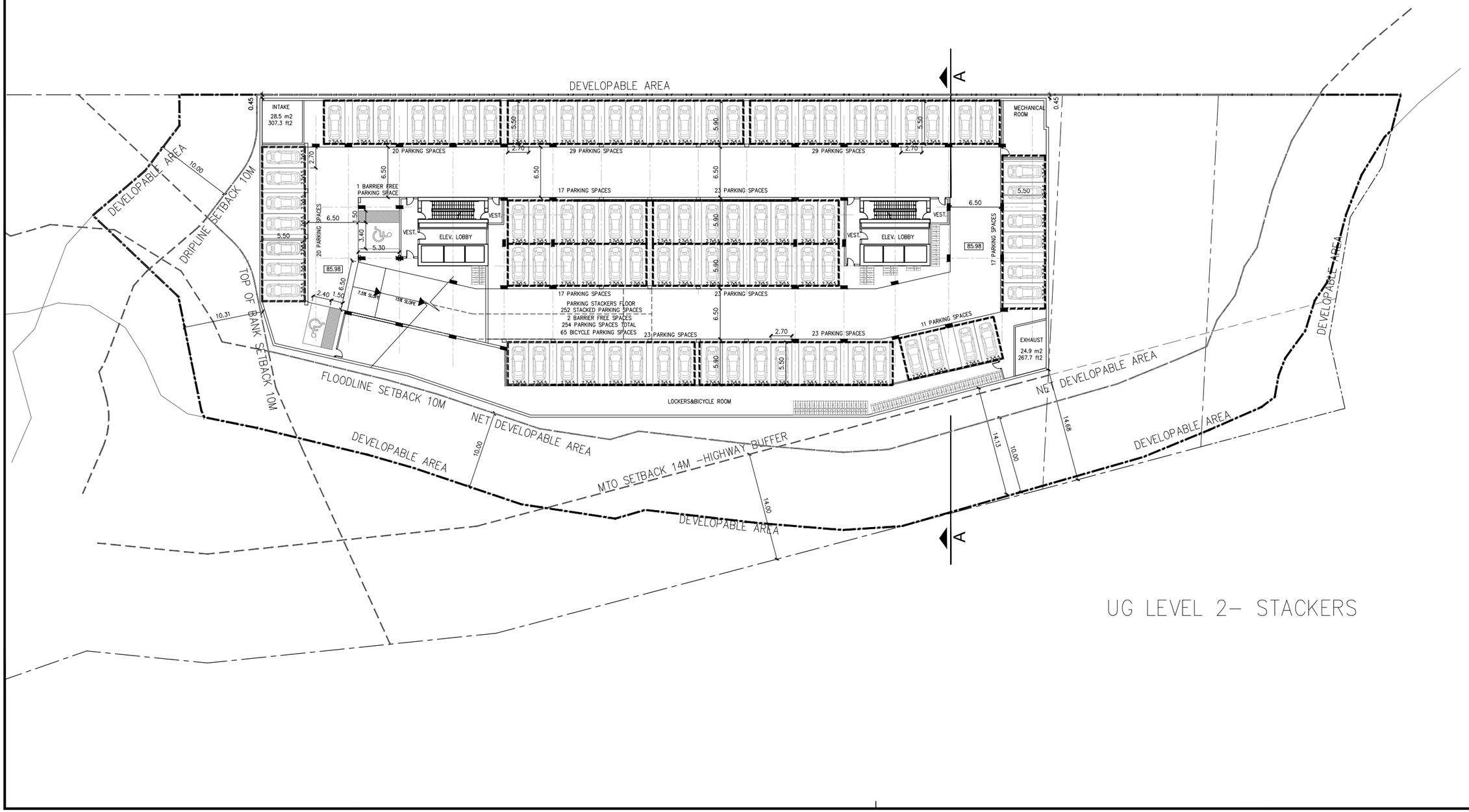
ICON ARCHITECTS

813-4789 YONGE ST., TORONTO
M2N 0G3 ICONARCHITECTS.CA
T:416-224-6600 F:416-224-6604

875 KINGSTON ROAD PICKERING,ONTARIO

SITE PLAN

Scale: 1:750
Date: SEPTEMBER 23, 2022
Project No. 21124
Drawn by: HT
Checked by: HG
Drawing No. 01



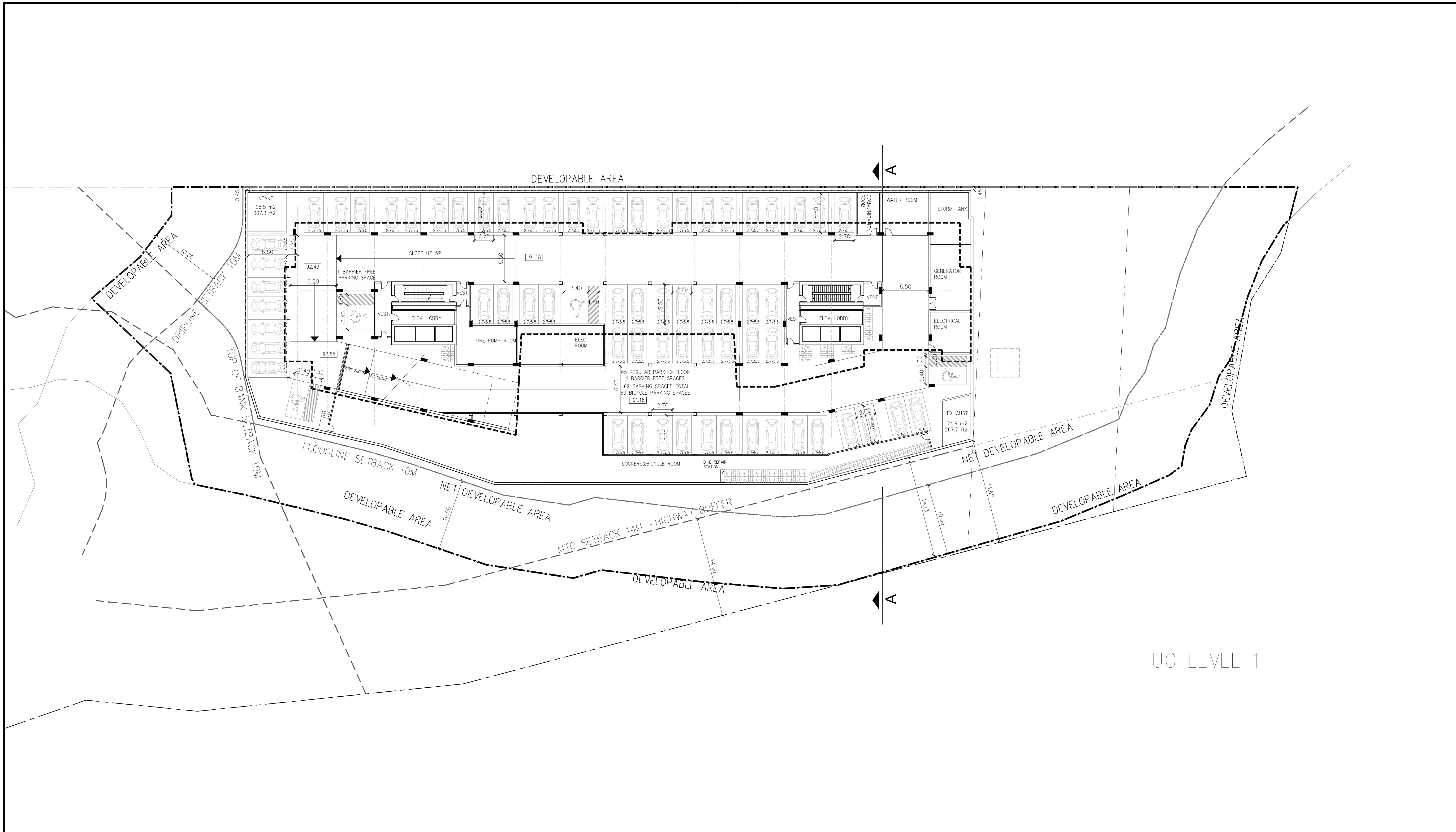
UG LEVEL 2- STACKERS

ICON ARCHITECTS
813-4789 YONGE ST. TORONTO
M2N 0G3 ICONARCHITECTS.CA
T:416-224-0000 F:416-224-0004

875 KINGSTON ROAD
PICKERING,ONTARIO

UG2 FLOOR PLAN

Scale: **1:500**	Drawn by: **HT**
Date: **SEPTEMBER 19, 2022**	Checked by: **HG**
Project No. **21124**	Drawing No. **02**



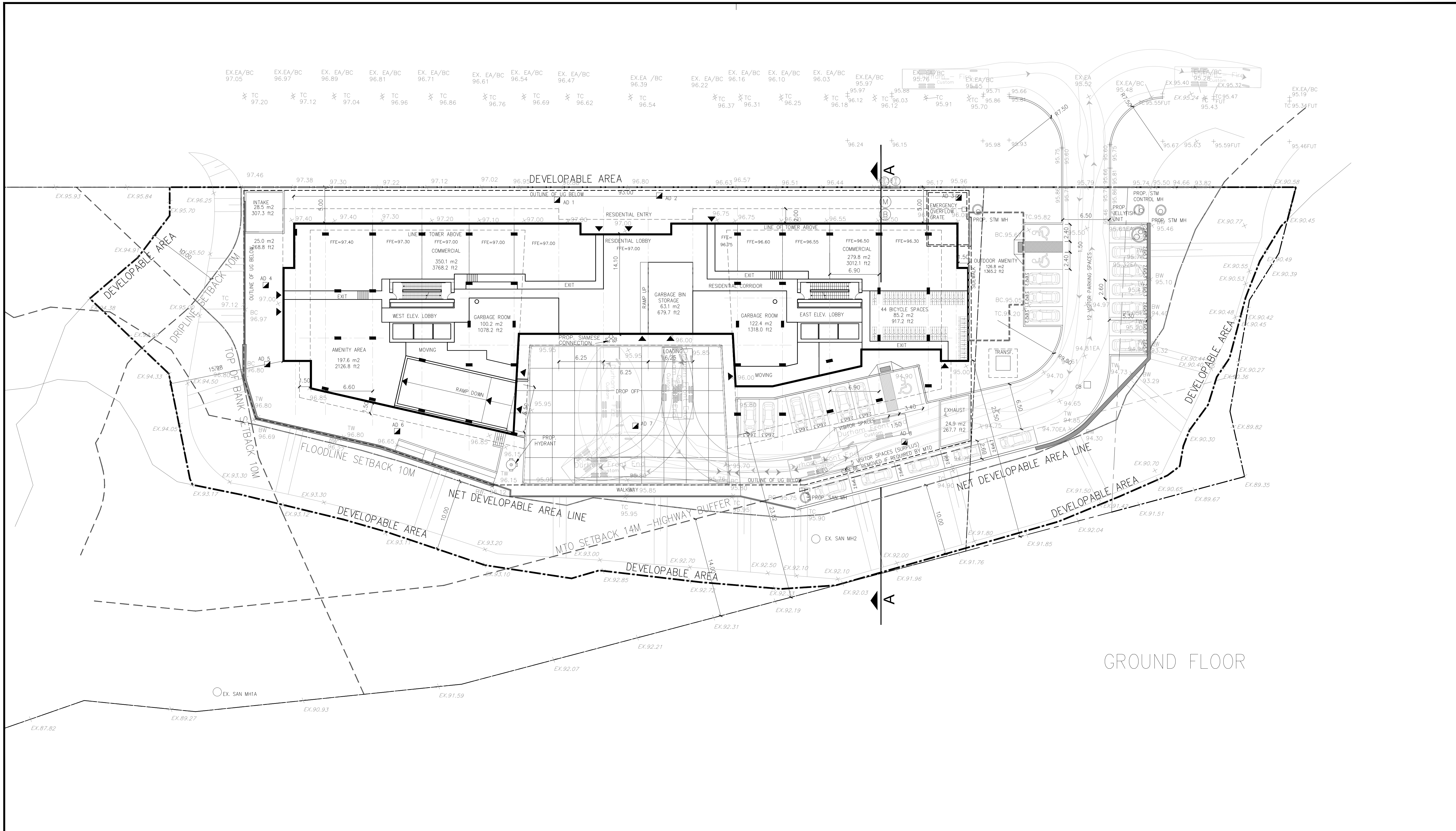
ICON ARCHITECTS

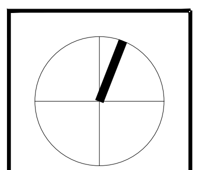
813-4789 YONGE ST. TORONTO M2N 0G3 ICONARCHITECTS.CA T:416-224-0504 F:416-224-0505

875 KINGSTON ROAD
PICKERING,ONTARIO

UG1 FLOOR PLAN

Scale: **1:500**	Drawn by: **HT**
Date: **SEPTEMBER 19, 2022**	Checked by: **HG**
Project No. **21124**	Drawing No. **03**





ICON ARCHITECTS

813-4789 YONGE ST. TORONTO M2N 0G3 ICONARCHITECTS.CA T:416-224-0504 F:416-224-0505

875 KINGSTON ROAD
PICKERING,ONTARIO

GROUND FLOOR PLAN

Scale: **1:500**	Drawn by: **HT**
Date: **SEPTEMBER 19, 2022**	Checked by: **HG**
Project No. **21124**	Drawing No. **04**

Appendix C:
Transit Service Information

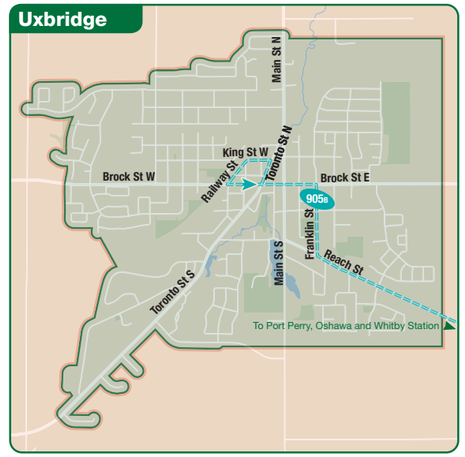
TYLin

Durham Region Transit

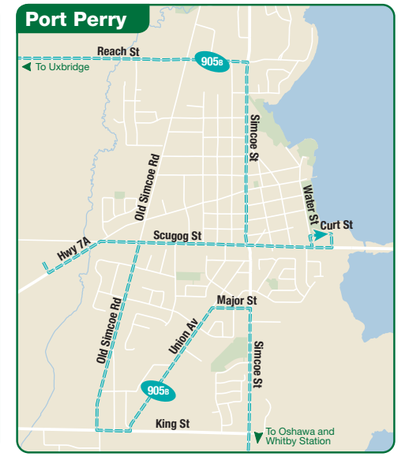
Effective
June 20, 2022

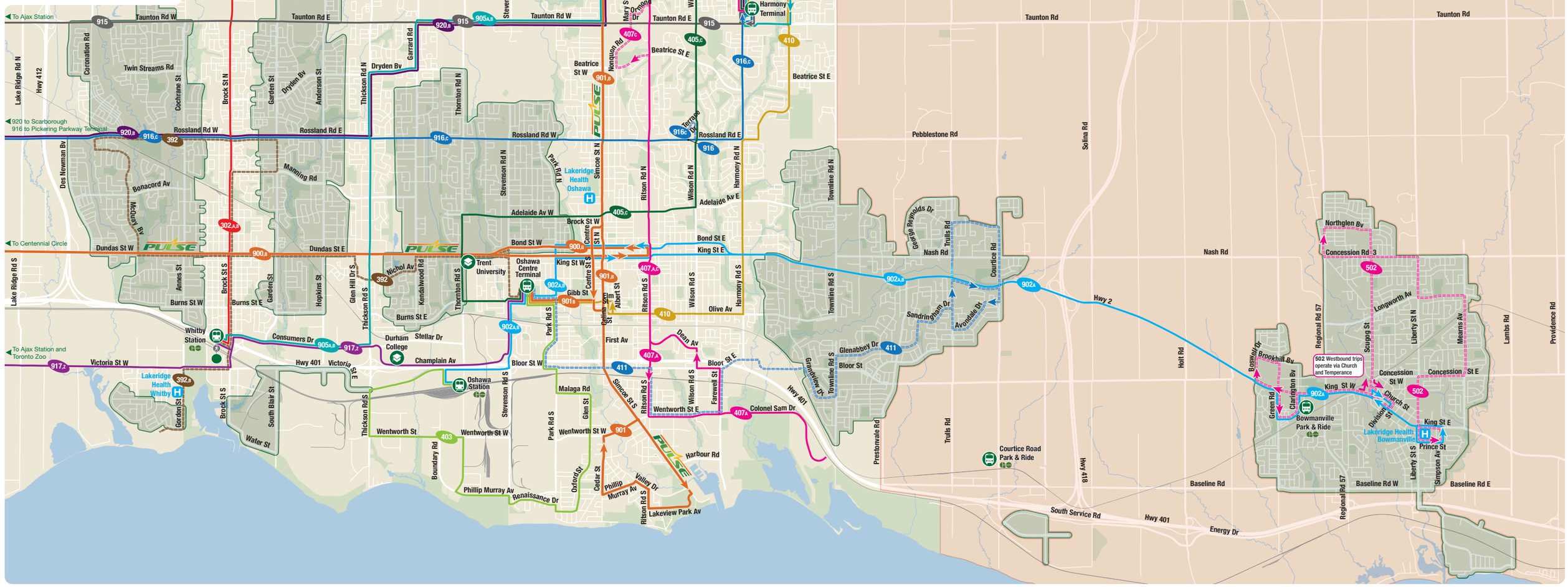
MAPS | ROUTES | INFO

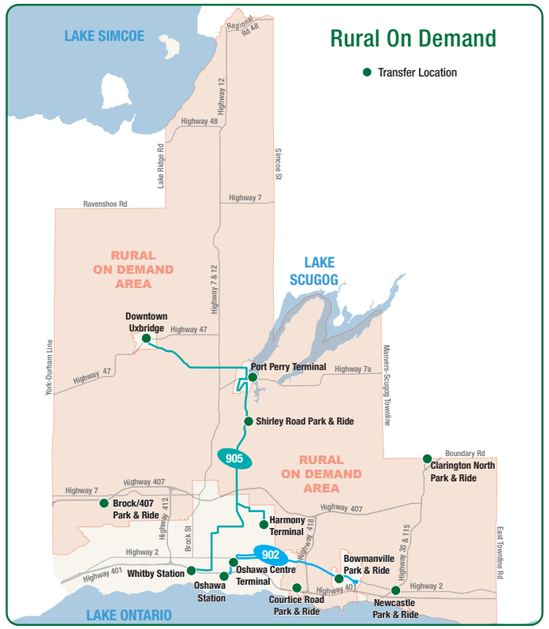
Uxbridge



Port Perry







Legend

- PULSE
- **Regular route** Service operates Monday to Sunday.
- **Peak route** Service operates Monday to Friday during the a.m. / p.m. peak periods.
- **Limited route** Service operates only part of the day or does not operate 7 days/week.
- **Urban On Demand area** Areas shown are illustrative.
- **Rural On Demand area** Areas shown are illustrative.
- **Pedestrian bridge or tunnel**
- **Hospital**
- **Train station**
- **Terminal**
- **College / University**
- Route number
- Branch
- Direction of travel
- Service type

407c

On Demand

What is On Demand?

On Demand is a flexible and convenient option in areas of our network that are not served by scheduled service. Customers can travel stop-to-stop within a zone, facilitate connecting to frequent and grid routes, or to the local GO station or bus terminal. Regular fares apply.

Urban On Demand

- Access On Demand service at designated On Demand bus stops
- Travel stop-to-stop within the On Demand area (minimum 800 metres), to connecting DRT and GO Transit bus service, and to nearby transit terminals and train stations

Rural On Demand

- Access On Demand service from designated On Demand bus stops in smaller communities, or from the end of your driveway in rural areas
- Travel within the On Demand area and to connecting DRT and GO Transit bus service.

Booking On Demand

You can book a trip by downloading the On Demand app or by calling 1-866-247-0055. Visit durhamregiontransit.com for more information.

Contact us

durhamregiontransit.com

Customer Service Centre
1-866-247-0055

@durham_transit

/durhamregiontransit

Service is available 24 hours a day. See **DurhamRegionTransit.com** for more information.

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock.
If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See **durhamregiontransit.com** for more information.

Route 920
Effective September 6, 2022

Route 920

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — West

Harmony Terminal **Stop #812**	Simcoe Southbound @ Founders **Stop #90076**	Southbound @ 800 Salem **Stop #93145**	Kingston Westbound @ Glenanna **Stop #1608**	Kingston Westbound @ Sheppard **Stop #93240**	Progress Southbound @ Centennial College **Stop #93993**	McCowan Station **Stop #93998**
05:07	05:18	05:46	06:01	06:13	06:28	06:34
05:37	05:48	06:16	06:31	06:43	06:58	07:04
06:07	06:18	06:46	07:01	07:13	07:28	07:34
06:22	06:33	07:01	07:16	07:28	07:43	07:49
06:37	06:48	07:16	07:31	07:43	07:58	08:04
06:52	07:03	07:31	07:46	07:58	08:13	08:19
07:07	07:18	07:46	08:01	08:13	08:28	08:34
07:22	07:33	08:01	08:16	08:28	08:43	08:49
07:37	07:48	08:16	08:31	08:43	08:58	09:04
07:52	08:03	08:31	08:46	08:58	09:13	09:19
08:07	08:18	08:46	09:01	09:13	09:28	09:34
08:22	08:33	09:01	09:16	09:28	09:43	09:49
08:37	08:48	09:16	09:31	09:43	09:58	10:04
08:52	09:03	09:31	09:46	09:58	10:13	10:19
09:07	09:18	09:46	10:01	10:13	10:28	10:34
09:22	09:33	10:01	10:16	10:28	10:43	10:49
09:37	09:48	10:16	10:33	10:45	11:00	11:06
09:52	10:03	10:31	10:48	11:00	11:15	11:21
10:07	10:18	10:46	11:03	11:15	11:30	11:36
10:22	10:33	11:01	11:18	11:30	11:45	11:51
10:37	10:48	11:16	11:33	11:45	12:00	12:06
10:52	11:03	11:31	11:48	12:00	12:15	12:21
11:07	11:18	11:46	12:03	12:15	12:30	12:36
11:22	11:33	12:01	12:18	12:30	12:45	12:51
11:37	11:48	12:17	12:34	12:46	13:01	13:07
11:52	12:03	12:32	12:49	13:01	13:16	13:22
12:07	12:18	12:47	13:04	13:16	13:31	13:37
12:22	12:33	13:02	13:19	13:31	13:46	13:52
12:37	12:48	13:17	13:34	13:46	14:01	14:07
12:52	13:03	13:32	13:49	14:01	14:16	14:22
13:07	13:18	13:49	14:06	14:18	14:33	14:38
13:22	13:33	14:04	14:21	14:33	14:48	14:53
13:37	13:48	14:19	14:36	14:48	15:03	15:08
13:52	14:03	14:34	14:51	15:03	15:18	15:23
14:07	14:18	14:49	15:06	15:18	15:33	15:38
14:22	14:33	15:04	15:21	15:33	15:48	15:53
14:37	14:48	15:20	15:37	15:50	16:07	16:12
14:52	15:03	15:35	15:52	16:05	16:22	16:27
15:07	15:18	15:50	16:07	16:20	16:37	16:42
15:22	15:33	16:05	16:22	16:35	16:52	16:57
15:37	15:48	16:20	16:37	16:50	17:07	17:12
15:57	16:08	16:40	16:57	17:10	17:27	17:32
16:12	16:23	16:55	17:12	17:25	17:42	17:47
16:30	16:41	17:13	17:30	17:43	18:00	18:05
16:45	16:56	17:26	17:43	17:56	18:11	18:16
17:00	17:11	17:41	17:58	18:11	18:26	18:31
17:15	17:26	17:56	18:13	18:26	18:41	18:46

Weekday — West

Harmony Terminal **Stop #812**	Simcoe Southbound @ Founders **Stop #90076**	Southbound @ 800 Salem **Stop #93145**	Kingston Westbound @ Glenanna **Stop #1608**	Kingston Westbound @ Sheppard **Stop #93240**	Progress Southbound @ Centennial College **Stop #93993**	McCowan Station **Stop #93998**
17:25	17:36	18:06	18:23	18:36	18:51	18:56
17:45	17:56	18:26	18:43	18:56	19:11	19:16
18:05	18:16	18:46	19:03	19:16	19:31	19:36
18:35	18:46	19:16	19:33	19:46	20:01	20:06
19:05	19:16	19:46	20:03	20:16	20:31	20:36
19:35	19:46	20:16	20:33	20:46	21:01	21:06
20:05	20:16	20:46	21:03	21:16	21:31	21:36
20:30	20:41	21:11	21:28	21:41	21:56	22:01
20:55	21:06	21:36	21:53	22:06	22:21	22:26

Route 920

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — East

McCowan Station **Stop #93998**	Progress Northbound @ Centennial College **Stop #94007**	Kingston Eastbound @ Port Union **Stop #93227**	Kingston Eastbound @ Glenanna **Stop #1786**	Salem Northbound @ Rossland **Stop #3043**	Simcoe Northbound @ Founders **Stop #3608**	Harmony Terminal **Stop #812**
05:45	05:49	06:04	06:17	06:34	07:00	07:12
06:15	06:19	06:34	06:47	07:04	07:30	07:42
06:45	06:50	07:06	07:18	07:35	08:03	08:15
07:15	07:20	07:36	07:48	08:05	08:33	08:45
-	-	-	07:33	07:50	08:18	08:30
07:45	07:50	08:06	08:18	08:35	09:03	09:15
08:00	08:05	08:21	08:33	08:50	09:18	09:30
-	-	-	08:03	08:20	08:48	09:00
08:15	08:20	08:36	08:48	09:05	09:33	09:45
08:30	08:35	08:51	09:03	09:20	09:48	10:00
08:45	08:50	09:06	09:18	09:35	10:03	10:15
09:00	09:05	09:21	09:33	09:50	10:18	10:30
09:15	09:20	09:36	09:48	10:05	10:33	10:45
09:30	09:35	09:51	10:03	10:20	10:48	11:00
09:45	09:50	10:06	10:18	10:35	11:03	11:15
10:00	10:05	10:21	10:33	10:50	11:18	11:30
10:15	10:20	10:36	10:48	11:05	11:33	11:45
10:30	10:35	10:51	11:03	11:20	11:48	12:00
10:45	10:50	11:06	11:18	11:35	12:03	12:15
11:00	11:05	11:21	11:33	11:50	12:18	12:30
11:15	11:20	11:36	11:48	12:05	12:33	12:45
11:30	11:35	11:51	12:03	12:20	12:48	13:00
11:45	11:50	12:06	12:18	12:35	13:03	13:15
12:00	12:05	12:21	12:33	12:50	13:18	13:30
12:15	12:20	12:36	12:48	13:05	13:33	13:45
12:30	12:35	12:51	13:03	13:20	13:48	14:00
12:45	12:50	13:06	13:18	13:35	14:03	14:15
13:00	13:05	13:21	13:33	13:50	14:18	14:30
13:15	13:20	13:36	13:48	14:05	14:33	14:45
13:30	13:35	13:51	14:03	14:20	14:48	15:00
13:45	13:50	14:06	14:18	14:35	15:03	15:15
14:00	14:05	14:21	14:33	14:50	15:18	15:30
14:15	14:21	14:37	14:50	15:08	15:38	15:50
14:30	14:36	14:52	15:05	15:23	15:53	16:05
14:45	14:51	15:07	15:20	15:38	16:08	16:20
15:00	15:06	15:22	15:35	15:53	16:23	16:35
15:15	15:21	15:37	15:50	16:08	16:38	16:50
15:30	15:36	15:52	16:05	16:23	16:53	17:05
15:45	15:51	16:07	16:20	16:38	17:08	17:20
16:00	16:06	16:22	16:35	16:53	17:23	17:35
16:17	16:23	16:39	16:52	17:10	17:40	17:52
16:32	16:38	16:54	17:07	17:25	17:55	18:07
16:47	16:53	17:09	17:22	17:40	18:10	18:22
17:03	17:09	17:25	17:38	17:56	18:26	18:38
17:20	17:26	17:42	17:55	18:13	18:43	18:55
17:33	17:39	17:55	18:08	18:26	18:56	19:08
17:50	17:56	18:12	18:25	18:43	19:13	19:25

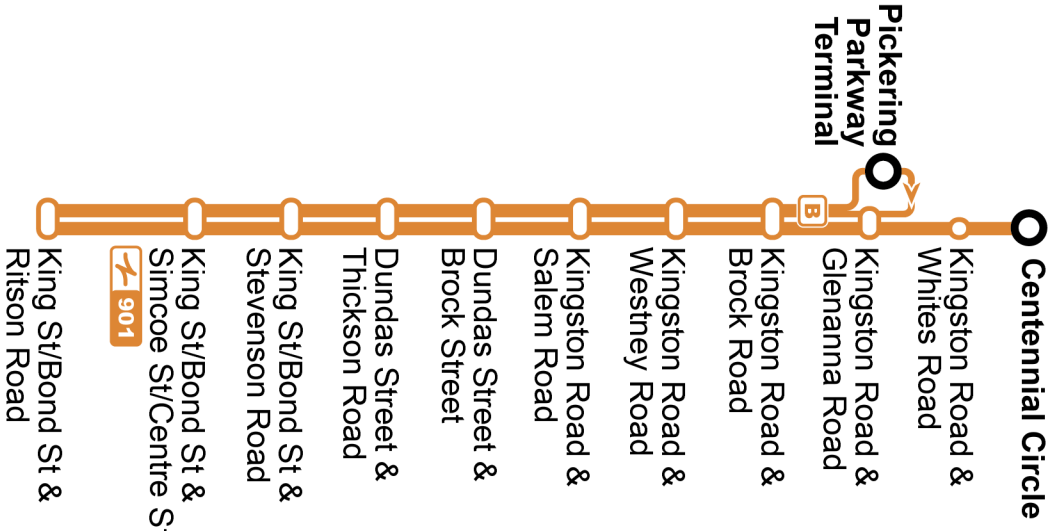
Weekday — East

McCowan Station **Stop #93998**	Progress Northbound @ Centennial College **Stop #94007**	Kingston Eastbound @ Port Union **Stop #93227**	Kingston Eastbound @ Glenanna **Stop #1786**	Salem Northbound @ Rossland **Stop #3043**	Simcoe @ Northbound Founders **Stop #3608**	Harmony Terminal **Stop #812**
18:05	18:11	18:26	18:39	18:57	19:25	19:37
18:25	18:31	18:46	18:59	19:17	19:45	19:57
18:45	18:51	19:06	19:19	19:37	20:05	20:17
19:15	19:20	19:35	19:48	20:05	20:31	20:43
19:45	19:50	20:05	20:18	20:35	21:01	21:13
20:15	20:20	20:35	20:48	21:05	21:31	21:43
20:45	20:50	21:05	21:18	21:35	22:01	22:13
21:15	21:20	21:35	21:48	22:05	22:31	22:43
21:40	21:45	22:00	22:13	22:30	22:56	23:08
22:10	22:15	22:30	22:43	23:00	23:26	23:38

Additional overnight service is available on Blue night Route N1.
See **DurhamRegionTransit.com** for more information.

