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July 11th, 2022

Reference Number: 21304

Arash Barati

Bara Group (River Oak) Inc.

Dear Mr. Barati,

**RE: Transportation Impact Study
Proposed Mixed Use Development
2163 & 2169 Sixth Line, Oakville**

LEA Consulting Ltd. is pleased to present the findings of our Transportation Impact Study (TIS) for the development application in support of the proposed mixed use development located at 2163 & 2169 Sixth Line in the Town of Oakville. This report concluded that the traffic associated with the proposed development will have a minimal impact on the surrounding transportation network.

Should you have any comments with our assumptions or have any concerns, please contact the undersigned.

Yours truly,

LEA CONSULTING LTD.

Robert Keel, MSc. PI, MCIP, RPP
Project Manager

Encl.



Bara Group (River Oak) Inc.

TRANSPORTATION IMPACT STUDY

**2163 & 2169 Sixth Line, Town of Oakville
Proposed Mixed-Use Development**

July 2022
21304

Disclaimer

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1 INTRODUCTION

LEA Consulting Ltd. (LEA) has been retained by Bara Group (River Oak) Inc. to undertake a Transportation Impact Study (TIS) for the proposed mixed use development located at 2163 & 2169 Sixth Line (herein referred to as the “subject site”) in the Town of Oakville. Currently, the subject site is occupied by a small commercial plaza. The site location is illustrated in **Figure 1-1**.

Figure 1-1: Site Location



Source: Google Maps, 2021

The development proposal consists of a 9-storey mid-rise mixed-use building containing 247 residential units, approximately 391 m² of medical/dental office GFA and approximately 352 m² of retail GFA, with vehicle parking to be provided in two levels of underground parking. The site statistics of the proposed development are presented in **Table 1-1**. **Figure 1-2** illustrates the proposed site plan.

2 EXISTING TRAFFIC CONDITIONS

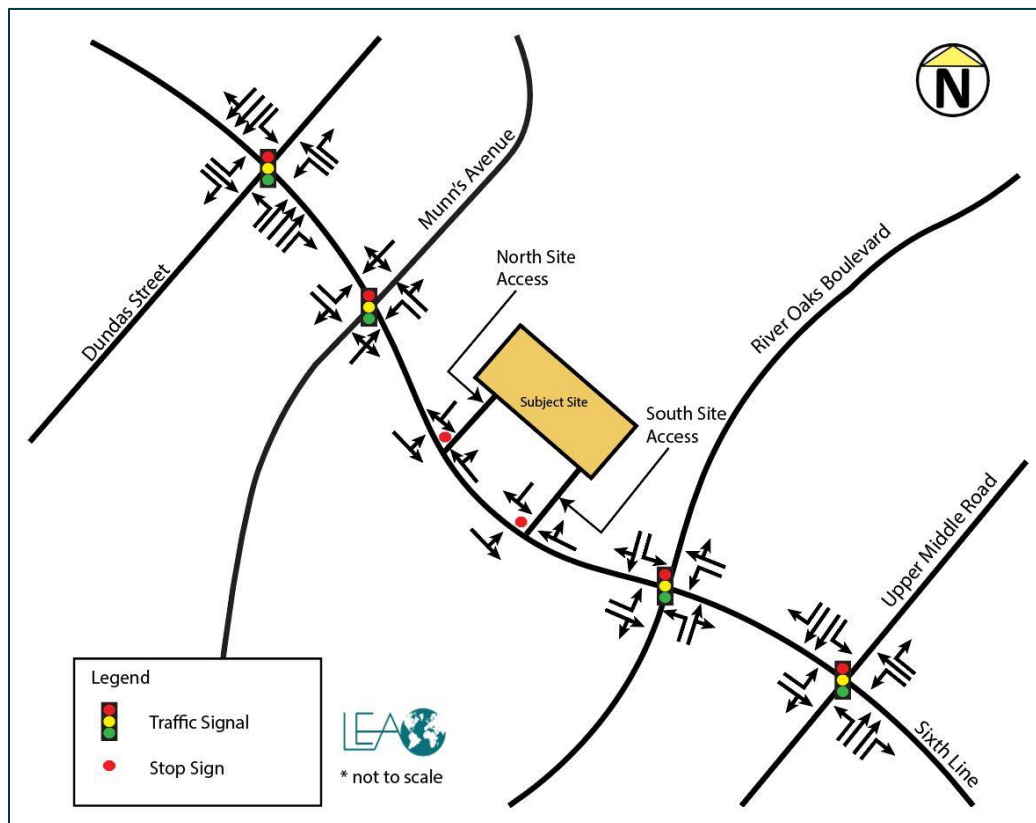
This section identifies and assesses the existing transportation conditions within the study area, including the road, transit, cycling, and pedestrian networks. The study area was determined by assessing the size of the proposed development and its anticipated transportation impact, and through consultation with Town and Region staff. The study includes the following intersections:

- ▶ Sixth Line and River Oaks Boulevard (Signalized);
- ▶ Sixth Line and Munn's Avenue (Signalized);
- ▶ Sixth Line and Dundas Street West (Signalized);
- ▶ Sixth line and Upper Middle Road (Signalized);
- ▶ Sixth Line and North Site Access (Unsignalized); and
- ▶ Sixth Line and South Site Access (Unsignalized).

2.1 ROAD NETWORK

The following section provides a description and classification of the roadways within the study area. **Figure 2-1** illustrating the existing lane configuration.

Figure 2-1: Existing Lane Configuration



Sixth Line is a north-south minor arterial road that operates with a two-lane cross-section (one lane per direction) until just south of the intersection with Glenashton Drive/River Glen Boulevard and a four-lane

cross-section (two lanes per direction) from that point to the intersection with Dundas Street. North of the intersection with Dundas Street, the roadway resumes operating with a two-lane cross-section. Sixth Line operates from North Service Road in the south and Steeles Avenue in the north. The roadway operates with a posted speed limit of 50 km/h within the study area.

Dundas Street is an east-west major arterial road that operates with a six-lane cross section (three lanes per direction) in the study area. Within the Town of Oakville, Dundas Street operates across the entire municipality from the intersection with Highway 6 in the City of Hamilton in the west and Kingston Road in the City of Toronto in the east. The roadway operates with a posted speed limit of 70 km/h within the study area.

Upper Middle Road is an east-west major arterial road that operates with a four-lane cross section (two lanes per direction) in the study area. The roadway operates between Havendale Boulevard in the City of Burlington in the west and Winston Churchill Boulevard in the east, at the border of the Town of Oakville and the City of Mississauga. The roadway operates with a posted speed limit of 60 km/h within the study area.

Munn's Avenue is a predominantly east-west local road that operates with a two-lane cross-section (one lane per direction) within the study area. The roadway operates between Neyagawa Boulevard in the West and Sixth Line in the east. The roadway operates with an assumed speed limit of 50 km/h within the study area.

River Oaks Boulevard is an east-west collector road that operates with a two-lane cross-section (one lane per direction) in the study area. The roadway operates between Neyagawa Boulevard in the west and Trafalgar Road in the east. The roadway operates with a posted speed limit of 50 km/h within the study area.

2.2 TRANSIT NETWORK

The subject site is located in an area with surface transit provided by the Oakville Transit network. The subject site is within walkable distance of bus stops at Sixth Line and River Oaks Boulevard, and Sixth Line and Upper Middle Road. Transit routes servicing the area are illustrated in **Figure 2-2**.

Figure 2-2: Existing Transit Network



Source: Oakville Transit, 2020

Oakville Transit Bus Route 19 – River Oaks is a bus route that generally operates in a north-south direction between Oakville GO Station and the Uptown Core stop. The route operates on weekdays, weekends and holidays. During the weekdays, the route operates with 30-minute service.

Access Location: Route 19 is accessible at the intersection of Sixth Line and River Oaks Boulevard, which is located approximately 140 m (equivalent to a two-minute walk) from the subject site.

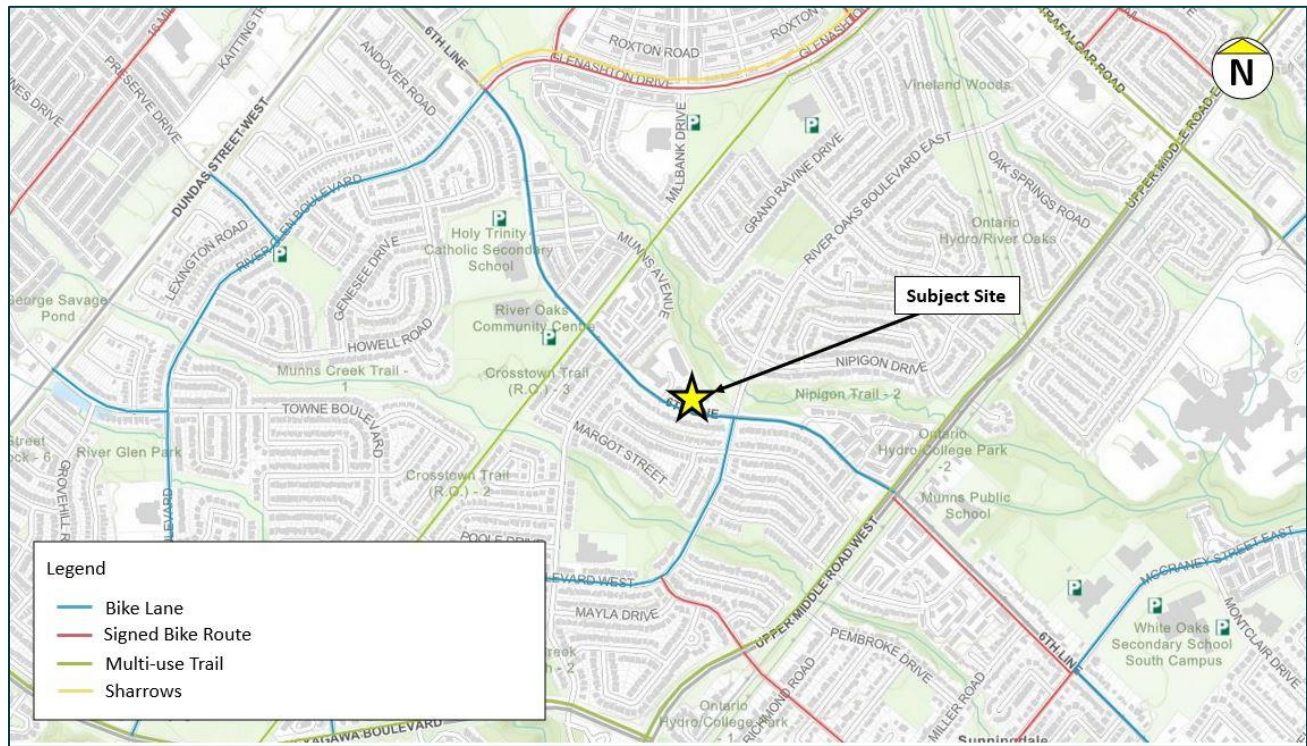
Oakville Transit Bus Route 6 – Upper Middle is a bus route that generally operates in an east-west direction between Bronte GO Station and, Laird Road and Ridgeway Drive. The route operates on weekdays, weekends and holidays. During the weekdays, the route operates with service headways of 30-minutes in the morning and evening hours, and 60-minute headways every other time.

Access Location: Route 6 is accessible at the intersection of Sixth Line and Upper Middle Road, which is located approximately 650 m (equivalent to an 8-minute walk) from the subject site.

2.3 CYCLING NETWORK

The existing cycling network surrounding the site is illustrated in **Figure 2-3**. The subject site is located in a neighbourhood with access to nearby cycling infrastructure. A bike lane is provided along Sixth Line, adjacent to the subject site. Another bike lane is located close by along River Oaks Boulevard west from Sixth Line, approximately 140 m from the subject site. Additionally, a multi-use trail is provided along Upper Middle Road, approximately 650 m away from the subject site.

Figure 2-3: Existing Cycling Network



Source: Town of Oakville

2.4 PEDESTRIAN NETWORK

In the area immediately surrounding the subject site, the existing pedestrian network consists of sidewalks along both sides of Sixth Line, River Oaks Boulevard, Munn's Avenue and Upper Middle Road. Along Dundas Street there exists paved pathways on either side of the road. Pedestrian crosswalks are available on all approaches with protected pedestrian phases at all signalized intersections in the study area.

2.5 TRAFFIC DATA COLLECTION

Turning movement counts (TMCs) were used as the source of traffic data for the intersection capacity analysis. Traffic counts were obtained from the Town of Oakville and Halton Region. Existing traffic volumes at the site accesses were inferred based on the ITE Trip Generation Manual. Traffic counts older than two (2) years old were escalated to 2021 using a growth rate of 2%. Heavy vehicle traffic and pedestrian traffic were provided by the Town of Oakville. Bus blockages were calculated based on the Town's bus schedule. A summary of the TMC data collected is provided in **Table 2-1**, with detailed traffic counts and signal timing plans obtained from the Town Oakville available in **Appendix A**.

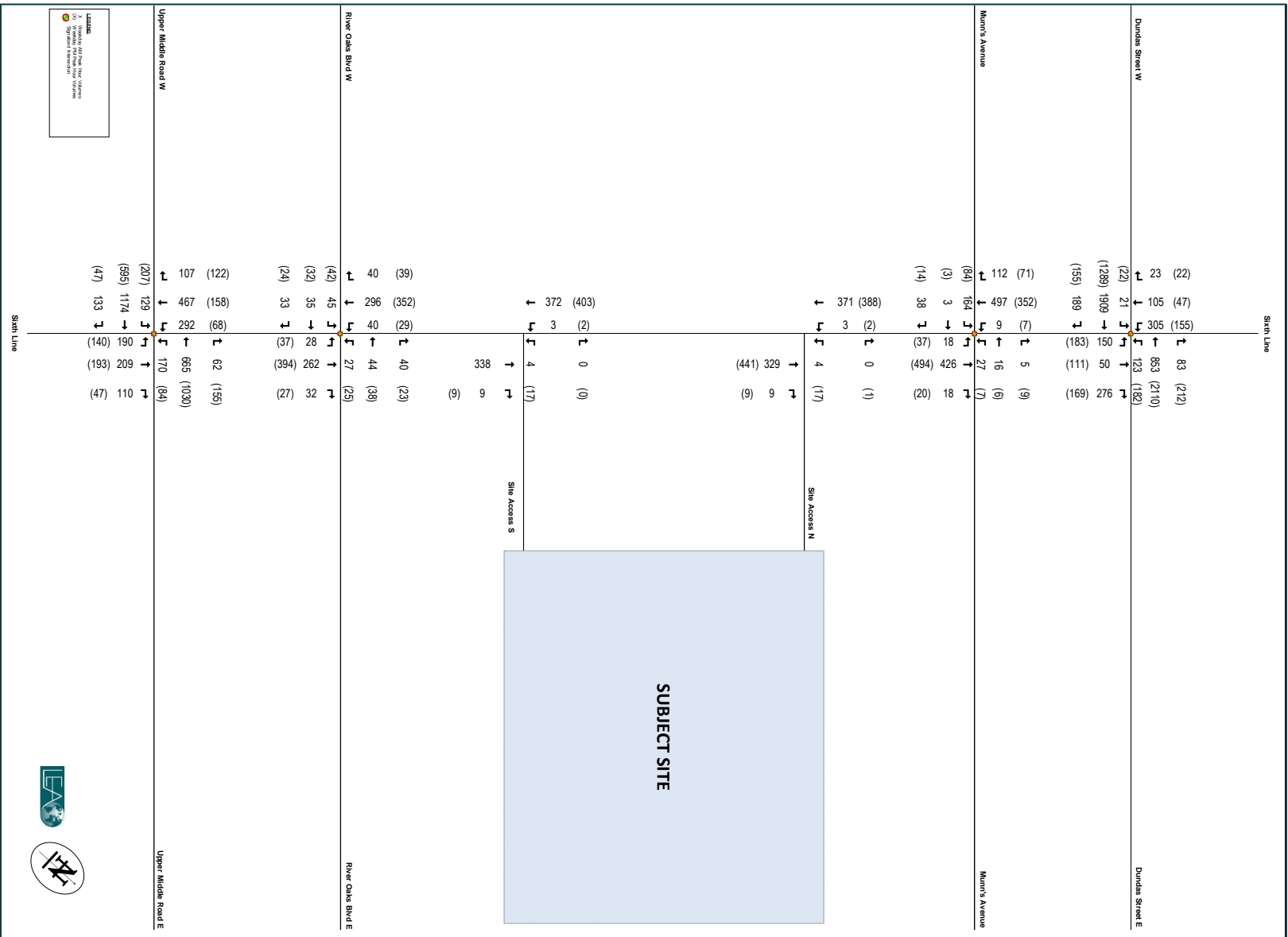
Table 2-1: Data Collection Summary

Intersection	Date	Source
Sixth Line and Munn’s Avenue	May 9, 2019	City of Oakville
Sixth Line and River Oaks Blvd	November 12, 2020	
Sixth Line and North Site Access	N/A	Based on ITE Trip Generation
Sixth Line and South Site Access		
Sixth Line and Dundas Street	May 24, 2017	Halton Region
Sixth Line and Upper Middle Road	April 10, 2018	

2.6 INTERSECTION CAPACITY ANALYSIS

Existing traffic operations were assessed to provide a baseline for future traffic operations. The capacity analysis for the study area was undertaken using Synchro Version 11.0, which is based on the Highway Capacity Manual 2000 methodology. Intersection movements are deemed to be “critical” in terms of operation if they are operating with a V/C at or above 0.85 or with LOS E or worse. The existing traffic volumes in the study area during the weekday AM and PM peak hours are illustrated in **Figure 2-4**.

Figure 2-4: Existing Traffic Volumes



The intersection capacity analysis was conducted under existing conditions during the weekday AM and PM peak hours. The results of the analysis are summarized in **Table 2-2** and **Table 2-3** for the signalized intersections, and in **Table 2-4** for the unsignalized intersections. The Synchro analysis parameters were calibrated at the Sixth Line and Dundas Street and Sixth Line and Upper Middle Road intersections during the AM peak hour, and at the Sixth Line and Dundas Street intersection during the PM peak hour. Model calibration is detailed in **Appendix C**. Detailed capacity results are provided in **Appendix D**.

Table 2-2: Existing Capacity Analysis (Signalized - AM Peak Hour)

Intersection	Weekday AM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Sixth Line & Munn's Ave	0.66	15.7	B	EBLTR	0.72	38.3	D	38	52
				WBLTR	0.14	26.5	C	7	14
				NBL	0.08	6.3	A	1	5
				NBTR	0.46	9.2	A	42	78
				SBL	0.02	5.7	A	1	3
				SBTR	0.64	12.4	B	68	125
Sixth Line & River Oaks Blvd W	0.29	9.3	A	EBL	0.27	28.1	C	6	15
				EBTR	0.17	27.3	C	5	15
				WBL	0.19	27.5	C	4	11
				WBTR	0.27	28.0	C	6	18
				NBL	0.05	2.7	A	1	4
				NBTR	0.26	3.6	A	12	23
				SBL	0.06	2.7	A	2	5
SBTR	0.29	3.3	A	15	27				
Sixth Line & Dundas Street	0.92	37.0	D	EBL	0.08	12.9	B	2	5
				EBT	0.98	44.7	D	235	318
				EBR	0.13	16.1	B	0	13
				WBL	0.58	32.0	C	14	34
				WBTR	0.54	17.9	B	82	103
				NBL	0.47	36.5	D	31	53
				NBT	0.11	31.9	C	10	20
				NBR	0.23	33.3	C	5	28
				SBL	0.92	71.0	E	74	129
SBTR	0.12	32.0	C	10	18				
Sixth Line & Upper Middle Road	0.94	44.2	D	EBL	0.47	21.6	C	18	31
				EBT	0.93	48.6	D	153	199
				EBR	0.10	24.4	C	0	13
				WBL	0.89	66.4	E	30	76
				WBT	0.53	29.8	C	71	90
				WBR	0.05	23.1	C	0	4
				NBL	0.92	69.7	E	32	78
				NBT	0.37	30.6	C	41	63
				NBR	0.09	27.3	C	0	13
SBL	0.67	31.9	C	49	72				
SBTR	0.95	63.0	E	142	215				

Under existing conditions, all study area intersections are operating at an acceptable LOS D or better during the AM peak hour. However, there are several critical movements that are near capacity and/or

experiencing LOS E at the intersections of Sixth Line with Dundas Street and Upper Middle Road. In particular the eastbound through at Sixth Line and Dundas is near capacity with a V/C of 0.98 but an acceptable LOS D. The eastbound and southbound through at Sixth Line and Upper Middle Road are also approaching capacity with a V/C of 0.93 and 0.95 respectively. The other critical movements are left turns at the above noted intersections, all of which maintain available capacity and experience LOS E or better.