Dashes indicate the stop is not served by a trip. Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock.
If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See **durhamregiontransit.com** for more information.

DurhamRegion Transit
PULSE 900
Effective September 6, 2022



PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Eastbound @ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
04:45	05:00	-	05:04	05:06	05:11	05:16	05:25	05:30	05:42
05:15	05:29	-	05:33	05:35	05:41	05:46	05:55	06:01	06:14
05:45	05:59	-	06:03	06:05	06:11	06:16	06:25	06:31	06:44
-	-	06:20	06:23	06:25	06:31	06:36	06:45	06:51	07:04
06:20	06:34	-	06:38	06:40	06:46	06:51	07:00	07:06	07:19
-	-	06:45	06:48	06:50	06:56	07:01	07:10	07:16	07:29
06:40	06:54	-	06:58	07:00	07:06	07:11	07:20	07:26	07:39
-	-	07:05	07:08	07:10	07:16	07:21	07:30	07:36	07:49
07:00	07:14	-	07:18	07:20	07:26	07:31	07:40	07:46	07:59
-	-	07:25	07:28	07:30	07:36	07:41	07:50	07:56	08:09
07:20	07:34	-	07:38	07:40	07:46	07:51	08:00	08:06	08:19
-	-	07:45	07:48	07:50	07:56	08:01	08:10	08:16	08:29
07:40	07:54	-	07:58	08:00	08:06	08:11	08:20	08:26	08:39
-	-	08:05	08:08	08:10	08:16	08:21	08:30	08:36	08:49
08:00	08:14	-	08:18	08:20	08:26	08:31	08:40	08:46	08:59
-	-	08:25	08:28	08:30	08:36	08:41	08:50	08:56	09:09
08:20	08:34	-	08:38	08:40	08:46	08:51	09:00	09:06	09:19
-	-	08:45	08:48	08:50	08:56	09:01	09:10	09:16	09:29
08:40	08:54	-	08:58	09:00	09:06	09:11	09:20	09:26	09:39
-	-	09:05	09:08	09:10	09:16	09:21	09:30	09:36	09:49
09:00	09:15	-	09:21	09:24	09:29	09:35	09:46	09:52	10:07
-	-	09:28	09:31	09:34	09:39	09:45	09:56	10:02	10:17
09:20	09:35	-	09:41	09:44	09:49	09:55	10:06	10:12	10:27
-	-	09:48	09:51	09:54	09:59	10:05	10:16	10:22	10:37
09:40	09:55	-	10:01	10:04	10:09	10:15	10:26	10:32	10:47
-	-	10:08	10:11	10:14	10:20	10:26	10:37	10:43	10:59
10:00	10:15	-	10:21	10:24	10:30	10:36	10:47	10:53	11:09
-	-	10:28	10:31	10:34	10:40	10:46	10:57	11:03	11:19
10:20	10:35	-	10:41	10:44	10:50	10:56	11:07	11:13	11:29
-	-	10:48	10:51	10:54	11:00	11:06	11:17	11:23	11:39
10:40	10:55	-	11:01	11:04	11:10	11:16	11:27	11:33	11:49
-	-	11:08	11:11	11:14	11:20	11:26	11:37	11:43	11:59
11:00	11:15	-	11:21	11:24	11:30	11:36	11:47	11:53	12:09
-	-	11:28	11:31	11:34	11:40	11:46	11:57	12:03	12:19
11:20	11:35	-	11:41	11:44	11:50	11:56	12:07	12:13	12:29
-	-	11:48	11:51	11:54	12:00	12:06	12:17	12:23	12:39
11:40	11:55	-	12:01	12:04	12:10	12:16	12:27	12:33	12:49
-	-	12:08	12:11	12:14	12:20	12:26	12:37	12:43	12:59
12:00	12:15	-	12:22	12:25	12:31	12:37	12:48	12:54	13:10
-	-	12:29	12:32	12:35	12:41	12:47	12:58	13:04	13:20
12:20	12:35	-	12:42	12:45	12:51	12:57	13:08	13:14	13:30
-	-	12:49	12:52	12:55	13:01	13:07	13:18	13:24	13:40
12:40	12:55	-	13:02	13:05	13:11	13:17	13:28	13:34	13:50

PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Esatbound @ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
-	-	13:09	13:12	13:15	13:21	13:27	13:38	13:44	14:00
13:00	13:15	-	13:22	13:25	13:31	13:37	13:48	13:54	14:10
-	-	13:29	13:32	13:35	13:41	13:47	13:58	14:04	14:20
13:20	13:35	-	13:42	13:45	13:51	13:57	14:08	14:14	14:30
-	-	13:49	13:52	13:55	14:01	14:07	14:18	14:24	14:40
13:40	13:55	-	14:02	14:05	14:11	14:17	14:28	14:34	14:50
-	-	14:09	14:12	14:15	14:21	14:27	14:38	14:44	15:00
14:00	14:15	-	14:22	14:25	14:31	14:37	14:48	14:54	15:10
-	-	14:29	14:32	14:35	14:41	14:47	14:58	15:04	15:20
14:20	14:35	-	14:42	14:45	14:51	14:57	15:08	15:14	15:30
-	-	14:49	14:52	14:55	15:01	15:07	15:18	15:24	15:40
14:40	14:55	-	15:02	15:05	15:11	15:17	15:28	15:34	15:50
-	-	15:09	15:12	15:15	15:21	15:27	15:38	15:44	16:00
15:00	15:15	-	15:22	15:25	15:31	15:37	15:48	15:54	16:10
-	-	15:29	15:32	15:35	15:41	15:47	15:58	16:04	16:20
15:20	15:35	-	15:42	15:45	15:51	15:57	16:08	16:14	16:30
-	-	15:49	15:52	15:55	16:01	16:07	16:18	16:24	16:40
15:40	15:55	-	16:02	16:05	16:11	16:17	16:28	16:34	16:50
-	-	16:09	16:12	16:15	16:21	16:27	16:38	16:44	17:00
16:00	16:15	-	16:22	16:25	16:31	16:37	16:48	16:54	17:10
-	-	16:29	16:32	16:35	16:41	16:47	16:58	17:04	17:20
16:20	16:35	-	16:42	16:45	16:51	16:57	17:08	17:14	17:30
-	-	16:49	16:52	16:55	17:01	17:07	17:18	17:24	17:40
16:40	16:55	-	17:02	17:05	17:11	17:17	17:28	17:34	17:50
-	-	17:09	17:12	17:15	17:21	17:27	17:38	17:44	18:00
17:00	17:15	-	17:22	17:25	17:31	17:37	17:48	17:54	18:10
-	-	17:29	17:32	17:35	17:41	17:47	17:58	18:04	18:20
17:20	17:35	-	17:42	17:45	17:51	17:57	18:08	18:14	18:30
-	-	17:49	17:52	17:55	18:01	18:07	18:18	18:24	18:40
17:40	17:55	-	18:02	18:05	18:11	18:17	18:28	18:34	18:50
-	-	18:09	18:12	18:15	18:21	18:27	18:38	18:44	19:00
18:00	18:15	-	18:21	18:24	18:30	18:35	18:46	18:51	19:05
-	-	18:28	18:31	18:34	18:40	18:45	18:56	19:01	19:15
18:20	18:35	-	18:41	18:44	18:50	18:55	19:06	19:11	19:25
-	-	18:48	18:51	18:54	19:00	19:05	19:16	19:21	19:35
18:40	18:55	-	19:01	19:04	19:10	19:15	19:26	19:31	19:45
-	-	19:03	19:06	19:09	19:15	19:20	19:31	19:36	19:50
18:55	19:10	-	19:16	19:19	19:25	19:30	19:41	19:46	20:00
-	-	19:23	19:26	19:29	19:35	19:40	19:51	19:56	20:10
19:15	19:30	-	19:36	19:39	19:45	19:50	20:01	20:06	20:20
-	-	19:43	19:46	19:49	19:55	20:00	20:11	20:16	20:30
19:35	19:50	-	19:56	19:59	20:05	20:10	20:21	20:26	20:40
19:55	20:10	-	20:16	20:19	20:25	20:30	20:41	20:46	21:00
20:15	20:30	-	20:36	20:39	20:45	20:50	21:01	21:06	21:20
20:45	20:59	-	21:05	21:08	21:13	21:18	21:28	21:33	21:46
21:15	21:29	-	21:35	21:38	21:43	21:48	21:58	22:03	22:16
21:45	21:59	-	22:05	22:08	22:13	22:18	22:28	22:33	22:46
22:15	22:29	-	22:35	22:38	22:43	22:48	22:58	23:03	23:16
22:45	22:59	-	23:05	23:08	23:13	23:18	23:28	23:33	23:46

PULSE 900

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Weekday — West

Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #1598**	Kingston Westbound @ Brock Road **Stop #1604**	Kingston Westbound @ Glenanna **Stop #1608**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
05:20	05:32	05:37	05:48	05:53	05:58	06:02	-	06:08	06:22
05:40	05:52	05:57	06:08	06:13	06:18	06:22	-	06:28	06:42
06:00	06:12	06:17	06:28	06:33	06:38	06:42	-	06:48	07:02
06:20	06:32	06:37	06:48	06:53	06:58	07:02	-	07:08	07:22
B 06:30	06:42	06:47	06:58	07:03	07:08	-	07:11	-	-
06:40	06:52	06:57	07:08	07:13	07:18	07:22	-	07:28	07:42
B 06:50	07:02	07:07	07:18	07:23	07:28	-	07:31	-	-
07:00	07:12	07:17	07:28	07:33	07:38	07:42	-	07:48	08:02
B 07:10	07:22	07:27	07:38	07:43	07:48	-	07:51	-	-
07:20	07:32	07:37	07:48	07:53	07:58	08:02	-	08:08	08:22
B 07:30	07:42	07:47	07:58	08:03	08:08	-	08:11	-	-
07:40	07:52	07:57	08:08	08:13	08:18	08:22	-	08:28	08:42
B 07:50	08:02	08:07	08:18	08:23	08:28	-	08:31	-	-
08:00	08:12	08:17	08:28	08:33	08:38	08:42	-	08:48	09:02
B 08:10	08:22	08:27	08:38	08:43	08:48	-	08:51	-	-
08:20	08:33	08:39	08:50	08:56	09:02	09:06	-	09:13	09:26
B 08:30	08:43	08:49	09:00	09:06	09:12	-	09:16	-	-
08:40	08:53	08:59	09:10	09:16	09:22	09:26	-	09:33	09:46
B 08:50	09:03	09:09	09:20	09:26	09:32	-	09:36	-	-
09:00	09:13	09:19	09:30	09:36	09:42	09:46	-	09:53	10:06
B 09:10	09:23	09:29	09:40	09:46	09:52	-	09:56	-	-
09:20	09:33	09:39	09:50	09:56	10:02	10:06	-	10:13	10:26
B 09:30	09:43	09:49	10:00	10:06	10:12	-	10:16	-	-
09:40	09:53	09:59	10:10	10:16	10:22	10:26	-	10:33	10:46
B 09:50	10:03	10:09	10:20	10:26	10:32	-	10:36	-	-
10:00	10:13	10:19	10:30	10:36	10:42	10:46	-	10:53	11:06
B 10:10	10:23	10:29	10:40	10:46	10:52	-	10:56	-	-
10:20	10:33	10:39	10:50	10:56	11:02	11:06	-	11:13	11:26
B 10:30	10:43	10:49	11:00	11:06	11:12	-	11:16	-	-
10:40	10:53	10:59	11:10	11:16	11:22	11:26	-	11:33	11:46
B 10:50	11:03	11:09	11:20	11:26	11:32	-	11:36	-	-
11:00	11:13	11:19	11:30	11:36	11:42	11:46	-	11:53	12:06
B 11:10	11:23	11:29	11:40	11:46	11:52	-	11:56	-	-
11:20	11:33	11:39	11:50	11:56	12:02	12:06	-	12:13	12:26
B 11:30	11:44	11:50	12:01	12:07	12:13	-	12:17	-	-
11:40	11:54	12:00	12:11	12:17	12:23	12:27	-	12:34	12:48
B 11:50	12:04	12:10	12:21	12:27	12:33	-	12:37	-	-
12:00	12:14	12:20	12:31	12:37	12:43	12:47	-	12:54	13:08
B 12:10	12:24	12:30	12:41	12:47	12:53	-	12:57	-	-
12:20	12:34	12:40	12:51	12:57	13:03	13:07	-	13:14	13:28
B 12:30	12:44	12:50	13:01	13:07	13:13	-	13:17	-	-
12:40	12:54	13:00	13:11	13:17	13:23	13:27	-	13:34	13:48
B 12:50	13:04	13:10	13:21	13:27	13:33	-	13:37	-	-

B To Pickering Parkway Terminal

PULSE 900

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Weekday — West

	Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #398**	Kingston Westbound @Brock Road **Stop #1591**	Kingston Westbound @ Glenanna **Stop #1604**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
	13:00	13:14	13:20	13:31	13:37	13:43	13:47	-	13:54	14:08
B	13:10	13:24	13:30	13:41	13:47	13:53	-	13:57	-	-
	13:20	13:34	13:40	13:51	13:57	14:03	14:07	-	14:14	14:28
B	13:30	13:44	13:50	14:01	14:07	14:13	-	14:17	-	-
	13:40	13:54	14:00	14:11	14:17	14:23	14:27	-	14:34	14:48
B	13:50	14:04	14:10	14:21	14:27	14:33	-	14:37	-	-
	14:00	14:14	14:20	14:31	14:37	14:43	14:47	-	14:54	15:08
B	14:10	14:24	14:30	14:41	14:47	14:53	-	14:57	-	-
	14:20	14:34	14:40	14:51	14:57	15:03	15:07	-	15:14	15:28
B	14:30	14:44	14:50	15:01	15:07	15:13	-	15:17	-	-
	14:40	14:54	15:00	15:11	15:17	15:23	15:27	-	15:34	15:48
B	14:50	15:04	15:10	15:21	15:27	15:33	-	15:37	-	-
	15:00	15:14	15:20	15:31	15:37	15:43	15:47	-	15:54	16:08
B	15:10	15:24	15:30	15:41	15:47	15:53	-	15:57	-	-
	15:20	15:34	15:40	15:51	15:57	16:03	16:07	-	16:14	16:28
B	15:30	15:44	15:50	16:01	16:07	16:13	-	16:17	-	-
	15:40	15:54	16:00	16:11	16:17	16:23	16:27	-	16:34	16:48
B	15:50	16:04	16:10	16:21	16:27	16:33	-	16:37	-	-
	16:00	16:14	16:20	16:31	16:37	16:43	16:47	-	16:54	17:08
B	16:10	16:24	16:30	16:41	16:47	16:53	-	16:57	-	-
	16:20	16:34	16:40	16:51	16:57	17:03	17:07	-	17:14	17:28
B	16:30	16:44	16:50	17:01	17:07	17:13	-	17:17	-	-
	16:40	16:54	17:00	17:11	17:17	17:23	17:27	-	17:34	17:48
B	16:50	17:03	17:09	17:20	17:26	17:32	-	17:37	-	-
	17:00	17:13	17:19	17:30	17:36	17:42	17:46	-	17:53	18:07
B	17:10	17:23	17:29	17:40	17:46	17:52	-	17:57	-	-
	17:20	17:33	17:39	17:50	17:56	18:02	18:06	-	18:13	18:27
B	17:30	17:43	17:49	18:00	18:06	18:12	-	18:17	-	-
	17:40	17:53	17:59	18:10	18:16	18:22	18:26	-	18:33	18:47
B	17:50	18:03	18:09	18:20	18:26	18:32	-	18:37	-	-
	18:00	18:13	18:18	18:28	18:33	18:38	18:41	-	18:48	19:01
B	18:10	18:23	18:28	18:38	18:43	18:48	-	18:53	-	-
	18:20	18:33	18:38	18:48	18:53	18:58	19:01	-	19:08	19:21
B	18:30	18:43	18:48	18:58	19:03	19:08	-	19:13	-	-
	18:40	18:53	18:58	19:08	19:13	19:18	19:21	-	19:28	19:41
B	18:50	19:03	19:08	19:18	19:23	19:28	-	19:33	-	-
	19:05	19:18	19:23	19:33	19:38	19:43	19:46	-	19:53	20:06
B	19:15	19:28	19:33	19:43	19:48	19:53	-	19:58	-	-
B	19:25	19:38	19:43	19:53	19:58	20:03	-	20:08	-	-
	19:35	19:48	19:53	20:03	20:08	20:13	20:16	-	20:23	20:36
B	19:50	20:03	20:08	20:18	20:23	20:28	-	20:33	-	-
	20:05	20:18	20:23	20:33	20:38	20:43	20:46	-	20:53	21:06
B	20:20	20:32	20:36	20:46	20:51	20:56	-	21:00	-	-
	20:41	20:53	20:57	21:07	21:12	21:17	21:20	-	21:27	21:40
	21:11	21:23	21:27	21:37	21:42	21:47	21:50	-	21:57	22:10
	21:41	21:53	21:57	22:07	22:12	22:17	22:20	-	22:27	22:40
	22:18	22:30	22:34	22:44	22:48	22:53	22:55	-	23:01	23:11
	22:48	23:00	23:04	23:14	23:18	23:23	23:25	-	23:31	23:41

B To Pickering Parkway Terminal

Saturday — West

Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #1598**	Kingston Westbound @Brock Road **Stop #1604**	Kingston Westbound @ Glenanna **Stop #1608**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
05:20	05:32	05:37	05:48	05:52	05:57	05:59	-	06:04	06:15
05:50	06:02	06:07	06:18	06:22	06:27	06:29	-	06:34	06:45
06:20	06:32	06:37	06:48	06:52	06:57	06:59	-	07:04	07:15
B 06:35	06:47	06:52	07:03	07:07	07:12	-	07:18	-	-
06:50	07:02	07:07	07:18	07:22	07:27	07:29	-	07:34	07:45
B 07:05	07:17	07:22	07:33	07:37	07:42	-	07:48	-	-
07:20	07:33	07:38	07:49	07:54	07:59	08:02	-	08:09	08:21
B 07:35	07:48	07:53	08:04	08:09	08:14	-	08:20	-	-
07:50	08:03	08:08	08:19	08:24	08:29	08:32	-	08:39	08:51
B 08:05	08:18	08:23	08:34	08:39	08:44	-	08:50	-	-
08:20	08:33	08:38	08:49	08:54	08:59	09:02	-	09:09	09:21
B 08:35	08:48	08:53	09:04	09:09	09:14	-	09:20	-	-
08:50	09:03	09:08	09:19	09:24	09:29	09:32	-	09:39	09:51
B 09:05	09:18	09:23	09:34	09:39	09:44	-	09:50	-	-
09:20	09:33	09:38	09:49	09:54	09:59	10:02	-	10:09	10:21
B 09:35	09:48	09:53	10:04	10:09	10:14	-	10:20	-	-
09:50	10:04	10:10	10:21	10:28	10:34	10:36	-	10:44	10:57
B 10:05	10:19	10:25	10:36	10:43	10:49	-	10:55	-	-
10:20	10:34	10:40	10:51	10:58	11:04	11:06	-	11:14	11:27
B 10:35	10:49	10:55	11:06	11:13	11:19	-	11:25	-	-
10:50	11:04	11:10	11:21	11:28	11:34	11:36	-	11:44	11:57
B 11:05	11:19	11:25	11:36	11:43	11:49	-	11:55	-	-
11:20	11:34	11:40	11:51	11:58	12:04	12:06	-	12:14	12:27
B 11:35	11:49	11:55	12:06	12:13	12:19	-	12:25	-	-
11:50	12:04	12:10	12:21	12:28	12:34	12:36	-	12:44	12:57
B 12:05	12:19	12:25	12:36	12:43	12:49	-	12:55	-	-
12:20	12:34	12:40	12:51	12:58	13:04	13:06	-	13:14	13:27
B 12:35	12:49	12:55	13:06	13:13	13:19	-	13:25	-	-
12:50	13:04	13:10	13:21	13:28	13:34	13:36	-	13:44	13:57
B 13:05	13:19	13:25	13:36	13:43	13:49	-	13:55	-	-
13:20	13:34	13:40	13:51	13:58	14:04	14:06	-	14:14	14:27
B 13:35	13:49	13:55	14:06	14:13	14:19	-	14:25	-	-
13:50	14:04	14:10	14:21	14:28	14:34	14:36	-	14:44	14:57
B 14:05	14:19	14:25	14:36	14:43	14:49	-	14:55	-	-
14:20	14:34	14:40	14:51	14:58	15:04	15:06	-	15:14	15:27
B 14:35	14:49	14:55	15:06	15:13	15:19	-	15:25	-	-
14:50	15:04	15:10	15:21	15:28	15:34	15:36	-	15:44	15:57
B 15:05	15:19	15:25	15:36	15:43	15:49	-	15:55	-	-
15:20	15:34	15:40	15:51	15:58	16:04	16:06	-	16:14	16:27
B 15:35	15:49	15:55	16:06	16:13	16:19	-	16:25	-	-
15:50	16:03	16:09	16:19	16:25	16:30	16:34	-	16:41	16:53
B 16:05	16:18	16:24	16:34	16:40	16:45	-	16:52	-	-
16:20	16:33	16:39	16:49	16:55	17:00	17:04	-	17:11	17:23

B To Pickering Parkway Terminal

Saturday — West

Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #1598**	Kingston Westbound @Brock Road **Stop #1604**	Kingston Westbound @ Glenanna **Stop #1608**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
B 16:35	16:48	16:54	17:04	17:10	17:15	-	17:22	-	-
16:50	17:03	17:09	17:19	17:25	17:30	17:34	-	17:41	17:53
B 17:05	17:18	17:24	17:34	17:40	17:45	-	17:52	-	-
17:20	17:33	17:39	17:49	17:55	18:00	18:04	-	18:11	18:23
B 17:35	17:48	17:54	18:04	18:10	18:15	-	18:22	-	-
17:50	18:03	18:09	18:19	18:25	18:30	18:34	-	18:41	18:53
B 18:05	18:18	18:24	18:34	18:40	18:45	-	18:52	-	-
18:20	18:33	18:39	18:49	18:55	19:00	19:04	-	19:11	19:23
B 18:35	18:48	18:54	19:04	19:10	19:15	-	19:22	-	-
18:50	19:02	19:07	19:17	19:22	19:27	19:29	-	19:35	19:47
B 19:05	19:17	19:22	19:32	19:37	19:42	-	19:48	-	-
19:20	19:32	19:37	19:47	19:52	19:57	19:59	-	20:05	20:17
B 19:35	19:47	19:52	20:02	20:07	20:12	-	20:18	-	-
19:50	20:02	20:07	20:17	20:22	20:27	20:29	-	20:35	20:47
B 20:05	20:17	20:22	20:32	20:37	20:42	-	20:48	-	-
20:20	20:32	20:37	20:47	20:52	20:57	20:59	-	21:05	21:17
B 20:35	20:47	20:52	21:02	21:07	21:12	-	21:18	-	-
20:50	21:02	21:07	21:17	21:22	21:27	21:29	-	21:35	21:47
21:20	21:32	21:37	21:47	21:52	21:57	21:59	-	22:05	22:17
21:50	22:02	22:07	22:17	22:22	22:27	22:29	-	22:35	22:47
22:20	22:32	22:37	22:47	22:52	22:57	22:59	-	23:05	23:12
22:50	23:02	23:07	23:17	23:22	23:27	23:29	-	23:35	23:42

B To Pickering Parkway Terminal

PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Saturday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Eastbound @ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
04:45	05:00	-	05:04	05:06	05:11	05:16	05:25	05:30	05:42
05:20	05:35	-	05:39	05:41	05:46	05:51	06:00	06:05	06:17
05:55	06:10	-	06:14	06:16	06:21	06:26	06:35	06:40	06:52
-	-	06:33	06:36	06:38	06:42	06:47	06:56	07:01	07:13
06:30	06:45	-	06:51	06:53	06:57	07:02	07:11	07:16	07:28
-	-	07:03	07:06	07:08	07:12	07:17	07:26	07:31	07:43
07:00	07:15	-	07:21	07:23	07:27	07:32	07:41	07:46	07:58
-	-	07:33	07:36	07:38	07:42	07:47	07:56	08:01	08:13
07:30	07:45	-	07:51	07:53	07:57	08:02	08:11	08:16	08:28
-	-	08:03	08:06	08:08	08:12	08:17	08:26	08:31	08:43
08:00	08:15	-	08:21	08:23	08:27	08:32	08:41	08:46	08:58
-	-	08:33	08:36	08:38	08:42	08:47	08:56	09:01	09:13
08:30	08:45	-	08:51	08:53	08:57	09:02	09:11	09:16	09:28
-	-	09:03	09:06	09:09	09:15	09:21	09:32	09:39	09:53
09:00	09:15	-	09:21	09:24	09:30	09:36	09:47	09:54	10:08
-	-	09:33	09:36	09:39	09:45	09:51	10:02	10:09	10:23
09:30	09:45	-	09:51	09:54	10:00	10:06	10:17	10:24	10:38
-	-	10:03	10:06	10:09	10:15	10:21	10:32	10:39	10:53
10:00	10:15	-	10:21	10:24	10:30	10:36	10:47	10:54	11:08
-	-	10:33	10:36	10:39	10:45	10:51	11:02	11:09	11:23
10:30	10:45	-	10:51	10:54	11:00	11:06	11:17	11:24	11:38
-	-	11:05	11:08	11:11	11:17	11:23	11:33	11:39	11:53
11:00	11:16	-	11:23	11:26	11:32	11:38	11:48	11:54	12:08
-	-	11:35	11:38	11:41	11:47	11:53	12:03	12:09	12:23
11:30	11:46	-	11:53	11:56	12:02	12:08	12:18	12:24	12:38
-	-	12:05	12:08	12:11	12:17	12:23	12:33	12:39	12:53
12:00	12:16	-	12:23	12:26	12:32	12:38	12:48	12:54	13:08
-	-	12:35	12:38	12:41	12:47	12:53	13:03	13:09	13:23
12:30	12:46	-	12:53	12:56	13:02	13:08	13:18	13:24	13:38
-	-	13:05	13:08	13:11	13:17	13:23	13:33	13:39	13:53
13:00	13:16	-	13:23	13:26	13:32	13:38	13:48	13:54	14:08
-	-	13:35	13:38	13:41	13:47	13:53	14:03	14:09	14:23
13:30	13:46	-	13:53	13:56	14:02	14:08	14:18	14:24	14:38
-	-	14:05	14:08	14:11	14:17	14:23	14:33	14:39	14:53
14:00	14:16	-	14:23	14:26	14:32	14:38	14:48	14:54	15:08
-	-	14:35	14:38	14:41	14:47	14:53	15:03	15:09	15:23
14:30	14:46	-	14:53	14:56	15:02	15:08	15:18	15:24	15:38
-	-	15:05	15:08	15:11	15:17	15:23	15:33	15:39	15:53
15:00	15:16	-	15:23	15:26	15:32	15:38	15:48	15:54	16:08
-	-	15:35	15:38	15:41	15:47	15:53	16:03	16:09	16:23
15:30	15:46	-	15:53	15:56	16:02	16:08	16:18	16:24	16:38
-	-	16:05	16:08	16:11	16:17	16:23	16:33	16:39	16:53
16:00	16:16	-	16:23	16:26	16:32	16:38	16:48	16:54	17:08

Saturday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Eastbound @ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
-	-	16:35	16:38	16:41	16:47	16:53	17:03	17:09	17:23
16:30	16:46	-	16:53	16:56	17:02	17:08	17:18	17:24	17:38
-	-	17:05	17:08	17:11	17:17	17:23	17:33	17:39	17:53
17:00	17:16	-	17:23	17:26	17:32	17:38	17:48	17:54	18:08
-	-	17:35	17:38	17:41	17:47	17:53	18:03	18:09	18:23
17:30	17:46	-	17:53	17:56	18:02	18:08	18:18	18:24	18:38
-	-	18:03	18:06	18:09	18:14	18:19	18:29	18:35	18:49
18:00	18:15	-	18:21	18:24	18:29	18:34	18:44	18:50	19:04
-	-	18:33	18:36	18:39	18:44	18:49	18:59	19:05	19:19
18:30	18:45	-	18:51	18:54	18:59	19:04	19:14	19:20	19:34
-	-	19:03	19:06	19:09	19:14	19:19	19:29	19:35	19:49
19:00	19:15	-	19:21	19:24	19:29	19:34	19:44	19:50	20:04
-	-	19:33	19:36	19:39	19:44	19:49	19:59	20:05	20:19
19:30	19:45	-	19:51	19:54	19:59	20:04	20:14	20:20	20:34
-	-	20:02	20:05	20:07	20:13	20:17	20:28	20:33	20:45
20:00	20:14	-	20:20	20:22	20:28	20:32	20:43	20:48	21:00
-	-	20:32	20:35	20:37	20:43	20:47	20:58	21:03	21:15
20:30	20:44	-	20:50	20:52	20:58	21:02	21:13	21:18	21:30
21:00	21:14	-	21:20	21:22	21:28	21:32	21:43	21:48	22:00
21:30	21:44	-	21:50	21:52	21:58	22:02	22:13	22:18	22:30
22:00	22:14	-	22:20	22:22	22:28	22:32	22:43	22:48	23:00
22:30	22:44	-	22:50	22:52	22:58	23:02	23:13	23:18	23:30

Durham Region Transit

PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday — West

Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #1598**	Kingston Westbound @Brock Road **Stop #1604**	Kingston Westbound @ Glenanna **Stop #1608**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
05:20	05:32	05:37	05:48	05:52	05:57	06:00	-	06:06	06:17
05:50	06:02	06:07	06:18	06:22	06:27	06:30	-	06:36	06:47
06:20	06:32	06:37	06:48	06:52	06:57	07:00	-	07:06	07:17
B 06:35	06:47	06:52	07:03	07:07	07:12	-	07:16	-	-
06:50	07:02	07:07	07:18	07:22	07:27	07:30	-	07:36	07:47
B 07:05	07:17	07:22	07:33	07:37	07:42	-	07:46	-	-
07:20	07:32	07:37	07:48	07:52	07:57	08:00	-	08:06	08:17
B 07:35	07:47	07:52	08:03	08:07	08:12	-	08:16	-	-
07:50	08:02	08:07	08:18	08:22	08:27	08:30	-	08:36	08:47
B 08:05	08:17	08:22	08:33	08:37	08:42	-	08:46	-	-
08:20	08:32	08:37	08:48	08:52	08:57	09:00	-	09:06	09:17
B 08:35	08:47	08:52	09:03	09:07	09:12	-	09:16	-	-
08:50	09:02	09:07	09:18	09:22	09:27	09:30	-	09:36	09:47
B 09:05	09:17	09:22	09:33	09:37	09:42	-	09:46	-	-
09:20	09:32	09:37	09:48	09:52	09:57	10:00	-	10:06	10:17
B 09:35	09:47	09:52	10:03	10:07	10:12	-	10:16	-	-
09:50	10:02	10:08	10:18	10:24	10:29	10:32	-	10:39	10:52
B 10:05	10:17	10:23	10:33	10:39	10:44	-	10:49	-	-
10:20	10:32	10:38	10:48	10:54	10:59	11:02	-	11:09	11:22
B 10:35	10:47	10:53	11:03	11:09	11:14	-	11:19	-	-
10:50	11:02	11:08	11:18	11:24	11:29	11:32	-	11:39	11:52
B 11:05	11:17	11:23	11:33	11:39	11:44	-	11:49	-	-
11:20	11:32	11:38	11:48	11:54	11:59	12:02	-	12:09	12:22
B 11:35	11:47	11:53	12:03	12:09	12:14	-	12:19	-	-
11:50	12:02	12:08	12:18	12:24	12:29	12:32	-	12:39	12:52
B 12:05	12:17	12:23	12:33	12:39	12:44	-	12:49	-	-
12:20	12:33	12:38	12:50	12:57	13:03	13:06	-	13:13	13:26
B 12:35	12:48	12:53	13:05	13:12	13:18	-	13:23	-	-
12:50	13:03	13:08	13:20	13:27	13:33	13:36	-	13:43	13:56
B 13:05	13:18	13:23	13:35	13:42	13:48	-	13:53	-	-
13:20	13:33	13:38	13:50	13:57	14:03	14:06	-	14:13	14:26
B 13:35	13:48	13:53	14:05	14:12	14:18	-	14:23	-	-
13:50	14:03	14:08	14:20	14:27	14:33	14:36	-	14:43	14:56
B 14:05	14:18	14:23	14:35	14:42	14:48	-	14:53	-	-
14:20	14:33	14:38	14:50	14:57	15:03	15:06	-	15:13	15:26
B 14:35	14:48	14:53	15:05	15:12	15:18	-	15:23	-	-
14:50	15:03	15:08	15:20	15:27	15:33	15:36	-	15:43	15:56
B 15:05	15:18	15:23	15:35	15:42	15:48	-	15:53	-	-
15:20	15:33	15:38	15:50	15:57	16:03	16:06	-	16:13	16:26
B 15:35	15:48	15:53	16:05	16:12	16:18	-	16:23	-	-
15:50	16:03	16:08	16:20	16:27	16:33	16:36	-	16:43	16:56
B 16:05	16:17	16:23	16:33	16:39	16:44	-	16:49	-	-
16:20	16:32	16:38	16:48	16:54	16:59	17:02	-	17:09	17:22

B To Pickering Parkway Terminal

PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday — West

Bond Westbound @ Ritson **Stop #1163**	Dundas Westbound @ Thickson **Stop #388**	Dundas Westbound @ Brock Street **Stop #398**	Kingston Westbound @ Salem **Stop #1591**	Kingston Westbound @ Westney **Stop #1598**	Kingston Westbound @Brock Road **Stop #1604**	Kingston Westbound @ Glenanna **Stop #1608**	Pickering Parkway Terminal **Stop #93112**	Kingston Westbound @ Whites **Stop #1742**	Centennial Circle **Stop #3589**
B 16:35	16:47	16:53	17:03	17:09	17:14	-	17:19	-	-
16:50	17:02	17:08	17:18	17:24	17:29	17:32	-	17:39	17:52
B 17:05	17:17	17:23	17:33	17:39	17:44	-	17:49	-	-
17:20	17:32	17:38	17:48	17:54	17:59	18:02	-	18:09	18:22
B 17:35	17:47	17:53	18:03	18:09	18:14	-	18:19	-	-
17:50	18:02	18:08	18:18	18:24	18:29	18:32	-	18:39	18:52
B 18:05	18:17	18:23	18:33	18:39	18:44	-	18:49	-	-
18:20	18:32	18:38	18:48	18:54	18:59	19:02	-	19:09	19:22
B 18:35	18:47	18:53	19:03	19:09	19:14	-	19:19	-	-
18:50	19:02	19:07	19:17	19:21	19:26	19:28	-	19:34	19:46
B 19:05	19:17	19:22	19:32	19:36	19:41	-	19:46	-	-
19:20	19:32	19:37	19:47	19:51	19:56	19:58	-	20:04	20:16
B 19:35	19:47	19:52	20:02	20:06	20:11	-	20:16	-	-
19:50	20:02	20:07	20:17	20:21	20:26	20:28	-	20:34	20:46
B 20:05	20:17	20:22	20:32	20:36	20:41	-	20:46	-	-
20:20	20:32	20:37	20:47	20:51	20:56	20:58	-	21:04	21:16
B 20:35	20:47	20:52	21:02	21:06	21:11	-	21:16	-	-
20:50	21:02	21:07	21:17	21:21	21:26	21:28	-	21:34	21:46
21:20	21:32	21:37	21:47	21:51	21:56	21:58	-	22:04	22:16
21:50	22:02	22:07	22:17	22:21	22:26	22:28	-	22:34	22:46
22:20	22:32	22:37	22:47	22:51	22:56	22:58	-	23:04	23:11
22:50	23:02	23:07	23:17	23:21	23:26	23:28	-	23:34	23:41

B To Pickering Parkway Terminal

PULSE 900

Effective September 6, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Sunday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Eastbound @ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
04:45	05:00	-	05:04	05:06	05:11	05:16	05:25	05:30	05:42
05:20	05:34	-	05:38	05:41	05:46	05:50	06:01	06:06	06:18
05:55	06:09	-	06:13	06:16	06:21	06:25	06:36	06:41	06:53
-	-	06:30	06:33	06:36	06:41	06:45	06:56	07:01	07:13
06:30	06:44	-	06:48	06:51	06:56	07:00	07:11	07:16	07:28
-	-	07:00	07:03	07:06	07:11	07:15	07:26	07:31	07:43
07:00	07:14	-	07:18	07:21	07:26	07:30	07:41	07:46	07:58
-	-	07:30	07:33	07:36	07:41	07:45	07:56	08:01	08:13
07:30	07:44	-	07:48	07:51	07:56	08:00	08:11	08:16	08:28
-	-	08:00	08:03	08:06	08:11	08:15	08:26	08:31	08:43
08:00	08:14	-	08:18	08:21	08:26	08:30	08:41	08:46	08:58
-	-	08:30	08:33	08:36	08:41	08:45	08:56	09:01	09:13
08:30	08:44	-	08:48	08:51	08:56	09:00	09:11	09:16	09:28
-	-	09:00	09:03	09:06	09:11	09:17	09:28	09:34	09:47
09:00	09:16	-	09:22	09:25	09:30	09:36	09:47	09:53	10:06
-	-	09:32	09:35	09:38	09:43	09:49	10:00	10:06	10:19
09:30	09:46	-	09:52	09:55	10:00	10:06	10:17	10:23	10:36
-	-	10:02	10:05	10:08	10:13	10:19	10:30	10:36	10:49
10:00	10:16	-	10:22	10:25	10:30	10:36	10:47	10:53	11:06
-	-	10:32	10:35	10:38	10:43	10:49	11:00	11:06	11:19
10:30	10:46	-	10:52	10:55	11:00	11:06	11:17	11:23	11:36
-	-	11:02	11:05	11:08	11:13	11:19	11:30	11:36	11:49
11:00	11:16	-	11:22	11:25	11:30	11:36	11:47	11:53	12:06
-	-	11:32	11:35	11:38	11:43	11:49	12:00	12:06	12:19
11:30	11:46	-	11:52	11:55	12:00	12:06	12:17	12:23	12:36
-	-	12:02	12:05	12:08	12:13	12:19	12:30	12:36	12:49
12:00	12:16	-	12:22	12:25	12:30	12:36	12:47	12:53	13:06
-	-	12:32	12:35	12:38	12:43	12:49	13:00	13:06	13:19
12:30	12:46	-	12:52	12:55	13:00	13:06	13:17	13:23	13:36
-	-	13:04	13:07	13:10	13:15	13:21	13:32	13:38	13:51
13:00	13:16	-	13:22	13:25	13:30	13:36	13:47	13:53	14:06
-	-	13:34	13:37	13:40	13:45	13:51	14:02	14:08	14:21
13:30	13:46	-	13:52	13:55	14:00	14:06	14:17	14:23	14:36
-	-	14:04	14:07	14:10	14:15	14:21	14:32	14:38	14:51
14:00	14:16	-	14:22	14:25	14:30	14:36	14:47	14:53	15:06
-	-	14:34	14:37	14:40	14:45	14:51	15:02	15:08	15:21
14:30	14:46	-	14:52	14:55	15:00	15:06	15:17	15:23	15:36
-	-	15:04	15:07	15:10	15:15	15:21	15:32	15:38	15:52
15:00	15:15	-	15:22	15:25	15:30	15:36	15:47	15:53	16:07
-	-	15:34	15:37	15:40	15:45	15:51	16:02	16:08	16:22
15:30	15:45	-	15:52	15:55	16:00	16:06	16:17	16:23	16:37
-	-	16:04	16:07	16:10	16:15	16:21	16:32	16:38	16:52
16:00	16:15	-	16:22	16:25	16:30	16:36	16:47	16:53	17:07

PULSE 900

Effective September 6, 2022

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Sunday — East

Centennial Circle **Stop #3589**	Kingston Eastbound @ Whites **Stop #1779**	Pickering Parkway Terminal **Stop #93112**	Kingston Eastbound @ Glenanna **Stop #1786**	Kingston Eastbound d@ Brock Road **Stop #1789**	Kingston Eastbound @ Westney **Stop #2236**	Kingston Eastbound @ Salem **Stop #93254**	Dundas Eastbound @ Brock Street **Stop #425**	Dundas Eastbound @ Thickson **Stop #451**	Ritson Northbound @ Richmond **Stop #3118**
-	-	16:34	16:37	16:40	16:45	16:51	17:02	17:08	17:22
16:30	16:45	-	16:52	16:55	17:00	17:06	17:17	17:23	17:37
-	-	17:02	17:05	17:08	17:13	17:18	17:29	17:34	17:46
17:00	17:14	-	17:20	17:23	17:28	17:33	17:44	17:49	18:01
-	-	17:32	17:35	17:38	17:43	17:48	17:59	18:04	18:16
17:30	17:44	-	17:50	17:53	17:58	18:03	18:14	18:19	18:31
-	-	18:02	18:05	18:08	18:13	18:18	18:29	18:34	18:46
18:00	18:14	-	18:20	18:23	18:28	18:33	18:44	18:49	19:01
-	-	18:32	18:35	18:38	18:43	18:48	18:59	19:04	19:16
18:30	18:44	-	18:50	18:53	18:58	19:03	19:14	19:19	19:31
-	-	19:02	19:05	19:08	19:13	19:18	19:29	19:34	19:46
19:00	19:14	-	19:20	19:23	19:28	19:33	19:44	19:49	20:01
-	-	19:32	19:35	19:38	19:43	19:48	19:59	20:04	20:16
19:30	19:44	-	19:50	19:53	19:58	20:03	20:14	20:19	20:31
-	-	20:02	20:05	20:08	20:13	20:18	20:29	20:34	20:46
20:00	20:14	-	20:20	20:23	20:28	20:33	20:44	20:49	21:01
-	-	20:32	20:35	20:38	20:43	20:48	20:59	21:04	21:16
20:30	20:44	-	20:50	20:53	20:58	21:03	21:14	21:19	21:31
21:00	21:14	-	21:20	21:23	21:28	21:33	21:44	21:49	22:01
21:30	21:44	-	21:50	21:53	21:58	22:03	22:14	22:19	22:31
22:00	22:14	-	22:20	22:23	22:28	22:33	22:44	22:49	23:01
22:30	22:44	-	22:50	22:53	22:58	23:03	23:14	23:19	23:31

Appendix D:
Background Development Traffic

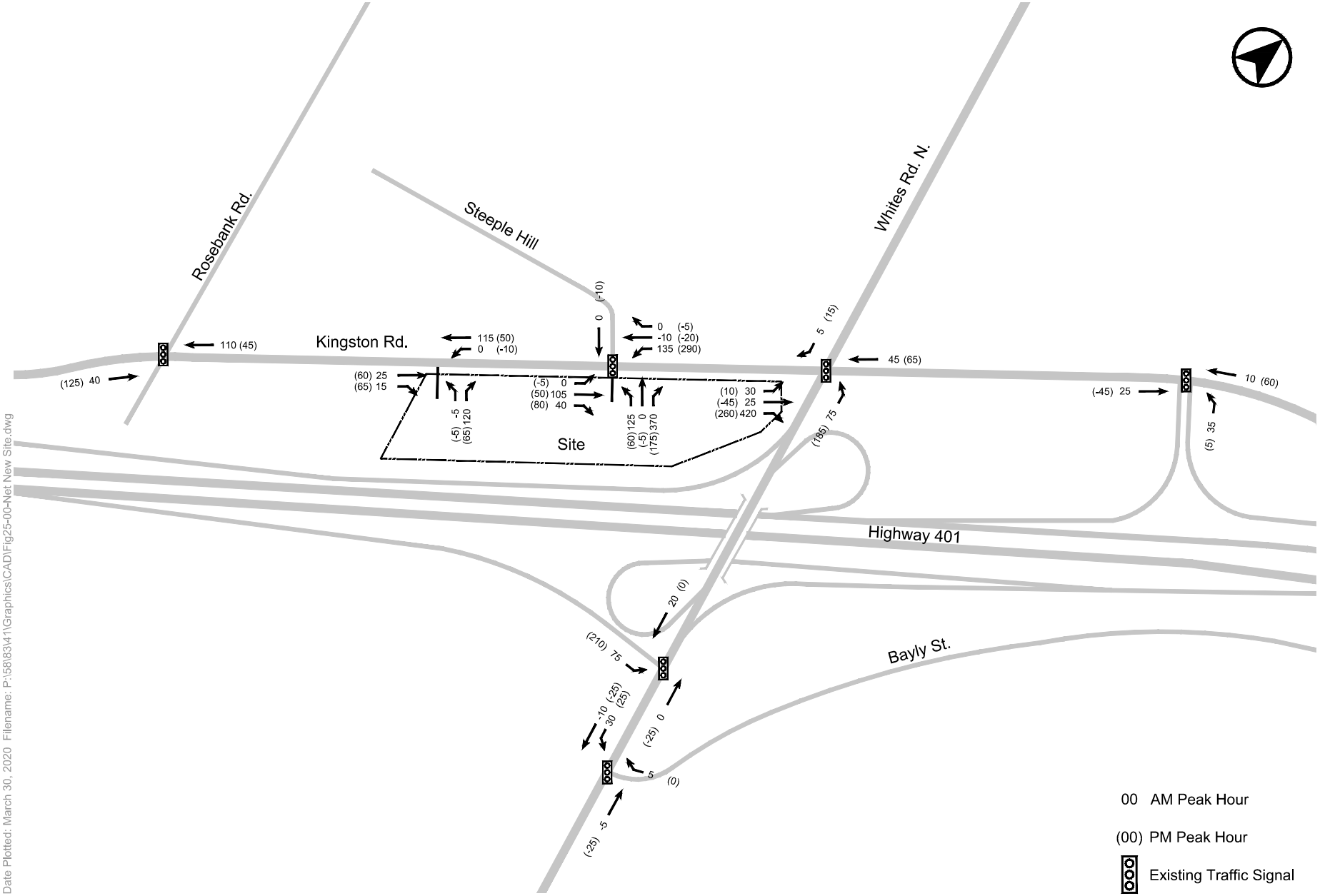


FIGURE 25 FORECAST NET-NEW SITE TRAFFIC VOLUMES

Reference: TIS Update | 760-770 Kingston Road, City of Pickering

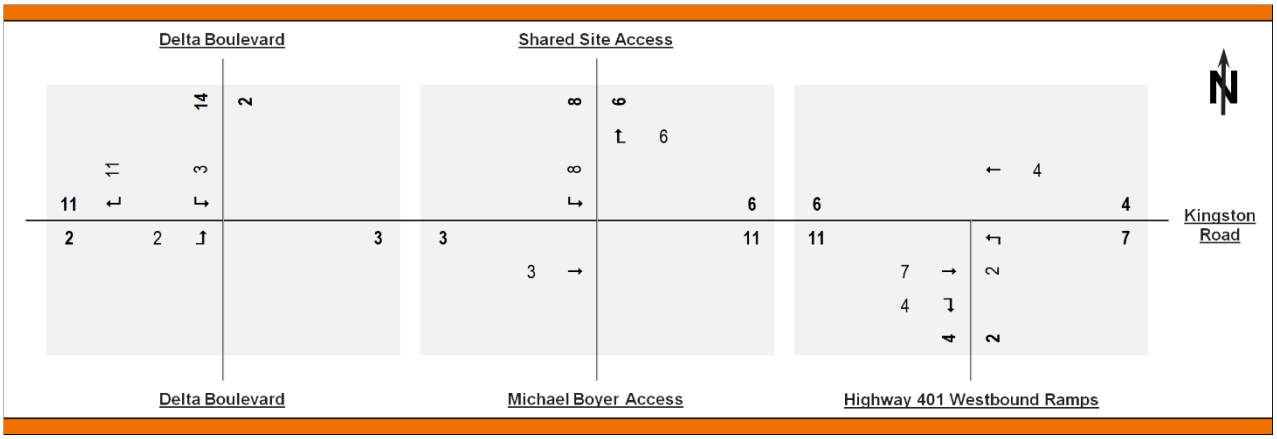


Figure 5 - Site Traffic Volumes AM

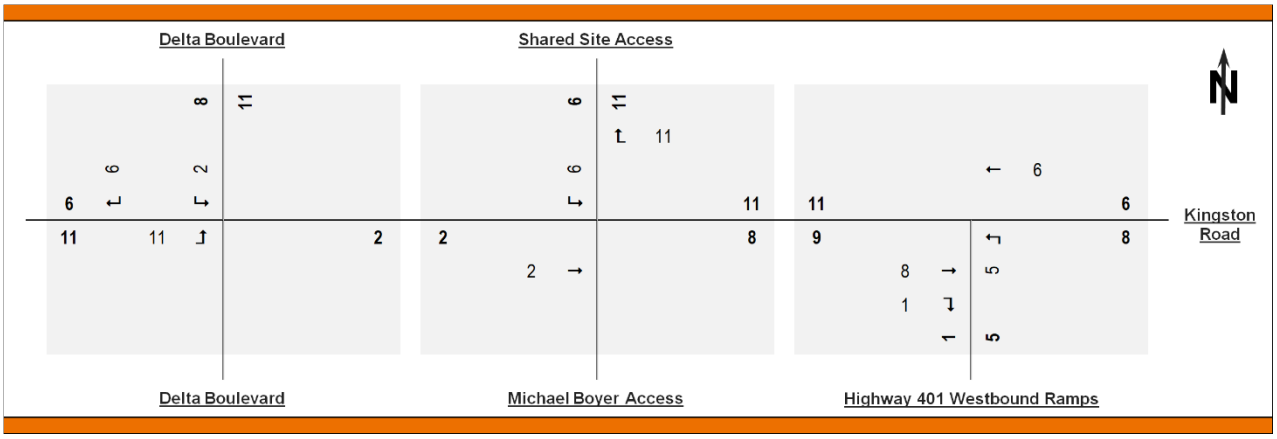


Figure 6 - Site Traffic Volumes PM

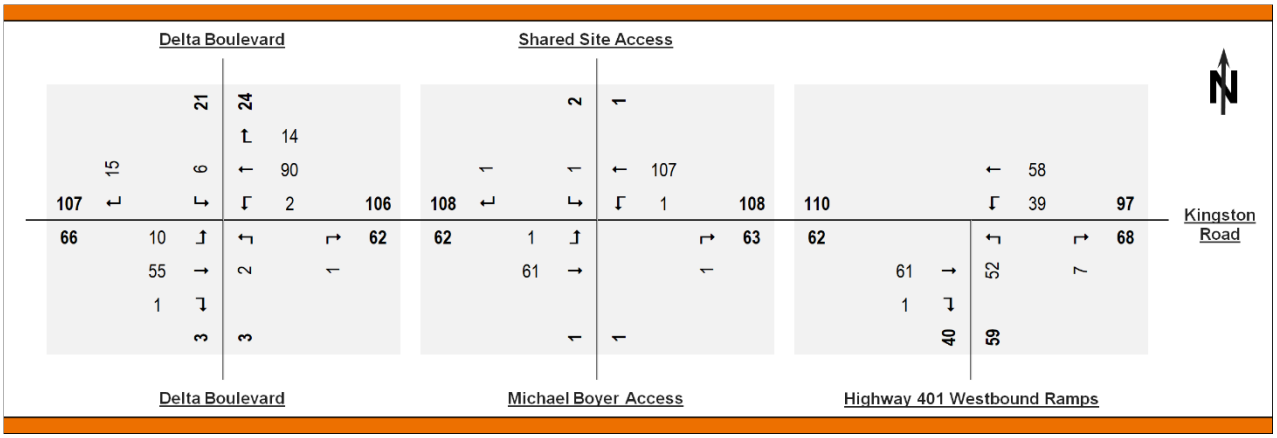
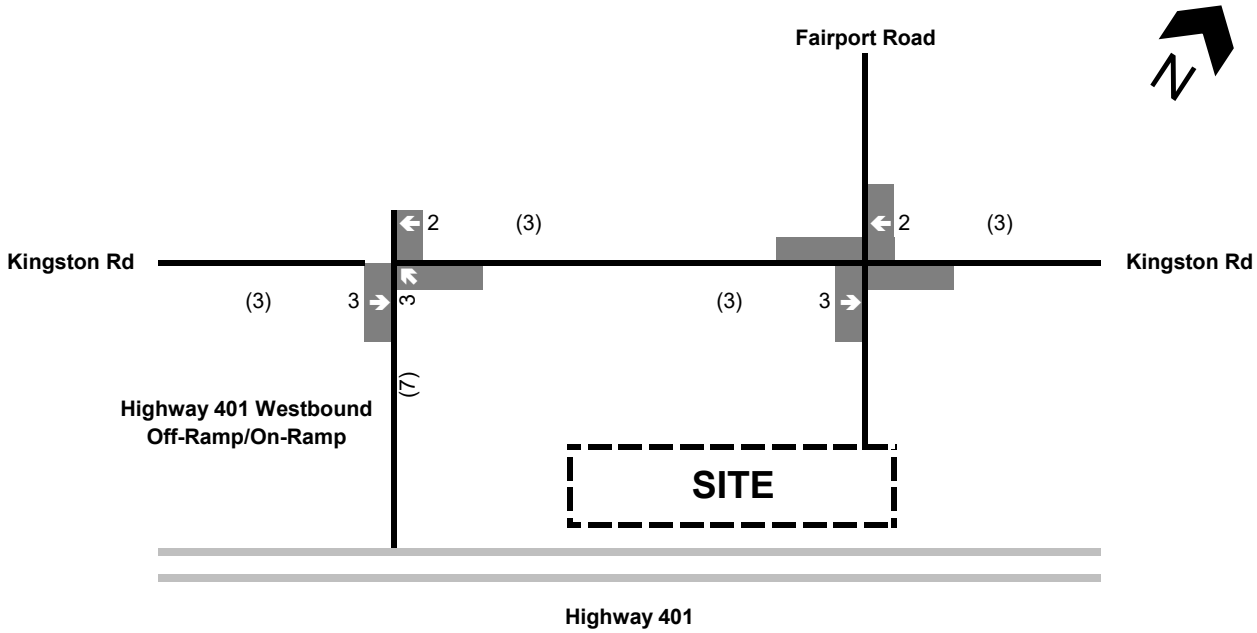