Table 2-3: Existing Capacity Analysis (Signalized - PM Peak Hour)

Intersection	Weekday PM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50 th	95 th
Sixth Line & Munn's Ave	0.43	8.0	A	EBLTR	0.57	41.2	D	16	31
				WBLTR	0.07	34.7	C	2	8
				NBL	0.07	2.7	A	1	5
				NBTR	0.40	4.3	A	27	56
				SBL	0.01	2.4	A	0	2
				SBTR	0.33	3.8	A	20	42
Sixth Line & River Oaks Blvd W	0.31	7.9	A	EBL	0.23	28.0	C	5	13
				EBTR	0.14	27.3	C	4	13
				WBL	0.16	27.6	C	3	10
				WBTR	0.20	27.8	C	5	15
				NBL	0.05	2.7	A	1	4
				NBTR	0.33	3.9	A	18	29
				SBL	0.05	2.7	A	1	3
Sixth Line & Dundas Street	0.91	30.7	C	SBTR	0.30	3.8	A	16	27
				EBL	0.17	27.1	C	1	5
				EBT	0.68	20.3	C	122	180
				EBR	0.11	12.3	B	0	12
				WBL	0.60	18.2	B	13	42
				WBTR	0.98	33.7	C	297	400
				NBL	0.74	55.1	E	45	66
				NBT	0.31	41.2	D	25	38
Sixth Line & Upper Middle Road	0.76	35.5	D	NBR	0.12	39.3	D	0	17
				SBL	0.72	55.0	D	38	57
				SBTR	0.08	38.8	D	5	11
				EBL	0.63	32.0	C	36	84
				EBT	0.40	21.0	C	53	83
				EBR	0.04	16.8	B	0	1
				WBL	0.25	19.6	B	9	20
				WBT	0.87	43.6	D	137	182
				WBR	0.21	26.9	C	12	30
				NBL	0.62	34.8	C	28	40
NBT	0.47	38.7	D	46	65				
NBR	0.04	33.7	C	0	2				
SBL	0.23	32.3	C	13	21				
SBTR	0.74	50.4	D	65	90				

Similar to the AM peak hour, under the PM peak hour, all study area signalized intersections are operating at an acceptable LOS D or better. At Sixth Line and Dundas, the westbound through is approaching capacity with a V/C of 0.98 but continues to maintain LOS C. The northbound left is also

deemed critical because it experiences LOS E, but this movement continues to maintain available capacity with a V/C of 0.74. At Sixth Line and Upper Middle Road, the westbound through is marginally deemed critical with a V/C of 0.87 and LOS D.

Table 2-4: Existing Capacity Analysis (Unsignalized)

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access - North	WBLR	4	367	14.9	0.3	0.01	B
	SBL	3	1191	0.1	0.1	0.00	A
Sixth Line and Site Access - South	WBLR	4	362	15.1	0.3	0.01	C
	SBL	3	1180	0.1	0.1	0.00	A
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access - North	WBLR	19	349	15.9	1.4	0.05	C
	SBL	2	1069	0.1	0.0	0.00	A
Sixth Line and Site Access - South	WBLR	18	294	18.0	1.6	0.06	C
	SBL	2	1056	0.1	0.0	0.00	A

Under existing conditions all unsignalized movements are operating with available capacity and an acceptable LOS C or better. No constraints have been identified.

3 FUTURE BACKGROUND CONDITIONS

For the analysis of future background traffic conditions, the study considered a five-year horizon to the year 2026.

3.1 BACKGROUND DEVELOPMENTS

Based on feedback received from the Town of Oakville, no background developments were identified within the study area.

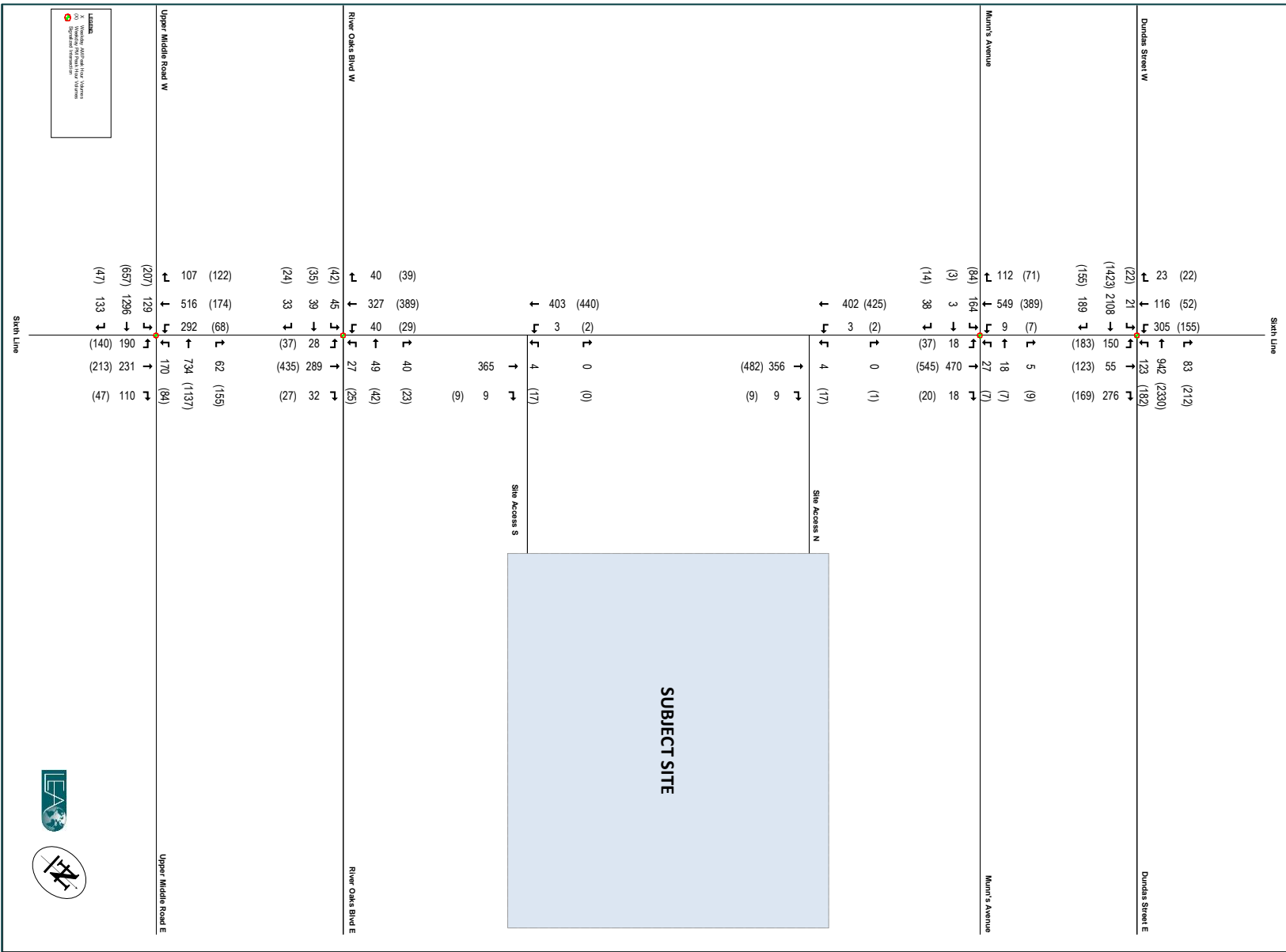
3.2 CORRIDOR GROWTH

A 2% corridor growth rate was considered as per the feedback from the Region.

3.3 INTERSECTION CAPACITY ANALYSIS

Future background traffic conditions were determined by incorporating the background growth rate along with the existing traffic volumes. The future background traffic volumes for the weekday AM and PM peak hours are illustrated in **Figure 3-1**.

Figure 3-1: Future Background Traffic Volumes



The intersection capacity analysis was conducted under future background conditions during the weekday AM and PM peak hours, where the results for the studied signalized intersections are summarized in **Table 3-1** and **Table 3-2** for the AM and PM peak hour, respectively. The intersection capacity analysis for the unsignalized intersections is summarized in **Table 3-3**. Detailed capacity results are provided in **Appendix E**.

Table 3-1: Future Background Capacity Analysis (Signalized - AM Peak Hour)

Intersection	Weekday AM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Sixth Line & Munn's Ave	0.70	16.2	B	EBLTR	0.72	38.3	D	38	52
				WBLTR	0.15	26.5	C	8	14
				NBL	0.09	6.5	A	1	5
				NBTR	0.51	9.8	A	495	89
				SBL	0.03	5.7	A	1	3
				SBTR	0.70	13.7	B	79	145
Sixth Line & River Oaks Blvd W	0.31	9.2	A	EBL	0.27	28.0	C	6	15
				EBTR	0.19	27.3	C	5	16
				WBL	0.19	27.5	C	4	11
				WBTR	0.29	28.0	C	7	19
				NBL	0.05	2.8	A	1	4
				NBTR	0.28	3.8	A	14	26
				SBL	0.07	2.7	A	2	5
				SBTR	0.32	3.5	A	16	31
Sixth Line & Dundas Street	1.04	76.1	E	EBL	0.09	13.2	B	2	5
				EBT	1.20	125.5	F	348	414
				EBR	0.14	16.2	B	2	16
				WBL	0.58	32.0	C	14	34
				WBTR	0.59	18.9	B	94	117
				NBL	0.47	36.6	D	31	53
				NBT	0.12	32.0	C	10	21
				NBR	0.23	33.3	C	5	28
				SBL	0.93	72.1	E	74	129
				SBTR	0.14	32.1	C	12	20
Sixth Line & Upper Middle Road	1.11	62.1	E	EBL	0.52	23.0	C	18	31
				EBT	1.03	69.2	E	190	234
				EBR	0.12	24.6	C	2	16
				WBL	1.08	124.9	F	35	83
				WBT	0.60	31.8	C	80	101
				WBR	0.05	23.6	C	0	4
				NBL	1.14	140.4	F	42	91
				NBT	0.40	30.4	C	46	69
				NBR	0.09	26.7	C	0	13
				SBL	0.69	32.2	C	49	72
SBTR	1.06	93.6	F	178	252				

During the weekday AM peak hour, corridor growth contributes to reduced capacity and increased vehicle delay, particularly at the intersections of Sixth Line with Dundas Street and Upper Middle Road.

Both intersections experience an overall LOS of E and a V/C above 1.0. Signal optimization was unable to significantly improve intersection operations due to the minimum pedestrian timing, which limits the ability to allocate additional green time to the east-west phases. Further discussion is provided below for each intersection.

At the intersection of Sixth Line and Dundas, the eastbound through experiences an increase in V/C from 0.98 to 1.20 based on the assumption of 2% annual traffic growth. An additional 199 vehicles were added to this movement relative to the 2021 prorated volumes, a conservative assumption which likely overstates future traffic growth given that traffic will be constrained by the overall capacity of the Dundas corridor. It is therefore more realistic to assume that the eastbound through movement will be operating near capacity, similar to existing conditions. The southbound left is anticipated to operate similar to existing conditions with a V/C of 0.93 and LOS E.

At the intersection of Sixth Line and Upper Middle Road, all critical movements experience a reduction in capacity and increased delay. Several movements are expected to operate with a V/C at or slightly above 1.0 and experience LOS E or F. Similar to Sixth Line and Dundas, the assumption of 2% annual traffic growth is overly conservative given that critical through movements were already operating near capacity during the AM peak hour. 122 and 49 vehicles were added to the eastbound and southbound through movements respectively despite the fact that they had V/Cs at or near 1.0 under existing conditions. It is expected that traffic growth will be negligible given the overall capacity limitations of Upper Middle Road and the lack of background developments in the surrounding area.

Table 3-2: Future Background Capacity Analysis (Signalized - PM Peak Hour)

Intersection	Weekday PM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Sixth Line & Munn's Ave	0.46	8.0	A	EBLTR	0.57	41.2	D	16	31
				WBLTR	0.07	34.7	C	2	9
				NBL	0.07	2.7	A	1	5
				NBTR	0.44	4.6	A	31	64
				SBL	0.01	2.4	A	0	2
				SBTR	0.36	4.0	A	22	47
Sixth Line & River Oaks Blvd W	0.34	7.9	A	EBL	0.22	27.9	C	5	13
				EBTR	0.15	27.3	C	4	14
				WBL	0.16	27.5	C	3	10
				WBTR	0.22	27.8	C	5	15
				NBL	0.06	2.8	A	1	4
				NBTR	0.36	4.2	A	20	34
				SBL	0.05	2.7	A	1	3
				SBTR	0.33	4.0	A	18	30
Sixth Line & Dundas Street	1.08	76.4	E	EBL	0.17	27.1	C	1	5
				EBT	0.75	22.4	C	144	211
				EBR	0.11	12.4	B	0	12
				WBL	0.67	32.0	C	22	51
				WBTR	1.21	122.1	F	439	519
				NBL	0.74	55.3	E	45	66
				NBT	0.34	41.4	D	28	42
				NBR	0.12	39.2	D	0	17
				SBL	0.75	58.0	E	38	58
				SBTR	0.09	38.8	D	6	12

Intersection	Weekday PM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
50th								95th	
Sixth Line & Upper Middle Road	0.81	41.7	D	EBL	0.64	33.3	C	36	89
				EBT	0.45	22.6	C	62	95
				EBR	0.04	17.6	B	0	1
				WBL	0.27	20.1	C	10	21
				WBT	0.98	59.1	E	163	215
				WBR	0.22	27.5	C	13	30
				NBL	0.62	34.0	C	27	39
				NBT	0.50	38.2	D	51	70
				NBR	0.04	32.8	C	0	2
				SBL	0.23	31.4	C	13	21
SBTR	0.75	50.2	D	70	95				

Similar to the AM peak hour, the addition of corridor growth contributes to reduced capacity and worsening level of service at study area intersections. In particular, the westbound through at Sixth Line and Dundas and Sixth Line and Upper Middle are predicted to be at or over capacity after the addition of background traffic (220 and 117 vehicles respectively). It is expected that westbound traffic growth along both corridors will be limited by the overall capacity of each roadway.

The analysis results for signalized intersections therefore indicate that the corridor growth assumptions likely overstate future capacity constraints along Dundas Street and Upper Middle Road. However, the results do indicate that both intersections are expected to operate near capacity in terms of east-west movement and demonstrate that significant growth in traffic volumes would require additional corridor capacity or parallel east-west routes.

Table 3-3: Future Background Capacity Analysis (Unsignalized)

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access – North	WBLR	4	337	15.8	0.3	0.01	C
	SBL	3	1161	0.1	0.1	0.00	A
Sixth Line and Site Access – South	WBLR	4	330	16.0	0.3	0.01	C
	SBL	3	1149	0.1	0.1	0.00	A
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access – North	WBLR	19	322	16.9	1.5	0.06	C
	SBL	2	1023	0.1	0.0	0.00	A
Sixth Line and Site Access – South	WBLR	18	277	18.9	1.7	0.06	C
	SBL	2	1011	0.1	0.0	0.00	A

Under future background conditions, during both the weekday AM and PM peak hours, the study area unsignalized intersections are operating at an acceptable LOS, with no critical movements identified.

4 SITE GENERATED TRAFFIC

As mentioned in **Section 1**, the development proposal consists of a 9-storey mid-rise mixed-use building containing 247 residential units, approximately 391 m² of medical/dental office GFA and approximately 352 m² of retail GFA. The sections below discuss the calculation, distribution, and assignment of site-generated vehicle trips.

4.1 MODAL SPLIT

Data from the 2016 Transportation Tomorrow Survey (TTS) was extracted to identify the existing modal split within the surrounding neighbourhood (TAZs: 4035, 4036, 4037, and 4038). The peak directional modal split was considered wherever applicable (e.g. residential and retail uses). The existing modal split is summarized in **Table 4-1**, **Table 4-2** and **Table 4-3** for the residential, retail and medical/dental office uses respectively. Detailed TTS calculations are provided in **Appendix D**.

Table 4-1: Modal Split (Residential)

Peak Hour / Direction	Auto Driver	Transit	Auto Passenger	Cycle	Walk
AM Inbound	82%	6%	9%	1%	2%
AM Outbound	82%	6%	9%	1%	2%
PM Inbound	82%	7%	10%	1%	0%
PM Outbound	82%	7%	10%	1%	0%

Table 4-2: Modal Split (Retail)

Peak Hour / Direction	Auto Driver	Transit	Auto Passenger	Cycle	Walk
AM Inbound	76%	8%	15%	0%	1%
AM Outbound	76%	6%	16%	0%	2%
PM Inbound	76%	8%	15%	0%	1%
PM Outbound	76%	6%	16%	0%	2%

Table 4-3: Modal Split (Medical/Dental Office)

Peak Hour / Direction	Auto Driver	Transit	Auto Passenger	Cycle	Walk
AM Inbound	83%	2%	7%	2%	6%
AM Outbound	83%	1%	11%	0%	5%
PM Inbound	78%	1%	20%	0%	1%
PM Outbound	78%	5%	16%	0%	1%

4.2 TRIP GENERATION

4.2.1 Existing Trip Generation

The current land uses on site consist of a commercial plaza and a medical/dental office building. Trip generation for the existing uses was calculated using rates from the *ITE Trip Generation Manual 10th Edition*. ITE Land Use Codes 720 and 820 were utilized for the medical/dental office building and retail uses, respectively. Trip generation is provided in **Table 4-4** and **Table 4-5** for the existing medical/dental office and retail uses respectively. **Table 4-6** illustrates the total auto trips generated from the existing uses.

Table 4-4: Trip Generation (Existing Medical/Dental Office)

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Medical/Dental Office Building, ITE Code (720) 7,313 ft ²	Vehicle Trip Rates	2.13	0.60	2.73	0.96	2.46	3.42
	ITE Vehicle Trips	16	4	20	7	18	25
	Person Trips	22	6	28	10	26	36
	Driver	18	5	23	8	20	28
	Transit	0	0	0	0	1	1
	Passenger	2	1	3	2	4	6
	Walk/Cycle	2	0	1	0	1	0
Auto Trips		18	5	23	8	20	28

Table 4-5: Trip Generation (Existing Retail Area)

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Shopping Mall, ITE Code (820) 8,200 ft ²	Vehicle Trip Rates	0.60	0.37	0.98	1.81	1.97	3.78
	ITE Vehicle Trips	5	3	8	15	16	31
	Person Trips	6	4	10	19	20	39
	Driver	5	3	8	14	15	29
	Transit	0	0	0	2	1	3
	Passenger	1	1	2	3	3	6
	Walk/Cycle	0	0	0	0	0	0
Auto Trips		5	3	8	14	15	29

Table 4-6: Summary of Existing Auto Trips

Description	Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Medical/Dental Office	Medical/Dental Office Building, ITE Code (720)	18	5	23	8	20	28
Retail	Shopping Mall, ITE Code (820)	5	3	8	14	15	29
Auto Trips		23	8	31	22	35	57

For the existing uses, it is assumed that 31 and 57 auto trips are generated by the existing medical/dental office and retail uses during the AM and PM peak hours, respectively. These trips were distributed at the site accesses under existing and future background conditions but were removed from the road network under future total conditions. The directional distribution discussed in **Section 4.3** was also assumed for the existing vehicle trips.

4.2.2 Future Trip Generation

Three trip types are expected to be generated by the proposed development: residential, medical/dental office and retail trips. Trip generation for the proposed uses were calculated using rates from the *ITE Trip Generation Manual 10th Edition*. ITE Land Use Codes 222, 720 and 820 were utilized for the mid-rise residential, medical/dental office building and retail uses, respectively. Trip generation is provided in **Table 4-7** for the proposed mid-rise residential development, **Table 4-8** for the proposed medical/dental office, and **Table 4-9** for the proposed retail uses. **Table 4-10** illustrates the total predicted auto trips from the proposed uses.

Table 4-7: Trip Generation (Proposed Mid-rise Residential Development)

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Multifamily housing (Mid-Rise), ITE Code (222)	Vehicle Trip Rates	0.09	0.27	0.36	0.27	0.17	0.44
	ITE Vehicle Trips	23	66	89	66	43	109
	Person Trips	27	75	102	80	54	134
	Driver	23	63	86	66	44	110
	Transit	2	4	6	5	4	9
	Passenger	2	7	9	8	5	13
	Walk/Cycle	0	1	1	1	1	2
Auto Trips		23	63	86	66	44	110

Table 4-8: Trip Generation (Proposed Medical/Dental Office)

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Medical/Dental Office Building, ITE Code (720)	Vehicle Trip Rates	2.22	0.63	2.85	1.00	2.56	3.56
	ITE Vehicle Trips	9	3	12	4	11	15
	Person Trips	13	4	17	6	15	21
	Driver	11	3	14	5	12	17
	Transit	0	0	0	0	1	1
	Passenger	1	0	1	1	2	3
	Walk/Cycle	1	1	2	0	0	0
Auto Trips		11	3	14	5	12	17

Table 4-9: Trip Generation (Proposed Retail Area)

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Shopping Mall, ITE Code (820)	Vehicle Trip Rates	0.5	0.31	0.81	1.81	1.96	3.76
	ITE Vehicle Trips	2	1	3	7	7	14
	Person Trips	2	1	3	8	9	17
	Driver	2	1	3	6	7	13
	Transit	0	0	0	1	1	2
	Passenger	0	0	0	1	1	2
	Walk/Cycle	0	0	0	0	0	0
Auto Trips		2	1	3	6	7	13

Table 4-10: Summary of Proposed Auto Trips

Description	Land Use	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Mid-Rise Residential	Multifamily Housing (High-Rise), ITE Code (222)	23	63	86	66	44	110
Medical Building	Medical/Dental Office Building, ITE Code (720)	11	3	14	5	12	17
Proposed At-Grade Retail Area	Shopping Mall, ITE Code (820)	2	1	3	6	7	13
Total Auto Trips		36	67	103	77	63	140

A total of 103 and 140 auto trips are predicted for the proposed residential, medical/dental office and retail uses during the AM and PM peak hour, respectively.

After accounting for the existing site trips that will be removed, the proposed development has a predicted net trip generation of 72 and 83 vehicle trips during the AM and PM peak hour, respectively.

4.3 TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution and assignment was estimated using TTS 2016 data. **Table 4-11** summarizes trip distribution and **Table 4-12** highlights trip assignment. Vehicle trips were broken down into internal (within Oakville) and external (outside Oakville) trips. All external trips were assigned to the QEW highway. Detailed TTS calculations are provided in **Appendix D**.

Table 4-11: Trip Distribution

Time Periods	Internal				External			
	N	E	S	W	N	E	S	W
AM (IN)	3%	18%	23%	10%	6%	19%	0%	20%
AM (OUT)	2%	12%	19%	7%	6%	46%	0%	9%
PM (IN)	0%	15%	20%	2%	5%	54%	0%	4%
PM (OUT)	4%	21%	14%	13%	6%	21%	0%	22%

Table 4-12: Trip Assignment

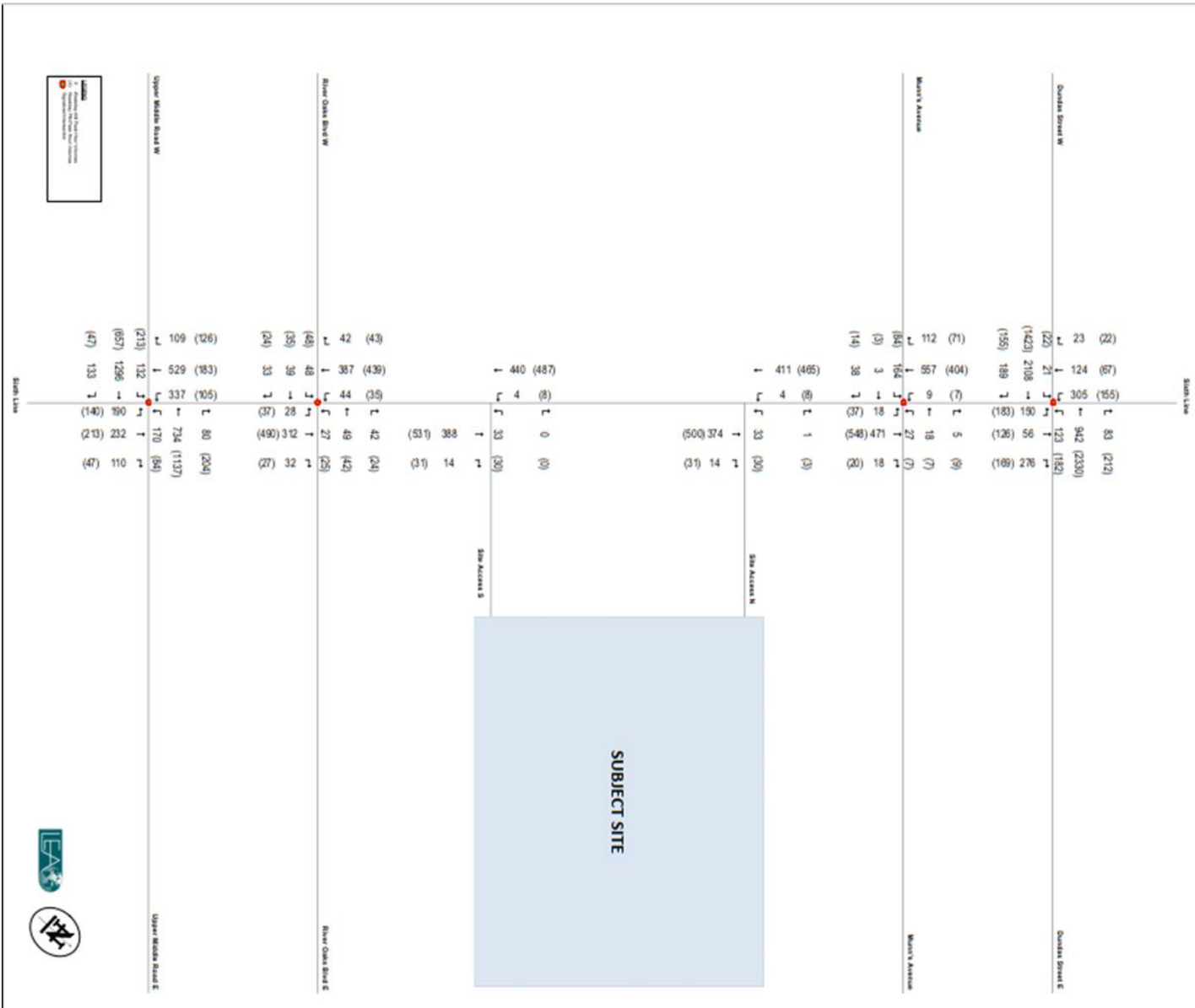
Internal				External			
N	E	S	W	N	E	S	W
Sixth Line	Upper Middle Road (50%), River Oaks Blvd (50%)	Sixth Line	Upper Middle Road (50%), River Oaks Blvd (50%)	Queen Elizabeth Way			

Figure 4-1 illustrates the assignment of site generated traffic volumes.

5 FUTURE TOTAL TRAFFIC CONDITIONS

Future total traffic conditions include the addition of site trips to future background volumes. Future total traffic volumes for the weekday AM and PM peak hours are illustrated in **Figure 5-1**.

Figure 5-1: Future Total Traffic Volumes



5.1 INTERSECTION CAPACITY ANALYSIS

Intersection capacity analysis was conducted under future total conditions during the weekday AM and PM peak hours using the same parameters as the future background conditions. Detailed capacity results are provided in **Appendix E**.

Table 5-1 and **Table 5-2** illustrate the capacity analysis for the signalized intersections. **Table 5-3** illustrates the capacity analysis for the unsignalized intersections.

Table 5-1: Future Total Capacity Analysis (Signalized – AM)

Intersection	Weekday AM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Sixth Line & Munn's Ave	0.71	16.3	B	EBLTR	0.72	38.3	D	37.9	52.1
				WBLTR	0.15	26.5	C	7.5	14.2
				NBL	0.09	6.6	A	1.3	5.4
				NBTR	0.51	9.8	A	48.6	89.0
				SBL	0.03	5.7	A	0.6	3.2
				SBTR	0.71	13.9	B	81.0	148.3
Sixth Line & River Oaks Blvd W	0.36	9.0	A	EBL	0.28	28.1	C	6.5	15.5
				EBTR	0.19	27.3	C	5.2	15.8
				WBL	0.19	27.5	C	3.6	10.5
				WBTR	0.29	28.1	C	6.6	18.9
				NBL	0.05	2.8	A	1.0	3.6
				NBTR	0.30	3.9	A	15.3	29.0
				SBL	0.08	2.8	A	1.7	5.0
SBTR	0.37	3.7	A	20.5	38.1				
Sixth Line & Dundas Street	1.04	76.4	E	EBL	0.09	13.2	B	1.9	5.1
				EBT	1.20	126.4	F	~347.7	#413.7
				EBR	0.14	16.2	B	2.1	15.9
				WBL	0.58	31.9	C	14.1	34.2
				WBTR	0.59	18.9	B	93.8	116.7
				NBL	0.47	36.6	D	31.2	52.8
				NBT	0.12	31.9	C	10.5	21.3
				NBR	0.23	33.2	C	5.3	27.8
				SBL	0.92	71.5	E	74.3	#128.9
SBTR	0.15	32.2	C	12.7	21.5				
Sixth Line & Upper Middle Road	1.11	63.7	E	EBL	0.53	23.2	C	18.6	31.4
				EBT	1.03	69.2	E	~190.1	#234.3
				EBR	0.12	24.6	C	2.2	15.7
				WBL	1.08	124.9	F	~34.9	#82.6
				WBT	0.60	31.8	C	79.9	101.3
				WBR	0.07	23.8	C	0.0	8.4
				NBL	1.14	140.4	F	~41.7	#91.1
				NBT	0.40	30.4	C	45.7	69.8
				NBR	0.09	26.7	C	0.0	13.0
SBL	0.80	40.1	D	59	90				
SBTR	1.09	102.7	F	186	261				

The analysis results indicate that all intersections are expected to operate similar to future background conditions in terms of capacity and LOS. No critical movements are added under future total conditions, and all capacity constraints remained unchanged. The only critical movement that is expected to be utilized by site traffic is the southbound through/right at Sixth Line and Upper Middle Road, where an additional 15 trips are anticipated (approx. 2% of total movement volumes). Although this movement is expected to operate near capacity the addition of site traffic will result in a negligible V/C increase of 0.03 and an additional 9 seconds of average delay.

Table 5-2: Future Total Capacity Analysis (Signalized – PM)

Intersection	Weekday PM Peak Hour								
	Overall			Movements of Interest					
	V/C	Delay (s)	LOS	Movement	V/C	Delay (s)	LOS	Queue (m)	
								50th	95th
Sixth Line & Munn's Ave	0.46	7.9	A	EBLTR	0.57	41.2	D	16.2	30.8
				WBLTR	0.07	34.7	C	2.3	8.7
				NBL	0.07	2.8	A	1.4	5.1
				NBTR	0.45	4.6	A	31.6	64.2
				SBL	0.01	2.4	A	0.2	1.6
				SBTR	0.37	4.1	A	23.5	48.8
Sixth Line & River Oaks Blvd W	0.38	7.9	A	EBL	0.26	28.1	C	5.9	14.8
				EBTR	0.15	27.3	C	4.2	13.7
				WBL	0.16	27.5	C	3.0	9.4
				WBTR	0.22	27.8	C	5.1	15.4
				NBL	0.06	2.8	A	1.2	3.7
				NBTR	0.41	4.5	A	23.7	40.1
				SBL	0.06	2.8	A	1.2	3.6
Sixth Line & Dundas Street	1.08	77.5	E	EBL	0.17	27.1	C	1.4	5.0
				EBT	0.75	22.6	C	144.6	211.4
				EBR	0.11	12.5	B	0.0	11.9
				WBL	0.68	32.5	C	22.4	51.7
				WBTR	1.22	124.4	F	~440.6	#521.0
				NBL	0.74	55.5	E	45.2	65.5
				NBT	0.34	41.3	D	28.5	42.6
				NBR	0.12	38.9	D	0.0	17.0
				SBL	0.75	57.8	E	38.3	58.0
Sixth Line & Upper Middle Road	0.82	43.0	D	EBL	0.65	34.0	C	38.1	#97.6
				EBT	0.45	22.8	C	62.8	96.2
				EBR	0.04	17.7	B	0.0	1.3
				WBL	0.27	20.4	C	9.7	21.4
				WBT	0.99	62.2	E	163.3	#215.1
				WBR	0.31	29.5	C	21.0	43.5
				NBL	0.64	35.5	D	26.7	38.3
				NBT	0.52	39.6	D	50.7	69.1
				NBR	0.04	33.7	C	0.0	1.8
				SBL	0.35	31.3	C	19.4	29.2
SBTR	0.78	51.9	D	73.1	98.4				

Similar to the weekday AM peak hour, all signalized intersections are expected to operate similar to future background conditions during the weekday PM peak hour. A minimal reduction in capacity and

increased delay is observed for individual movements within the study area and no site traffic is added to any critical movements.

Table 5-3: Future Total Capacity Analysis (Unsignalized)

Intersection	Movement of Interest	Weekday AM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access North	WBLR	37	325	17.5	3.1	0.11	C
	SBL	4	1136	0.1	0.1	0.00	A
Sixth Line and Site Access South	WBLR	36	299	18.7	3.2	0.12	C
	SBL	4	1118	0.1	0.1	0.00	A
Intersection	Movement of Interest	Weekday PM Peak Hour					
		Flow Rate (vph)	Capacity (vph)	Control Delay (s)	95th Queue (m)	V/C	LOS
Sixth Line and Site Access North	WBLR	36	292	19.0	3.3	0.12	C
	SBL	9	981	0.3	0.2	0.01	A
Sixth Line and Site Access South	WBLR	33	232	23.1	3.9	0.14	C
	SBL	9	947	0.3	0.2	0.01	A

The analysis results indicate that both site accesses are expected to operate well during the weekday peak hours. All individual movements are expected to have available capacity and experience LOS C or better.

The future total analysis therefore demonstrates that the proposed development will have a negligible impact on the surrounding road network, resulting in a minimal change in intersection operations relative to future background conditions.

6 TRANSPORTATION DEMAND MANAGEMENT PLAN

Transportation Demand Management (TDM) is a set of strategies which strive towards a more efficient transportation network by influencing travel behaviour. Effective TDM measures can reduce vehicle usage and encourage people to engage in more sustainable methods of travel. The location of the subject site relative to cycling infrastructure and local transit provides opportunities to promote non-auto travel.

6.1 PEDESTRIAN-BASED STRATEGIES

Building entrances oriented close to the street with direction connections to the pedestrian pathways.

The proposed pedestrian entrances to the medical/dental office and retail uses will front on to Sixth Line. This orientation enables convenient access for pedestrians, transit users and cyclists.

Provide enhanced landscaping that would encourage walking and pedestrian activity

The sidewalk network within the site and along Sixth Line should provide a pleasant and safe pedestrian experience through enhanced landscaping. Pedestrian-scale lighting and tree planting will be provided along the exterior of the building. The pedestrian network in the vicinity of the subject site will provide a variety of amenities for a safe and enjoyable pedestrian environment, which will encourage the use of walking as a travel alternative.

6.2 PARKING-BASED STRATEGIES

Provision of unbundled parking

The proposed development will sell parking spaces separately from the cost to purchase a unit. This will encourage the use sustainable travel modes and reduce auto-dependency by decoupling the cost of home and vehicle ownership.

Provision of carshare spaces

Carshare programs generally function as a membership program where members pay an upfront fee to join and subsequently pay a monthly/annual fee for access to a fleet of vehicles and parking locations. The proposed development will provide four (4) dedicated carshare parking spaces on-site to serve residents and visitors.

The provision of carshare spaces will further reduce demand for automobile ownership as they will allow residents without a personal vehicle to still have occasional access when required. This is particularly useful for discretionary trips which do not occur as frequently as work or school trips, such as grocery shopping, social/recreational gatherings, and long-distance recreational trips.

6.3 TRANSIT-BASED STRATEGIES

Provision of pre-loaded PRESTO cards to all new residents

PRESTO is a contactless smart card used on participating public transit systems within the Greater Toronto and Hamilton Area (GTHA) and Ottawa. To further incentivize unit purchasers to make more transit-based trips, it is proposed that \$50 pre-loaded PRESTO cards be provided with the sale of each unit. Furthermore, PRESTO cards should be accompanied by information regarding transit connections and typical travel times to various attractions within Oakville and neighbouring municipalities.

6.4 CYCLING-BASED STRATEGIES

Provision of bicycle repair facility

Providing basic equipment for keeping bicycles in good working condition can encourage residents, as well as users and employees of the retail and medical/dental office to use cycling as a travel alternative. The proposed development will include a bike repair facility. Bicycle repair facilities include hand tools, tire gauges, and tire pumps will also be provided on-site.

Provide active transport/transit information packages to residents

It is recommended that information packages be provided to residents of the proposed development to help encourage active transportation and increase awareness of different travel alternatives. The package should include information regarding the environmental and health benefits of cycling, rules of the road, as well as maps of active transportation infrastructure available in the surrounding area. The packages should also include route, schedule, and fare information. This information will also be made easily accessible in the building lobby, so residents/tenants can stay up to date on available travel options.

7 VEHICLE PARKING

7.1 VEHICULAR PARKING REQUIREMENTS

Table 7-1: Vehicular Parking Supply

Land Use	Unit Count/ NFA	Unit Mix	Zoning By-law 2014-014 – Mixed Use Zones		Proposed Supply	Effective Supply
			Parking Rate	Parking Supply		
< 75 m ² NFA	204	83%	0.80 spaces/unit	163 spaces	0.75 spaces/unit (185 residential spaces)	0.81 spaces/unit (185 residential + 4 carshare spaces = 201 spaces) ¹
> 75 m ² NFA	43	17%	1.05 spaces/unit	45 spaces		
Total				208 spaces (0.84 spaces/unit)		
Visitor	247	100%	0.2 spaces/unit	49 spaces	55 spaces	55 spaces
Retail	352 m ²	-	1 space/24.0 m ² NFA	15 spaces		
Medical / Dental	391 m ²	-	1 space/18.0 m ² NFA	22 spaces		
Total				294 spaces	240 spaces	256 spaces

As per the Town of Oakville By-law 2014-014, a total of 208 residential, 49 visitor, and 37 non-residential parking spaces are required. The proposed parking supply consists of 185 residential (0.75 spaces per unit), 4 carshare, and 55 shared visitor/non-residential spaces. In terms of the by-law requirements, the proposed parking supply is deficient by 23 residential spaces and 31 visitor/non-residential spaces. However, as per parking demand research conducted by IBI, a typical carshare space can replace the demand of 4 residential spaces (see footnote below). As a result, the effective residential parking supply is 201 spaces (0.81 spaces per unit), resulting in a minor by-law deficiency of 7 residential parking spaces. Residents without a personal vehicle will have access to the 4 on-site carshare spaces to accommodate occasional vehicle trips, along with the transit and active transport travel alternatives highlighted in the sections above.

A discussion of the appropriateness of the proposed parking supply is provided below.

¹ In the IBI Group report, *Parking Standards Review Examination of Potential Options and Impacts of Car Share Programs on Parking Standards* (March 2009), it was found that a dedicated car share space is approximately equivalent to 4 regular parking spaces. The report provides the following equation to define the maximum allowable reduction of regular spaces for a given development:

$$\text{Maximum allowable reduction} = 4 \times \left(\frac{\# \text{ units}}{60} \right), \text{ rounded down to the nearest whole number}$$

For the subject site, this equation yields a maximum allowable reduction of 16 spaces from 4 carshare spaces. Thus, the parking supply of 185 residential and 4 carshare spaces is equivalent to 201 residential spaces and an effective parking rate of 0.81 spaces per unit.