Figure 7 - Background Growth of Traffic AM



TYLin

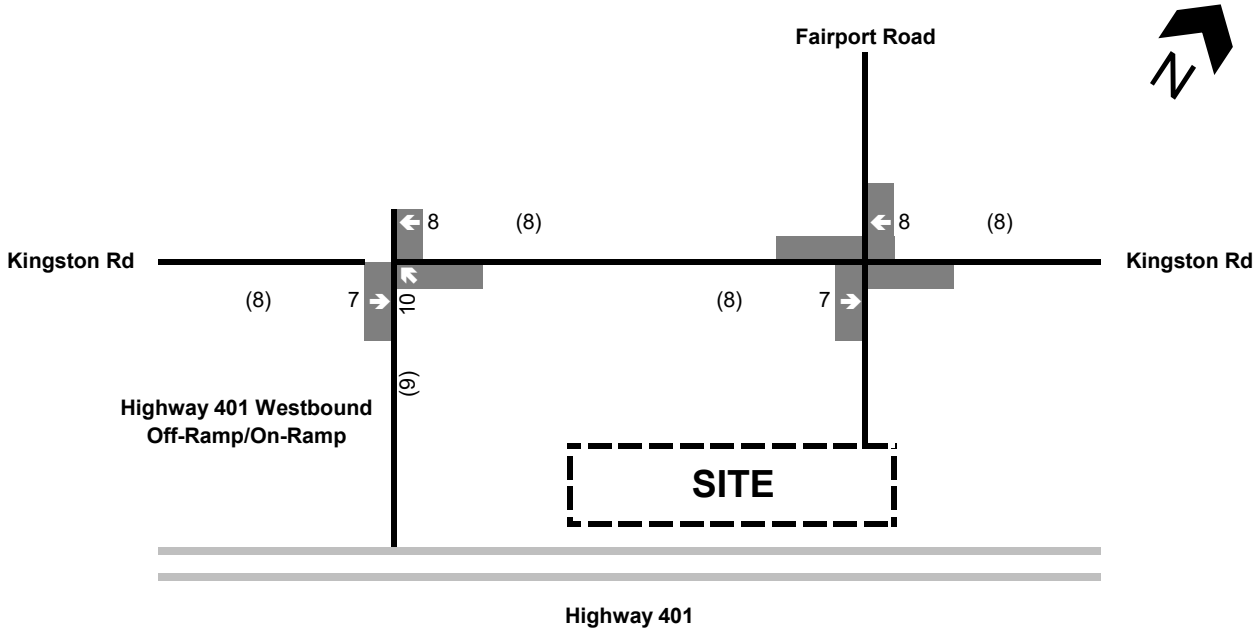
Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

Appendix D BGD3

1473 Whites Road N
Traffic Volumes
875 Kingston Road TIS

N



TYLin

Legend

xx	A.M. Peak Hour Traffic
(xx)	P.M. Peak Hour Traffic

Appendix D BGD4

698 Kingston Road
Traffic Volumes
875 Kingston Road TIS

Appendix E:
Transportation Tomorrow Survey Outputs

TYLin

Thu Jun 09 2022 11:41:55 GMT-0400 (Eastern Daylight Time) - Run Time: 3367ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA z 1050 1046 1047 1049
and
Start time of trip - start_time In 0630-0930
and
Age of person - age In 18-98

Trip 2016
Table:

	1046	1047	1048	1049	1050
16	0	0	0	0	1
53	0	0	0	1	0
61	0	1	0	0	0
66	1	0	0	0	0
78	0	1	0	0	0
201	0	2	0	0	0
229	1	0	0	0	0
230	1	0	0	0	0
235	1	0	0	0	0
257	0	0	0	0	1
270	1	0	0	0	0
277	1	0	0	0	0
430	1	0	0	0	0
436	1	0	0	0	0
442	0	1	0	0	0
443	0	1	0	0	0
450	0	1	0	0	0
491	1	0	0	1	0
495	1	0	0	0	0
540	1	0	0	0	0
541	1	0	0	0	0
543	0	1	0	0	0
555	1	0	0	0	0
558	0	0	0	1	0
568	0	1	0	0	0
569	2	0	0	0	0
570	5	0	0	0	0
571	1	1	2	0	0
572	1	1	0	0	0
574	1	0	0	0	0
575	2	0	0	0	0
603	1	0	0	0	0
621	2	0	0	0	0
1002	2	0	0	0	0
1014	0	0	0	1	0
1028	0	0	2	0	0
1029	1	0	0	0	0
1030	2	0	2	2	0
1031	0	1	0	0	0
1032	0	0	0	1	0
1033	1	1	2	0	0
1034	6	1	1	0	0
1035	7	0	3	0	0
1036	3	0	1	2	0
1037	5	2	0	0	0
1038	2	0	0	0	0
1039	2	1	2	0	0
1040	1	0	1	0	0
1042	0	0	0	1	0
1043	2	0	0	1	1
1044	0	0	0	1	1
1045	0	0	0	1	0
1046	12	1	1	4	0
1047	2	2	0	1	1
1049	3	1	0	3	1
1050	4	0	0	1	2
1051	0	2	0	3	0
1052	0	0	0	0	1
1055	0	0	0	1	0
1056	1	0	0	0	0
1060	1	0	1	0	0
1061	1	1	0	0	0
1065	1	0	0	0	0
1068	0	1	0	0	0
1069	1	0	0	0	0
1074	0	1	1	1	1
1076	0	0	0	2	0
1082	1	0	1	0	0
1088	0	0	0	1	0
1093	1	0	0	0	0
1096	0	0	1	0	1
1097	0	3	0	1	1
1106	1	0	0	0	0
1117	0	1	0	0	0
1121	0	1	0	0	0
1122	0	0	0	1	0
1124	0	1	0	0	0
1129	0	0	1	0	0
1136	1	0	0	0	0
1137	1	0	0	0	0
1140	0	1	0	0	0
1145	3	0	0	0	0
1147	1	0	0	0	0
1152	0	1	0	0	0
1153	3	0	0	1	0
1181	0	1	0	0	0

Thu Jun 09 2022 11:42:51 GMT-0400 (Eastern Daylight Time) - Run Time: 2929ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA z 1050 1046 1047 1049
and
Start time of trip - start_time In 1530-1830
and
Age of person - age In 18-98

Trip 2016
Table:

	1046	1047	1048	1049	1050
21	0	0	0	1	0
25	1	0	0	0	1
36	1	0	0	0	0
37	0	1	0	0	0
38	4	1	0	1	0
43	0	1	0	0	0
46	0	0	0	2	0
48	1	0	0	0	0
49	1	0	0	1	1
50	0	0	0	1	0
51	0	0	0	0	1
52	2	1	0	1	1
53	0	1	0	0	0
54	2	1	0	0	0
55	1	0	0	1	1
57	4	1	0	0	1
58	0	0	0	0	1
60	0	1	0	0	0
65	0	0	0	2	0
66	2	0	0	2	0
68	1	0	1	0	1
70	0	0	0	2	0
78	0	0	0	0	1
90	0	0	0	1	0
175	1	0	0	0	0
179	1	0	0	0	0
195	0	1	0	0	0
211	1	0	0	0	0
218	1	0	1	0	0
223	0	0	0	1	0
231	2	0	0	0	0
236	1	0	0	1	0
239	1	1	0	1	0
241	2	0	0	0	0
243	1	1	0	1	0
259	0	0	0	1	0
260	1	0	0	0	1
266	0	0	0	0	1
272	1	0	0	0	0
279	1	0	0	0	0
286	0	0	0	2	0
391	1	0	0	0	0
394	0	0	0	1	0
420	0	1	0	0	0
430	0	0	0	1	0
452	1	0	0	0	0
455	0	0	0	0	1
465	0	0	0	1	0
466	1	0	0	0	0
473	1	0	0	0	1
480	0	0	0	1	0
484	1	2	0	1	0
486	0	0	0	0	1
487	0	0	0	1	0
490	6	0	0	0	0
491	2	0	0	0	0
492	1	0	0	0	0
493	1	0	0	0	0
497	0	1	0	0	0
498	1	0	0	0	0
503	1	0	1	0	0
510	2	0	0	0	0
511	0	0	0	0	1
515	0	1	0	0	0
516	1	0	0	0	3
524	0	0	0	1	0
525	0	1	0	0	0
526	1	0	0	0	0
530	1	0	0	0	0
534	1	0	0	0	0
538	1	0	0	0	0
540	2	0	0	0	0
546	1	0	0	0	0
552	1	0	0	0	0
560	2	0	0	0	0
561	0	0	0	1	0
563	0	0	0	1	0
564	0	0	1	0	0
565	1	1	0	0	0
566	1	0	0	0	0
567	0	2	0	0	0
568	1	0	0	1	0
569	2	0	0	0	0
570	0	0	0	1	0
571	1	1	0	2	1
572	4	0	1	0	0

1182	0	2	1	0	0
1185	0	0	0	1	0
1187	0	1	0	0	0
1188	0	1	0	0	0
1197	0	0	1	0	0
1202	1	1	0	0	0
1204	0	0	1	0	0
1211	0	0	0	1	0
1216	0	1	0	0	0
1217	0	0	0	1	0
1240	1	0	0	0	0
1250	1	0	0	0	0
1254	0	0	0	1	0
1314	0	1	1	0	0
1333	0	1	0	0	0
2238	1	0	0	0	0
2447	0	0	1	0	0
2618	0	0	0	0	1
2716	1	0	0	0	0
2783	0	0	1	0	0
3346	1	0	0	0	0
3356	0	2	0	0	0
3420	0	0	0	1	0
8128	1	0	0	0	0
8854	0	1	0	0	0

574	0	0	0	0	1
576	0	0	0	1	0
581	0	0	0	1	0
595	0	0	0	1	0
599	0	0	1	0	0
615	1	0	0	0	0
620	0	0	1	0	0
621	1	0	0	0	0
622	0	2	0	0	0
623	0	0	0	1	0
1024	0	0	0	2	0
1028	0	0	2	0	0
1030	3	0	0	0	1
1031	0	1	0	0	0
1033	2	0	0	0	0
1034	3	0	0	0	2
1035	4	0	2	1	3
1036	3	2	0	1	0
1037	1	0	0	0	0
1038	2	1	2	1	2
1039	0	0	0	1	0
1040	0	0	0	0	1
1041	1	3	1	2	4
1042	5	2	1	5	3
1043	2	0	1	1	2
1044	0	0	1	0	0
1045	2	0	0	2	0
1046	8	4	1	2	2
1047	1	0	0	1	0
1048	0	0	1	1	0
1049	1	0	0	1	1
1050	0	0	0	1	3
1051	0	1	0	1	4
1052	0	2	2	0	3
1053	2	0	0	0	1
1055	2	0	0	2	2
1056	0	0	0	1	0
1059	1	0	0	0	0
1060	0	0	3	0	1
1062	2	0	0	0	0
1068	0	1	0	0	0
1069	0	0	0	0	1
1074	1	0	1	0	0
1075	2	0	0	0	0
1078	1	0	0	0	0
1080	0	0	0	0	1
1081	0	0	0	1	0
1082	0	0	1	0	0
1085	1	0	0	0	0
1088	0	0	0	1	0
1090	0	1	0	0	0
1091	0	0	0	0	1
1092	1	0	0	2	0
1095	1	0	0	0	0
1097	0	1	0	1	0
1114	1	0	0	0	0
1128	0	0	1	0	0
1145	2	0	0	0	0
1147	1	0	0	0	0
1154	0	0	0	1	0
1155	0	3	0	0	0
1179	2	0	0	0	1
1189	1	0	0	0	0
1194	0	0	0	2	0
1208	0	0	0	1	1
1210	1	0	0	0	0
1216	0	1	0	0	0
1252	0	1	0	0	1
1267	1	0	0	0	0
1299	0	0	0	1	0
1321	0	0	0	1	0
2014	0	1	0	0	0
2088	1	0	0	0	0
2111	1	0	0	0	0
2210	0	0	1	0	0
2211	0	0	1	0	0
2271	1	1	0	0	0
2374	0	0	1	0	0
2375	2	1	0	1	0
2376	0	0	0	0	1
2386	2	0	0	0	0
2394	1	0	0	0	0
2396	1	0	0	0	0
2399	1	0	0	0	0
2408	1	0	0	0	0
2434	0	0	0	1	0
2445	0	0	0	1	0
2562	0	0	0	0	1
2619	0	0	0	0	1
3605	0	0	0	0	1
3701	0	0	0	1	0
3704	0	0	1	0	0
3709	2	0	0	0	0
3816	1	0	0	0	0
3822	1	0	0	0	0
5198	1	0	0	0	0
7341	0	1	0	0	0
8523	0	1	0	0	0
8705	0	0	0	0	1
8802	0	1	0	0	0
9998	1	0	0	0	0

Thu Jun 09 2022 11:44:55 GMT-0400 (Eastern Daylight Time) - Run Time: 2856ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA z 1050 1046 1047 1049
and
Start time of trip - start_time In 0630-0930
and
Age of person - age In 18-98

Trip 2016
Table:

	1046	1047	1048	1049	1050
15	0	0	0	1	0
17	1	0	0	0	0
21	0	0	0	1	0
22	0	1	0	0	0
25	1	0	0	0	1
36	1	0	0	1	0
37	0	2	0	0	0
38	1	1	0	1	0
43	0	2	0	0	0
45	0	0	0	1	0
46	0	0	0	2	0
48	1	0	0	0	0
49	0	1	0	0	1
50	0	0	0	1	0
51	0	0	0	0	1
52	1	1	0	1	1
54	2	1	0	0	0
55	1	0	0	1	1
57	4	1	0	0	1
58	1	0	0	0	1
63	0	1	0	0	0
65	0	0	0	2	0
66	1	0	0	2	0
68	1	0	1	0	1
69	1	0	0	0	0
70	0	0	0	2	0
78	0	0	0	0	1
89	1	0	0	0	0
90	0	0	0	1	0
155	0	0	0	1	0
175	1	0	0	0	0
179	1	0	0	0	0
194	0	1	0	0	0
195	1	1	0	0	0
200	1	0	0	0	0
206	0	0	0	0	1
218	1	0	1	1	0
223	0	0	0	1	0
231	1	1	0	0	0
235	1	0	0	0	0
236	3	0	1	0	0
239	1	1	0	1	0
242	0	0	0	1	0
243	1	1	0	2	1
268	1	0	0	0	0
270	0	0	0	1	0
272	1	0	0	0	0
279	1	0	0	0	0
332	0	0	0	1	0
388	0	1	0	0	0
391	2	0	0	0	0
402	0	0	0	1	0
420	0	1	0	0	0
430	0	0	0	1	1
443	1	0	0	0	0
459	0	0	0	1	0
465	1	0	0	0	0
473	1	0	0	0	1
484	1	3	0	3	3
487	0	0	0	2	0
490	5	0	0	0	0
491	2	1	0	2	0
493	2	0	0	0	0
494	0	0	0	0	1
497	0	1	0	0	0
501	0	0	0	0	1
503	1	0	0	0	0
505	0	0	0	1	0
509	0	0	0	1	0
510	2	0	0	0	0
511	2	0	0	0	1
516	1	0	0	0	0
521	0	0	0	2	0
525	0	1	0	0	0
526	1	0	1	0	0
530	2	0	0	0	0
532	1	0	0	0	0
538	1	0	0	0	0
551	0	0	0	0	1
552	1	0	0	0	0
560	2	0	1	2	0
561	0	0	0	0	1
565	1	1	0	0	0
566	2	0	0	0	0
570	1	0	0	1	1
571	3	1	1	1	0

Thu Jun 09 2022 11:44:02 GMT-0400 (Eastern Daylight Time) - Run Time: 2606ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA z 1050 1046 1047 1049
and
Start time of trip - start_time In 1530-1830
and
Age of person - age In 18-98

Trip 2016
Table:

	1046	1047	1048	1049	1050
16	0	0	0	0	1
22	1	0	0	0	0
59	1	0	0	0	0
76	0	1	0	0	0
78	0	1	0	0	0
201	0	2	0	0	0
211	1	0	0	0	0
221	0	0	0	1	0
232	0	0	1	0	0
240	0	0	0	1	0
270	1	0	0	0	0
277	1	0	0	0	0
430	1	0	0	0	0
442	0	1	0	0	0
443	0	1	0	0	0
450	0	1	0	0	0
454	1	0	0	0	0
491	1	0	0	0	0
492	1	0	0	0	0
497	0	1	0	0	0
498	0	1	0	0	0
516	0	0	0	0	2
518	2	0	0	0	0
532	0	1	0	0	0
540	1	0	0	0	0
541	1	0	0	0	0
542	0	1	0	0	0
544	0	0	0	1	0
558	0	0	0	1	0
566	2	0	0	0	0
568	0	1	0	0	0
569	3	0	0	1	0
570	7	0	0	1	0
571	1	1	1	0	0
572	2	0	0	0	0
581	0	0	0	1	0
584	1	0	0	0	0
600	0	1	0	0	0
609	1	0	0	0	0
621	2	0	0	0	0
622	0	2	0	0	0
623	0	0	0	0	1
1002	0	0	0	2	0
1013	0	0	0	0	1
1024	0	0	0	1	0
1028	0	0	1	0	0
1029	1	0	0	0	0
1030	2	1	1	1	0
1031	0	1	0	0	3
1033	0	1	2	0	0
1034	5	1	0	0	2
1035	6	1	1	0	4
1036	3	0	0	1	1
1037	0	2	0	0	0
1038	4	0	3	0	1
1039	0	1	2	0	1
1040	2	0	2	1	0
1041	2	0	1	2	0
1042	0	0	0	1	2
1043	1	0	0	2	2
1044	0	0	0	0	1
1045	2	4	0	3	0
1046	8	1	0	1	0
1047	4	0	0	0	0
1048	1	0	1	0	0
1049	2	1	1	1	1
1050	2	0	0	1	3
1051	1	2	0	1	4
1052	2	1	1	0	1
1053	0	1	0	1	0
1055	1	0	0	1	0
1056	1	0	0	0	0
1060	1	0	1	0	1
1061	0	1	0	0	0
1065	1	0	0	0	0
1068	0	1	0	0	0
1069	1	0	0	0	0
1074	0	2	2	1	0
1075	1	0	0	0	0
1076	0	0	0	2	0
1077	3	0	0	0	0
1078	0	2	0	0	0
1082	1	0	0	0	0
1085	0	1	0	0	0
1088	3	0	0	0	0
1089	1	0	0	0	1

572	0	0	1	0	0
574	0	0	0	1	0
575	0	0	0	1	0
576	0	1	0	1	0
580	0	0	1	0	0
594	0	2	0	0	0
595	0	0	0	1	0
612	1	0	0	0	0
614	1	0	0	0	0
621	1	0	0	0	0
623	0	0	0	1	0
624	1	0	0	0	0
1030	0	0	1	0	0
1031	1	1	0	0	1
1033	0	0	1	1	0
1034	3	0	0	0	0
1035	3	0	2	0	0
1036	1	0	0	2	0
1037	2	0	0	0	0
1038	1	0	0	1	1
1039	0	0	2	0	0
1041	1	0	0	4	2
1042	1	1	0	3	1
1043	2	0	0	4	2
1044	0	0	0	1	0
1045	1	0	0	2	0
1046	12	2	0	3	4
1047	1	2	0	1	0
1048	1	0	0	0	0
1049	4	1	0	3	1
1050	0	1	0	1	2
1051	0	1	1	3	3
1052	0	1	0	0	2
1053	2	0	0	0	1
1055	2	0	1	0	1
1056	0	1	0	0	0
1062	2	0	0	0	0
1069	0	0	0	0	1
1074	1	0	0	0	1
1075	0	0	0	1	0
1077	0	0	0	0	2
1082	0	0	1	0	0
1085	0	1	0	0	0
1088	0	0	0	4	1
1091	0	0	0	0	1
1092	2	0	0	2	1
1094	0	0	0	0	1
1117	0	0	0	2	0
1130	1	0	0	0	0
1132	1	0	0	0	0
1139	0	0	0	1	0
1145	0	2	0	0	0
1152	0	2	0	0	0
1154	0	0	0	1	0
1179	1	1	0	0	1
1189	1	0	0	0	0
1194	0	0	0	1	0
1208	0	0	0	1	1
1210	1	0	0	0	0
1211	0	0	0	1	0
1216	0	1	0	0	0
1222	0	0	0	0	1
1225	1	0	0	0	0
1240	1	0	0	0	0
1267	1	0	0	0	0
1299	0	0	0	2	0
1314	0	0	0	1	0
2096	1	0	0	0	0
2111	1	0	0	0	0
2211	0	0	1	0	0
2259	0	0	0	1	0
2271	1	1	0	0	0
2355	0	0	0	2	0
2371	1	0	0	0	0
2374	0	0	1	0	0
2375	1	1	0	1	0
2376	0	0	0	0	1
2394	2	0	0	0	0
2408	1	0	0	0	0
2428	3	0	0	0	0
2434	0	0	0	1	0
2444	0	0	0	1	0
2447	2	0	0	0	0
2454	1	0	0	0	0
2562	0	0	0	0	1
2618	0	0	0	0	1
2664	0	0	0	1	0
2667	0	0	0	1	0
3605	1	0	0	0	0
3701	0	0	0	1	0
3704	0	0	1	0	0
3709	1	0	0	0	0
3816	0	0	0	0	1
3822	1	0	0	0	0
7341	0	1	0	0	0
8802	0	1	0	0	0
8821	0	0	0	1	0
9030	1	0	0	1	1
9066	0	0	0	0	1
9998	1	1	0	0	0

1093	1	0	0	0	0
1094	2	0	0	0	0
1095	0	0	2	2	0
1096	0	0	1	0	0
1097	0	1	0	0	1
1106	0	0	1	0	0
1114	1	0	0	0	0
1117	0	1	0	0	0
1123	0	1	0	0	0
1132	0	0	0	1	0
1135	2	0	0	0	1
1136	1	0	0	0	0
1137	1	0	0	0	0
1140	0	1	0	0	0
1147	1	0	0	0	0
1153	1	0	0	0	0
1179	1	0	0	0	0
1185	0	0	0	1	0
1187	0	1	0	0	0
1188	0	2	1	0	1
1199	0	0	1	0	0
1202	0	1	0	0	0
1204	0	0	1	0	1
1208	0	1	0	0	0
1216	0	1	0	0	0
1241	0	0	0	1	0
1250	1	0	0	0	0
1295	0	1	0	0	0
1314	0	1	1	0	0
1318	0	1	0	0	0
2056	0	0	0	2	0
2210	0	0	1	0	0
2212	0	0	0	0	2
2367	1	0	0	0	0
2445	0	0	0	1	0
2783	0	0	1	0	0
2868	1	0	0	0	0
3346	1	0	0	0	0
3420	0	0	0	1	0
3701	0	0	0	1	0
8128	1	0	0	0	0
8816	2	0	0	0	0

Appendix F:
Synchro Capacity Analysis

TYLin

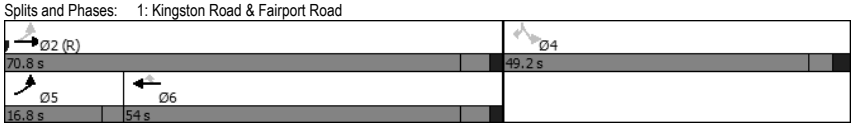
Appendix G1:
Existing Capacity Analysis

TYLin

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	117	610	649	102	179	263
Future Volume (vph)	117	610	649	102	179	263
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	20.0	8.0	8.0
Minimum Split (s)	8.0	32.3	32.3	32.3	29.0	29.0
Total Split (s)	16.8	70.8	54.0	54.0	49.2	49.2
Total Split (%)	14.0%	59.0%	45.0%	45.0%	41.0%	41.0%
Yellow Time (s)	3.0	4.3	4.3	4.3	3.3	3.3
All-Red Time (s)	0.0	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	1.0	6.3	6.3	6.3	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	Max	Max	None	None
Act Effct Green (s)	93.2	87.9	76.7	76.7	19.8	19.8
Actuated g/C Ratio	0.78	0.73	0.64	0.64	0.16	0.16
v/c Ratio	0.24	0.28	0.35	0.13	0.71	0.60
Control Delay	12.1	16.7	11.7	6.2	61.0	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	16.7	11.7	6.2	61.0	10.4
LOS	B	B	B	A	E	B
Approach Delay		16.0	10.9		30.9	
Approach LOS		B	B		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 60 (50%), Referenced to phase 2:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	126	656	698	110	192	283
v/c Ratio	0.24	0.28	0.35	0.13	0.71	0.60
Control Delay	12.1	16.7	11.7	6.2	61.0	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	16.7	11.7	6.2	61.0	10.4
Queue Length 50th (m)	17.9	70.8	36.8	4.6	43.3	0.0
Queue Length 95th (m)	41.1	97.7	61.5	14.6	62.9	22.6
Internal Link Dist (m)		395.6	426.6		284.5	
Turn Bay Length (m)	75.0			20.0	20.0	
Base Capacity (vph)	561	2334	1984	848	591	687
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.28	0.35	0.13	0.32	0.41

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	117	610	649	102	179	263
Future Volume (vph)	117	610	649	102	179	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.2	3.2
Total Lost time (s)	1.0	6.3	6.3	6.3	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1499	3187	3104	1296	1643	1407
Flt Permitted	0.36	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	565	3187	3104	1296	1643	1407
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	126	656	698	110	192	283
RTOR Reduction (vph)	0	0	0	19	0	236
Lane Group Flow (vph)	126	656	698	91	192	47
Confl. Peds. (#/hr)	3			3		2
Heavy Vehicles (%)	15%	12%	15%	14%	5%	8%
Bus Blockages (#/hr)	0	0	0	4	0	0
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	87.9	87.9	76.7	76.7	19.8	19.8
Effective Green, g (s)	89.9	87.9	76.7	76.7	19.8	19.8
Actuated g/C Ratio	0.75	0.73	0.64	0.64	0.17	0.17
Clearance Time (s)	3.0	6.3	6.3	6.3	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	502	2334	1983	828	271	232
v/s Ratio Prot	0.02	c0.21	c0.22			
v/s Ratio Perm	0.17			0.07	c0.12	0.03
v/c Ratio	0.25	0.28	0.35	0.11	0.71	0.20
Uniform Delay, d1	4.3	5.4	10.1	8.4	47.4	43.3
Progression Factor	2.73	2.73	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.5	0.3	8.2	0.4
Delay (s)	12.0	15.0	10.6	8.7	55.6	43.7
Level of Service	B	B	B	A	E	D
Approach Delay (s)		14.5	10.3		48.5	
Approach LOS		B	B		D	

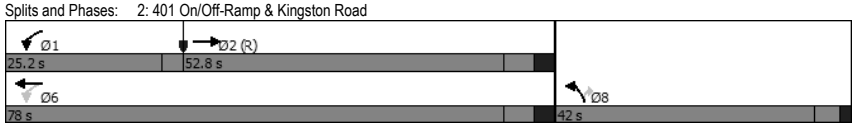
Intersection Summary				
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	654	354	524	565	74
Future Volume (vph)	654	354	524	565	74
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	52.8	25.2	78.0	42.0	42.0
Total Split (%)	44.0%	21.0%	65.0%	35.0%	35.0%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	59.3	84.4	78.2	31.2	29.2
Actuated g/C Ratio	0.49	0.70	0.65	0.26	0.24
v/c Ratio	0.45	0.69	0.30	0.76	0.20
Control Delay	22.8	12.1	6.5	47.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	12.1	6.5	47.3	8.7
LOS	C	B	A	D	A
Approach Delay	22.8		8.8	42.8	
Approach LOS	C		A	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 115.2 (96%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.76		
Intersection Signal Delay: 23.0	Intersection LOS: C	
Intersection Capacity Utilization 66.8%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	699	373	552	595	78
v/c Ratio	0.45	0.69	0.30	0.76	0.20
Control Delay	22.8	12.1	6.5	47.3	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	12.1	6.5	47.3	8.7
Queue Length 50th (m)	53.7	43.0	33.2	66.9	0.4
Queue Length 95th (m)	87.3	52.7	32.8	80.2	11.4
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		50.0			45.0
Base Capacity (vph)	1557	599	1831	969	469
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.62	0.30	0.61	0.17

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	654	10	354	524	565	74
Future Volume (vph)	654	10	354	524	565	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3149		1597	2811	3014	1366
Flt Permitted	1.00		0.33	1.00	0.95	1.00
Satd. Flow (perm)	3149		551	2811	3014	1366
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	688	11	373	552	595	78
RTOR Reduction (vph)	1	0	0	0	0	58
Lane Group Flow (vph)	698	0	373	552	595	20
Heavy Vehicles (%)	13%	20%	8%	27%	11%	13%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	59.3		78.2	78.2	29.2	29.2
Effective Green, g (s)	59.3		80.2	78.2	31.2	29.2
Actuated g/C Ratio	0.49		0.67	0.65	0.26	0.24
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1556		524	1831	783	332
v/s Ratio Prot	c0.22		c0.11	0.20	c0.20	
v/s Ratio Perm			0.37			0.02
v/c Ratio	0.45		0.71	0.30	0.76	0.06
Uniform Delay, d1	19.7		9.5	9.1	40.9	34.9
Progression Factor	1.00		0.71	0.63	1.00	1.00
Incremental Delay, d2	0.9		4.3	0.4	4.3	0.1
Delay (s)	20.7		11.0	6.1	45.2	35.0
Level of Service	C		B	A	D	C
Approach Delay (s)	20.7			8.1	44.0	
Approach LOS	C			A	D	

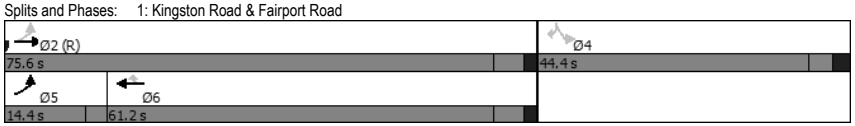
Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	202	1371	629	218	284	152
Future Volume (vph)	202	1371	629	218	284	152
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	20.0	8.0	8.0
Minimum Split (s)	8.0	32.3	32.3	32.3	29.0	29.0
Total Split (s)	14.4	75.6	61.2	61.2	44.4	44.4
Total Split (%)	12.0%	63.0%	51.0%	51.0%	37.0%	37.0%
Yellow Time (s)	3.0	4.3	4.3	4.3	3.3	3.3
All-Red Time (s)	0.0	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	1.0	6.3	6.3	6.3	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	Max	Max	None	None
Act Effct Green (s)	86.2	80.9	67.1	67.1	26.8	26.8
Actuated g/C Ratio	0.72	0.67	0.56	0.56	0.22	0.22
v/c Ratio	0.38	0.61	0.36	0.27	0.80	0.36
Control Delay	11.6	23.3	16.8	7.8	59.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	23.3	16.8	7.8	59.7	7.6
LOS	B	C	B	A	E	A
Approach Delay		21.8	14.5		41.6	
Approach LOS		C	B		D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 72 (60%), Referenced to phase 2:EBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	206	1399	642	222	290	155
v/c Ratio	0.38	0.61	0.36	0.27	0.80	0.36
Control Delay	11.6	23.3	16.8	7.8	59.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	23.3	16.8	7.8	59.7	7.6
Queue Length 50th (m)	25.6	177.9	41.8	9.6	64.8	0.0
Queue Length 95th (m)	m37.2	205.1	68.2	28.4	87.7	15.1
Internal Link Dist (m)		395.6	426.6		284.5	
Turn Bay Length (m)	75.0			20.0	20.0	
Base Capacity (vph)	549	2291	1782	830	520	542
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.61	0.36	0.27	0.56	0.29

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	202	1371	629	218	284	152
Future Volume (vph)	202	1371	629	218	284	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.2	3.2
Total Lost time (s)	1.0	6.3	6.3	6.3	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1567	3400	3187	1381	1627	1365
Flt Permitted	0.37	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	607	3400	3187	1381	1627	1365
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	206	1399	642	222	290	155
RTOR Reduction (vph)	0	0	0	58	0	120
Lane Group Flow (vph)	206	1399	642	164	290	35
Confl. Peds. (#/hr)	3			3		4
Heavy Vehicles (%)	10%	5%	12%	7%	6%	11%
Bus Blockages (#/hr)	0	0	0	4	0	0
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	80.9	80.9	67.2	67.2	26.8	26.8
Effective Green, g (s)	82.9	80.9	67.2	67.2	26.8	26.8
Actuated g/C Ratio	0.69	0.67	0.56	0.56	0.22	0.22
Clearance Time (s)	3.0	6.3	6.3	6.3	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	520	2292	1784	773	363	304
v/s Ratio Prot	0.04	c0.41	0.20			
v/s Ratio Perm	0.23			0.12	c0.18	0.03
v/c Ratio	0.40	0.61	0.36	0.21	0.80	0.11
Uniform Delay, d1	6.9	10.8	14.5	13.2	44.1	37.1
Progression Factor	1.60	1.88	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.7	0.6	0.6	11.6	0.2
Delay (s)	11.3	21.0	15.1	13.8	55.7	37.3
Level of Service	B	C	B	B	E	D
Approach Delay (s)		19.7	14.8		49.3	
Approach LOS		B	B		D	

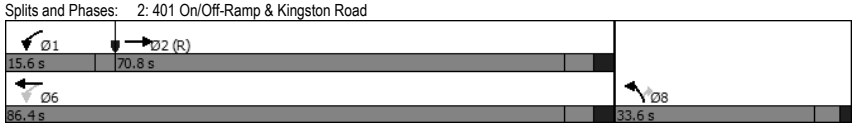
Intersection Summary				
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.3	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1381	193	703	650	141
Future Volume (vph)	1381	193	703	650	141
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	70.8	15.6	86.4	33.6	33.6
Total Split (%)	59.0%	13.0%	72.0%	28.0%	28.0%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	64.7	85.6	79.4	30.0	28.0
Actuated g/C Ratio	0.54	0.71	0.66	0.25	0.23
v/c Ratio	0.86	0.84	0.36	0.92	0.38
Control Delay	30.1	47.0	8.4	62.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	47.0	8.4	62.5	14.8
LOS	C	D	A	E	B
Approach Delay	30.1		16.7	54.0	
Approach LOS	C		B	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 8.4 (7%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 32.4	Intersection LOS: C	
Intersection Capacity Utilization 80.9%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1525	210	764	707	153
v/c Ratio	0.86	0.84	0.36	0.92	0.38
Control Delay	30.1	47.0	8.4	62.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	47.0	8.4	62.5	14.8
Queue Length 50th (m)	158.5	30.1	57.3	83.7	7.3
Queue Length 95th (m)	193.4	#64.2	11.9	#117.6	25.5
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		50.0			45.0
Base Capacity (vph)	1780	261	2147	772	406
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.36	0.92	0.38

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1381	22	193	703	650	141
Future Volume (vph)	1381	22	193	703	650	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3300		1568	3245	3070	1359
Flt Permitted	1.00		0.07	1.00	0.95	1.00
Satd. Flow (perm)	3300		121	3245	3070	1359
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1501	24	210	764	707	153
RTOR Reduction (vph)	1	0	0	0	0	87
Lane Group Flow (vph)	1524	0	210	764	707	66
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	8%	0%	10%	10%	9%	12%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	64.6		79.4	79.4	28.0	28.0
Effective Green, g (s)	64.6		81.4	79.4	30.0	28.0
Actuated g/C Ratio	0.54		0.68	0.66	0.25	0.23
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1776		248	2147	767	317
v/s Ratio Prot	c0.46		c0.10	0.24	c0.23	
v/s Ratio Perm			0.48			0.05
v/c Ratio	0.86		0.85	0.36	0.92	0.21
Uniform Delay, d1	23.8		32.7	9.0	43.9	37.1
Progression Factor	1.00		0.75	0.87	1.00	1.00
Incremental Delay, d2	5.6		22.0	0.5	16.4	0.3
Delay (s)	29.4		46.5	8.3	60.3	37.4
Level of Service	C		D	A	E	D
Approach Delay (s)	29.4			16.5	56.2	
Approach LOS	C			B	E	

Intersection Summary				
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

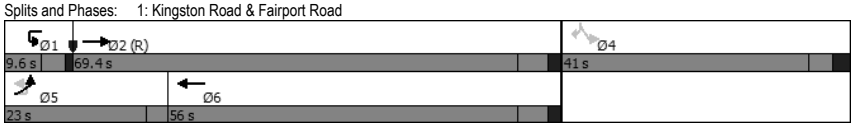
Appendix H2:
Future Background 2027 Capacity Analysis

TYLin

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø1
Lane Configurations						
Traffic Volume (vph)	202	1415	739	284	152	
Future Volume (vph)	202	1415	739	284	152	
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			1
Permitted Phases				4	4	
Detector Phase	5	2	6	4	4	
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	8.0	8.0	5.0
Minimum Split (s)	8.0	32.3	32.3	29.0	29.0	9.5
Total Split (s)	23.0	69.4	56.0	41.0	41.0	9.6
Total Split (%)	19.2%	57.8%	46.7%	34.2%	34.2%	8%
Yellow Time (s)	3.0	4.3	4.3	3.3	3.3	3.5
All-Red Time (s)	0.0	2.0	2.0	2.7	2.7	1.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	1.0	6.3	6.3	6.0	6.0	
Lead/Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	C-Max	Max	None	None	None
Act Effct Green (s)	21.4	81.0	58.6	26.7	26.7	
Actuated g/C Ratio	0.18	0.68	0.49	0.22	0.22	
v/c Ratio	0.74	0.63	0.64	0.80	0.37	
Control Delay	61.3	16.5	25.9	60.4	7.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	61.3	16.5	25.9	60.4	7.7	
LOS	E	B	C	E	A	
Approach Delay		22.1	25.9	42.1		
Approach LOS		C	C	D		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 73.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	206	1444	976	290	155
v/c Ratio	0.74	0.63	0.64	0.80	0.37
Control Delay	61.3	16.5	25.9	60.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	16.5	25.9	60.4	7.7
Queue Length 50th (m)	51.3	87.4	86.8	65.0	0.0
Queue Length 95th (m)	m64.1	116.7	122.6	88.2	15.1
Internal Link Dist (m)		395.6	426.6	284.5	
Turn Bay Length (m)	230.0			20.0	
Base Capacity (vph)	301	2296	1529	474	507
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.63	0.64	0.61	0.31

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

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	202	1415	0	739	218	284	152
Future Volume (vph)	202	1415	0	739	218	284	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.7	3.5	3.2	3.2	3.2
Total Lost time (s)	1.0	6.3		6.3		6.0	6.0
Lane Util. Factor	1.00	0.95		0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00		0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.97		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1568	3400		3091		1627	1365
Flt Permitted	0.95	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1568	3400		3091		1627	1365
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	206	1444	0	754	222	290	155
RTOR Reduction (vph)	0	0	0	20	0	0	121
Lane Group Flow (vph)	206	1444	0	956	0	290	34
Confl. Peds. (#/hr)	3				3		4
Heavy Vehicles (%)	10%	5%	2%	12%	7%	6%	11%
Bus Blockages (#/hr)	0	0	0	0	4	0	0
Turn Type	Prot	NA	Prot	NA		Perm	Perm
Protected Phases	5	2	1	6			
Permitted Phases						4	4
Actuated Green, G (s)	19.4	81.0		58.6		26.7	26.7
Effective Green, g (s)	21.4	81.0		58.6		26.7	26.7
Actuated g/C Ratio	0.18	0.68		0.49		0.22	0.22
Clearance Time (s)	3.0	6.3		6.3		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	279	2295		1509		362	303
v/s Ratio Prot	c0.13	c0.42		0.31			
v/s Ratio Perm						c0.18	0.03
v/c Ratio	0.74	0.63		0.63		0.80	0.11
Uniform Delay, d1	46.7	11.0		22.7		44.1	37.2
Progression Factor	1.09	1.29		1.00		1.00	1.00
Incremental Delay, d2	6.4	0.8		2.0		12.0	0.2
Delay (s)	57.3	15.0		24.8		56.1	37.4
Level of Service	E	B		C		E	D
Approach Delay (s)		20.3		24.8		49.6	
Approach LOS		C		C		D	

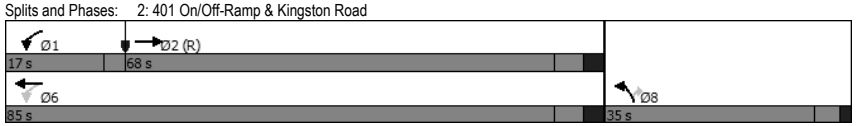
Intersection Summary				
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1426	203	816	710	149
Future Volume (vph)	1426	203	816	710	149
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	68.0	17.0	85.0	35.0	35.0
Total Split (%)	56.7%	14.2%	70.8%	29.2%	29.2%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	63.3	84.6	78.4	31.0	29.0
Actuated g/C Ratio	0.53	0.70	0.65	0.26	0.24
v/c Ratio	0.83	0.76	0.38	0.90	0.36
Control Delay	29.9	53.3	9.1	58.2	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	53.3	9.1	58.2	14.0
LOS	C	D	A	E	B
Approach Delay	29.9		17.9	50.5	
Approach LOS	C		B	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 8.4 (7%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 31.6	Intersection LOS: C	
Intersection Capacity Utilization 84.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1451	203	816	710	149
v/c Ratio	0.83	0.76	0.38	0.90	0.36
Control Delay	29.9	53.3	9.1	58.2	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	53.3	9.1	58.2	14.0
Queue Length 50th (m)	152.9	34.1	23.4	82.7	6.8
Queue Length 95th (m)	186.9	#62.1	48.6	#113.8	24.4
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1741	288	2120	808	419
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.83	0.70	0.38	0.88	0.36

Intersection Summary

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

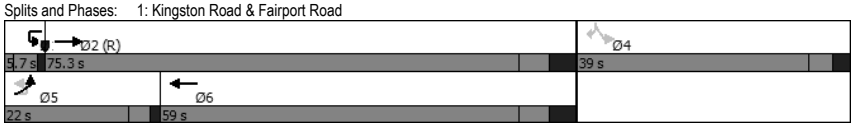
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1426	25	203	816	710	149
Future Volume (vph)	1426	25	203	816	710	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3300		1568	3245	3070	1359
Flt Permitted	1.00		0.08	1.00	0.95	1.00
Satd. Flow (perm)	3300		139	3245	3070	1359
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1426	25	203	816	710	149
RTOR Reduction (vph)	1	0	0	0	0	85
Lane Group Flow (vph)	1450	0	203	816	710	64
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	8%	0%	10%	10%	9%	12%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	63.3		78.4	78.4	29.0	29.0
Effective Green, g (s)	63.3		80.4	78.4	31.0	29.0
Actuated g/C Ratio	0.53		0.67	0.65	0.26	0.24
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1740		261	2120	793	328
v/s Ratio Prot	c0.44		c0.09	0.25	c0.23	
v/s Ratio Perm			0.43			0.05
v/c Ratio	0.83		0.78	0.38	0.90	0.20
Uniform Delay, d1	23.9		28.1	9.6	42.9	36.2
Progression Factor	1.00		1.69	0.88	1.00	1.00
Incremental Delay, d2	4.9		11.9	0.5	12.6	0.3
Delay (s)	28.8		59.4	8.9	55.6	36.5
Level of Service	C		E	A	E	D
Approach Delay (s)	28.8			19.0	52.2	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø1
Lane Configurations						
Traffic Volume (vph)	117	684	707	179	263	
Future Volume (vph)	117	684	707	179	263	
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			1
Permitted Phases				4	4	
Detector Phase	5	2	6	4	4	
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	8.0	8.0	1.0
Minimum Split (s)	9.5	34.1	34.1	38.0	38.0	5.5
Total Split (s)	22.0	75.3	59.0	39.0	39.0	5.7
Total Split (%)	18.3%	62.8%	49.2%	32.5%	32.5%	5%
Yellow Time (s)	3.0	4.3	4.3	3.3	3.3	3.5
All-Red Time (s)	1.5	3.8	3.8	2.7	2.7	1.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	2.5	8.1	8.1	6.0	6.0	
Lead/Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	C-Max	Max	None	None	None
Act Effct Green (s)	17.3	86.3	66.5	19.6	19.6	
Actuated g/C Ratio	0.14	0.72	0.55	0.16	0.16	
v/c Ratio	0.59	0.32	0.51	0.72	0.61	
Control Delay	73.7	1.5	19.5	61.9	10.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	73.7	1.5	19.5	61.9	10.5	
LOS	E	A	B	E	B	
Approach Delay		12.0	19.5	31.3		
Approach LOS		B	B	C		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 61.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	126	735	870	192	283
v/c Ratio	0.59	0.32	0.51	0.72	0.61
Control Delay	73.7	1.5	19.5	61.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.7	1.5	19.5	61.9	10.5
Queue Length 50th (m)	31.7	4.2	62.8	43.4	0.0
Queue Length 95th (m)	m46.5	8.6	102.7	63.2	22.7
Internal Link Dist (m)		395.6	426.6	284.5	
Turn Bay Length (m)	230.0			20.0	
Base Capacity (vph)	253	2292	1691	451	592
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.32	0.51	0.43	0.48

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

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	117	684	0	707	102	179	263
Future Volume (vph)	117	684	0	707	102	179	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.7	3.5	3.2	3.2	3.2
Total Lost time (s)	2.5	8.1		8.1		6.0	6.0
Lane Util. Factor	1.00	0.95		0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.98		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1500	3187		3038		1643	1409
Flt Permitted	0.95	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1500	3187		3038		1643	1409
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	126	735	0	760	110	192	283
RTOR Reduction (vph)	0	0	0	7	0	0	237
Lane Group Flow (vph)	126	735	0	863	0	192	46
Confl. Peds. (#/hr)	3				3		2
Heavy Vehicles (%)	15%	12%	2%	15%	14%	5%	8%
Bus Blockages (#/hr)	0	0	0	0	4	0	0
Turn Type	Prot	NA	Prot	NA		Perm	Perm
Protected Phases	5	2	1	6			
Permitted Phases						4	4
Actuated Green, G (s)	15.3	86.3		66.5		19.6	19.6
Effective Green, g (s)	17.3	86.3		66.5		19.6	19.6
Actuated g/C Ratio	0.14	0.72		0.55		0.16	0.16
Clearance Time (s)	4.5	8.1		8.1		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	216	2291		1683		268	230
v/s Ratio Prot	c0.08	0.23		c0.28			
v/s Ratio Perm						c0.12	0.03
v/c Ratio	0.58	0.32		0.51		0.72	0.20
Uniform Delay, d1	48.0	6.2		16.7		47.6	43.4
Progression Factor	1.38	0.18		1.00		1.00	1.00
Incremental Delay, d2	3.1	0.3		1.1		8.8	0.4
Delay (s)	69.3	1.4		17.8		56.4	43.9
Level of Service	E	A		B		E	D
Approach Delay (s)		11.3		17.8		48.9	
Approach LOS		B		B		D	

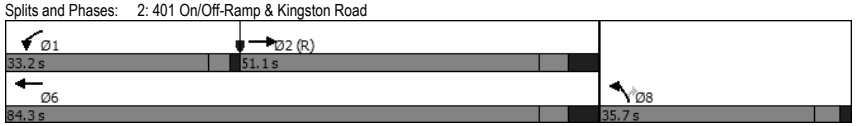
Intersection Summary				
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	730	373	575	644	78
Future Volume (vph)	730	373	575	644	78
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	50.6	9.5	50.6	35.7	35.7
Total Split (s)	51.1	33.2	84.3	35.7	35.7
Total Split (%)	42.6%	27.7%	70.3%	29.8%	29.8%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	4.4	1.5	4.4	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	8.6	2.5	8.6	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	43.4	31.0	76.9	31.1	29.1
Actuated g/C Ratio	0.36	0.26	0.64	0.26	0.24
v/c Ratio	0.69	0.95	0.34	0.87	0.22
Control Delay	36.6	78.9	17.8	55.1	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	78.9	17.8	55.1	13.4
LOS	D	E	B	E	B
Approach Delay	36.6		41.8	50.6	
Approach LOS	D		D	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 42.8	Intersection LOS: D	
Intersection Capacity Utilization 73.5%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	784	393	605	678	82
v/c Ratio	0.69	0.95	0.34	0.87	0.22
Control Delay	36.6	78.9	17.8	55.1	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.6	78.9	17.8	55.1	13.4
Queue Length 50th (m)	82.7	97.9	38.9	77.7	3.0
Queue Length 95th (m)	105.0	#156.7	80.8	#102.3	15.6
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1138	412	1800	811	393
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.95	0.34	0.84	0.21

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	730	15	373	575	644	78
Future Volume (vph)	730	15	373	575	644	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	8.6		2.5	8.6	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3146		1597	2811	3014	1366
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3146		1597	2811	3014	1366
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	768	16	393	605	678	82
RTOR Reduction (vph)	1	0	0	0	0	49
Lane Group Flow (vph)	783	0	393	605	678	33
Heavy Vehicles (%)	13%	20%	8%	27%	11%	13%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	43.4		29.0	76.9	29.1	29.1
Effective Green, g (s)	43.4		31.0	76.9	31.1	29.1
Actuated g/C Ratio	0.36		0.26	0.64	0.26	0.24
Clearance Time (s)	8.6		4.5	8.6	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1137		412	1801	781	331
v/s Ratio Prot	c0.25		c0.25	0.22	c0.22	
v/s Ratio Perm						0.02
v/c Ratio	0.69		0.95	0.34	0.87	0.10
Uniform Delay, d1	32.6		43.8	9.9	42.5	35.3
Progression Factor	1.00		1.07	1.70	1.00	1.00
Incremental Delay, d2	3.4		29.9	0.4	10.1	0.1
Delay (s)	36.0		76.9	17.2	52.6	35.4
Level of Service	D		E	B	D	D
Approach Delay (s)	36.0			40.7	50.7	
Approach LOS	D			D	D	

Intersection Summary				
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

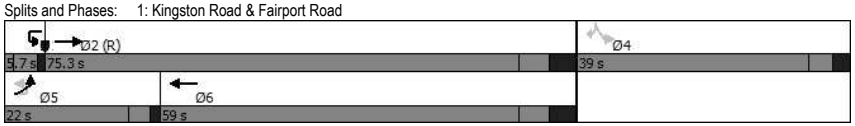
Appendix I3:
Future Background 2032 Capacity Analysis

TYLin

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø1
Lane Configurations						
Traffic Volume (vph)	117	716	741	179	263	
Future Volume (vph)	117	716	741	179	263	
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			1
Permitted Phases				4	4	
Detector Phase	5	2	6	4	4	
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	8.0	8.0	1.0
Minimum Split (s)	9.5	34.1	34.1	38.0	38.0	5.5
Total Split (s)	22.0	75.3	59.0	39.0	39.0	5.7
Total Split (%)	18.3%	62.8%	49.2%	32.5%	32.5%	5%
Yellow Time (s)	3.0	4.3	4.3	3.3	3.3	3.5
All-Red Time (s)	1.5	3.8	3.8	2.7	2.7	1.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	2.5	8.1	8.1	6.0	6.0	
Lead/Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	C-Max	Max	None	None	None
Act Effct Green (s)	17.3	86.3	66.5	19.6	19.6	
Actuated g/C Ratio	0.14	0.72	0.55	0.16	0.16	
v/c Ratio	0.59	0.34	0.54	0.72	0.61	
Control Delay	73.2	1.7	19.9	61.9	10.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	73.2	1.7	19.9	61.9	10.8	
LOS	E	A	B	E	B	
Approach Delay		11.8	19.9	31.4		
Approach LOS		B	B	C		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	126	770	907	192	283
v/c Ratio	0.59	0.34	0.54	0.72	0.61
Control Delay	73.2	1.7	19.9	61.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	1.7	19.9	61.9	10.8
Queue Length 50th (m)	31.4	5.3	66.7	43.4	0.4
Queue Length 95th (m)	m46.7	10.5	108.6	63.2	23.3
Internal Link Dist (m)		395.6	426.6	284.5	
Turn Bay Length (m)	230.0			20.0	
Base Capacity (vph)	253	2292	1693	451	591
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.34	0.54	0.43	0.48

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

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	117	716	0	741	102	179	263
Future Volume (vph)	117	716	0	741	102	179	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.7	3.5	3.2	3.2	3.2
Total Lost time (s)	2.5	8.1		8.1		6.0	6.0
Lane Util. Factor	1.00	0.95		0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.98		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1500	3187		3041		1643	1409
Flt Permitted	0.95	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1500	3187		3041		1643	1409
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	126	770	0	797	110	192	283
RTOR Reduction (vph)	0	0	0	7	0	0	235
Lane Group Flow (vph)	126	770	0	900	0	192	48
Confl. Peds. (#/hr)	3				3		2
Heavy Vehicles (%)	15%	12%	2%	15%	14%	5%	8%
Bus Blockages (#/hr)	0	0	0	0	4	0	0
Turn Type	Prot	NA	Prot	NA		Perm	Perm
Protected Phases	5	2	1	6			
Permitted Phases						4	4
Actuated Green, G (s)	15.3	86.3		66.5		19.6	19.6
Effective Green, g (s)	17.3	86.3		66.5		19.6	19.6
Actuated g/C Ratio	0.14	0.72		0.55		0.16	0.16
Clearance Time (s)	4.5	8.1		8.1		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	216	2291		1685		268	230
v/s Ratio Prot	c0.08	0.24		c0.30			
v/s Ratio Perm						c0.12	0.03
v/c Ratio	0.58	0.34		0.53		0.72	0.21
Uniform Delay, d1	48.0	6.2		16.9		47.6	43.5
Progression Factor	1.36	0.20		1.00		1.00	1.00
Incremental Delay, d2	3.2	0.3		1.2		8.8	0.5
Delay (s)	68.5	1.6		18.2		56.4	43.9
Level of Service	E	A		B		E	D
Approach Delay (s)		11.0		18.2		49.0	
Approach LOS		B		B		D	