Link: <http://www.urbandb.com/document/ibi-group-parking-standards-review-examination-of-potential-options-and-impacts-of-car-share-programs-on-par...-2009-03-01.pdf>

7.2 POLICY REVIEW

7.2.1 The Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) outlines the Ontario Government’s policies on land use planning and provides direction to ensure the development of healthy and resilient communities with a thriving economy. Under Section 3 of the Planning Act, all decisions affecting land use planning matters “*shall be consistent with*” the PPS. One of the key matters pertaining to PPS policies includes promoting transportation decisions that increase active transportation and transit usage. As stated under PPS Section 1.8.1 b, **planning authorities shall support land use and development patterns which “*promote the use of active transportation and transit in and between residential, employment (including commercial and industrial) and institutional uses and other areas;*”**.

By providing a reduction in parking relative to the zoning by-law requirements, the proposed development is in support of the changing paradigm towards shifting away from the provision of excess parking spaces. Given that the subject site is located adjacent to existing cycling infrastructure and a transit route, employees and visitors to the site will be encouraged to use alternative modes of transportation and will be less reliant upon personal vehicles.

Relatedly, a key focus of the PPS is to manage development to support population growth while minimizing impacts to the natural environment. For transportation systems, which are defined to include parking, key directives include providing efficient systems to address project needs, efficiently using existing and planned infrastructure through TDM strategies, minimizing the length and number of vehicle trips, and supporting the use of transit and active transportation modes.

7.2.2 The Growth Plan for the Greater Golden Horseshoe (2020)

The Growth Plan for the Greater Golden Horseshoe provides a framework for municipalities to better manage growth in the region that supports a high quality of life, environmental protection, as well as economic prosperity. The support of municipalities in land use choices are vital to achieve the long-term framework outlined by the Growth Plan. Some of the key issues listed in the Growth Plan include:

- ▶ Building complete communities that better connect transit with where residents live, work, and play
- ▶ Minimize the negative impacts of climate change

By lowering the number of parking spaces available for visitors and retail/medical office customers and employees, the proposed development supports **lowering the negative environmental impact caused by automobile usage**. The proposed parking for this development therefore aligns with transportation-related issues and goals outlined in the Growth Plan.

7.2.3 Town of Oakville Official Plan

The Town of Oakville Official Plan, referred to as the ‘Livable Oakville Plan’, establishes the “***desired land use pattern for lands within the Town, south of Dundas Street and north of Highway 407***”. The Plan also establishes the policies and land use designations within the town which implement the Town of Oakville’s vision “***to be the most livable Town in Canada***”.

The Town’s Official Plan notes that the municipality’s general objectives for transportation are “***to provide a public transit network that can offer a real alternative to private automobile use***” and “***to provide a network of on- and off-road pedestrian and cycling facilities that allow the use of active transportation modes as an alternative to the automobile***”. These general transportation objectives highlight the desire

of the Town to see transit and active forms of transportation be utilized as a way of reducing auto dependency. The proposed development supports these objectives as it is located within a two-minute walk of a local transit route and fronts onto a road with bike lanes, and is also located near a major arterial which is equipped with a multi-use path. Therefore, use of the nearby transit and active transportation infrastructure will be promoted through the appropriate provision of on-site vehicle parking.

In addition, the Town of Oakville's Official Plan also encourages the development of Transportation Demand Management Plans (TDM) as a way of reducing single occupancy motor vehicle usage, particularly during the peak travel periods. The plan notes through Section 8.14.2 that ***"TDM will be used to reduce the use of single occupancy vehicles and encourage increased transit ridership, walking and cycling."*** Section 8.14.3 also notes that ***"as an incentive to encourage TDM, the Town may permit reduced parking standards for developments which demonstrate, through a TDM plan and implementation strategy, that a reduction in parking standards is appropriate"***. Consequently, a TDM plan is included as part of this TIS which provides a number of measures that will encourage a reduction in single occupancy vehicle trips.

7.3 PROXY PARKING SURVEYS – VISITOR DEMAND

Due to the circumstances surrounding public safety and the COVID-19 outbreak, it was not feasible to obtain permission to enter residential buildings to survey visitor parking utilization. Therefore, past parking demand surveys from the existing LEA Consulting database were used to perform a proxy site comparison.

Table 7-2 details comparable proxy sites and the peak parking demand observed during each survey period. The surveys were primarily conducted from 2017 to 2019 and are therefore indicative of residential visitor parking demand over the past four (4) years.

The proxy sites are located primarily within the nearby City of Mississauga, with one site located in the Town of Oakville. The sites were chosen because they have a similar WalkScore™, a common metric used to assess walkability. A map illustrating the location of each proxy site is illustrated below in **Figure 7-1**. Detailed proxy parking survey data can be found in **Appendix G**.

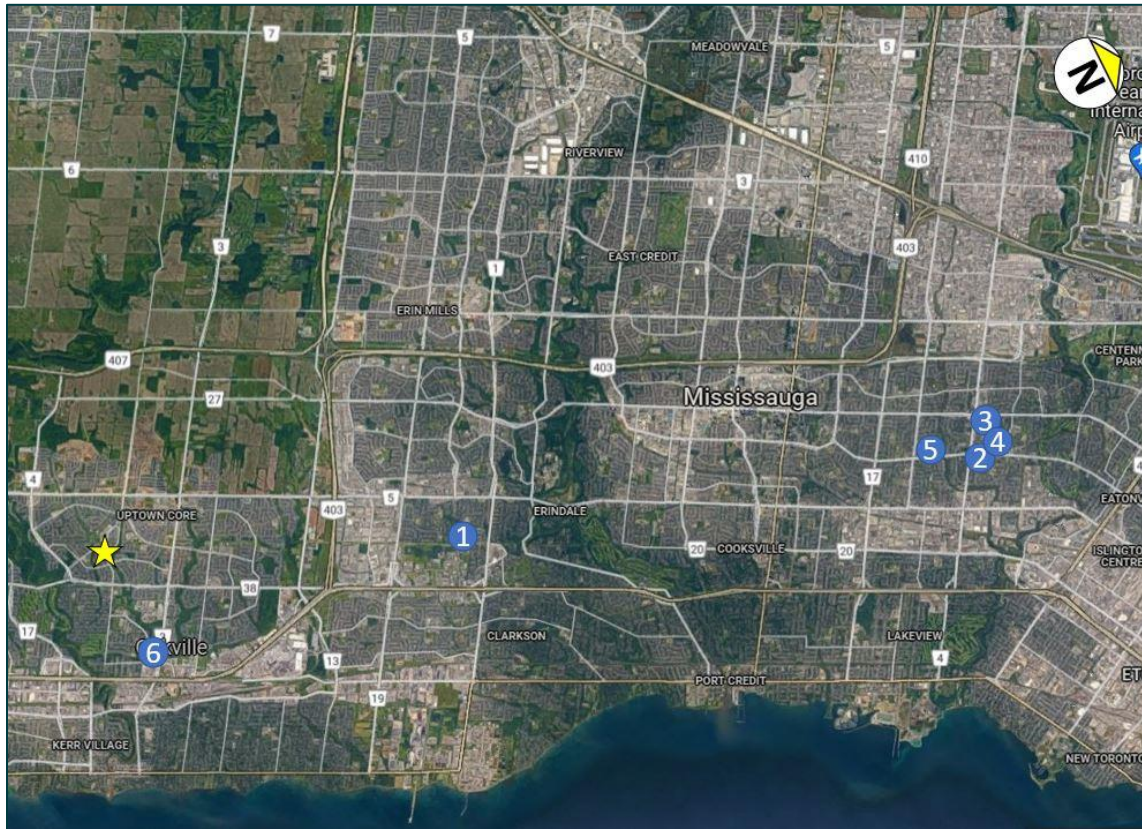
Table 7-2: Residential Visitor Proxy Parking Surveys

#	Proxy Site Locations	Total Units	WalkScore	Survey Period Visitor Peak Parking Demand	Parking Demand Rate (spaces/unit)	
					Spaces	Rate/Unit
1	2185 Sheridan Park Drive and 2250 Homelands Drive, Mississauga	332	23	Fri., September 14 th , 2018 (7:00 AM to 9:00 AM) Fri., September 14 th , 2018 (4:00 PM to 1:00 AM) Sat., September 15 th , 2018 (6:00 PM to 1:00 AM)	22	0.07 ¹
2	1475 Bloor Street, Mississauga	60	57	Fri., April 13 th , 2018 Sat., April 14 th , 2018	5	0.09
3	3480 Havenwood Drive, Mississauga	132	65	Fri., August 9 th , 2019 Sat., August 10 th , 2019	7	0.05
4	1485 Williamsport Drive, Mississauga	132	59	Fri., August 9 th , 2019 Sat., August 10 th , 2019	10	0.08
5	1055 Bloor Street, Mississauga	323	48	Fri., October 25 th , 2019	14	0.04
6	297 Queens Avenue, Oakville	100	66	Fri., September 8 th , 2017 Sat., September 9 th , 2017 Fri., September 15 th , 2017 Sat., September 16 th , 2017	5	0.05
			Avg. WalkScore: 47	Average Visitor Demand Rate		0.06
Subject Site			Walk Score: 46	Proposed Visitor Parking Rate		0.22²

(1) Rate includes peak visitor parking on-site and on-street visitor parking demand

(2) Shared with non-residential component

Figure 7-1: Residential Proxy Parking Survey Location



Source: Google Maps, 2021

The proxy survey results indicate an average visitor parking demand of 0.06 spaces per unit, well below the proposed visitor rate of 0.22 spaces per unit or the Town of Oakville by-law requirement of 0.20 spaces per unit. As a result, it can be concluded that the proposed visitor parking rate will adequately meet anticipated visitor parking demand.

7.4 SHARED PARKING UTILIZATION

The proposed visitor parking supply will be shared with the non-residential uses given their offsetting periods of elevated demand. Given that specific parking rates by time period are not specified in the Town of Oakville By-law 2014-014, hourly anticipated demand was determined based on the *Shared Parking – Third Edition Report (March 2020)* published by the Urban Land Institute (ULI). As part of this assessment, it was assumed that peak visitor parking demand would be more consistent with the observed demand at comparable proxy sites (discussed above in **Section 7.3**). To be conservative, it was assumed that peak visitor demand would be 25% below the rate specified in the Town by-law, or 0.15 spaces per unit. No modifications were made to the assumed parking demand of the retail or medical/dental office components. The resulting shared parking demand calculations are detailed below in **Table 7-3**.

Table 7-3: Shared Parking Demand Based on Time-of-Day by Hour (as per the ULI Shared Parking Report 3rd Edition)

Use	Req. Spaces	Peak Parking Demand By Hour (Weekday) & [Weekend]																		
		Day											Night							
		6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM
Percentage of Peak Parking Demand																				
Residential Visitor	37	(0%) [0%]	(10%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(20%) [20%]	(40%) [40%]	(60%) [60%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(80%) [80%]	(50%) [50%]
Medical/Dental Office ⁽¹⁾	22	(0%) [0%]	(20%) [20%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(100%) [100%]	(67%) [0%]	(30%) [0%]	(15%) [0%]	(0%) [0%]	(0%) [0%]	(0%) [0%]	(0%) [0%]
Retail ⁽²⁾	15	(2%) [2%]	(6%) [6%]	(16%) [31%]	(36%) [53%]	(62%) [72%]	(77%) [91%]	(100%) [96%]	(100%) [100%]	(96%) [100%]	(87%) [96%]	(87%) [91%]	(87%) [82%]	(91%) [76%]	(82%) [71%]	(68%) [66%]	(47%) [52%]	(18%) [32%]	(7%) [11%]	(0%) [0%]
Number of Spaces Required Based on Demand																				
Residential Visitor	37	(0) [0]	(4) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(7) [7]	(15) [15]	(22) [22]	(37) [37]	(37) [37]	(37) [37]	(37) [37]	(30) [30]	(19) [19]
Medical/Dental Office	22	(0) [0]	(4) [4]	(22) [22]	(22) [22]	(22) [22]	(22) [22]	(22) [22]	(22) [0]	(22) [0]	(22) [0]	(22) [0]	(22) [0]	(15) [0]	(7) [0]	(3) [0]	(0) [0]	(0) [0]	(0) [0]	(0) [0]
Retail	15	(0) [0]	(1) [1]	(2) [5]	(5) [8]	(9) [11]	(12) [14]	(15) [14]	(15) [15]	(14) [15]	(13) [14]	(13) [14]	(13) [12]	(14) [11]	(12) [11]	(10) [10]	(7) [8]	(3) [5]	(1) [2]	(0) [0]
Total Spaces Required	74	(0) [0]	(9) [12]	(31) [34]	(34) [37]	(38) [40]	(41) [43]	(44) [43]	(44) [22]	(43) [22]	(42) [21]	(42) [21]	(50) [27]	(51) [33]	(56) [48]	(50) [47]	(44) [45]	(40) [42]	(31) [32]	(19) [19]
Remaining Unoccupied Spaces Compared to Proposed Supply																				
Available Supply	55	(55) [55]	(46) [43]	(24) [21]	(21) [18]	(17) [15]	(14) [12]	(11) [12]	(11) [33]	(12) [33]	(13) [34]	(13) [34]	(5) [28]	(4) [22]	(-1) [7]	(5) [8]	(11) [10]	(15) [13]	(24) [23]	(36) [36]

(1) To be conservative, parking demand for the medical/dental office uses was calculated based on the employee utilization rate (as it is always at or higher than the visitor rate)

(2) A weighted parking demand rate was calculated for the retail use assuming 90% of demand is from visitors and 10% is from employees. This proportion was assumed based on typical employee to customer ratios in retail stores.

As illustrated in **Table 7-3**, the residential visitor, retail, and medical/dental office uses have varying levels of peak demand. As a result, the overall anticipated visitor/non-residential parking demand is largely consistent with the proposed parking supply of 55 spaces. Peak demand is anticipated to marginally exceed the available supply during the weekday period from 7-8pm, when demand is expected to peak at 56 spaces. As a result, a minor shortfall will exist that can be accommodated by the adjacent on-street parking on Sixth Line (see **Section 7.5** below for details).

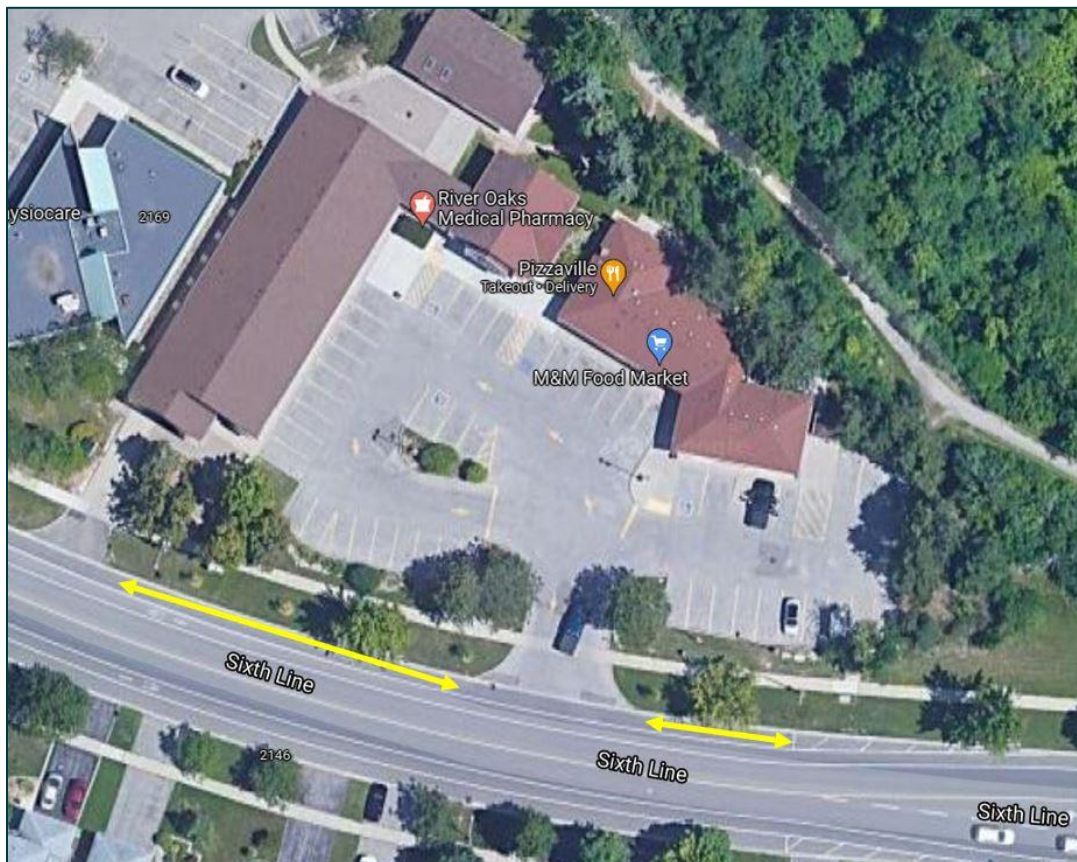
7.5 ON-STREET PARKING AVAILABILITY

As noted above, the shared parking calculation results in a minor supply deficiency during the weekday evening period between 7-8pm, resulting in a shortfall of 1 non-residential space.

As per the Town of Oakville by-law, on-street parking is permitted for up to 3 hours, consistent with the typical duration required for retail and medical/dental office customers. Temporary parking permits are also available for longer periods.

As illustrated in **Figure 7-2**, there is approximately 60m of curb space available on Sixth Line adjacent to the site frontage. Parallel parking spaces typically require 6.7m of space per vehicle, resulting in an effective on-street supply of 9 spaces directly adjacent to the site. This exceeds the predicted parking shortfall of 1 space that is anticipated to occur for a one hour period. In the unlikely event that demand exceeds the available on-street supply, additional on-street parking is available on Sixth Line to the north and south of the subject site.

Figure 7-2: On-Street Parking Availability



Source: Google Maps, 2021

7.6 CONCLUSION

In conclusion, the proposed development is seeking an appropriate reduction in parking from the by-law requirements. The proposed residential supply of 185 regular and 4 carshare spaces will adequately serve anticipated demand and provide a convenient alternative to personal vehicle ownership for residents who would otherwise own one or more automobiles. The proposed residential supply is only deficient by 6 spaces relative to the by-law requirements. In terms of visitor/non-residential parking, the supporting justification demonstrates that the proposed supply of 55 spaces will adequately serve anticipated demand based on observed proxy data and time of day utilization as per the ULI Shared Parking Report. During periods of heightened visitor/non-residential parking demand, additional on-street curbside space is available along Sixth Line to serve visitors and customers. As a result, it can be concluded that the proposed parking supply will adequately serve anticipated demand and is consistent with the policy objectives articulated by the Province and Town.

8 BICYCLE PARKING REQUIREMENTS

Table 8-1: Bicycle Parking Supply

Land Use	Zoning By-law 2014-014	Unit Count/NFA	Required Supply	Proposed Supply
	Bicycle Requirements			
Apartment Dwelling	0.75 spaces/dwelling	247 units	30 spaces	80 spaces
Visitor	0.25 spaces/dwelling	247 units		6
Retail	Greater of 2 or 1.0 spaces/1,000 m ² NFA	352 m ²		
Medical/Dental	Greater of 2 or 1.0 spaces/1,000 m ² NFA	391 m ²		
Total				86 spaces

As detailed above in **Table 8-1**, a total of 30 bicycle parking spaces are required as per the Town of Oakville's Zoning By-law 2014-014 Section 5.4.1 b): *"In no circumstance shall the number of minimum bicycle parking spaces required on a lot be greater than 30"*. 86 bicycle parking spaces are proposed for the subject site, exceeding the by-law requirement.

9 LOADING REQUIREMENTS

According to Zoning By-Law 2014-014, there is no minimum number of loading spaces required. One (1) loading space is provided on site for the residential and medical/dental office and retail uses. Zoning By-Law 2014-014 dictates the following requirements for a loading space: *“the minimum dimensions of a loading space are 3.5 metres in width and 12.0 metres in length, with a minimum vertical clearance of 4.2 metres”*. The proposed loading space satisfies the minimum by-law requirements. Swept path diagrams illustrating vehicular and loading functionality are provided in **Appendix F**.