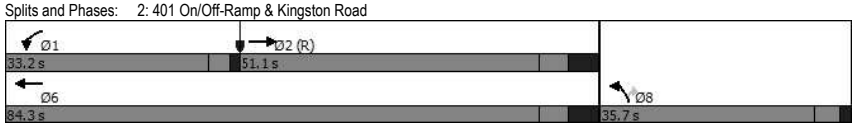
Intersection Summary				
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	765	392	603	675	82
Future Volume (vph)	765	392	603	675	82
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	50.6	9.5	50.6	35.7	35.7
Total Split (s)	51.1	33.2	84.3	35.7	35.7
Total Split (%)	42.6%	27.7%	70.3%	29.8%	29.8%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	4.4	1.5	4.4	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	8.6	2.5	8.6	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	43.5	30.9	76.9	31.1	29.1
Actuated g/C Ratio	0.36	0.26	0.64	0.26	0.24
v/c Ratio	0.69	0.95	0.33	0.86	0.22
Control Delay	36.4	78.3	18.0	54.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	78.3	18.0	54.9	13.1
LOS	D	E	B	D	B
Approach Delay	36.4		41.7	50.1	
Approach LOS	D		D	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 42.6	Intersection LOS: D	
Intersection Capacity Utilization 76.5%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	781	392	603	675	86
v/c Ratio	0.69	0.95	0.33	0.86	0.22
Control Delay	36.4	78.3	18.0	54.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	78.3	18.0	54.9	13.1
Queue Length 50th (m)	82.3	97.5	40.1	77.3	3.1
Queue Length 95th (m)	104.6	#155.1	81.2	#101.0	15.8
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1140	411	1801	811	396
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.95	0.33	0.83	0.22

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	765	16	392	603	675	82
Future Volume (vph)	765	16	392	603	675	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	8.6		2.5	8.6	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3145		1597	2811	3014	1366
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3145		1597	2811	3014	1366
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	0.95
Adj. Flow (vph)	765	16	392	603	675	86
RTOR Reduction (vph)	1	0	0	0	0	52
Lane Group Flow (vph)	780	0	392	603	675	34
Heavy Vehicles (%)	13%	20%	8%	27%	11%	13%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	43.5		28.9	76.9	29.1	29.1
Effective Green, g (s)	43.5		30.9	76.9	31.1	29.1
Actuated g/C Ratio	0.36		0.26	0.64	0.26	0.24
Clearance Time (s)	8.6		4.5	8.6	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1140		411	1801	781	331
v/s Ratio Prot	c0.25		c0.25	0.21	c0.22	
v/s Ratio Perm						0.02
v/c Ratio	0.68		0.95	0.33	0.86	0.10
Uniform Delay, d1	32.4		43.8	9.9	42.4	35.3
Progression Factor	1.00		1.07	1.73	1.00	1.00
Incremental Delay, d2	3.3		29.6	0.4	9.8	0.1
Delay (s)	35.8		76.4	17.4	52.2	35.4
Level of Service	D		E	B	D	D
Approach Delay (s)	35.8			40.7	50.3	
Approach LOS	D			D	D	

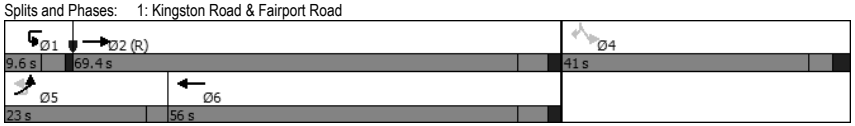
Intersection Summary				
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	76.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø1
Lane Configurations						
Traffic Volume (vph)	202	1489	772	284	152	
Future Volume (vph)	202	1489	772	284	152	
Turn Type	Prot	NA	NA	Perm	Perm	
Protected Phases	5	2	6			1
Permitted Phases				4	4	
Detector Phase	5	2	6	4	4	
Switch Phase						
Minimum Initial (s)	5.0	20.0	20.0	8.0	8.0	5.0
Minimum Split (s)	8.0	32.3	32.3	29.0	29.0	9.5
Total Split (s)	23.0	69.4	56.0	41.0	41.0	9.6
Total Split (%)	19.2%	57.8%	46.7%	34.2%	34.2%	8%
Yellow Time (s)	3.0	4.3	4.3	3.3	3.3	3.5
All-Red Time (s)	0.0	2.0	2.0	2.7	2.7	1.0
Lost Time Adjust (s)	-2.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	1.0	6.3	6.3	6.0	6.0	
Lead/Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Recall Mode	None	C-Max	Max	None	None	None
Act Effct Green (s)	21.4	81.0	58.6	26.7	26.7	
Actuated g/C Ratio	0.18	0.68	0.49	0.22	0.22	
v/c Ratio	0.74	0.66	0.66	0.80	0.37	
Control Delay	58.7	17.8	26.6	60.4	7.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	58.7	17.8	26.6	60.4	7.7	
LOS	E	B	C	E	A	
Approach Delay		22.7	26.6	42.1		
Approach LOS		C	C	D		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Kingston Road & Fairport Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	206	1519	1010	290	155
v/c Ratio	0.74	0.66	0.66	0.80	0.37
Control Delay	58.7	17.8	26.6	60.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	17.8	26.6	60.4	7.7
Queue Length 50th (m)	51.2	97.7	91.6	65.0	0.0
Queue Length 95th (m)	m60.3	122.8	129.0	88.2	15.1
Internal Link Dist (m)		395.6	426.6	284.5	
Turn Bay Length (m)	230.0			20.0	
Base Capacity (vph)	301	2296	1529	474	507
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	0.66	0.66	0.61	0.31

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

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	202	1489	0	772	218	284	152
Future Volume (vph)	202	1489	0	772	218	284	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.7	3.5	3.2	3.2	3.2
Total Lost time (s)	1.0	6.3		6.3		6.0	6.0
Lane Util. Factor	1.00	0.95		0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00		0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00
Frt	1.00	1.00		0.97		1.00	0.85
Flt Protected	0.95	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1568	3400		3095		1627	1365
Flt Permitted	0.95	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1568	3400		3095		1627	1365
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	206	1519	0	788	222	290	155
RTOR Reduction (vph)	0	0	0	19	0	0	121
Lane Group Flow (vph)	206	1519	0	991	0	290	34
Confl. Peds. (#/hr)	3				3		4
Heavy Vehicles (%)	10%	5%	2%	12%	7%	6%	11%
Bus Blockages (#/hr)	0	0	0	0	4	0	0
Turn Type	Prot	NA	Prot	NA		Perm	Perm
Protected Phases	5	2	1	6			
Permitted Phases						4	4
Actuated Green, G (s)	19.4	81.0		58.6		26.7	26.7
Effective Green, g (s)	21.4	81.0		58.6		26.7	26.7
Actuated g/C Ratio	0.18	0.68		0.49		0.22	0.22
Clearance Time (s)	3.0	6.3		6.3		6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	279	2295		1511		362	303
v/s Ratio Prot	c0.13	c0.45		0.32			
v/s Ratio Perm						c0.18	0.03
v/c Ratio	0.74	0.66		0.66		0.80	0.11
Uniform Delay, d1	46.7	11.5		23.1		44.1	37.2
Progression Factor	1.06	1.33		1.00		1.00	1.00
Incremental Delay, d2	5.6	0.9		2.2		12.0	0.2
Delay (s)	55.2	16.1		25.3		56.1	37.4
Level of Service	E	B		C		E	D
Approach Delay (s)		20.8		25.3		49.6	
Approach LOS		C		C		D	

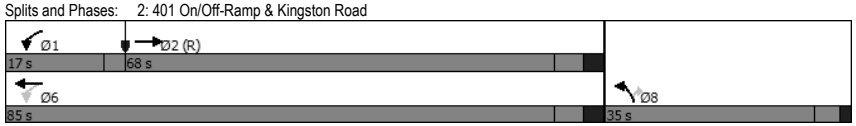
Intersection Summary				
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1500	214	854	745	156
Future Volume (vph)	1500	214	854	745	156
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	68.0	17.0	85.0	35.0	35.0
Total Split (%)	56.7%	14.2%	70.8%	29.2%	29.2%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	62.1	84.2	78.0	31.4	29.4
Actuated g/C Ratio	0.52	0.70	0.65	0.26	0.24
v/c Ratio	0.89	0.84	0.40	0.93	0.37
Control Delay	34.5	65.5	9.6	62.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	65.5	9.6	62.1	15.1
LOS	C	E	A	E	B
Approach Delay	34.5		20.8	53.9	
Approach LOS	C		C	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 8.4 (7%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 35.3	Intersection LOS: D	
Intersection Capacity Utilization 88.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1526	214	854	745	156
v/c Ratio	0.89	0.84	0.40	0.93	0.37
Control Delay	34.5	65.5	9.6	62.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	65.5	9.6	62.1	15.1
Queue Length 50th (m)	167.6	39.9	24.7	88.2	8.1
Queue Length 95th (m)	#209.8	#73.0	53.0	#123.1	26.5
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1708	269	2109	808	419
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.80	0.40	0.92	0.37

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1500	26	214	854	745	156
Future Volume (vph)	1500	26	214	854	745	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3300		1568	3245	3070	1359
Flt Permitted	1.00		0.06	1.00	0.95	1.00
Satd. Flow (perm)	3300		106	3245	3070	1359
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1500	26	214	854	745	156
RTOR Reduction (vph)	1	0	0	0	0	85
Lane Group Flow (vph)	1525	0	214	854	745	71
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	8%	0%	10%	10%	9%	12%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	62.1		78.0	78.0	29.4	29.4
Effective Green, g (s)	62.1		80.0	78.0	31.4	29.4
Actuated g/C Ratio	0.52		0.67	0.65	0.26	0.24
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1707		252	2109	803	332
v/s Ratio Prot	c0.46		c0.11	0.26	c0.24	
v/s Ratio Perm			0.46			0.05
v/c Ratio	0.89		0.85	0.40	0.93	0.22
Uniform Delay, d1	26.0		35.5	10.0	43.2	36.1
Progression Factor	1.00		1.46	0.90	1.00	1.00
Incremental Delay, d2	7.6		19.9	0.5	16.6	0.3
Delay (s)	33.6		71.8	9.5	59.8	36.4
Level of Service	C		E	A	E	D
Approach Delay (s)	33.6			22.0	55.8	
Approach LOS	C			C	E	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix J4:
Future Total 2027 Capacity Analysis

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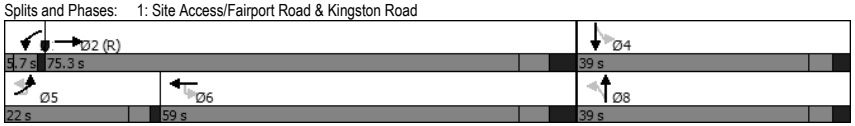
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	117	684	5	707	38	6	179	4
Future Volume (vph)	117	684	5	707	38	6	179	4
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	1.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.5	34.1	5.5	34.1	38.0	38.0	38.0	38.0
Total Split (s)	22.0	75.3	5.7	59.0	39.0	39.0	39.0	39.0
Total Split (%)	18.3%	62.8%	4.8%	49.2%	32.5%	32.5%	32.5%	32.5%
Yellow Time (s)	3.0	4.3	3.5	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.5	3.8	1.0	3.8	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	-2.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.5	8.1	2.5	8.1		6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	Max	None	None	None	None
Act Effct Green (s)	16.5	80.6	6.8	62.7		24.2	24.2	24.2
Actuated g/C Ratio	0.14	0.67	0.06	0.52		0.20	0.20	0.20
v/c Ratio	0.61	0.36	0.05	0.55		0.36	0.72	0.55
Control Delay	78.9	1.9	56.6	22.2		40.8	59.4	8.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	78.9	1.9	56.6	22.2		40.8	59.4	8.7
LOS	E	A	E	C		D	E	A
Approach Delay		12.9		22.4		40.8		29.0
Approach LOS		B		C		D		C

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 73.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Site Access/Fairport Road & Kingston Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	126	759	5	870	55	192	287
v/c Ratio	0.61	0.36	0.05	0.55	0.36	0.72	0.55
Control Delay	78.9	1.9	56.6	22.2	40.8	59.4	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	1.9	56.6	22.2	40.8	59.4	8.7
Queue Length 50th (m)	31.6	4.8	1.1	69.7	9.7	42.4	0.8
Queue Length 95th (m)	m45.0	9.6	5.5	106.1	20.6	62.2	21.6
Internal Link Dist (m)		395.6		426.6	47.2		284.5
Turn Bay Length (m)	230.0		100.0			20.0	
Base Capacity (vph)	244	2137	95	1596	206	363	607
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.36	0.05	0.55	0.27	0.53	0.47

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	684	22	5	707	102	38	6	7	179	4	263
Future Volume (vph)	117	684	22	5	707	102	38	6	7	179	4	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.5	3.2	3.7	3.5	3.7	3.2	3.5	3.2
Total Lost time (s)	2.5	8.1		2.5	8.1			6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1500	3181		1691	3038			1739		1643	1463	
Flt Permitted	0.95	1.00		0.95	1.00			0.41		0.76	1.00	
Satd. Flow (perm)	1500	3181		1691	3038			733		1320	1463	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	126	735	24	5	760	110	41	6	8	192	4	283
RTOR Reduction (vph)	0	1	0	0	8	0	0	6	0	0	226	0
Lane Group Flow (vph)	126	758	0	5	862	0	0	49	0	192	61	0
Confl. Peds. (#/hr)	3					3	2					2
Heavy Vehicles (%)	15%	12%	2%	2%	15%	14%	2%	2%	2%	5%	2%	8%
Bus Blockages (#/hr)	0	0	4	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	14.5	77.0		0.2	62.7			24.2		24.2	24.2	
Effective Green, g (s)	16.5	77.0		2.2	62.7			24.2		24.2	24.2	
Actuated g/C Ratio	0.14	0.64		0.02	0.52			0.20		0.20	0.20	
Clearance Time (s)	4.5	8.1		4.5	8.1			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	206	2041		31	1587			147		266	295	
v/s Ratio Prot	c0.08	0.24		0.00	c0.28						0.04	
v/s Ratio Perm								0.07		c0.15		
v/c Ratio	0.61	0.37		0.16	0.54			0.34		0.72	0.21	
Uniform Delay, d1	48.7	10.1		58.0	19.1			41.0		44.8	39.9	
Progression Factor	1.43	0.16		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.4		2.4	1.3			1.4		9.3	0.4	
Delay (s)	73.7	2.0		60.4	20.4			42.4		54.0	40.3	
Level of Service	E	A		E	C			D		D	D	
Approach Delay (s)		12.3			20.7			42.4			45.8	
Approach LOS		B			C			D			D	

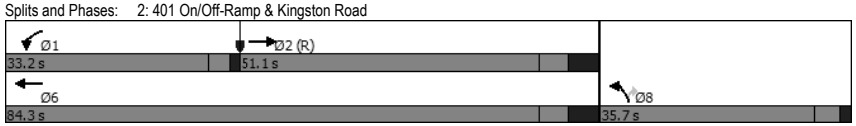
Intersection Summary				
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.6	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	748	397	589	644	82
Future Volume (vph)	748	397	589	644	82
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	50.6	9.5	50.6	35.7	35.7
Total Split (s)	51.1	33.2	84.3	35.7	35.7
Total Split (%)	42.6%	27.7%	70.3%	29.8%	29.8%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	4.4	1.5	4.4	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	8.6	2.5	8.6	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	42.5	31.9	76.9	31.1	29.1
Actuated g/C Ratio	0.35	0.27	0.64	0.26	0.24
v/c Ratio	0.72	0.99	0.34	0.87	0.22
Control Delay	38.0	83.0	19.7	55.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	83.0	19.7	55.1	13.3
LOS	D	F	B	E	B
Approach Delay	38.0		45.2	50.4	
Approach LOS	D		D	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 44.5	Intersection LOS: D	
Intersection Capacity Utilization 75.4%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	803	418	620	678	86
v/c Ratio	0.72	0.99	0.34	0.87	0.22
Control Delay	38.0	83.0	19.7	55.1	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	83.0	19.7	55.1	13.3
Queue Length 50th (m)	85.4	~107.5	47.7	77.7	3.2
Queue Length 95th (m)	108.2	#169.9	86.0	#102.3	16.0
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1115	423	1800	811	395
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.99	0.34	0.84	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	748	15	397	589	644	82
Future Volume (vph)	748	15	397	589	644	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	8.6		2.5	8.6	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3146		1597	2811	3014	1366
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3146		1597	2811	3014	1366
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	787	16	418	620	678	86
RTOR Reduction (vph)	1	0	0	0	0	52
Lane Group Flow (vph)	802	0	418	620	678	34
Heavy Vehicles (%)	13%	20%	8%	27%	11%	13%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	42.5		29.9	76.9	29.1	29.1
Effective Green, g (s)	42.5		31.9	76.9	31.1	29.1
Actuated g/C Ratio	0.35		0.27	0.64	0.26	0.24
Clearance Time (s)	8.6		4.5	8.6	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1114		424	1801	781	331
v/s Ratio Prot	c0.25		c0.26	0.22	c0.22	
v/s Ratio Perm						0.03
v/c Ratio	0.72		0.99	0.34	0.87	0.10
Uniform Delay, d1	33.6		43.8	9.9	42.5	35.3
Progression Factor	1.00		1.02	1.88	1.00	1.00
Incremental Delay, d2	4.0		36.7	0.5	10.1	0.1
Delay (s)	37.6		81.2	19.1	52.6	35.5
Level of Service	D		F	B	D	D
Approach Delay (s)	37.6			44.1	50.6	
Approach LOS	D			D	D	

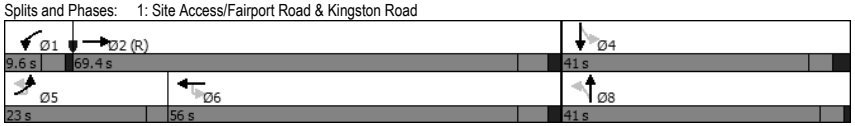
Intersection Summary				
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	202	1415	11	739	34	8	284	10
Future Volume (vph)	202	1415	11	739	34	8	284	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	5.0	5.0	8.0	8.0
Minimum Split (s)	8.0	32.3	9.5	32.3	22.5	22.5	29.0	29.0
Total Split (s)	23.0	69.4	9.6	56.0	41.0	41.0	41.0	41.0
Total Split (%)	19.2%	57.8%	8.0%	46.7%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	4.3	3.5	4.3	3.5	3.5	3.3	3.3
All-Red Time (s)	0.0	2.0	1.0	2.0	1.0	1.0	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	-2.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	1.0	6.3	2.5	6.3		4.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	Max	None	None	None	None
Act Effct Green (s)	20.6	74.9	7.5	55.2		32.4	30.9	30.9
Actuated g/C Ratio	0.17	0.62	0.06	0.46		0.27	0.26	0.26
v/c Ratio	0.77	0.70	0.10	0.68		0.14	0.88	0.34
Control Delay	65.2	20.8	55.7	28.6		27.5	68.8	8.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	65.2	20.8	55.7	28.6		27.5	68.8	8.0
LOS	E	C	E	C		C	E	A
Approach Delay		26.2		28.9		27.5		46.8
Approach LOS		C		C		C		D

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 30.0		Intersection LOS: C	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Site Access/Fairport Road & Kingston Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	206	1486	11	976	52	290	165
v/c Ratio	0.77	0.70	0.10	0.68	0.14	0.88	0.34
Control Delay	65.2	20.8	55.7	28.6	27.5	68.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	20.8	55.7	28.6	27.5	68.8	8.0
Queue Length 50th (m)	51.2	94.0	2.5	97.2	7.4	63.6	1.7
Queue Length 95th (m)	m61.9	121.8	8.5	122.6	16.9	#103.5	17.6
Internal Link Dist (m)		395.6		426.6	47.2		284.5
Turn Bay Length (m)	230.0		100.0			20.0	
Base Capacity (vph)	290	2116	105	1443	428	375	528
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.70	0.10	0.68	0.12	0.77	0.31

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	202	1415	41	11	739	218	34	8	9	284	10	152
Future Volume (vph)	202	1415	41	11	739	218	34	8	9	284	10	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.5	3.2	3.7	3.5	3.7	3.2	3.5	3.2
Total Lost time (s)	1.0	6.3		2.5	6.3			4.5		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.98		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1568	3386		1691	3091			1735		1627	1436	
Flt Permitted	0.95	1.00		0.95	1.00			0.77		0.75	1.00	
Satd. Flow (perm)	1568	3386		1691	3091			1389		1288	1436	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	206	1444	42	11	754	222	35	8	9	290	10	155
RTOR Reduction (vph)	0	2	0	0	21	0	0	7	0	0	115	0
Lane Group Flow (vph)	206	1484	0	11	955	0	0	45	0	290	50	0
Confl. Peds. (#/hr)	3		1	1		3	4					4
Heavy Vehicles (%)	10%	5%	2%	2%	12%	7%	2%	2%	2%	6%	2%	11%
Bus Blockages (#/hr)	0	0	4	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	18.6	71.3		1.0	55.2			32.4		30.9	30.9	
Effective Green, g (s)	20.6	71.3		3.0	55.2			32.4		30.9	30.9	
Actuated g/C Ratio	0.17	0.59		0.02	0.46			0.27		0.26	0.26	
Clearance Time (s)	3.0	6.3		4.5	6.3			4.5		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	269	2011		42	1421			375		331	369	
v/s Ratio Prot	c0.13	c0.44		0.01	0.31						0.03	
v/s Ratio Perm								0.03		c0.23		
v/c Ratio	0.77	0.74		0.26	0.67			0.12		0.88	0.14	
Uniform Delay, d1	47.4	17.6		57.4	25.3			33.1		42.7	34.3	
Progression Factor	1.13	1.16		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	7.7	1.5		3.3	2.6			0.1		21.9	0.2	
Delay (s)	61.0	21.9		60.7	27.9			33.2		64.6	34.4	
Level of Service	E	C		E	C			C		E	C	
Approach Delay (s)		26.6			28.2			33.2			53.7	
Approach LOS		C			C			C			D	

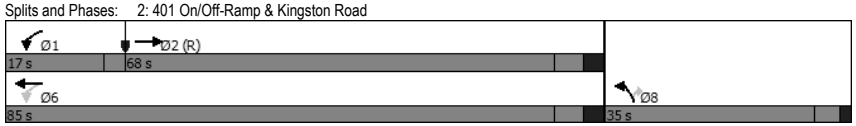
Intersection Summary				
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	82.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1459	223	830	710	157
Future Volume (vph)	1459	223	830	710	157
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	68.0	17.0	85.0	35.0	35.0
Total Split (%)	56.7%	14.2%	70.8%	29.2%	29.2%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	62.4	84.6	78.4	31.0	29.0
Actuated g/C Ratio	0.52	0.70	0.65	0.26	0.24
v/c Ratio	0.86	0.84	0.39	0.90	0.38
Control Delay	32.2	61.9	9.6	58.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	61.9	9.6	58.2	14.1
LOS	C	E	A	E	B
Approach Delay	32.2		20.6	50.2	
Approach LOS	C		C	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 8.4 (7%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 33.2	Intersection LOS: C	
Intersection Capacity Utilization 86.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1484	223	830	710	157
v/c Ratio	0.86	0.84	0.39	0.90	0.38
Control Delay	32.2	61.9	9.6	58.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	61.9	9.6	58.2	14.1
Queue Length 50th (m)	159.4	41.5	27.0	82.7	7.2
Queue Length 95th (m)	194.6	#74.5	52.2	#113.8	25.3
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1716	279	2120	808	424
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.80	0.39	0.88	0.37

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1459	25	223	830	710	157
Future Volume (vph)	1459	25	223	830	710	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3300		1568	3245	3070	1359
Flt Permitted	1.00		0.07	1.00	0.95	1.00
Satd. Flow (perm)	3300		122	3245	3070	1359
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1459	25	223	830	710	157
RTOR Reduction (vph)	1	0	0	0	0	89
Lane Group Flow (vph)	1483	0	223	830	710	68
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	8%	0%	10%	10%	9%	12%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	62.4		78.4	78.4	29.0	29.0
Effective Green, g (s)	62.4		80.4	78.4	31.0	29.0
Actuated g/C Ratio	0.52		0.67	0.65	0.26	0.24
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1716		262	2120	793	328
v/s Ratio Prot	c0.45		c0.11	0.26	c0.23	
v/s Ratio Perm			0.46			0.05
v/c Ratio	0.86		0.85	0.39	0.90	0.21
Uniform Delay, d1	25.1		33.3	9.7	42.9	36.3
Progression Factor	1.00		1.49	0.92	1.00	1.00
Incremental Delay, d2	6.1		19.7	0.5	12.6	0.3
Delay (s)	31.2		69.3	9.4	55.6	36.6
Level of Service	C		E	A	E	D
Approach Delay (s)	31.2			22.1	52.1	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix K5:
Future Total 2032 Capacity Analysis

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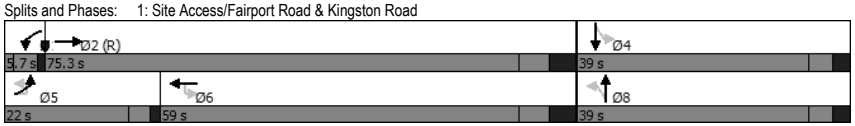
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	117	716	5	741	38	6	179	4
Future Volume (vph)	117	716	5	741	38	6	179	4
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	1.0	20.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.5	34.1	5.5	34.1	38.0	38.0	38.0	38.0
Total Split (s)	22.0	75.3	5.7	59.0	39.0	39.0	39.0	39.0
Total Split (%)	18.3%	62.8%	4.8%	49.2%	32.5%	32.5%	32.5%	32.5%
Yellow Time (s)	3.0	4.3	3.5	4.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.5	3.8	1.0	3.8	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	-2.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.5	8.1	2.5	8.1		6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	Max	None	None	None	None
Act Effct Green (s)	16.5	80.6	6.8	62.7		24.2	24.2	24.2
Actuated g/C Ratio	0.14	0.67	0.06	0.52		0.20	0.20	0.20
v/c Ratio	0.61	0.37	0.05	0.57		0.36	0.72	0.55
Control Delay	78.5	2.2	56.6	22.7		40.8	59.4	8.9
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	78.5	2.2	56.6	22.7		40.8	59.4	8.9
LOS	E	A	E	C		D	E	A
Approach Delay		12.7		22.9		40.8		29.1
Approach LOS		B		C		D		C

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Site Access/Fairport Road & Kingston Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	126	794	5	907	55	192	287
v/c Ratio	0.61	0.37	0.05	0.57	0.36	0.72	0.55
Control Delay	78.5	2.2	56.6	22.7	40.8	59.4	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.5	2.2	56.6	22.7	40.8	59.4	8.9
Queue Length 50th (m)	31.5	6.1	1.1	74.1	9.7	42.4	1.2
Queue Length 95th (m)	m45.2	11.8	5.5	112.1	20.6	62.2	22.1
Internal Link Dist (m)		395.6		426.6	47.2		284.5
Turn Bay Length (m)	230.0		100.0			20.0	
Base Capacity (vph)	244	2137	95	1598	206	363	606
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.37	0.05	0.57	0.27	0.53	0.47

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	716	22	5	741	102	38	6	7	179	4	263
Future Volume (vph)	117	716	22	5	741	102	38	6	7	179	4	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.5	3.2	3.7	3.5	3.7	3.2	3.5	3.2
Total Lost time (s)	2.5	8.1		2.5	8.1			6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98			0.98		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95	1.00	
Satd. Flow (prot)	1500	3182		1691	3041			1739		1643	1463	
Flt Permitted	0.95	1.00		0.95	1.00			0.41		0.76	1.00	
Satd. Flow (perm)	1500	3182		1691	3041			733		1320	1463	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	126	770	24	5	797	110	41	6	8	192	4	283
RTOR Reduction (vph)	0	1	0	0	8	0	0	6	0	0	224	0
Lane Group Flow (vph)	126	793	0	5	899	0	0	49	0	192	63	0
Confl. Peds. (#/hr)	3					3	2					2
Heavy Vehicles (%)	15%	12%	2%	2%	15%	14%	2%	2%	2%	5%	2%	8%
Bus Blockages (#/hr)	0	0	4	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	14.5	77.0		0.2	62.7			24.2		24.2	24.2	
Effective Green, g (s)	16.5	77.0		2.2	62.7			24.2		24.2	24.2	
Actuated g/C Ratio	0.14	0.64		0.02	0.52			0.20		0.20	0.20	
Clearance Time (s)	4.5	8.1		4.5	8.1			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	206	2041		31	1588			147		266	295	
v/s Ratio Prot	c0.08	0.25		0.00	c0.30						0.04	
v/s Ratio Perm								0.07		c0.15		
v/c Ratio	0.61	0.39		0.16	0.57			0.34		0.72	0.21	
Uniform Delay, d1	48.7	10.3		58.0	19.4			41.0		44.8	40.0	
Progression Factor	1.41	0.19		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.1	0.4		2.4	1.5			1.4		9.3	0.4	
Delay (s)	73.1	2.4		60.4	20.9			42.4		54.0	40.3	
Level of Service	E	A		E	C			D		D	D	
Approach Delay (s)		12.0			21.1			42.4			45.8	
Approach LOS		B			C			D			D	

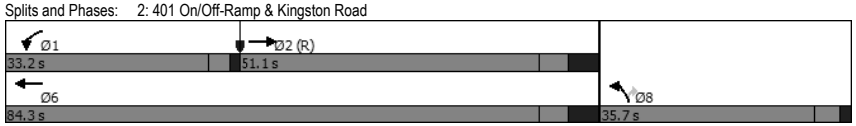
Intersection Summary				
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.6	
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	783	416	617	675	86
Future Volume (vph)	783	416	617	675	86
Turn Type	NA	Prot	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases					8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	50.6	9.5	50.6	35.7	35.7
Total Split (s)	51.1	33.2	84.3	35.7	35.7
Total Split (%)	42.6%	27.7%	70.3%	29.8%	29.8%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	4.4	1.5	4.4	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	8.6	2.5	8.6	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	42.5	31.9	76.9	31.1	29.1
Actuated g/C Ratio	0.35	0.27	0.64	0.26	0.24
v/c Ratio	0.72	0.98	0.34	0.86	0.22
Control Delay	37.8	81.1	19.8	54.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	81.1	19.8	54.9	13.1
LOS	D	F	B	D	B
Approach Delay	37.8		44.5	50.1	
Approach LOS	D		D	D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 44.1		Intersection LOS: D	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	799	416	617	675	86
v/c Ratio	0.72	0.98	0.34	0.86	0.22
Control Delay	37.8	81.1	19.8	54.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	81.1	19.8	54.9	13.1
Queue Length 50th (m)	84.9	~106.2	48.5	77.3	3.1
Queue Length 95th (m)	107.7	#169.1	86.1	#101.0	15.8
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1115	424	1801	811	396
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.98	0.34	0.83	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	783	16	416	617	675	86
Future Volume (vph)	783	16	416	617	675	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	8.6		2.5	8.6	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3146		1597	2811	3014	1366
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3146		1597	2811	3014	1366
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	783	16	416	617	675	86
RTOR Reduction (vph)	1	0	0	0	0	52
Lane Group Flow (vph)	798	0	416	617	675	34
Heavy Vehicles (%)	13%	20%	8%	27%	11%	13%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	42.5		29.9	76.9	29.1	29.1
Effective Green, g (s)	42.5		31.9	76.9	31.1	29.1
Actuated g/C Ratio	0.35		0.27	0.64	0.26	0.24
Clearance Time (s)	8.6		4.5	8.6	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1114		424	1801	781	331
v/s Ratio Prot	c0.25		c0.26	0.22	c0.22	
v/s Ratio Perm						0.02
v/c Ratio	0.72		0.98	0.34	0.86	0.10
Uniform Delay, d1	33.5		43.8	9.9	42.4	35.3
Progression Factor	1.00		1.01	1.89	1.00	1.00
Incremental Delay, d2	4.0		35.4	0.4	9.8	0.1
Delay (s)	37.5		79.7	19.2	52.2	35.4
Level of Service	D		E	B	D	D
Approach Delay (s)	37.5			43.6	50.3	
Approach LOS	D			D	D	

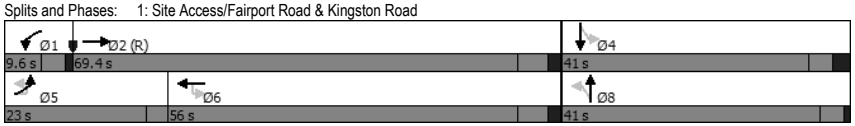
Intersection Summary				
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	202	1489	11	772	34	8	284	10
Future Volume (vph)	202	1489	11	772	34	8	284	10
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	20.0	5.0	20.0	5.0	5.0	8.0	8.0
Minimum Split (s)	8.0	32.3	9.5	32.3	22.5	22.5	29.0	29.0
Total Split (s)	23.0	69.4	9.6	56.0	41.0	41.0	41.0	41.0
Total Split (%)	19.2%	57.8%	8.0%	46.7%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	4.3	3.5	4.3	3.5	3.5	3.3	3.3
All-Red Time (s)	0.0	2.0	1.0	2.0	1.0	1.0	2.7	2.7
Lost Time Adjust (s)	-2.0	0.0	-2.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	1.0	6.3	2.5	6.3		4.5	6.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	Max	None	None	None	None
Act Effct Green (s)	20.6	74.9	7.5	55.2		32.4	30.9	30.9
Actuated g/C Ratio	0.17	0.62	0.06	0.46		0.27	0.26	0.26
v/c Ratio	0.77	0.74	0.10	0.70		0.14	0.88	0.34
Control Delay	62.8	22.1	55.7	29.4		27.5	68.8	8.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	62.8	22.1	55.7	29.4		27.5	68.8	8.0
LOS	E	C	E	C		C	E	A
Approach Delay		26.8		29.7		27.5		46.8
Approach LOS		C		C		C		D

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 30.5		Intersection LOS: C	
Intersection Capacity Utilization 84.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Site Access/Fairport Road & Kingston Road



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	206	1561	11	1010	52	290	165
v/c Ratio	0.77	0.74	0.10	0.70	0.14	0.88	0.34
Control Delay	62.8	22.1	55.7	29.4	27.5	68.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	22.1	55.7	29.4	27.5	68.8	8.0
Queue Length 50th (m)	51.4	104.4	2.5	102.5	7.4	63.6	1.7
Queue Length 95th (m)	m58.6	m125.5	8.5	129.0	16.9	#103.5	17.6
Internal Link Dist (m)		395.6		426.6	47.2		284.5
Turn Bay Length (m)	230.0		100.0			20.0	
Base Capacity (vph)	290	2115	105	1444	428	375	528
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.74	0.10	0.70	0.12	0.77	0.31

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	202	1489	41	11	772	218	34	8	9	284	10	152
Future Volume (vph)	202	1489	41	11	772	218	34	8	9	284	10	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.2	3.5	3.5	3.2	3.5	3.2	3.7	3.5	3.7	3.2	3.5	3.2
Total Lost time (s)	1.0	6.3		2.5	6.3			4.5		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.97			0.98		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95	1.00	
Satd. Flow (prot)	1568	3387		1691	3095			1735		1627	1436	
Flt Permitted	0.95	1.00		0.95	1.00			0.77		0.75	1.00	
Satd. Flow (perm)	1568	3387		1691	3095			1389		1288	1436	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	206	1519	42	11	788	222	35	8	9	290	10	155
RTOR Reduction (vph)	0	1	0	0	20	0	0	7	0	0	115	0
Lane Group Flow (vph)	206	1560	0	11	990	0	0	45	0	290	50	0
Confl. Peds. (#/hr)	3		1	1		3	4					4
Heavy Vehicles (%)	10%	5%	2%	2%	12%	7%	2%	2%	2%	6%	2%	11%
Bus Blockages (#/hr)	0	0	4	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	18.6	71.3		1.0	55.2			32.4		30.9	30.9	
Effective Green, g (s)	20.6	71.3		3.0	55.2			32.4		30.9	30.9	
Actuated g/C Ratio	0.17	0.59		0.02	0.46			0.27		0.26	0.26	
Clearance Time (s)	3.0	6.3		4.5	6.3			4.5		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	269	2012		42	1423			375		331	369	
v/s Ratio Prot	c0.13	c0.46		0.01	0.32						0.03	
v/s Ratio Perm								0.03		c0.23		
v/c Ratio	0.77	0.78		0.26	0.70			0.12		0.88	0.14	
Uniform Delay, d1	47.4	18.3		57.4	25.7			33.1		42.7	34.3	
Progression Factor	1.10	1.18		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	6.7	1.6		3.3	2.8			0.1		21.9	0.2	
Delay (s)	59.1	23.3		60.7	28.6			33.2		64.6	34.4	
Level of Service	E	C		E	C			C		E	C	
Approach Delay (s)		27.4			28.9			33.2			53.7	
Approach LOS		C			C			C			D	

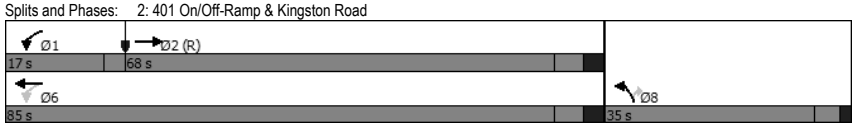
Intersection Summary				
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	84.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations					
Traffic Volume (vph)	1533	234	868	745	164
Future Volume (vph)	1533	234	868	745	164
Turn Type	NA	pm+pt	NA	Prot	Perm
Protected Phases	2	1	6	8	
Permitted Phases		6			8
Detector Phase	2	1	6	8	8
Switch Phase					
Minimum Initial (s)	20.0	5.0	20.0	8.0	8.0
Minimum Split (s)	49.2	8.0	49.2	31.4	31.4
Total Split (s)	68.0	17.0	85.0	35.0	35.0
Total Split (%)	56.7%	14.2%	70.8%	29.2%	29.2%
Yellow Time (s)	4.2	3.0	4.2	3.7	3.7
All-Red Time (s)	3.0	0.0	3.0	1.7	1.7
Lost Time Adjust (s)	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	7.2	1.0	7.2	3.4	5.4
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	Max	None	None
Act Effct Green (s)	61.6	84.2	78.0	31.4	29.4
Actuated g/C Ratio	0.51	0.70	0.65	0.26	0.24
v/c Ratio	0.92	0.90	0.41	0.93	0.39
Control Delay	37.4	73.8	10.3	62.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	73.8	10.3	62.1	15.1
LOS	D	E	B	E	B
Approach Delay	37.4		23.7	53.6	
Approach LOS	D		C	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 8.4 (7%), Referenced to phase 2:EBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 37.3	Intersection LOS: D	
Intersection Capacity Utilization 90.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: 401 On/Off-Ramp & Kingston Road



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1559	234	868	745	164
v/c Ratio	0.92	0.90	0.41	0.93	0.39
Control Delay	37.4	73.8	10.3	62.1	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	73.8	10.3	62.1	15.1
Queue Length 50th (m)	174.7	45.7	30.8	88.2	8.5
Queue Length 95th (m)	#229.1	m#86.9	56.5	#123.1	27.3
Internal Link Dist (m)	485.9		395.6	175.8	
Turn Bay Length (m)		245.0			45.0
Base Capacity (vph)	1693	266	2109	808	424
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.92	0.88	0.41	0.92	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1533	26	234	868	745	164
Future Volume (vph)	1533	26	234	868	745	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.2	3.5	3.2	3.2
Total Lost time (s)	7.2		1.0	7.2	3.4	5.4
Lane Util. Factor	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3300		1568	3245	3070	1359
Flt Permitted	1.00		0.06	1.00	0.95	1.00
Satd. Flow (perm)	3300		102	3245	3070	1359
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1533	26	234	868	745	164
RTOR Reduction (vph)	1	0	0	0	0	89
Lane Group Flow (vph)	1558	0	234	868	745	75
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	8%	0%	10%	10%	9%	12%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases			6			8
Actuated Green, G (s)	61.6		78.0	78.0	29.4	29.4
Effective Green, g (s)	61.6		80.0	78.0	31.4	29.4
Actuated g/C Ratio	0.51		0.67	0.65	0.26	0.24
Clearance Time (s)	7.2		3.0	7.2	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1694		256	2109	803	332
v/s Ratio Prot	c0.47		c0.12	0.27	c0.24	
v/s Ratio Perm			0.49			0.06
v/c Ratio	0.92		0.91	0.41	0.93	0.23
Uniform Delay, d1	26.9		37.9	10.0	43.2	36.2
Progression Factor	1.00		1.35	0.96	1.00	1.00
Incremental Delay, d2	9.6		30.3	0.5	16.6	0.3
Delay (s)	36.5		81.3	10.1	59.8	36.5
Level of Service	D		F	B	E	D
Approach Delay (s)	36.5			25.2	55.6	
Approach LOS	D			C	E	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix L:
1899 Brock Road TIS Excerpts

TYLin

March 22, 2022

Kamyar Rahimi
Development Manager
SmartCentres
3200 Highway 7
Vaughan ON L4K 5Z5

Subject: **1899 Brock Road, City of Pickering – Response to Comments Letter Associated with Parking**

Dear Mr. Rahimi,

WSP Canada Inc. (WSP) previously prepared the following submission materials for the proposed mixed-use redevelopment that is planned to be built in two phases, located at 1899 Brock Road in the City of Pickering, which received parking-related comments from the City's peer reviewer, Paradigm Transportation Solutions Ltd. (Paradigm):

- A Transportation Impact Study (TIS), dated March 2021; and
- A TIS Addendum, dated May 2021.

Paradigm conducted a technical review and provided comments on the parking component of the above-listed documents, which were included in a letter addressed to the City, dated September 27, 2021.

This Response to Comments Letter has been prepared to justify the currently proposed Phase 1 parking supply rates and to address Paradigm's comments on the previous submissions in support of the development application process. It is noted that Phase 2 parking rates are recommended to be established based on future parking surveys and sales data for Phase 1. The original comments received from Paradigm are provided in **Attachment A**.

SITE STATISTICS AND PARKING SUPPLY

Previously, the following parking supply rates were proposed for Phase 1 of the development:

- For residents: 0.73 spaces per unit;
- For residential visitors: 0.15 spaces per unit;
- For retail / commercial: 1.00 space per 100 m^2 GFA; and
- Shared parking reduction of 4 spaces out of 157 non-resident parking spaces.

Paradigms' comments were taken into advisement and as a result, in consultation with WSP, the applicant has revised the site plan with increased parking supply rates relative to the previous submissions. **Table 1** summarizes the updated Phase 1 site statistics, proposed parking rates and parking supply based on site plan provided to WSP on March 21, 2022.

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wsp.com

Table 1: Updated Site Statistics and Parking Supply

Phase	Land Use	Statistics (units or GFA m^2)	Proposed Parking Rate	Proposed Parking	In Phase 1 Parking Structure	On Phase 2 Ground Level
Phase 1	Residential	922 units	0.85 spaces per unit for residents	787	787	
			0.15 spaces per unit for visitors	138	127	11
	Retail / Commercial	1,920 m^2	3.50 spaces per 100 m^2 GFA	67		67
	Non-Resident Shared Parking Reduction [1]			-33		-33
Total				**959**	**914**	**45**

1 Shared parking among non-resident uses was calculated per City Centre zoning by-law formulas, assuming a 50-50 split between retail and medical or dental office.

As compared to the proposed parking supply previous submission, the proposed residential parking rate increased from 0.73 to 0.85 spaces per unit and the retail parking rate increased from 1.0 to 3.5 spaces per 100 m^2 of GFA, while the residential visitor parking rate remained the same. A shared parking reduction among non-resident uses of 33 spaces is also proposed, which was calculated using City Centre Zoning By-law 7553/17 Shared Parking Formulas, assuming half of the commercial component being retail and half being medical or dental office. As a comparison. Urban Land Institute (ULI) Parking Time-of-Day Factors were used to calculate a shared-parking reduction, which yielded a reduction of 30 spaces, similar to the by-law methodology. The details of calculations are provided in **Attachment B**.

As indicated in **Table 1**, a total of 959 parking spaces are proposed, of which 914 spaces will be provided in Phase 1 parking areas and 45 spaces will be provided off-site on Phase 2 ground level.

Justifications for the updated Phase 1 parking supply rates and responses to Paradigm's comments are provided in the following sections. It is recommended that Phase 2 parking supply rates be determined based on future parking surveys and sales data for Phase 1.

PARADIGM'S COMMENTS AND WSP'S RESPONSES

Paradigm's parking comments have been categorized into four categories, which are resident parking, residential visitor parking, retail parking and off-site parking.

Resident Parking Comments

Summary

- ***The rationale used to recommend residential parking rates per unit for this site that are either the same (i.e. visitors) or lower (i.e. residents) than both proposed residential developments in the City Centre or existing residential developments that are virtually adjacent to the Pickering GO Station is not sufficient. This is primarily due to the subject site not having the same locational advantages as the City Centre area or sites next to the Pickering GO Station that reduce the reliance on a private automobile. It is our opinion that the City-recommended residential parking rates are reasonable for the subject site given its location and in consideration of City-wide vehicle ownership statistics for apartments. In subsequent reporting, the consultant should identify specific transportation-related measures that would make the subject site equal to or better than the areas that they have used for comparison;***

8.4.2 REVIEW OF TTS VEHICLE OWNERSHIP DATA

A TTS analysis was performed for the GTA zones studied near the subject site. In particular, the vehicle ownership for apartments were observed within the same zones that were used to calculate existing mode split characteristics (see **Figure 3-5**). The summary of the results can be found in **Table 8-5** below. The TTS data extractions are provided in **Appendix I**.

Table 8-5: Vehicle Ownership in Apartments

Year	0 Vehicles	1 Vehicle	2 Vehicles	3 Vehicles	Total Vehicles	Total Number of Apartments	No. of Veh per Unit
2001	172	163	41	23	314	398	**0.79**
2006	92	172	0	0	172	264	**0.65**
2011	90	151	0	0	151	241	**0.63**
2016	330	238	0	0	238	569	**0.42**
Total	**684**	**724**	**41**	**23**	**875**		
	46%	**49%**	**3%**	**2%**	**100%**		

Filtering for the zones of interest near the study area, it is shown that 46% of individuals do not own a vehicle and 49% own a single vehicle. The nearly 40% of residents that do not own a vehicle are assumed to use other modes of transportation as a means to travel and therefore will not occupy or require a parking space. Furthermore, as discussed in **Section 4.2** and **Section 4.3**, there are large transportation improvements that are planned near the site which will only serve to further incentivize commuters to utilize other non-auto means of travelling to and from the site.

The number of apartments in the zones of interest were also determined and a vehicle ownership rate was calculated by dividing the total vehicles by the total apartments. The data indicates a reduced vehicle ownership trend in apartment dwellings from 2001 to 2016, dropping from 0.79 to 0.42 vehicles per unit.

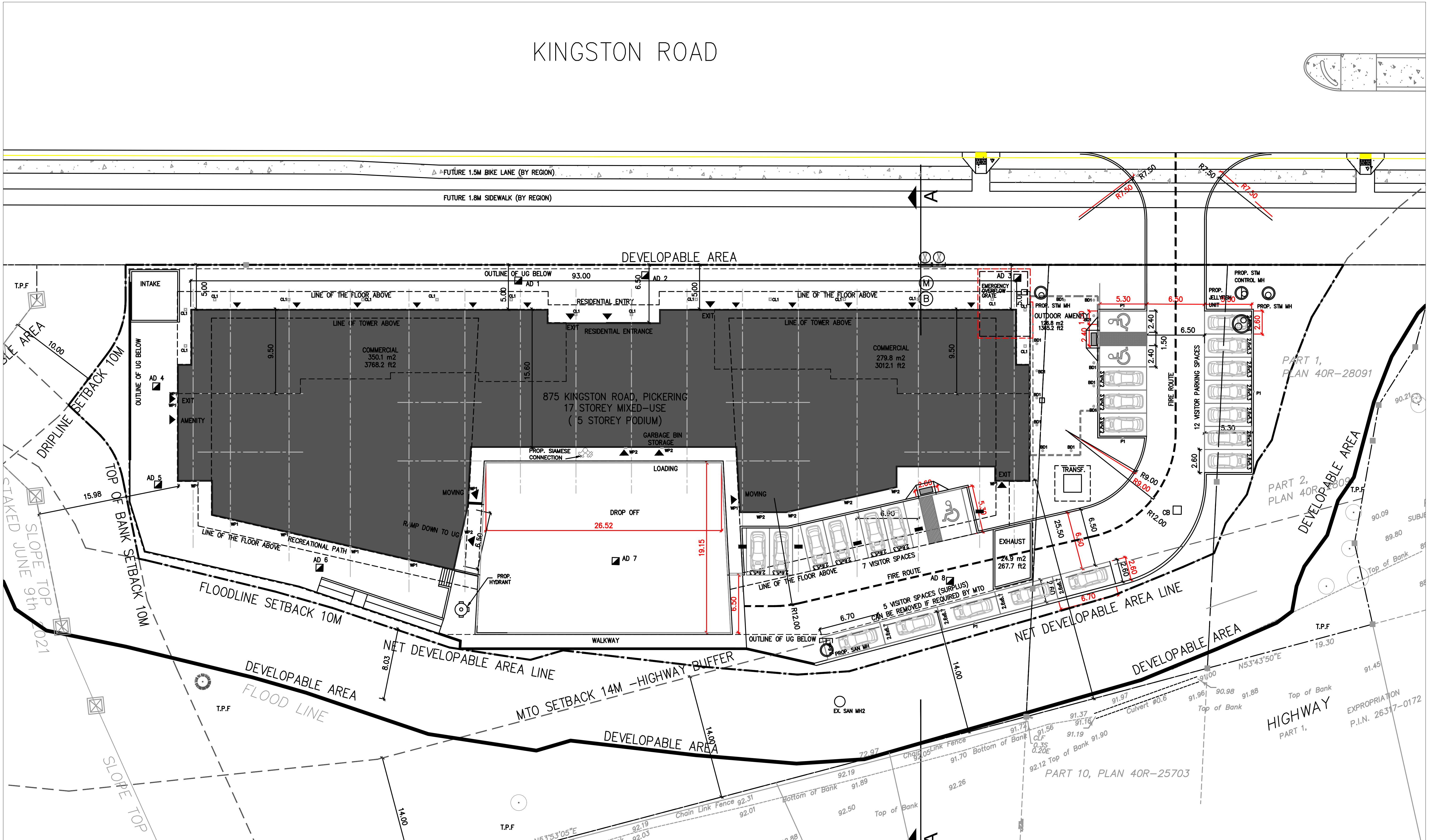
Based on the 2016 TTS data, apartment dwellings in the area own an average of 0.42 vehicles, and this appears to be a downwards trend. The data suggests that the parking demand of the site may be lower than the proposed 0.58 parking rate for the Block 1 development. Therefore, the TTS vehicle ownership data supports the proposed blended residential parking rates of 0.78 (Phase 1 in 2024) and 0.58 (Block 1 in 2029) spaces per unit.

8.4.3 PARKING RATES IN OTHER MUNICIPALITIES

Many municipalities have adopted (or are in the process of adopting) reduced parking standards within major transit stations areas and in transit-supportive neighbourhoods. Parking rates for apartment building minimum parking requirements in the GTA and in the City of Ottawa as shown in **Table 8-6**. The table shows that the proposed residential parking rate of 0.58 to 0.78 spaces per unit is within the range of parking requirements in the GTA and Ottawa.

Appendix M:
Vehicle Maneuvering Diagrams

TYLin



KINGSTON ROAD
FUTURE 1.5M BIKE LANE (BY REGION)
FUTURE 1.8M SIDEWALK (BY REGION)
DEVELOPABLE AREA
OUTLINE OF UG BELOW
93.00
LINE OF THE FLOOR ABOVE
RESIDENTIAL ENTRY
RESIDENTIAL ENTRANCE
LINE OF TOWER ABOVE
INTAKE
OUTLINE OF UG BELOW
EXIT
AMENITY
COMMERCIAL
350.1 m2
3768.2 ft2
COMMERCIAL
279.8 m2
3012.1 ft2
875 KINGSTON ROAD, PICKERING
17 STOREY MIXED-USE
(5 STOREY PODIUM)
GARBAGE BIN STORAGE
PROP. SIAMESE CONNECTION
LOADING
MOVING
DROP OFF
26.52
19.15
RAMP DOWN TO UG
PROP. HYDRANT
WALKWAY
RECREATIONAL PATH
LINE OF THE FLOOR ABOVE
EMERGENCY OVERFLOW GRATE
PROP. STM MH
OUTDOOR AMENITY
128.8 m2
1383.2 ft2
PROP. JELLYFISH UNIT
PROP. STM CONTROL MH
12 VISITOR PARKING SPACES
FIRE ROUTE
TRANSF.
EXHAUST
24.9 m2
267.7 ft2
7 VISITOR SPACES
5 VISITOR SPACES (SURPLUS) CAN BE REMOVED IF REQUIRED BY MTO
PROP. SAN MH
EX. SAN MH2
PART 1, PLAN 40R-28091
PART 2, PLAN 40R-28091
NET DEVELOPABLE AREA LINE
MTO SETBACK 14M -HIGHWAY BUFFER
FLOODLINE SETBACK 10M
TOP OF BANK SETBACK 10M
DRIPLINE SETBACK 10M
FLOOD LINE
SLOPE TOP
SLOPE TOP STAKED JUNE 9th 2021
DEVELOPABLE AREA
HIGHWAY PART 1,
EXPROPRIATION P.I.N. 26317-0172
PART 10, PLAN 40R-25703
N53°43'50"E
N53°53'05"E
Chain Link Fence
Top of Bank
Bottom of Bank
T.P.F
A

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TYLin

8800 Dufferin Street,
Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700

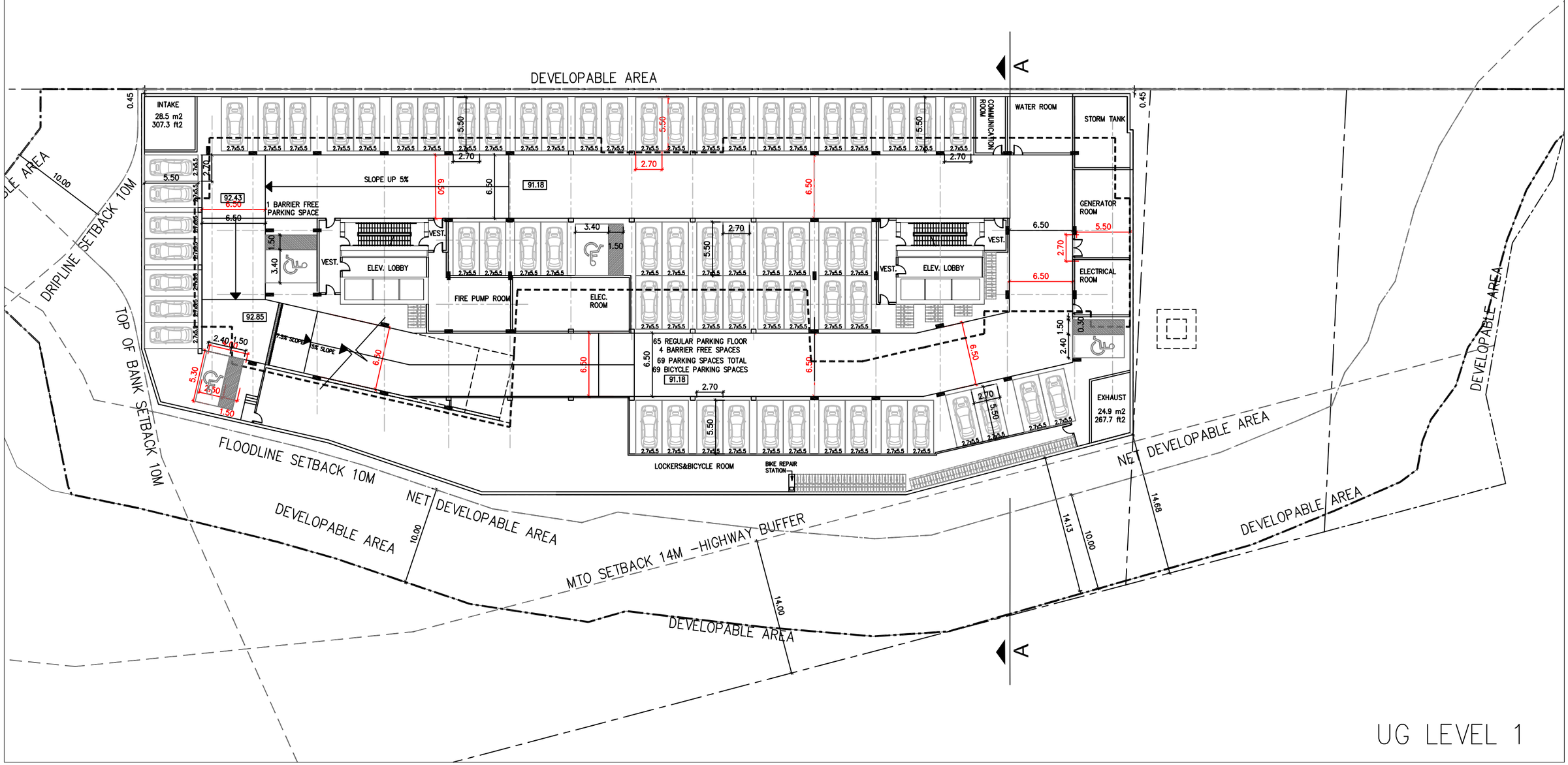
875 KINGSTON ROAD WEST
SITE PLAN DIMENSION REVIEW
GROUND FLOOR

SCALE: 1:400

4 0 4 8 12m

DRAWING No. 001

DATE SEP 2022



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Suite 200
Vaughan, ON
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875 KINGSTON ROAD WEST
SITE PLAN DIMENSION REVIEW
UG 1 FLOOR