10 CONCLUSIONS

- ▶ The proposed development consists of a 9-storey mid-rise mixed use building containing 247 residential units, approximately 391 m² of medical/dental office NFA and approximately 352 m² of retail NFA, with parking provided in two levels of underground parking.
- ▶ Under existing conditions, all study area signalized and unsignalized intersections are operating at an acceptable LOS D or better. However, there are several critical movements at signalized intersections, including the eastbound through at Sixth Line & Dundas and Sixth Line & Upper Middle (AM), the southbound through at Sixth Line & Upper Middle (AM), and the westbound through at Sixth Line & Dundas (PM), along with several left turn movements at both intersections. All unsignalized movements are currently operating well.
- ▶ Under future background conditions, the study area intersections are expected to experience a reduction in capacity and level of service based on general background traffic growth. Capacity constraints identified under existing conditions are expected to worsen, with several experiencing a V/C above 1.0 and/or LOS F. However, the corridor growth rate assumption of 2% is unrealistic given the overall capacity constraints along the Dundas Street and Upper Middle Road corridors, and it is more likely that all constrained movements will be operating near capacity.
- ▶ A total of 72 and 83 net auto trips are predicted for the proposed development during the AM and PM peak hour, respectively.
- ▶ Under future total conditions, all movements are anticipated to operate similar to future background conditions. All movements at the site accesses are expected to function well.
- ▶ The proposed parking supply consists of 185 residential, 4 carshare, and 55 shared visitor/non-residential spaces. The effective residential supply of 201 spaces (based on the 4:1 carshare ratio) results in a minor by-law deficiency of 7 spaces. The proposed visitor/non-residential supply is deficient by 31 spaces relative to the by-law requirements. A supporting justification has been prepared based on proxy survey data, shared parking utilization rates and a review of available on-street parking adjacent to the site, illustrating that the proposed parking supply is sufficient and can support anticipated visitor/non-residential demand.
- ▶ A total of 86 bicycle spaces will be provided: 80 resident bicycle parking spaces and 6 non-residential/visitor bicycle parking spaces. The proposed bike parking supply exceeds the by-law requirements.
- ▶ According to the zoning by-law, there is no minimum number of loading spaces required. One loading space will be provided on the subject site.





APPENDIX A

Terms of Reference and Correspondence



August 16th, 2021

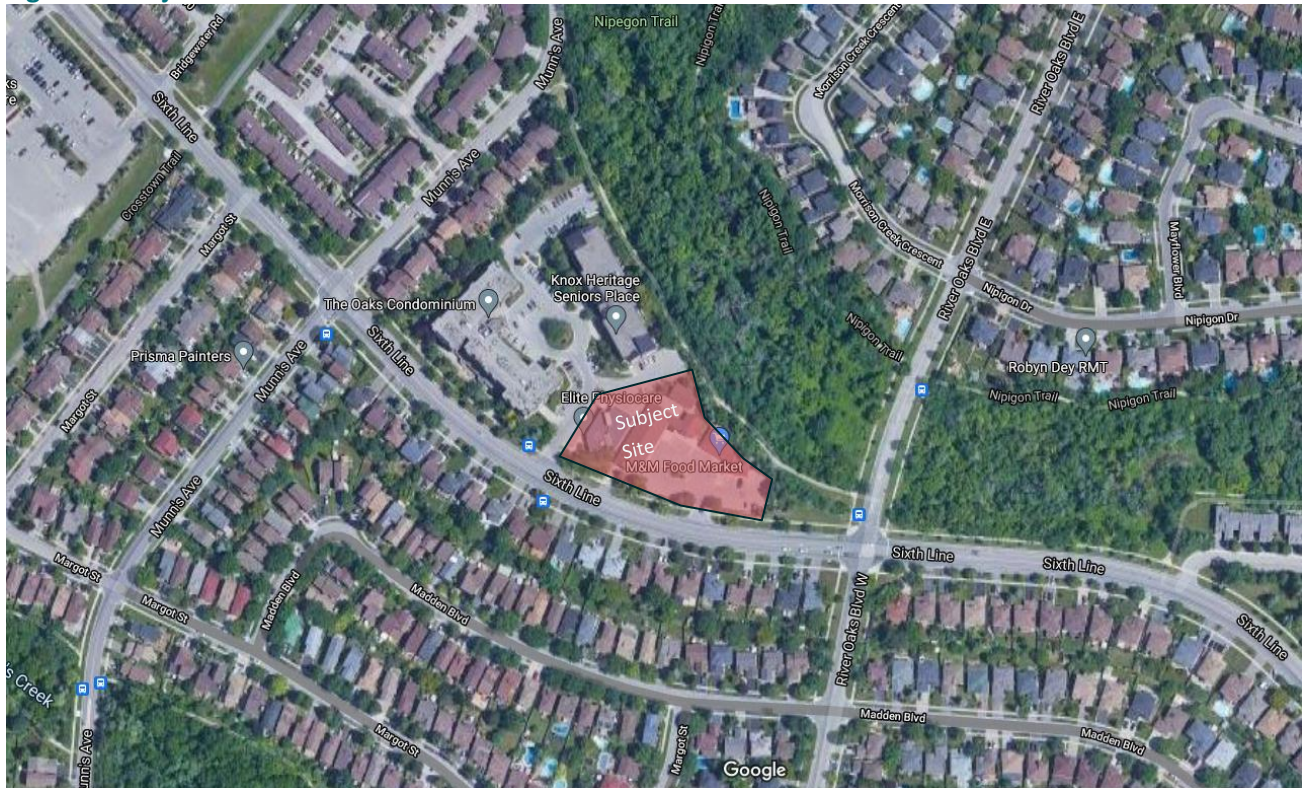
Reference Number: 21304

Town of Oakville Development Engineering
Via email: service@oakville.ca

**RE: Terms of Reference – Transportation Impact Study
Proposed Mixed Use Development
2163-2169 Sixth Line, Town of Oakville**

We wish to confirm the following work plan for a Transportation Impact Study (TIS) for the proposed mid-rise mixed use development located at 2163-2169 Sixth Line (herein referred to as the “subject site”) in the Town of Oakville. The subject site is currently occupied by a commercial plaza, as illustrated in **Figure 1**.

Figure 1: Subject Site Location



The development proposal consists of an 8-storey mixed use building containing 256 residential units and 743 m² of commercial GFA. The proposed parking supply has not yet been finalized. Site access will be provided via two driveways on Sixth Line, consistent with the existing site access configuration.



The TIS for the proposed development will be conducted following the Halton Region Transportation Impact Study Guidelines, dated January 2015. The following outlines the proposed Terms of Reference for the study.

STUDY AREA & TRAFFIC DATA

The proposed study area will include the analysis of the following intersections:

- Sixth Line and River Oaks Boulevard (Signalized); and
- Sixth Line and Munn's Avenue (Signalized).

Due to the limitations brought forth by the COVID-19 pandemic in capturing updated traffic data during typical weekday peak periods, LEA will purchase the most recent turning movement count (TMC) data available for the study area intersections. Where data less than two (2) years old are not available, LEA will adjust the TMC data in order to derive present day traffic volumes for the year 2021.

TRAFFIC ASSESSMENT & STUDY HORIZON YEAR

The study will focus on weekday AM and PM peak hour traffic operations. Synchro version 11.0 will be used to assess intersection operations during the weekday peak hours. A five (5) year horizon will be assessed for the year 2026.

BACKGROUND TRAFFIC

General Corridor Growth Rate – Given the lack of significant development activity in the surrounding area, a 0.5% corridor growth rate will be assumed for through traffic volumes on all roadways. Please confirm if this assumption is appropriate or suggest an alternative growth rate(s).

Road Network Improvements – LEA will note any road network improvements identified within the study area and account for any traffic diversions associated with these improvements within in our analysis.

Background Development Traffic – LEA is requesting that the Region/Town provide any relevant background developments for inclusion within our study.

TRIP GENERATION, DISTRIBUTION, & ASSIGNMENT

Trip generation associated with the proposed development will be forecast using the Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition.

The general trip distribution and assignment of site traffic will be based on the latest Transportation Tomorrow Survey (TTS) data and existing traffic patterns. Trip assignment will reflect the configuration of site accesses, turning restrictions, and logical routings.

FUTURE TRAFFIC SCENARIOS

Future background and future total analyses for the aforementioned intersections within the study area will be over a five (5) year horizon for the year 2026.

REMEDIAL MEASURES

Any movements at the studied intersections that exceed a V/C ratio of 0.85 under future total conditions will be identified. If remedial actions such as signal optimization are unsuccessful this will also be identified.



If remedial measures are to be employed, a scenario will be provided demonstrating the change in intersection operations.

PARKING

LEA proposes to conduct a parking study to determine the applicability of the enforcing by-law to the present local transportation context. A review of proposed and approved parking rates at nearby developments will inform what has been deemed appropriate for the study area.

TRANSPORTATION DEMAND MANAGEMENT

A Transportation Demand Management (TDM) Plan will be provided to promote alternate modes of travel.

ACCESS & ON-SITE CIRCULATION

A sightline analysis will be conducted to confirm adequate sightlines for the site access. A swept path analysis will also be conducted to confirm that all servicing vehicles can be accommodated in an acceptable manner.

Should you have any questions or concerns regarding these terms of reference, please do not hesitate to contact me at 905-470-0015 Ext. 274 or by email at rkeel@lea.ca.

Yours truly,

LEA CONSULTING LTD.

Robert Keel, M.Sc.Pl., MCIP, RPP
Project Coordinator



August 16th, 2021

Reference Number: 21304

Mr. Patrick Monaghan
Transportation Planning Coordinator
Infrastructure Planning & Policy
Public Works
Halton Region

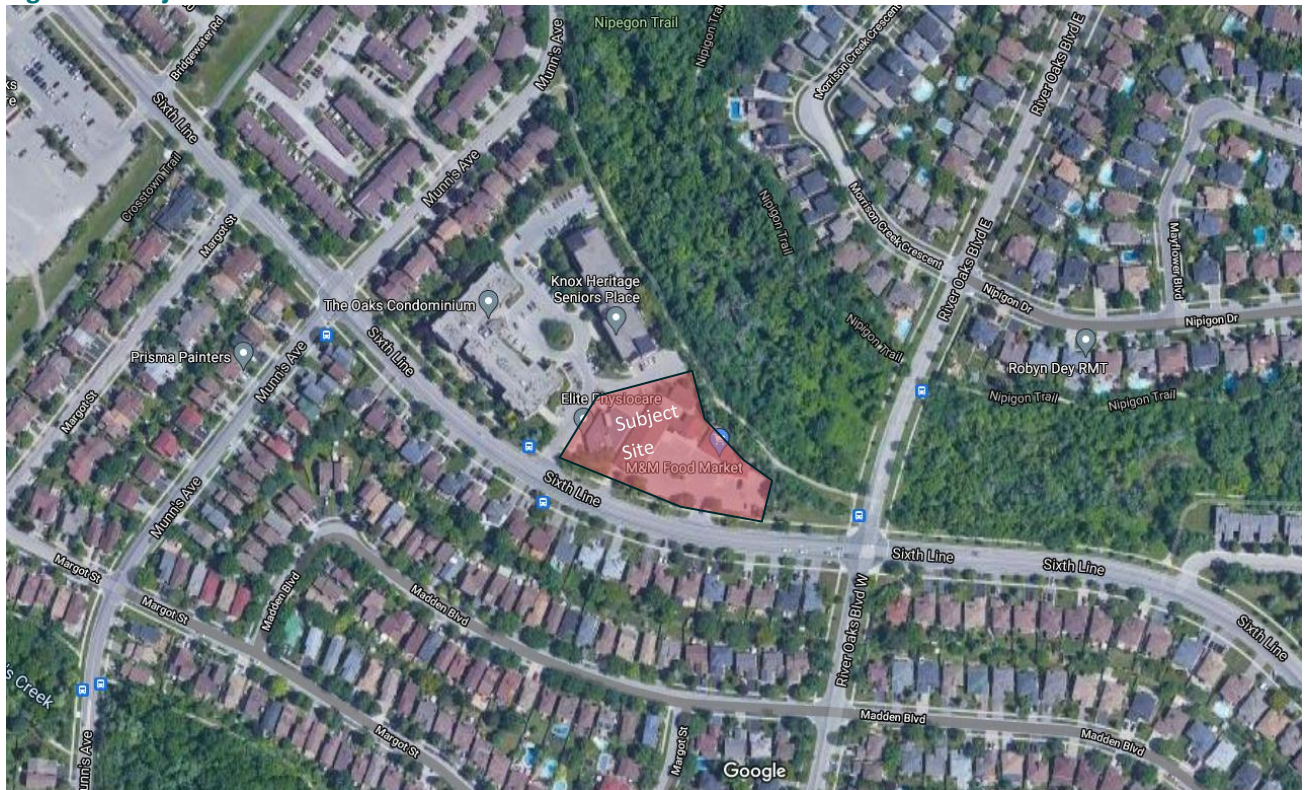
Via Email: Patrick.Monaghan@halton.ca

**RE: Terms of Reference – Transportation Impact Study
Proposed Mixed Use Development
2163-2169 Sixth Line, Town of Oakville**

Dear Mr. Monaghan,

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A sightline analysis will be conducted to confirm adequate sightlines for the site access. A swept path analysis will also be conducted to confirm that all servicing vehicles can be accommodated in an acceptable manner.

Should you have any questions or concerns regarding these terms of reference, please do not hesitate to contact me at 905-470-0015 Ext. 274 or by email at rkeel@lea.ca.

Yours truly,

LEA CONSULTING LTD.

A handwritten signature in black ink, appearing to read 'Robert Keel', is positioned above the printed name.

Robert Keel, M.Sc.Pl., MCIP, RPP
Project Coordinator

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: August 25, 2021 8:18 PM
To: Robert Keel
Subject: 2163-2169 Sixth Line TIS Terms of Reference
Attachments: 2163 Sixth Line TIS Terms of Reference_Region.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

External Sender

Hi Robert,

Patrick forwarded your request over to me, as I handle the development review for the Oakville files here at Halton Region. I assume this has also been sent to Town staff for review and approval (usually that should be done in the same email, so Town and Region staff are aware of the circulation to both).

I have reviewed the terms of reference and have the following comments.

-As stated in your terms of reference, *"The TIS for the proposed development will be conducted following the Halton Region Transportation Impact Study Guidelines, dated January 2015."*

-Please include the Regional intersections of Sixth Line at Dundas Street and Sixth Line at Upper Middle Road.

-For the traffic volume counts and traffic signal timing (from Halton Region), information can be requested from our Road Operations group at trafficdatarequests@halton.ca.

-Growth rates for Regional intersection to develop 2021 base year volumes can use 2%.

-The Background Developments must be confirmed and approved by the Town of Oakville.

-For Modal Split Assumptions: Halton's Transportation Master Plan 2011 utilizes a transit mode split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable. **Transit mode splits will need to be adjusted from the 2011 TMP assumptions to reasonable percentages based on current year (2021), 2026 and 2031 planned and proposed mode splits (based on existing facilities and service in the area to date (planned &/or proposed). Reasonable assumptions and rationale must be clearly outlined in the Study.**

Other standard terms of reference comments to be reviewed are:

The TIS report will include:

- *Site Plan and Map,*
- *Size & Number of Development Phases,*

- *Existing Conditions (Study Area Intersections, Road Network, Pedestrian Routes, Cycling Routes, Transit Services),*
- *Existing Traffic Conditions (Site Operating Characteristics, Data Collection/Traffic Counts, Analysis Periods (5 years Ahead),*
- *Future Background Conditions (Horizon Years, Horizon Year Volumes)*
- *Background Traffic Demand (with TMC's < 2 years old),*
- *Background Traffic Demand Forecast (with acceptable growth rates)*
- *Site Generated Traffic (Transit Modal Split, Trip Generation/Distribution/Assignment)*
- *Future Total Traffic Demand,*
- *Capacity Analysis (by Intersection, with LOS, Avg. Delay, V/C ratios),*
- *Traffic Impacts (Tables – Total Traffic with/without Mitigation)*
- *Access Considerations – Existing, Proposed, Geometrics (turn lanes, sight lines),*
- *Recommendations - Identify required/recommended road improvements either as a result of the development impacts, or general non-development improvements.*
- *TDM recommendations (Transit, Pedestrian & Cycling Facilities Analysis)*
- *Conclusions*

Hope this helps.

Matt

Matt Krusto

Supervisor, Transportation Development Review

Infrastructure Planning & Policy

Public Works

Halton Region

905-825-6000, ext. 7225 | 1-866-442-5866



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From: Monaghan, Patrick <Patrick.Monaghan@halton.ca>

Sent: Tuesday, August 17, 2021 9:30 AM

To: Krusto, Matt <Matt.Krusto@halton.ca>

Cc: 'rkeel@lea.ca' <rkeel@lea.ca>

Subject: FW: 2163-2169 Sixth Line TIS Terms of Reference

Hi Matt,

Please see attached TIS Terms of Reference located in Oakville.

Patrick Monaghan, CET, PMP

Project Manager II

Infrastructure Planning & Policy

Public Works

Halton Region

905-825-6000, ext. 7213 | 1-866-442-5866



From: Robert Keel <rkeel@lea.ca>

Sent: Monday, August 16, 2021 5:16 PM

To: Monaghan, Patrick <Patrick.Monaghan@halton.ca>

Subject: 2163-2169 Sixth Line TIS Terms of Reference

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. If you are unsure or need assistance please contact the IT Service Desk.

Dear Patrick,

See attached a terms of reference for a TIS in support of the proposed development at 2163-2169 Sixth Line in the Town of Oakville. Please advise if you have any questions or comments.

Regards,

Robert Keel, MSc. PI, MCIP, RPP

Project Coordinator

LEA Consulting Ltd.

425 University Suite 400 | Toronto, ON | M5G 1T6

T: 905-470-0015 Ext. 274 | E: rkeel@lea.ca

www.LEA.ca



APPENDIX B

Traffic Data and Signal Timing Plans

Upper Middle Rd @ Sixth Line

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:45:00

To: 8:45:00

Municipality: Halton Region
Site #: 1005760100
Intersection: Upper Middle Rd & Sixth Line
TFR File #: 2
Count date: 10-Apr-2018

Weather conditions:
Sunny/Dry
Person(s) who counted:
Armando

**** Signalized Intersection ****

Major Road: Upper Middle Rd runs W/E

North Leg Total: 1193
 North Entering: 816
 North Peds: 7
 Peds Cross: \times

Heavys	3	7	5	15
Trucks	3	2	0	5
Cars	95	431	270	796
Totals	101	440	275	



Heavys	15
Trucks	3
Cars	359
Totals	377

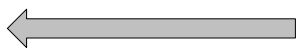
East Leg Total: 2330
 East Entering: 845
 East Peds: 2
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
23	19	865	907

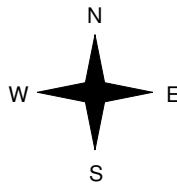


Sixth Line

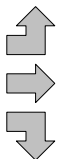
Cars	Trucks	Heavys	Totals
50	1	7	58
598	14	15	627
145	1	14	160
793	16	36	



Upper Middle Rd



Heavys	Trucks	Cars	Totals
2	2	118	122
12	10	1084	1106
7	1	117	125
21	13	1319	



Sixth Line

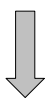
Upper Middle Rd



Cars	Trucks	Heavys	Totals
1443	11	31	1485

Peds Cross: \times
 West Peds: 3
 West Entering: 1353
 West Leg Total: 2260

Cars	693
Trucks	4
Heavys	28
Totals	725



Cars	172	191	89	452
Trucks	2	0	1	3
Heavys	5	6	14	25
Totals	179	197	104	

Peds Cross: \times
 South Peds: 1
 South Entering: 480
 South Leg Total: 1205

Comments

Upper Middle Rd @ Sixth Line

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:00:00

To: 13:00:00

Municipality: Halton Region
Site #: 1005760100
Intersection: Upper Middle Rd & Sixth Line
TFR File #: 2
Count date: 10-Apr-2018

Weather conditions:
 Sunny/Dry
Person(s) who counted:
 Armando

**** Signalized Intersection ****

Major Road: Upper Middle Rd runs W/E

North Leg Total: 590
 North Entering: 282
 North Peds: 6
 Peds Cross: \times

Heavys	0	0	0	0
Trucks	3	1	2	6
Cars	72	126	78	276
Totals	75	127	80	



Heavys 0
 Trucks 4
 Cars 304
 Totals 308

East Leg Total: 1086
 East Entering: 522
 East Peds: 4
 Peds Cross: \times

Heavys	5
Trucks	16
Cars	528
Totals	549

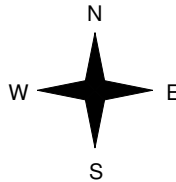


Sixth Line

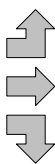
Cars	74	Trucks	2	Heavys	0	Totals	76
Cars	389	Trucks	13	Heavys	5		407
Cars	37	Trucks	0	Heavys	2		39
Totals	500	Totals	15	Totals	7		



Upper Middle Rd



Heavys	0
Trucks	2
Cars	112
Totals	114
Heavys	7
Trucks	6
Cars	432
Totals	445
Heavys	0
Trucks	0
Cars	73
Totals	73
Heavys	7
Trucks	8
Cars	617
Totals	617



Sixth Line

Upper Middle Rd



Cars	545	Trucks	11	Heavys	8	Totals	564
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Peds Cross: \times
 West Peds: 10
 West Entering: 632
 West Leg Total: 1181

Cars	236
Trucks	1
Heavys	2
Totals	239



Cars	67	118	35	220
Trucks	0	0	3	3
Heavys	0	0	1	1
Totals	67	118	39	

Peds Cross: \times
 South Peds: 3
 South Entering: 224
 South Leg Total: 463

Comments

Upper Middle Rd @ Sixth Line

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Municipality: Halton Region
Site #: 1005760100
Intersection: Upper Middle Rd & Sixth Line
TFR File #: 2
Count date: 10-Apr-2018

Weather conditions:
 Sunny/Dry
Person(s) who counted:
 Armando

**** Signalized Intersection ****

Major Road: Upper Middle Rd runs W/E

North Leg Total: 851
 North Entering: 328
 North Peds: 6
 Peds Cross: \times

Heavys	0	2	0	2
Trucks	1	1	0	2
Cars	114	146	64	324
Totals	115	149	64	



Heavys	4
Trucks	4
Cars	515
Totals	523

East Leg Total: 1865
 East Entering: 1196
 East Peds: 2
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
3	2	1213	1218

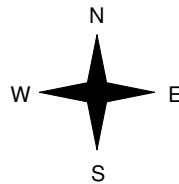


Sixth Line

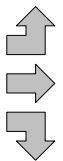
Cars	Trucks	Heavys	Totals
144	2	0	146
967	1	3	971
75	0	4	79
1186	3	7	



Upper Middle Rd



Heavys	Trucks	Cars	Totals
1	1	193	195
5	8	548	561
0	0	44	44
6	9	785	



Upper Middle Rd



Cars	Trucks	Heavys	Totals
651	8	10	669

Peds Cross: \times
 West Peds: 4
 West Entering: 800
 West Leg Total: 2018

Cars	265
Trucks	1
Heavys	6
Totals	272



Cars	132	178	39	349
Trucks	0	1	0	1
Heavys	0	3	5	8
Totals	132	182	44	

Peds Cross: \times
 South Peds: 3
 South Entering: 358
 South Leg Total: 630

Comments

Upper Middle Rd @ Sixth Line

Total Count Diagram

Municipality: Halton Region
Site #: 1005760100
Intersection: Upper Middle Rd & Sixth Line
TFR File #: 2
Count date: 10-Apr-2018

Weather conditions:
 Sunny/Dry
Person(s) who counted:
 Armando

**** Signalized Intersection ****

Major Road: Upper Middle Rd runs W/E

North Leg Total: 5821
 North Entering: 3069
 North Peds: 40
 Peds Cross: \bowtie

Heavys	12	21	9	42
Trucks	14	6	2	22
Cars	695	1507	803	3005
Totals	721	1534	814	



Heavys	44
Trucks	27
Cars	2681
Totals	2752

East Leg Total: 11620
 East Entering: 5883
 East Peds: 36
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
94	89	6044	6227

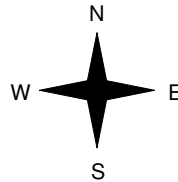


Sixth Line

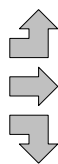
Cars	Trucks	Heavys	Totals
618	12	13	643
4543	69	66	4678
520	7	35	562
5681	88	114	



Upper Middle Rd



Heavys	Trucks	Cars	Totals
13	10	1019	1042
57	62	4384	4503
19	7	483	509
89	79	5886	



Sixth Line

Upper Middle Rd



Cars	Trucks	Heavys	Totals
5557	74	106	5737

Peds Cross: \bowtie
 West Peds: 37
 West Entering: 6054
 West Leg Total: 12281

Cars	2510
Trucks	20
Heavys	75
Totals	2605



Cars	806	1044	370	2220
Trucks	6	5	10	21
Heavys	16	18	40	74
Totals	828	1067	420	

Peds Cross: \bowtie
 South Peds: 31
 South Entering: 2315
 South Leg Total: 4920

Comments

Dundas St W @ Sixth Line

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:45:00

To: 8:45:00

Municipality: Halton Region
Site #: 0000002967
Intersection: Dundas St W & Sixth Line
TFR File #: 4
Count date: 24-May-2017

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 542

North Entering: 400

North Peds: 0

Peds Cross: \times

Heavys	2	2	5	9
Trucks	0	0	5	5
Cars	19	95	272	386
Totals	21	97	282	



Heavys 9

Trucks 2

Cars 131

Totals 142

East Leg Total: 3280

East Entering: 979

East Peds: 0

Peds Cross: \times

Heavys	Trucks	Cars	Totals
71	31	846	948

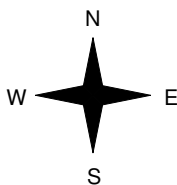


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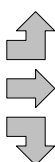
Cars	Trucks	Heavys	Totals
72	1	4	77
693	30	65	788
111	0	3	114
876	31	72	



Dundas St W



Heavys	Trucks	Cars	Totals
2	0	17	19
23	20	1721	1764
2	1	172	175
27	21	1910	



Sixth Line

Dundas St W



Cars	Trucks	Heavys	Totals
2245	26	30	2301

Peds Cross: \times
 West Peds: 4
 West Entering: 1958
 West Leg Total: 2906

Cars	378	Cars	134	42	252	428
Trucks	1	Trucks	1	1	1	3
Heavys	7	Heavys	4	3	2	9
Totals	386	Totals	139	46	255	



Peds Cross: \times
 South Peds: 1
 South Entering: 440
 South Leg Total: 826

Comments

Dundas St W @ Sixth Line

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:30:00

To: 13:30:00

Municipality: Halton Region
Site #: 0000002967
Intersection: Dundas St W & Sixth Line
TFR File #: 4
Count date: 24-May-2017

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 284

North Entering: 141

North Peds: 0

Peds Cross: \times

Heavys	3	0	1	4
Trucks	1	0	3	4
Cars	8	20	105	133
Totals	12	20	109	



Heavys 5

Trucks 7

Cars 131

Totals 143

East Leg Total: 2527

East Entering: 1314

East Peds: 0

Peds Cross: \times

Heavys	Trucks	Cars	Totals
67	22	1132	1221

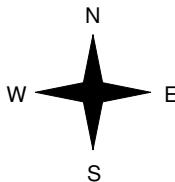


Sixth Line

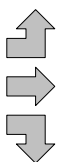
Cars	Trucks	Heavys	Totals
98	5	2	105
1034	21	63	1118
90	1	0	91
1222	27	65	



Dundas St W



Heavys	Trucks	Cars	Totals
3	2	11	16
38	19	914	971
3	0	102	105
44	21	1027	



Sixth Line

Dundas St W



Cars	Trucks	Heavys	Totals
1151	23	39	1213

Peds Cross: \times

West Peds: 4

West Entering: 1092

West Leg Total: 2313

Cars	212	Cars	90	22	132	244
Trucks	1	Trucks	0	0	1	1
Heavys	3	Heavys	1	0	0	1
Totals	216	Totals	91	22	133	



Peds Cross: \times

South Peds: 5

South Entering: 246

South Leg Total: 462

Comments

Dundas St W @ Sixth Line

Afternoon Peak Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

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

Municipality: Halton Region
Site #: 0000002967
Intersection: Dundas St W & Sixth Line
TFR File #: 4
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 525
North Entering: 206
North Peds: 3
Peds Cross: \times

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	20	43	143	206
Totals	20	43	143	



Heavys	0
Trucks	1
Cars	318
Totals	319

East Leg Total: 3803
East Entering: 2313
East Peds: 1
Peds Cross: \times

Heavys	Trucks	Cars	Totals
38	12	2088	2138

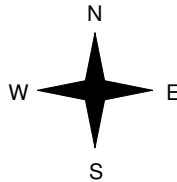


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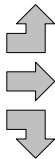
Cars	Trucks	Heavys	Totals
195	1	0	196
1899	12	38	1949
167	0	1	168
2261	13	39	



Dundas St W



Heavys	Trucks	Cars	Totals
0	0	20	20
29	8	1154	1191
0	2	141	143
29	10	1315	



Sixth Line

Dundas St W



Cars	Trucks	Heavys	Totals
1452	8	30	1490

Peds Cross: \times
West Peds: 4
West Entering: 1354
West Leg Total: 3492

Cars	351	Cars	169	103	155	427
Trucks	2	Trucks	0	0	0	0
Heavys	1	Heavys	0	0	1	1
Totals	354	Totals	169	103	156	



Peds Cross: \times
South Peds: 0
South Entering: 428
South Leg Total: 782

Comments

Dundas St W @ Sixth Line

Total Count Diagram

Municipality: Halton Region
Site #: 0000002967
Intersection: Dundas St W & Sixth Line
TFR File #: 4
Count date: 24-May-2017

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Dundas St W runs W/E

North Leg Total: 2997
 North Entering: 1652
 North Peds: 8
 Peds Cross: \times

Heavys	16	9	21	46
Trucks	4	0	18	22
Cars	90	345	1149	1584
Totals	110	354	1188	



Heavys	47
Trucks	17
Cars	1281
Totals	1345

East Leg Total: 24360
 East Entering: 11989
 East Peds: 8
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
456	168	10597	11221

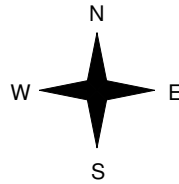


Sixth Line

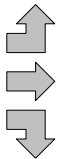
Cars	Trucks	Heavys	Totals
844	9	20	873
9548	159	426	10133
963	9	11	983
11355	177	457	



Dundas St W



Heavys	Trucks	Cars	Totals
14	6	90	110
281	140	9427	9848
19	3	924	946
314	149	10441	



Sixth Line

Dundas St W



Cars	Trucks	Heavys	Totals
11886	170	315	12371

Peds Cross: \times
 West Peds: 26
 West Entering: 10904
 West Leg Total: 22125

Cars	2232	Cars	959	347	1310	2616
Trucks	12	Trucks	5	2	12	19
Heavys	39	Heavys	14	13	13	40
Totals	2283	Totals	978	362	1335	



Peds Cross: \times
 South Peds: 17
 South Entering: 2675
 South Leg Total: 4958

Comments



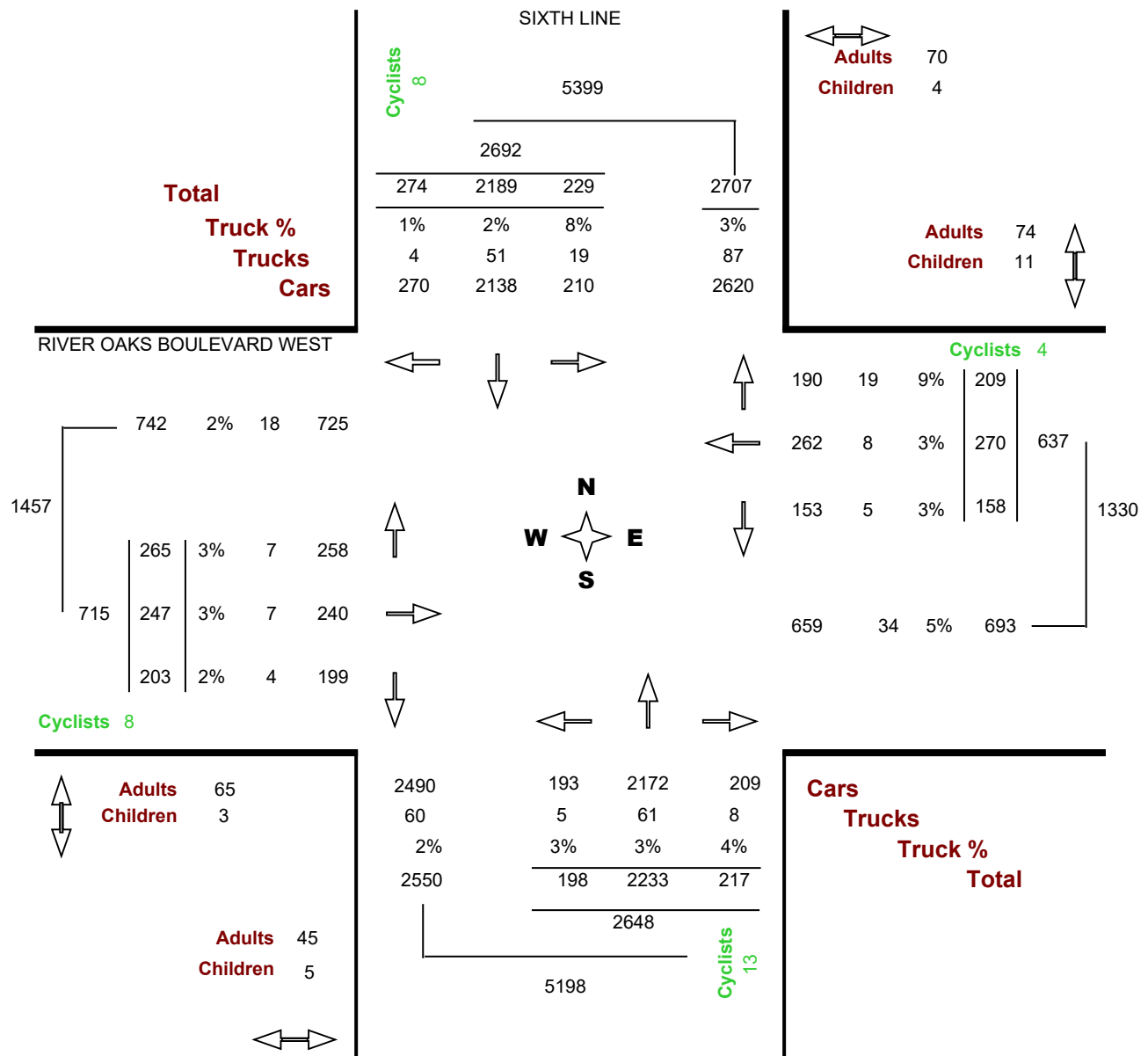
Turning Movements Count - Full Study Report

Location..... SIXTH LINE @ RIVER OAKS BOULEVARD WEST

Municipality..... OAKVILLE

GeoID..... 30363301

Count Date..... Thursday, 12 November, 2020



Adults 74

Children 11

Cyclists 4

190	19	9%	209
262	8	3%	270
153	5	3%	158
659	34	5%	693

1330

In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movement Count - Details Report

Location..... SIXTH LINE @ RIVER OAKS BOULEVARD WEST
Municipality..... OAKVILLE
Count Date..... Thursday, November 12, 2020

SIXTH LINE

RIVER OAKS BOULEVARD WEST

North Approach

South Approach

East Approach

West Approach

Time Period	SIXTH LINE North Approach					SIXTH LINE South Approach					RIVER OAKS BOULEVARD WEST East Approach					RIVER OAKS BOULEVARD WEST West Approach				
	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped
07:00 07:15	2	30	0	0	1	2	19	0	0	1	1	3	5	0	4	1	4	2	0	1
07:15 07:30	4	59	5	0	0	2	27	0	0	0	2	5	2	0	0	5	3	6	0	2
07:30 07:45	4	52	5	0	0	1	38	2	0	0	3	6	2	1	2	8	4	14	0	0
07:45 08:00	6	58	6	1	2	3	47	5	0	1	1	13	4	0	1	9	8	5	0	2
Hourly Total	16	199	16	1	3	8	131	7	0	2	7	27	13	1	7	23	19	27	0	5
08:00 08:15	7	57	9	0	4	6	61	3	0	0	1	4	7	0	3	13	9	4	0	1
08:15 08:30	11	78	17	0	3	2	77	7	1	2	4	9	15	0	6	13	8	15	0	2
08:30 08:45	12	89	8	0	3	8	67	8	0	2	6	14	5	0	1	11	8	5	0	0
08:45 09:00	10	72	6	0	2	12	57	14	0	7	16	17	13	0	4	8	10	9	0	3
Hourly Total	40	296	40	0	12	28	262	32	1	11	27	44	40	0	14	45	35	33	0	6
11:00 11:15	1	42	2	0	1	1	38	2	1	0	3	6	5	0	0	2	3	1	1	0
11:15 11:30	6	42	5	1	0	2	33	7	1	0	2	3	5	0	2	4	5	5	0	0
11:30 11:45	6	49	9	0	5	2	65	2	2	0	1	6	4	0	3	6	2	2	0	1
11:45 12:00	11	84	3	2	3	6	74	4	0	0	2	8	7	1	4	3	6	6	0	19
Hourly Total	24	217	19	3	9	11	210	15	4	0	8	23	21	1	9	15	16	14	1	20
12:00 12:15	6	83	9	0	1	5	63	10	0	0	4	5	3	0	0	8	10	5	0	6
12:15 12:30	7	70	6	0	8	2	68	3	1	1	3	3	9	0	1	10	8	5	1	1
12:30 12:45	6	67	10	1	4	6	63	5	0	2	8	5	6	1	2	7	6	9	0	0
12:45 13:00	3	58	12	0	2	7	58	8	0	0	3	6	5	0	6	11	6	7	0	0
Hourly Total	22	278	37	1	15	20	252	26	1	3	18	19	23	1	9	36	30	26	1	7
13:00 13:15	7	73	10	0	1	3	92	5	0	0	2	4	4	0	2	9	5	8	0	1
13:15 13:30	7	56	10	0	6	5	63	1	0	0	5	5	5	0	1	4	7	2	0	1
13:30 13:45	4	52	5	0	4	0	50	5	0	1	3	3	6	0	5	5	8	4	0	0
13:45 14:00	6	50	6	0	1	4	55	8	0	1	5	6	5	0	3	8	6	3	0	0
Hourly Total	24	231	31	0	12	12	260	19	0	2	15	18	20	0	11	26	26	17	0	2
15:00 15:15	5	74	11	0	2	5	64	12	1	0	11	8	1	0	1	8	11	3	3	3
15:15 15:30	9	72	16	0	2	12	83	8	1	4	5	18	7	0	1	9	6	15	0	3
15:30 15:45	6	82	12	0	0	6	93	10	0	0	16	18	4	0	6	8	10	11	0	1
15:45 16:00	4	64	8	0	1	12	87	12	0	7	7	7	7	0	9	15	15	8	0	3
Hourly Total	24	292	47	0	5	35	327	42	2	11	39	51	19	0	17	40	42	37	3	10
16:00 16:15	7	82	9	2	1	15	93	18	1	5	4	11	5	0	3	9	17	6	0	2
16:15 16:30	13	74	11	0	1	11	111	13	2	1	4	12	12	0	0	7	14	7	1	4
16:30 16:45	15	74	16	0	4	10	94	11	0	3	7	13	17	1	3	13	7	7	0	2
16:45 17:00	15	94	9	0	2	11	99	7	1	1	4	14	16	0	2	9	9	5	0	3
Hourly Total	50	324	45	2	8	47	397	49	4	10	19	50	50	1	8	38	47	25	1	11
17:00 17:15	11	90	6	0	4	9	123	7	1	0	5	10	5	0	5	8	11	6	0	1
17:15 17:30	6	90	8	0	0	11	107	8	0	9	7	11	3	0	4	10	6	9	0	4
17:30 17:45	5	97	19	0	1	7	102	6	0	0	8	8	9	0	1	15	7	7	2	2
17:45 18:00	7	75	6	1	5	10	62	6	0	2	5	9	6	0	0	9	8	2	0	0
Hourly Total	29	352	39	1	10	37	394	27	1	11	25	38	23	0	10	42	32	24	2	7
Grand Total	229	2189	274	8	74	198	2233	217	13	50	158	270	209	4	85	265	247	203	8	68
Truck %	8%	2%	1%			3%	3%	4%			3%	3%	9%			3%	3%	2%		