SCALE: 1:400
4 0 4 8 12m

DRAWING No. 002
DATE SEP 2022

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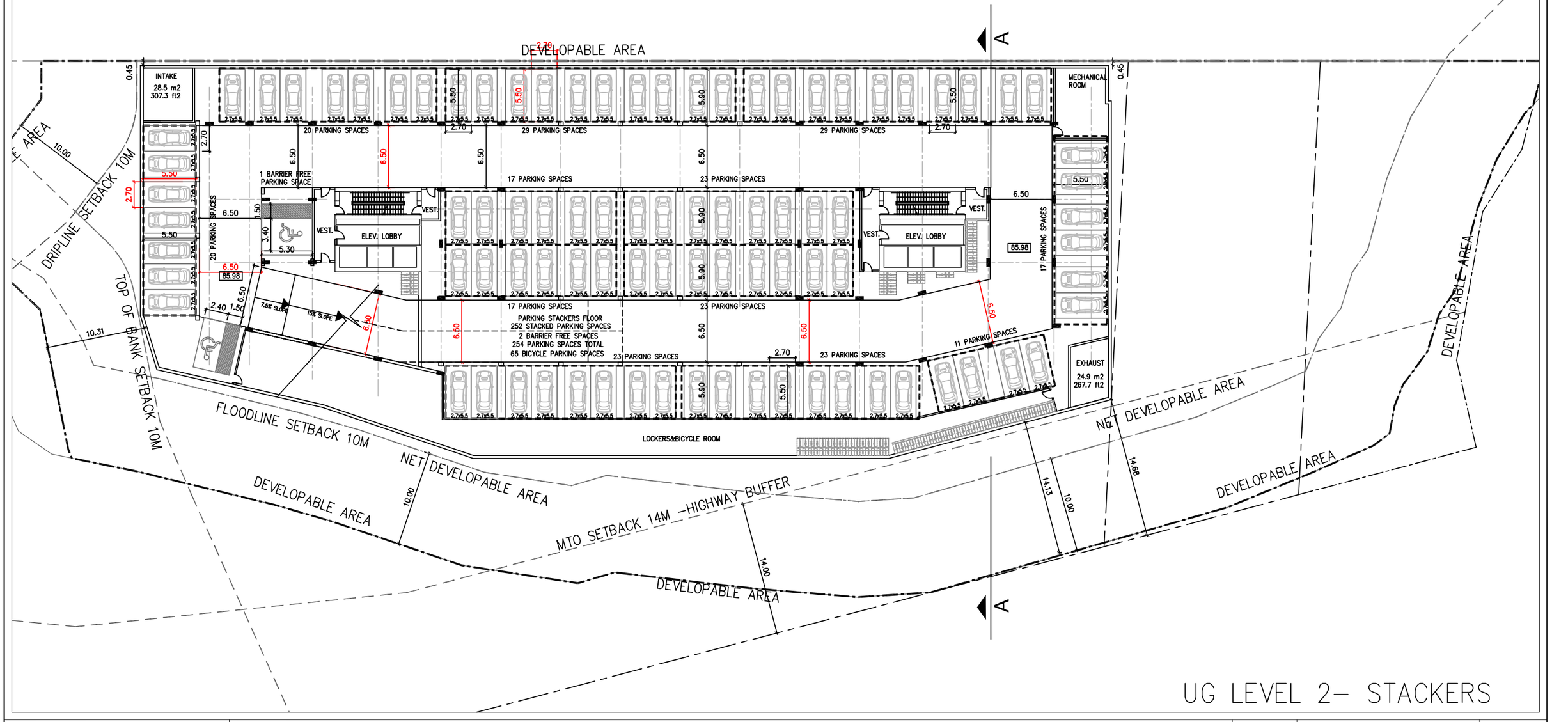

UG LEVEL 2– STACKERS

TYLin
8800 Dufferin Street,
Suite 200
Vaughan, ON
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875 KINGSTON ROAD WEST
SITE PLAN DIMENSION REVIEW
UG 2 FLOOR

SCALE: 1:400
4 0 4 8 12m

DRAWING No. 003
DATE SEP 2022

ENTRY MANEUVER

EXIT MANEUVER

LINE OF TOWER ABOVE

COMMERCIAL
279.8 m2
3012.1 ft2
6.90

EXIT

RESIDENTIAL CORRIDOR

GARBAGE BIN
STORAGE
63.1 m2
679.7 ft2

GARBAGE ROOM
122.4 m2
1318.0 ft2

EAST ELEV. LOBBY

44 BICYCLE SPA
85.2 m2
917.2 ft2

RAMP UP

SIAMESE
ECTION

LOADING
6.25

MOVING

DROP OFF

6.25

6.90

3.40

7 VISITOR SPACES

2.6x5.3

Durham Front End
Custom

AD 7

AD 8

1.50

5 VISITOR SPACES (SURPLUS)
CAN BE REMOVED IF REQUIRED BY

6.70

OUTLINE OF UG BELOW

2.6x6.7

PROP. SAN MH

EX. SAN MH2

WALKWAY

HIGHWAY BUFFER

SETBACK 14M – HIGHWAY BUFFER

23.82

14.00

DEVELOPABLE AREA

9850
1507
4880

Durham Front End
mm

Width	: 2770
Track	: 2770
Lock to Lock Time	6.0
Steering Angle	: 25.1

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TYLin
8800 Dufferin Street,
Suite 200
Vaughan, ON
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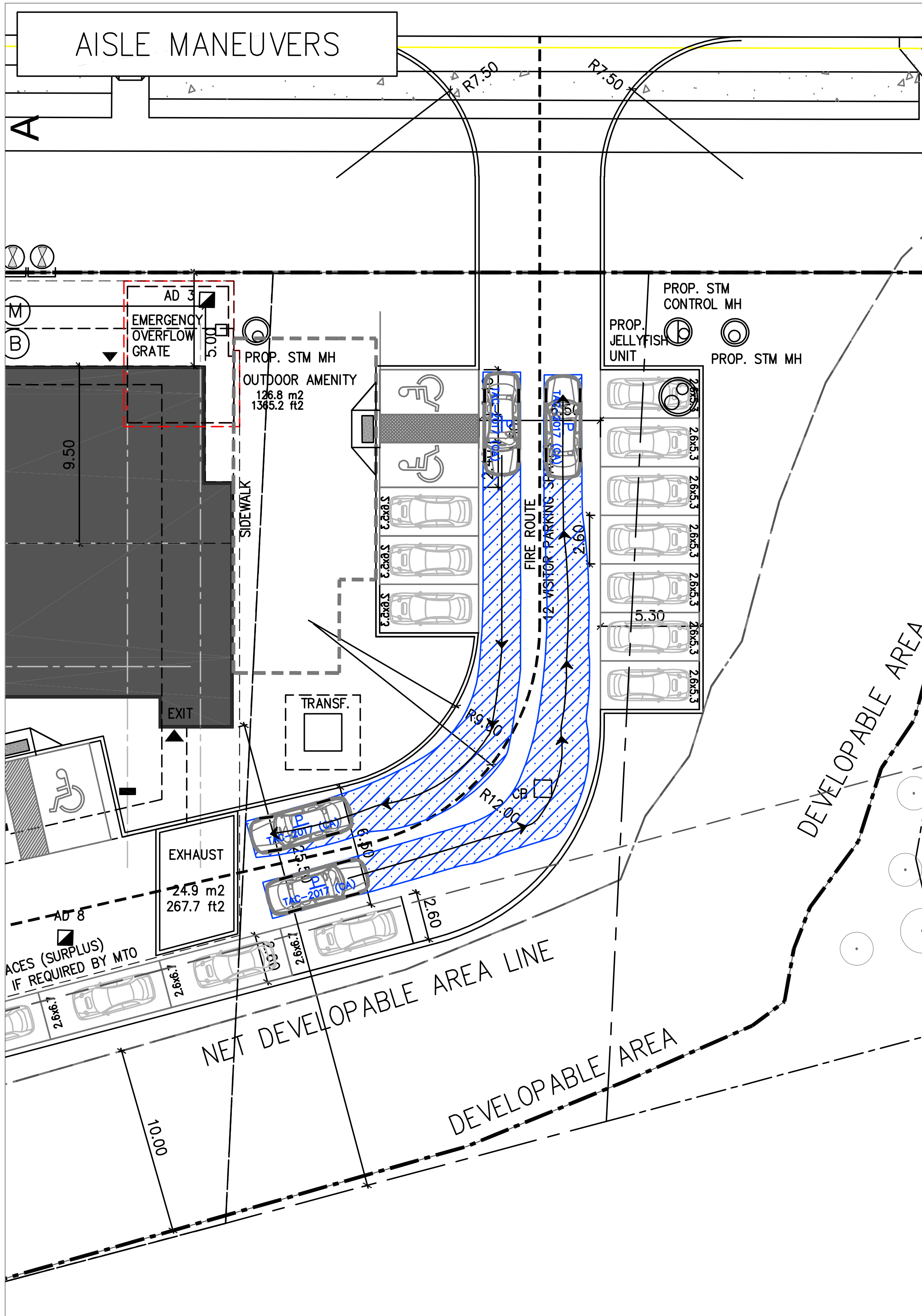
p: 905.738.5700

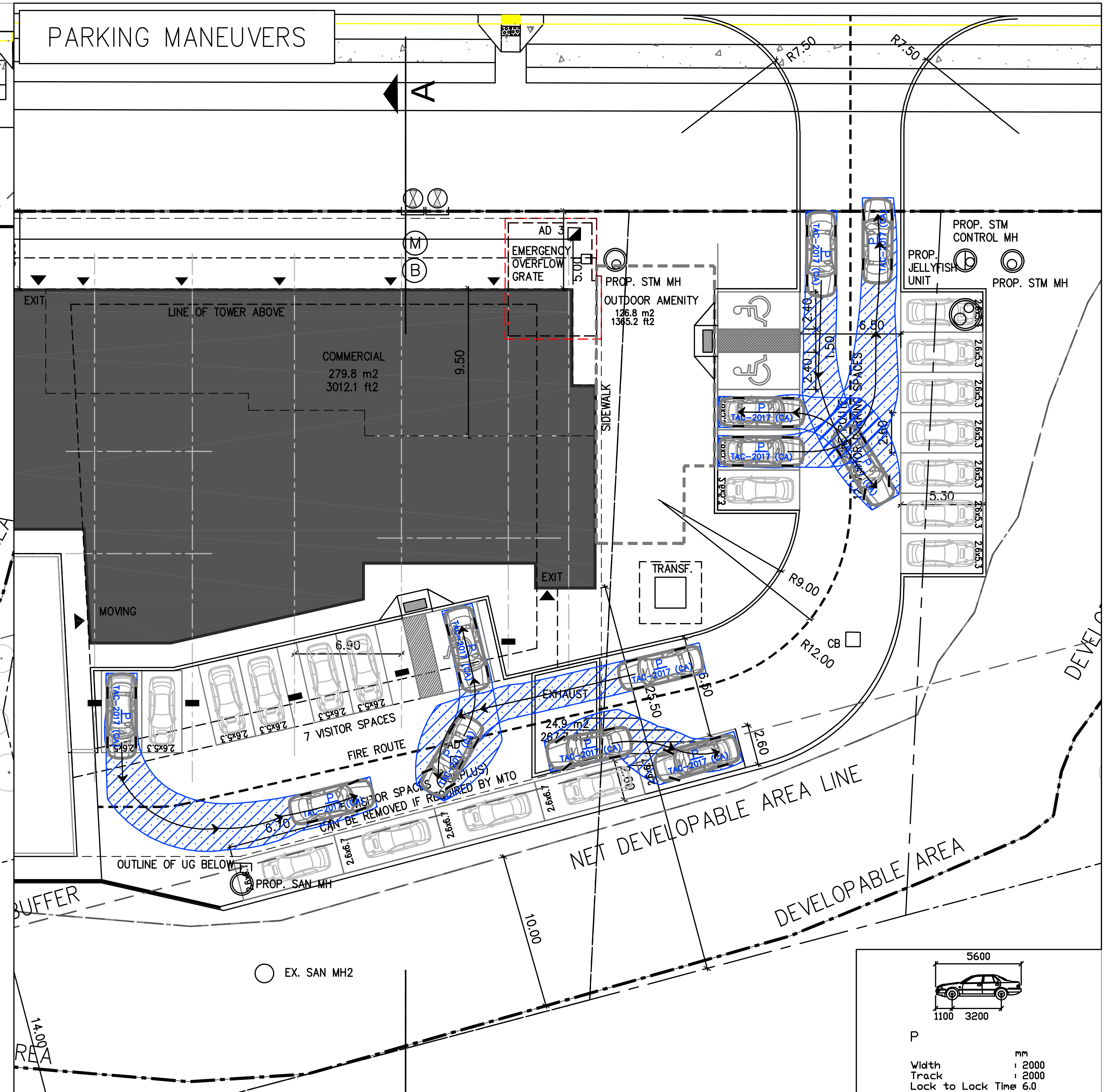
875 KINGSTON ROAD WEST
SITE PLAN REVIEW
DURHAM REGION WASTE TRUCK CIRCULATION

SCALE: 1:200
2 0 2 4 6m

DRAWING No. 004
DATE SEP 2022



AISLE MANEUVERS
R7.50
AD 3
EMERGENCY OVERFLOW GRATE
PROP. STM MH
OUTDOOR AMENITY
126.8 m2
1365.2 ft2
SIDEWALK
PROP. STM CONTROL MH
PROP. JELLYFISH UNIT
FIRE ROUTE
12 VISITOR PARKING SPACES
TRANSF.
EXIT
EXHAUST
24.9 m2
267.7 ft2
AD 8
NET DEVELOPABLE AREA LINE
DEVELOPABLE AREA
R9.00
R12.00
CB
TAC-2017 (CA)



PARKING MANEUVERS
R7.50
LINE OF TOWER ABOVE
COMMERCIAL
279.8 m2
3012.1 ft2
AD 3
EMERGENCY OVERFLOW GRATE
PROP. STM MH
OUTDOOR AMENITY
126.8 m2
1365.2 ft2
SIDEWALK
PROP. STM CONTROL MH
PROP. JELLYFISH UNIT
EXIT
MOVING
TRANSF.
R9.00
R12.00
CB
7 VISITOR SPACES
FIRE ROUTE
EXHAUST
CAN BE REMOVED IF REQUIRED BY MTO
OUTLINE OF UG BELOW
PROP. SAN MH
BUFFER
EX. SAN MH2
NET DEVELOPABLE AREA LINE
DEVELOPABLE AREA
TAC-2017 (CA)
5600
1100
3200
P
Width : 2000
Track : 2000
Lock to Lock Time : 6.0
Steering Angle : 35.9

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TYLin
8800 Dufferin Street, Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700

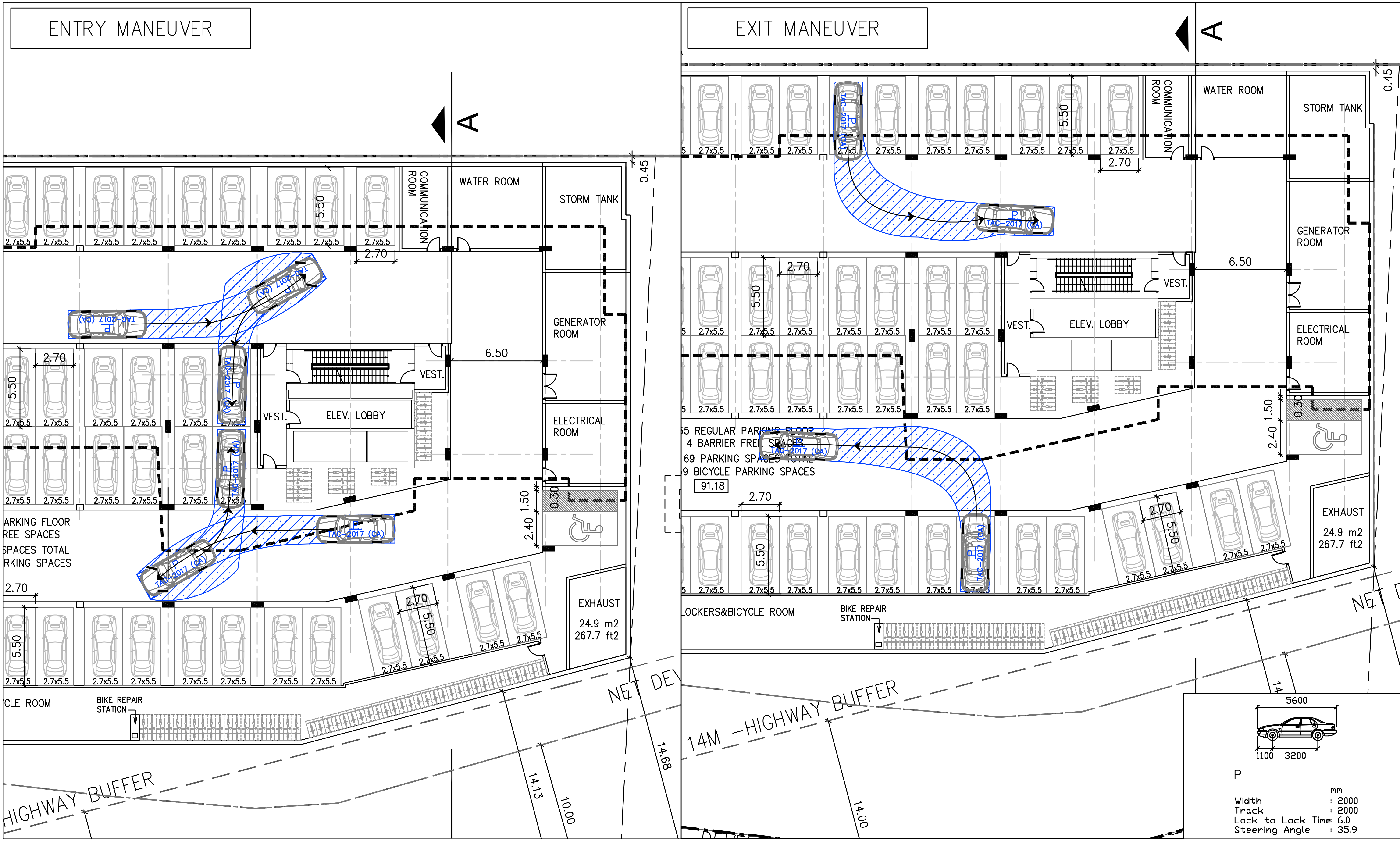
875 KINGSTON ROAD WEST
SITE PLAN REVIEW
PASSENGER VEHICLE CIRCULATION - GROUND FLOOR

SCALE: 1:300

3 0 3 6 9m

DRAWING No. 005

DATE SEP 2022


ENTRY MANEUVER
EXIT MANEUVER
A
COMMUNICATION ROOM
WATER ROOM
STORM TANK
GENERATOR ROOM
ELECTRICAL ROOM
ELEV. LOBBY
VEST.
EXHAUST
24.9 m2
267.7 ft2
2.7x5.5
2.70
5.50
6.50
0.45
1.50
2.40
0.30
TAC-2017 (CA)
P
65 REGULAR PARKING FLOOR
4 BARRIER FREE SPACES
69 PARKING SPACES TOTAL
9 BICYCLE PARKING SPACES
91.18
LOCKERS&BICYCLE ROOM
BIKE REPAIR STATION
NET DEV
14M -HIGHWAY BUFFER
14.68
14.13
10.00
14.00
14.66
5600
1100
3200
mm
Width : 2000
Track : 2000
Lock to Lock Time : 6.0
Steering Angle : 35.9

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875 KINGSTON ROAD WEST
SITE PLAN REVIEW
PASSENGER VEHICLE CIRCULATION - UG 1 FLOOR

SCALE: 1:250

2.5 0 2.5 5 7.5m

DRAWING No.
006

DATE
SEP 2022

ENTRY MANEUVER

EXIT MANEUVER

A

A

MECHANICAL ROOM

MECHANICAL ROOM

29 PARKING SPACES

23 PARKING SPACES

23 PARKING SPACES

23 PARKING SPACES

11 PARKING SPACES

11 PARKING SPACES

17 PARKING SPACES

VEST.

VEST.

ELEV. LOBBY

ELEV. LOBBY

EXHAUST
24.9 m2
267.7 ft2

EXHAUST
24.9 m2
267.7 ft2

LOCKERS&BICYCLE ROOM

BICYCLE ROOM

5.90

5.50

6.50

2.70

0.45

85.98

14.13

10.00

14.00

-HIGHWAY BUFFER

K 14M -HIGHWAY BUFFER

NET

P
TAC-2017 (CA)

5600
1100 3200

P

mm	
Width	: 2000
Track	: 2000
Lock to Lock Time	6.0
Steering Angle	: 35.9

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TYLin

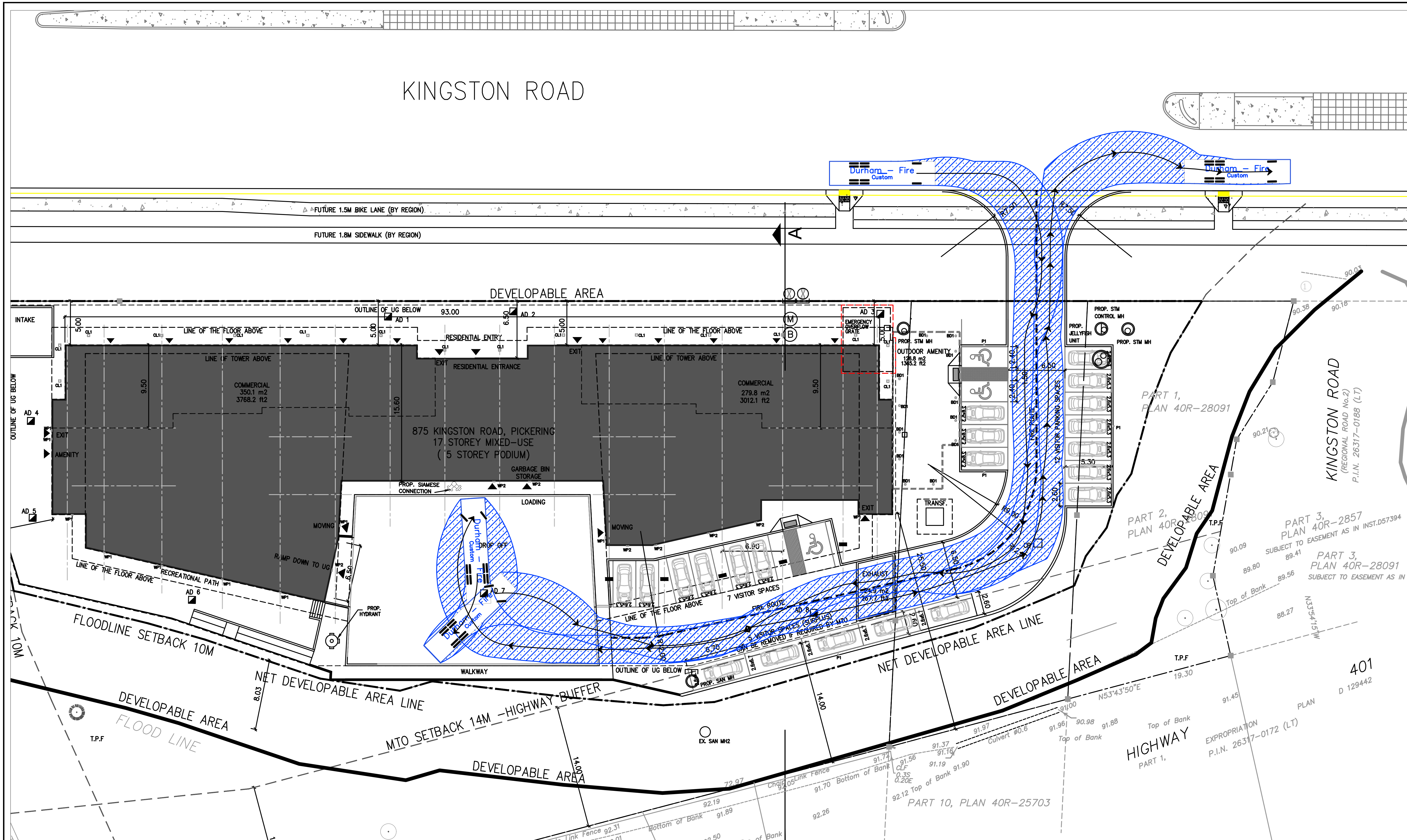
8800 Dufferin Street,
Suite 200
Vaughan, ON
L4K 0C5
p: 905.738.5700

875 KINGSTON ROAD WEST
SITE PLAN REVIEW
PASSENGER VEHICLE CIRCULATION - UG 2 FLOOR

SCALE: 1:250
2.5 0 2.5 5 7.5m

DRAWING No. 007

DATE SEP 2022


KINGSTON ROAD
FUTURE 1.5M BIKE LANE (BY REGION)
FUTURE 1.8M SIDEWALK (BY REGION)
DEVELOPABLE AREA
875 KINGSTON ROAD, PICKERING
17 STOREY MIXED-USE
(5 STOREY PODIUM)
COMMERCIAL
350.1 m2
3768.2 ft2
COMMERCIAL
279.8 m2
3012.1 ft2
RESIDENTIAL ENTRY
RESIDENTIAL ENTRANCE
LINE OF THE FLOOR ABOVE
LINE OF TOWER ABOVE
OUTDOOR AMENITY
LOADING
GARBAGE BIN STORAGE
PROP. SIAMESE CONNECTION
PROP. HYDRANT
RAMP DOWN TO UG
RECREATIONAL PATH
WALKWAY
7 VISITOR SPACES
12 VISITOR PARKING SPACES
FIRE ROUTE
TRANSF.
EXHAUST
FLOODLINE SETBACK 10M
NET DEVELOPABLE AREA LINE
MTO SETBACK 14M -HIGHWAY BUFFER
FLOOD LINE
PART 10, PLAN 40R-25703
HIGHWAY 401
KINGSTON ROAD (REGIONAL ROAD No.2) P.I.N. 26317-0188 (LT)
Durham - Fire Custom

TYLin

8800 Dufferin Street, Suite 200
Vaughan, ON
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p: 905.738.5700

875 KINGSTON ROAD WEST
SITE PLAN REVIEW
DURHAM REGION FIRE TRUCK CIRCULATION

SCALE: 1:400

DRAWING No. 008

DATE SEP 2022

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