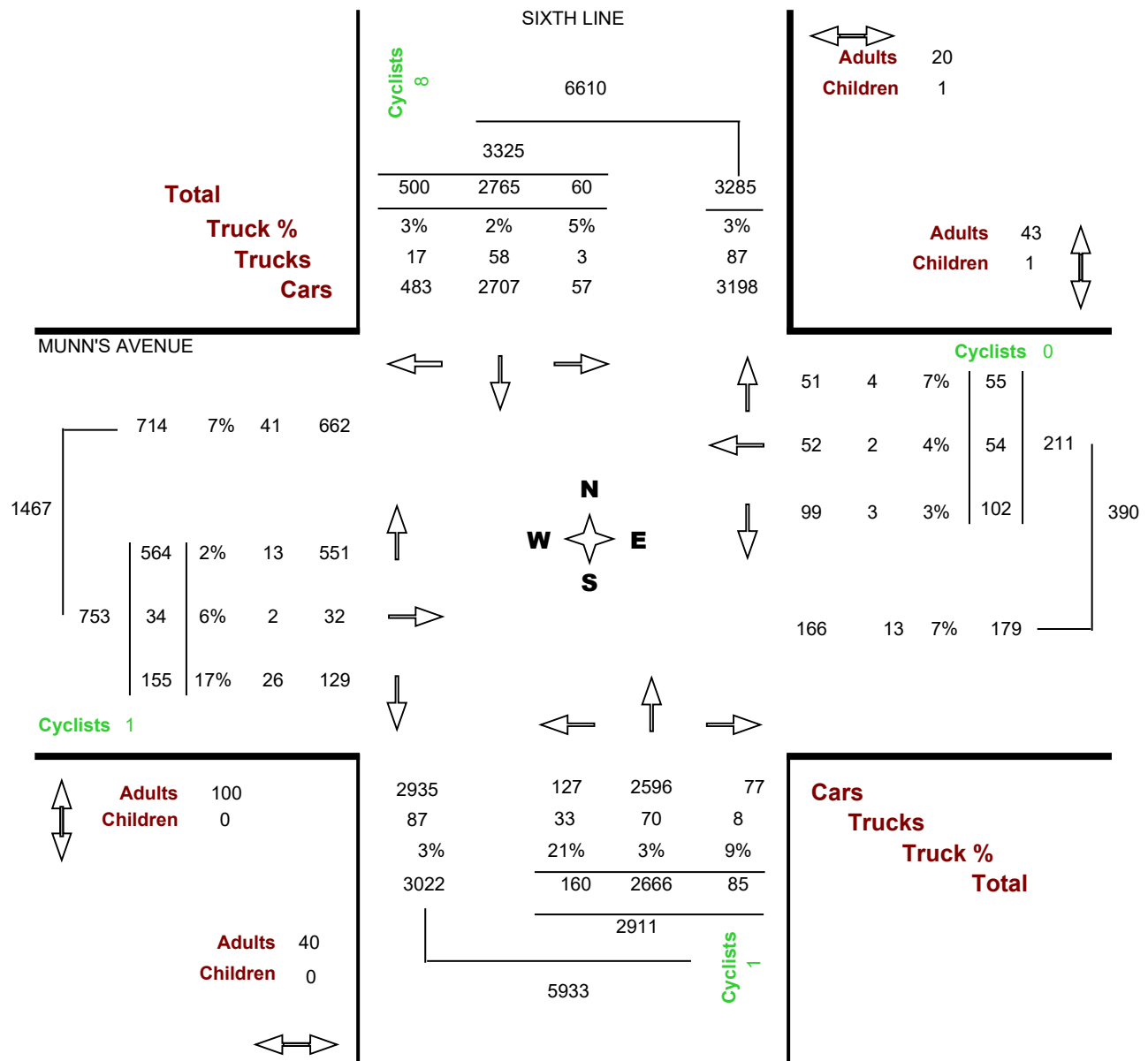
Turning Movements Count - Full Study Report

Location..... SIXTH LINE @ MUNN'S AVENUE

Municipality..... OAKVILLE

GeoID..... 30363401

Count Date..... Thursday, 09 May, 2019



In all counts dated before 2018 - Adult pedestrian numbers include seniors, and the senior count = 0



Turning Movement Count - Details Report

Location..... SIXTH LINE @ MUNN'S AVENUE
Municipality..... OAKVILLE
Count Date..... Thursday, May 09, 2019

SIXTH LINE

MUNN'S AVENUE

North Approach

South Approach

East Approach

West Approach

Time Period	SIXTH LINE North Approach					SIXTH LINE South Approach					MUNN'S AVENUE East Approach					MUNN'S AVENUE West Approach				
	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped	LT	TH	RT	Cyclists	Ped
07:00 07:15	0	56	2	1	2	2	30	0	0	0	2	0	1	0	0	13	1	6	0	1
07:15 07:30	0	88	6	0	0	2	46	1	0	2	5	3	2	0	3	23	0	5	0	0
07:30 07:45	0	131	9	0	0	5	45	1	0	2	10	5	0	0	2	11	1	10	0	3
07:45 08:00	1	127	15	0	0	3	86	4	0	3	11	2	1	0	3	26	1	5	0	4
Hourly Total	1	402	32	1	2	12	207	6	0	7	28	10	4	0	8	73	3	26	0	8
08:00 08:15	0	140	42	0	2	6	111	2	0	2	7	4	0	0	2	24	0	11	0	8
08:15 08:30	6	130	28	1	1	5	127	8	0	4	10	6	3	0	8	71	2	11	0	20
08:30 08:45	0	153	28	0	0	2	105	4	0	1	8	4	2	0	1	42	1	6	0	3
08:45 09:00	3	74	14	1	1	5	83	4	0	0	2	2	0	0	0	27	0	10	0	1
Hourly Total	9	497	112	2	4	18	426	18	0	7	27	16	5	0	11	164	3	38	0	32
11:00 11:15	5	70	15	0	0	5	50	3	0	0	1	1	6	0	3	16	3	4	0	0
11:15 11:30	2	75	9	2	1	5	56	3	0	1	2	2	4	0	1	19	2	4	0	8
11:30 11:45	1	58	8	0	0	1	58	0	0	0	1	0	1	0	0	15	2	6	0	0
11:45 12:00	1	62	12	0	0	9	67	1	0	2	5	1	2	0	1	11	0	4	0	6
Hourly Total	9	265	44	2	1	20	231	7	0	3	9	4	13	0	5	61	7	18	0	14
12:00 12:15	0	70	7	0	0	4	59	0	0	0	3	5	1	0	0	8	0	3	0	0
12:15 12:30	3	62	11	0	0	5	68	0	0	2	2	1	1	0	0	17	0	5	0	1
12:30 12:45	0	69	14	0	0	2	62	2	0	3	2	0	0	0	0	6	1	3	0	5
12:45 13:00	3	51	8	0	0	5	39	3	0	1	3	1	3	0	0	8	1	5	0	1
Hourly Total	6	252	40	0	0	16	228	5	0	6	10	7	5	0	0	39	2	16	0	7
13:00 13:15	3	34	15	1	1	4	41	3	0	3	3	2	0	0	1	11	2	3	0	3
13:15 13:30	1	55	9	1	0	2	62	1	0	2	2	2	2	0	0	9	1	1	0	1
13:30 13:45	1	64	10	0	1	5	42	1	1	0	1	1	2	0	0	6	3	4	0	3
13:45 14:00	3	45	7	0	0	4	56	3	0	0	4	2	3	0	0	5	1	4	0	2
Hourly Total	8	198	41	2	2	15	201	8	1	5	10	7	7	0	1	31	7	12	0	9
15:00 15:15	1	104	10	0	3	5	107	3	0	3	0	0	2	0	4	16	0	2	0	6
15:15 15:30	1	97	18	0	0	4	89	2	0	0	1	0	2	0	3	21	1	7	0	3
15:30 15:45	3	94	25	0	1	7	100	5	0	2	1	0	1	0	2	10	2	5	0	1
15:45 16:00	2	101	25	0	0	4	113	1	0	0	2	1	0	0	0	10	1	2	1	4
Hourly Total	7	396	78	0	4	20	409	11	0	5	4	1	5	0	9	57	4	16	1	14
16:00 16:15	7	102	18	0	2	4	115	2	0	2	1	1	1	0	5	11	2	2	0	4
16:15 16:30	1	93	17	0	0	5	129	5	0	3	1	0	4	0	0	13	1	5	0	2
16:30 16:45	1	107	21	0	0	8	106	1	0	0	4	1	1	0	2	10	1	2	0	1
16:45 17:00	4	101	26	0	0	5	120	2	0	0	1	1	1	0	0	21	1	6	0	3
Hourly Total	13	403	82	0	2	22	470	10	0	5	7	3	7	0	7	55	5	15	0	10
17:00 17:15	3	95	20	0	1	8	114	5	0	0	1	4	2	0	1	21	0	4	0	1
17:15 17:30	3	76	16	0	3	11	113	3	0	1	4	1	0	0	1	23	0	4	0	1
17:30 17:45	0	76	16	0	0	9	144	7	0	1	2	1	4	0	1	18	1	4	0	2
17:45 18:00	1	105	19	1	2	9	123	5	0	0	0	0	3	0	0	22	2	2	0	2
Hourly Total	7	352	71	1	6	37	494	20	0	2	7	6	9	0	3	84	3	14	0	6
Grand Total	60	2765	500	8	21	160	2666	85	1	40	102	54	55	0	44	564	34	155	1	100
Truck %	5%	2%	3%			21%	3%	9%			3%	4%	7%			2%	6%	17%		



Date: 24-Nov-21

Intersection: Upper Middle Road & Sixth Line

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X	X	X	X	X	X	X	X	X
Direction	WBL	EB	NBL	SB	EBL	WB	SBL	NB				
Min Green	7	20	7	10	7	20	7	10				
Veh Ext.	3.5	4.5	3.5	3.5	3.5	4.5	3.5	3.5				
Yellow	3	3.7	3	3.7	3	3.7	3	3.7				
Red	1	1.8	1	2.7	1	1.8	1	2.7				
Walk		7		7		7		7				
Don't Walk		23		32		23		32				
Max 1	25	60	25	40	25	60	25	40				
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall												
Notes:	Pedestrian Reservice Active Sync Reference to 3:15											

<p>Pattern 1 Time: 6:00 Cycle Length: 120 Offset (%): 97%</p> <table border="1"> <tr> <td>Direction</td> <td>WBL</td> <td>EB</td> <td>NBL</td> <td>SB</td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>10</td> <td>42</td> <td>10</td> <td>38</td> </tr> <tr> <td>Direction</td> <td>EBL</td> <td>WB</td> <td>SBL</td> <td>NB</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>10</td> <td>42</td> <td>10</td> <td>38</td> </tr> </table>	Direction	WBL	EB	NBL	SB	Phase	1	2	3	4	%	10	42	10	38	Direction	EBL	WB	SBL	NB	Phase	5	6	7	8	%	10	42	10	38	<p>Pattern 2 Time: 9:30, 18:30 Cycle Length: 110 Offset (%): 27%</p> <table border="1"> <tr> <td>Direction</td> <td>WBL</td> <td>EB</td> <td>NBL</td> <td>SB</td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>10</td> <td>38</td> <td>10</td> <td>42</td> </tr> <tr> <td>Direction</td> <td>EBL</td> <td>WB</td> <td>SBL</td> <td>NB</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>10</td> <td>38</td> <td>10</td> <td>42</td> </tr> </table>	Direction	WBL	EB	NBL	SB	Phase	1	2	3	4	%	10	38	10	42	Direction	EBL	WB	SBL	NB	Phase	5	6	7	8	%	10	38	10	42
Direction	WBL	EB	NBL	SB																																																									
Phase	1	2	3	4																																																									
%	10	42	10	38																																																									
Direction	EBL	WB	SBL	NB																																																									
Phase	5	6	7	8																																																									
%	10	42	10	38																																																									
Direction	WBL	EB	NBL	SB																																																									
Phase	1	2	3	4																																																									
%	10	38	10	42																																																									
Direction	EBL	WB	SBL	NB																																																									
Phase	5	6	7	8																																																									
%	10	38	10	42																																																									
<p>Pattern 3 Time: 15:15 Cycle Length: 120 Offset (%): 68%</p> <table border="1"> <tr> <td>Direction</td> <td>WBL</td> <td>EB</td> <td>NBL</td> <td>SB</td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>10</td> <td>40</td> <td>12</td> <td>38</td> </tr> <tr> <td>Direction</td> <td>EBL</td> <td>WB</td> <td>SBL</td> <td>NB</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>11</td> <td>39</td> <td>10</td> <td>40</td> </tr> </table>	Direction	WBL	EB	NBL	SB	Phase	1	2	3	4	%	10	40	12	38	Direction	EBL	WB	SBL	NB	Phase	5	6	7	8	%	11	39	10	40	<p>Pattern 4 Time: Weekend, 07:00-19:00 Cycle Length: 110 Offset (%): 27%</p> <table border="1"> <tr> <td>Direction</td> <td>WBL</td> <td>EB</td> <td>NBL</td> <td>SB</td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td>10</td> <td>41</td> <td>10</td> <td>39</td> </tr> <tr> <td>Direction</td> <td>EBL</td> <td>WB</td> <td>SBL</td> <td>NB</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td>10</td> <td>41</td> <td>10</td> <td>39</td> </tr> </table>	Direction	WBL	EB	NBL	SB	Phase	1	2	3	4	%	10	41	10	39	Direction	EBL	WB	SBL	NB	Phase	5	6	7	8	%	10	41	10	39
Direction	WBL	EB	NBL	SB																																																									
Phase	1	2	3	4																																																									
%	10	40	12	38																																																									
Direction	EBL	WB	SBL	NB																																																									
Phase	5	6	7	8																																																									
%	11	39	10	40																																																									
Direction	WBL	EB	NBL	SB																																																									
Phase	1	2	3	4																																																									
%	10	41	10	39																																																									
Direction	EBL	WB	SBL	NB																																																									
Phase	5	6	7	8																																																									
%	10	41	10	39																																																									
<p>Pattern 5 Time: 21:00 Cycle Length: Local Offset (%):</p> <table border="1"> <tr> <td>Direction</td> <td>WBL</td> <td>EB</td> <td>NBL</td> <td>SB</td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Direction</td> <td>EBL</td> <td>WB</td> <td>SBL</td> <td>NB</td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Direction	WBL	EB	NBL	SB	Phase	1	2	3	4	%					Direction	EBL	WB	SBL	NB	Phase	5	6	7	8	%					<p>Pattern 6 Time: Cycle Length: Offset (%):</p> <table border="1"> <tr> <td>Direction</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Phase</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>%</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Direction</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Phase</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>%</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Direction					Phase	1	2	3	4	%					Direction					Phase	5	6	7	8	%				
Direction	WBL	EB	NBL	SB																																																									
Phase	1	2	3	4																																																									
%																																																													
Direction	EBL	WB	SBL	NB																																																									
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%																																																													
Direction																																																													
Phase	5	6	7	8																																																									
%																																																													



Date:
Intersection:

4 Phase Basic Timing Sheet						
	1	2	3	4	2 Ped	4 Ped
Phases in use						
Direction						
Min Green						
Veh Ext.						
Yellow						
Red						
Walk						
Don't Walk						
Max 1						
Max 2						
Max 3						
Veh Recall						
Ped Recall						
Notes:						

<p>Pattern 1 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>	<p>Pattern 2 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>
<p>Pattern 3 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>	<p>Pattern 4 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>
<p>Pattern 5 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>	<p>Pattern 6 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>



Date: 24-Nov-21

Intersection: Dundas & Sixth Line

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X		X	X	X		X	X	X	X	X
Direction	WBL	EB		SB	EBL	WB		NB				
Min Green	7	20		10	7	20		10				
Veh Ext.	3.0			3.0	3.0			3.0				
Yellow	3	3.7		3.7	3	3.7		3.7				
Red	1	2.5		2.8	1	2.5		2.8				
Walk		7		7		7		7				
Don't Walk		24		27		24		27				
Max 1												
Max 2												
Max 3												
Veh Recall												
Ped Recall												
Notes:	Local Zero Override' in use.											

20 59 41									
Pattern 1					Pattern 2				
Time: 6:00					Time: 10:00				
Cycle Length: 120					Cycle Length: 120				
Offset (%): 35%					Offset (%): 45%				
Direction	WBL	EB		SB	Direction	WBL	EB		SB
Phase	1	2	3	4	Phase	1	2	3	4
%	17	49	0	34	%	10	55	0	35
Direction	EBL	WB		NB	Direction	EBL	WB		NB
Phase	5	6	7	8	Phase	5	6	7	8
%	17	49	0	34	%	10	55	0	35
18 66 36									
12 72 36									
Pattern 3					Pattern 4				
Time: 15:15					Time: 19:00				
Cycle Length: 120					Cycle Length: 120				
Offset (%): 18%					Offset (%): 45%				
Direction	WBL	EB		SB	Direction	WBL	EB		SB
Phase	1	2	3	4	Phase	1	2	3	4
%	15	55	0	30	%	10	55	0	35
Direction	EBL	WB		NB	Direction	EBL	WB		NB
Phase	5	6	7	8	Phase	5	6	7	8
%	10	60	0	30	%	10	55	0	35
Pattern 5					Pattern 6				
Time: 22:00					Time:				
Cycle Length: Local					Cycle Length:				
Offset (%):					Offset (%):				
Direction	WBL	EB		SB	Direction				
Phase	1	2	3	4	Phase	1	2	3	4
%					%				
Direction	EBL	WB		NB	Direction				
Phase	5	6	7	8	Phase	5	6	7	8
%					%				



Date:
Intersection:

4 Phase Basic Timing Sheet						
	1	2	3	4	2 Ped	4 Ped
Phases in use						
Direction						
Min Green						
Veh Ext.						
Yellow						
Red						
Walk						
Don't Walk						
Max 1						
Max 2						
Max 3						
Veh Recall						
Ped Recall						
Notes:						

<p>Pattern 1 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>	<p>Pattern 2 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>
<p>Pattern 3 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>	<p>Pattern 4 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 | 3 4 %</p>
<p>Pattern 5 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 3 4 %</p>	<p>Pattern 6 Time: Cycle Length: Offset (%):</p> <p style="text-align: center;"> Direction Phase 1 2 3 4 %</p>

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B											
Sequence 1																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 2																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 3																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 4																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 5																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 6																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 7																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 8																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 9																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 10																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 11																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 12																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .

Sequence 13

Ring 1	| 1	2	| 3	4	| 9	10	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 14

Ring 1	| 2	1	| 3	4	| 10	9	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 15

Ring 1	| 1	2	| 4	3	| 9	10	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 16

Ring 1	| 2	1	| 4	3	| 10	9	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X		X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																
Associated PED																
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC No
 CRC (16 bit) 61D7
 Enable Automatic Backup to Datakey No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	.				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	.				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	.				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	.				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

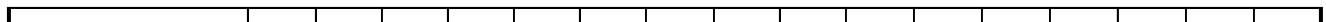
Enable TS2/MMU Type Cabinet: No
 Enable MMU Extended Status: Yes
 Enable SDLC Stop Time: Yes
 Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3

Enable Color Check: No



MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: SIXTH LN @ RIVER OAKS BLVD
 Sign On Message Line 2: ZONE 8

Software Modules (MM) 8-7

Application Version: 32.64.00
 OS (Boot) Version: 06.04.00

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Controller Timing Plan (MM)

Major roads (Sixth Line)

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	0	25	0	10	0	25	0	10	0	0	0	0	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	0	0	0	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	12	0	16	0	12	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	0.0	5.5	0.0	3.5	0.0	5.5	0.0	3.5	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	40	0	30	0	40	0	30	0	0	0	0	35	35	35	35
Max2	0	0	0	0	0	0	0	0	0	0	0	0	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.3	1.0	2.6	1.0	2.3	1.0	2.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5**Start Up**

Phase	Phase Setting
1	.
2	R
3	.
4	.
5	.
6	R
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap

Flash Thru Mon: Yes
Flash Time: 0
All Red: 6
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B

C
D

Flash Thru Mon: Yes
Exit Flash: W
Minimum Flash: 8
Minimum Recall: No
Cycle Through Phase: No

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Controller Options

phases of interest

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X					X										
Non-Act II				X				X								
Dual Entry	X	X	X	X	X											
Cond Service																
Cond Reservice																
Ped Re-Service	X					X										
Rest In Walk	X					X										
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

None of the phases are max recall

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall			X					X								
Ped Recall			X					X								
Max Recall																
Soft Recall																
No Rest																
AI Calc																

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero	No	FO Added Ini	No
Override		Green	
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	No	Interlock Enable	No
Det Lock	No	Delay	0	Inhibit	0
Override Flash	Yes	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	5	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On Out
 Other - Priority Preempt Off
 Inhibit Extension Time 0.0
 Veh Priority Return Off
 Conditional Delay Off

Preempt Act Dwell No
 Non-Priority Pmt Off
 Ped Priority Return Off
 Queue Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable Yes Preempt Override No Interlock Enable No
 Det Lock No Delay 0 Inhibit 0
 Override Flash Yes Duration 10 CLR > GRN No
 Term Ovlp Asap No PC Through Yel No Terminate Phase No
 Ped Dark No Track Clear Rsrv No Dwell Flash Off
 Linked Pmt 0 FL Exit Color Grn Exit Options Off
 Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	5	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red

Dwell / Cycle-Exit	0	0.0	0	4.0	1.0
--------------------	---	-----	---	-----	-----

Preemption Active Out On Preempt Act Dwell No
 Other - Priority Preempt Off Non-Priority Pmt Off
 Inhibit Extension Time 0.0 Ped Priority Return Off
 Veh Priority Return Off Queue Delay Off
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

**Preempt Preempt Filtering
 Enable Preempt Filtering &
 TSP/SCP (MM) 4-2**

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Time Base Clock/Calendar**Clock/Calendar Data (MM) 5-1**

Manual Action Plan: 0
SYNC Reference Time: 03:15
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0



MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Schedule (MM) 5-4

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MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Detectors**Detectors - Pg 1****Veh Det Phase Assignment (MM) 6-1****Vehicle Detector Plan Number - 1**

Veh Detector	Assigned Phase	Called Phase	Type
1	2		S
2	2		S
3	4	8	S
4	4	8	S
5	5		S
6	6		S
7	8	4	S
8	8	4	S
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
--------------	----------------	--------------	------

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
--------------	----------------	--------------	------

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
--------------	----------------	--------------	------

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	S-STANDARD	Yes	
2	S-STANDARD	Yes	
3	S-STANDARD	Yes	
4	S-STANDARD	Yes	
5	S-STANDARD	Yes	
6	S-STANDARD	Yes	
7	S-STANDARD	Yes	
8	S-STANDARD	Yes	

9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	
16	N-NTCIP	No	
17	S-STANDARD	Yes	
18	S-STANDARD	Yes	
19	S-STANDARD	Yes	
20	S-STANDARD	Yes	
21	S-STANDARD	Yes	
22	S-STANDARD	Yes	
23	S-STANDARD	Yes	
24	S-STANDARD	Yes	
25	S-STANDARD	Yes	
26	S-STANDARD	Yes	
27	S-STANDARD	Yes	
28	S-STANDARD	Yes	
29	S-STANDARD	Yes	
30	S-STANDARD	Yes	
31	S-STANDARD	Yes	
32	S-STANDARD	Yes	
33	S-STANDARD	Yes	
34	S-STANDARD	Yes	
35	S-STANDARD	Yes	
36	S-STANDARD	Yes	
37	S-STANDARD	Yes	
38	S-STANDARD	Yes	
39	S-STANDARD	Yes	
40	S-STANDARD	Yes	
41	S-STANDARD	Yes	
42	S-STANDARD	Yes	
43	S-STANDARD	Yes	
44	S-STANDARD	Yes	
45	S-STANDARD	Yes	
46	S-STANDARD	Yes	
47	S-STANDARD	Yes	
48	S-STANDARD	Yes	
49	S-STANDARD	Yes	
50	S-STANDARD	Yes	
51	S-STANDARD	Yes	
52	S-STANDARD	Yes	
53	S-STANDARD	Yes	
54	S-STANDARD	Yes	
55	S-STANDARD	Yes	
56	S-STANDARD	Yes	
57	S-STANDARD	Yes	
58	S-STANDARD	Yes	
59	S-STANDARD	Yes	

60	S-STANDARD	Yes	
61	S-STANDARD	Yes	
62	S-STANDARD	Yes	
63	S-STANDARD	Yes	
64	S-STANDARD	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
18	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
19	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
20	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
21	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
22	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
23	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
24	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
25	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
26	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
27	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
28	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
29	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
30	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
31	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
32	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
33	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
34	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
35	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
36	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
37	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
38	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
39	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

40	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
41	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
42	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
43	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
44	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
45	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
46	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
47	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
48	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
49	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
50	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
51	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
52	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
53	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
54	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
55	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
56	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
57	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
58	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
59	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
60	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
61	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
62	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
63	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
64	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
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Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
--------------	-------	----------	-------------	------------	------------	----------------------------	---------------------------	-------------------	-----------------	---------	------------	------------	-----------------

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
--------------	-------	----------	-------------	------------	------------	----------------------------	---------------------------	-------------------	-----------------	---------	------------	------------	-----------------

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3

Called Phase	Detector
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1114 - Sixth Line @ River Oaks Blvd - Econolite Type - Cobalt

Detectors**Detectors - Pg 2****Log - Speed Detector Setup (MM) 6-4**

NTCIP Log ECPI Log Length Unit:
 Period: 60 Period: 0 Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5**Veh Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
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Pedestrian Detector Diagnostics (MM) 6-6**Ped Diagnostic Plan Number - 1**

Det	Counts	Act	Pres	Multiplier
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Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier
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Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier
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Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B											
Sequence 1																
Ring 1	| 1	2 |	3	4 |	9	10 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	7	8 |	11	12 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	| 2	1 |	3	4 |	10	9 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	7	8 |	11	12 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	| 1	2 |	4	3 |	9	10 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	7	8 |	11	12 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	| 2	1 |	4	3 |	10	9 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	7	8 |	11	12 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	| 1	2 |	3	4 |	9	10 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	7	8 |	12	11 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	| 2	1 |	3	4 |	10	9 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	7	8 |	12	11 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	| 1	2 |	4	3 |	9	10 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	7	8 |	12	11 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	| 2	1 |	4	3 |	10	9 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	7	8 |	12	11 |	15	16 |	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	| 1	2 |	3	4 |	9	10 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	8	7 |	11	12 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	| 2	1 |	3	4 |	10	9 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	8	7 |	11	12 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	| 1	2 |	4	3 |	9	10 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	8	7 |	11	12 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	| 2	1 |	4	3 |	10	9 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 5	6 |	8	7 |	11	12 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 13																
Ring 1	| 1	2 |	3	4 |	9	10 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	8	7 |	12	11 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 14																
Ring 1	| 2	1 |	3	4 |	10	9 |	13	14 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	8	7 |	12	11 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 15																
Ring 1	| 1	2 |	4	3 |	9	10 |	14	13 |	.	.	.	.	.	.	.	.
Ring 2	| 6	5 |	8	7 |	12	11 |	16	15 |	.	.	.	.	.	.	.	.
Sequence 16																
Ring 1	2	1	4	3	10	9	14	13
Ring 2	6	5	8	7	12	11	16	15

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Hardware Alternate Sequence Enable: No

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Configuration Port 1 (SDLC)**Port 1 SDLC (MM) 1-4-1**

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
 Enable MMU Extended Status: Yes
 Enable SDLC Stop Time: No
 Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	Channel 2

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1
Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	S-T	N	E-T	N	N	N	N-T	N	N	N	N	N	N	N	N
Min Green	5	16	5	10	5	16	Min initial					5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	Walk					10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	9	0	18	0	9	Flash don't walk					16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	5.0	3.0	3.5	3.0	5.0	3.0	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	40	35	30	35	40	35	30	35	35	35	35	35	35	35	35
Max2	40	50	40	40	40	50	Cycle length					40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	1.8	0.0	2.6	0.0	1.8	All red					1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	30	0	15	0	30	0	15	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	Y
3	.
4	.
5	.
6	Y
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No
 Flash Time: 0
 All Red: 0
 Power Start Seq: 1
 MUTCD Enabled: No
 Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No
 Exit Flash: W
 Minimum Flash: 8
 Mimimum Recall: No

Cycle Through Phase: No

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph
Guar Passage																
Non-Act I		X				X										
Non-Act II				X												
Dual Entry																
Cond Service																
Cond Reservice																
Ped Re-Service		X				X										
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off

Unit Red Revert: 2.0

MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No

Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X		X		X										
Ped Recall																
Max Recall		X				X										
Soft Recall																
No Rest																
AI Calc																

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

**Coordination Options
Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lag	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh
Trk Clr Overlap
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped
Dwell Overlap
Cycling Veh
Cycling Ped
Cycling Overlap
Exit Phases	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Exit Calls
Special Function

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	10	2	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP

Free Default Pattern: 120

Headway Allowance: 0

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1
2
3
4
5
6

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan: 0
SYNC Reference Time: 00:00
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
-----------------	--	--	--	--	--	--	--	--

Aux Func (1-3)			
----------------	--	--	--

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 2 - "2"

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 3 - "3"

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #2 - "2"**

Event	Action Plan	Start Time
1	99	00:00
2	2	09:00
3	3	15:00
4	99	19:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Detectors**Detectors - Pg 1****Veh Det Phase Assignment (MM) 6-1****Vehicle Detector Plan Number - 1**

Veh Detector	Called Phase	Type
1	2, 6	N
2	2, 6	N
3	4	N
4	4	N

Vehicle Detector Plan Number - 2

Veh Detector	Called Phase	Type
--------------	--------------	------

Vehicle Detector Plan Number - 3

Veh Detector	Called Phase	Type
--------------	--------------	------

Vehicle Detector Plan Number - 4

Veh Detector	Called Phase	Type
--------------	--------------	------

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	No	
6	N-NTCIP	No	
7	N-NTCIP	No	
8	N-NTCIP	No	
9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	
16	N-NTCIP	No	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	

31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Town of Oakville, ON



Solutions that Move the World™

OAK1113 - Sixth Line @ Munn's Ave - Econolite Type - Cobalt

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60 ECPI Log Period: 0 Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier
-----	--------	-----	------	------------



APPENDIX C

Synchro Calibration – Existing Conditions

Synchro calibration parameters

- Existing AM:
 - Sixth Line and Dundas Street
 - ✓ Ideal Saturated Flow Rate: changed to 2005 for EBT movement.
 - ✓ Lane Utilization Factor: changed from 0.95 to 1.0 for EBT movement
 - Sixth Line and Upper Middle Road
 - ✓ Lost time adjust: changed from (-1) to (-3) for NBL and WBL movements
 - ✓ Ideal Saturated Flow Rate: changed to 2050 and 2005 for NBL and SBT movements, respectively.
- Existing PM:
 - Sixth Line and Dundas Street
 - ✓ Ideal Saturated Flow Rate: changed to 2005 for WBT movement.
 - ✓ Lane Utilization Factor: changed from 0.95 to 1.0 for WBT movement



APPENDIX D

Intersection Capacity Analysis – Existing Conditions

Queues
1: Sixth Line & Munn's Ave

Existing (AM)
EX (AM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		+		+	+	+	+	+
Traffic Volume (vph)	164	3	27	16	18	426	9	497
Future Volume (vph)	164	3	27	16	18	426	9	497
Lane Group Flow (vph)	0	242	0	57	21	522	11	717
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	22.5	22.5	22.5	22.5
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.72		0.15	0.08	0.46	0.02	0.65
Control Delay		40.8		22.4	8.9	10.8	8.2	14.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		40.8		22.4	8.9	10.8	8.2	14.3
Queue Length 50th (m)		37.9		7.2	1.3	42.1	0.6	68.3
Queue Length 95th (m)		52.2		14.0	5.2	77.8	3.1	125.4
Internal Link Dist (m)		178.9		139.7		134.9		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		514		578	274	1128	446	1108
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		0.47		0.10	0.08	0.46	0.02	0.65

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave





















HCM Signalized Intersection Capacity Analysis

Existing (AM)

1: Sixth Line & Munn's Ave

EX (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	3	38	27	16	5	18	426	18	9	497	112
Future Volume (vph)	164	3	38	27	16	5	18	426	18	9	497	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		0.99	1.00	
Frt		0.97			0.99		1.00	0.99		1.00	0.97	
Flt Protected		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1783		1425	1730		1625	1693	
Flt Permitted		0.73			0.81		0.28	1.00		0.40	1.00	
Satd. Flow (perm)		1295			1476		421	1730		685	1693	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	193	4	45	32	19	6	21	501	21	11	585	132
RTOR Reduction (vph)	0	11	0	0	5	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	231	0	0	52	0	21	521	0	11	711	0
Confl. Peds. (#/hr)	4		7	7		4	32		11	11		32
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		21.4			21.4		57.6	57.6		57.6	57.6	
Effective Green, g (s)		22.4			22.4		58.6	58.6		58.6	58.6	
Actuated g/C Ratio		0.25			0.25		0.65	0.65		0.65	0.65	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		322			367		274	1126		446	1102	
v/s Ratio Prot								0.30			c0.42	
v/s Ratio Perm		c0.18			0.04		0.05			0.02		
v/c Ratio		0.72			0.14		0.08	0.46		0.02	0.64	
Uniform Delay, d1		30.9			26.3		5.8	7.8		5.6	9.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.4			0.2		0.5	1.4		0.1	2.9	
Delay (s)		38.3			26.5		6.3	9.2		5.7	12.4	
Level of Service		D			C		A	A		A	B	
Approach Delay (s)		38.3			26.5			9.1			12.3	
Approach LOS		D			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			15.7								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0							9.0		
Intersection Capacity Utilization			58.4%								ICU Level of Service	B
Analysis Period (min)			15									

c Critical Lane Group

Queues

Existing (AM)

2: Sixth Line & River Oaks Blvd W

EX (AM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	45	35	27	44	28	262	40	296
Future Volume (vph)	45	35	27	44	28	262	40	296
Lane Group Flow (vph)	50	76	30	93	31	327	44	373
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	15.9	15.9	15.9	15.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	None
v/c Ratio	0.22	0.22	0.15	0.32	0.04	0.25	0.06	0.28
Control Delay	27.9	17.1	27.0	18.8	3.6	4.0	3.7	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	17.1	27.0	18.8	3.6	4.0	3.7	4.2
Queue Length 50th (m)	6.1	4.7	3.6	6.0	1.0	12.4	1.5	14.6
Queue Length 95th (m)	15.0	15.2	10.6	17.8	3.5	23.4	4.5	27.0
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	514	710	446	591	715	1314	719	1335
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.07	0.16	0.04	0.25	0.06	0.28

Intersection Summary

Cycle Length: 70

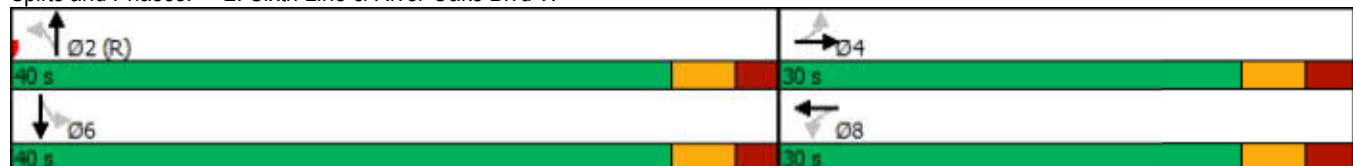
Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Splits and Phases: 2: Sixth Line & River Oaks Blvd W
























HCM Signalized Intersection Capacity Analysis

Existing (AM)

2: Sixth Line & River Oaks Blvd W










EX (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	35	33	27	44	40	28	262	32	40	296	40
Future Volume (vph)	45	35	33	27	44	40	28	262	32	40	296	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.93		1.00	0.93		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1907	1890		1631	1551		1665	1724		1593	1751	
Flt Permitted	0.70	1.00		0.71	1.00		0.54	1.00		0.56	1.00	
Satd. Flow (perm)	1399	1890		1215	1551		940	1724		944	1751	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	39	37	30	49	44	31	291	36	44	329	44
RTOR Reduction (vph)	0	32	0	0	38	0	0	3	0	0	4	0
Lane Group Flow (vph)	50	44	0	30	55	0	31	324	0	44	369	0
Confl. Peds. (#/hr)	12		11	11		12	6		14	14		6
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		8.3	8.3		50.2	50.2		50.2	50.2	
Effective Green, g (s)	9.3	9.3		9.3	9.3		51.2	51.2		51.2	51.2	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.73	0.73		0.73	0.73	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	251		161	206		687	1260		690	1280	
v/s Ratio Prot		0.02			0.04			0.19			c0.21	
v/s Ratio Perm	c0.04			0.02			0.03			0.05		
v/c Ratio	0.27	0.17		0.19	0.27		0.05	0.26		0.06	0.29	
Uniform Delay, d1	27.3	26.9		27.0	27.3		2.6	3.1		2.6	3.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.3		0.6	0.7		0.1	0.5		0.0	0.1	
Delay (s)	28.1	27.3		27.5	28.0		2.7	3.6		2.7	3.3	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.6			27.9			3.5			3.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.3				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			50.3%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
 3: Sixth Line & North Site Access

Existing (AM)
 EX (AM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	329	9	3	371
Future Volume (Veh/h)	4	0	329	9	3	371
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	358	10	3	403
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	200			159		
pX, platoon unblocked						
vC, conflicting volume	772	363			368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	363			368	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	367	682			1191	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	368	406			
Volume Left	4	0	3			
Volume Right	0	10	0			
cSH	367	1700	1191			
Volume to Capacity	0.01	0.22	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s)	14.9	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	14.9	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			31.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 4: Sixth Line & South Site Access

Existing (AM)
 EX (AM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	338	9	3	372
Future Volume (Veh/h)	4	0	338	9	3	372
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	367	10	3	404
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	106			253		
pX, platoon unblocked	0.97	0.97			0.97	
vC, conflicting volume	782	372			377	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	759	335			340	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	362	684			1180	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	377	407			
Volume Left	4	0	3			
Volume Right	0	10	0			
cSH	362	1700	1180			
Volume to Capacity	0.01	0.22	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s)	15.1	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			32.0%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

Existing (AM)

5: Sixth Line & Dundas Street West/Dundas Street East

EX (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↗	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	21	1909	189	123	853	150	50	276	305	105
Future Volume (vph)	21	1909	189	123	853	150	50	276	305	105
Lane Group Flow (vph)	22	1968	195	127	965	155	52	285	314	132
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	20.0	59.0	59.0	20.0	59.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	16.7%	49.2%	49.2%	16.7%	49.2%	34.2%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.07	0.98	0.23	0.57	0.53	0.47	0.11	0.46	0.92	0.14
Control Delay	9.1	45.7	3.3	29.3	18.0	40.3	31.6	8.4	74.9	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	45.7	3.3	29.3	18.0	40.3	31.6	8.4	74.9	26.2
Queue Length 50th (m)	1.9	234.9	0.0	14.1	81.9	31.2	9.4	5.3	74.2	10.3
Queue Length 95th (m)	5.1	#317.6	13.3	34.2	102.7	52.6	19.5	27.8	#128.5	18.4
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	416	2011	845	293	1825	347	510	636	355	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.98	0.23	0.43	0.53	0.45	0.10	0.45	0.88	0.13

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



























Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis

5: Sixth Line & Dundas Street West/Dundas Street East

Existing (AM)
EX (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	21	1909	189	123	853	83	150	50	276	305	105	23
Future Volume (vph)	21	1909	189	123	853	83	150	50	276	305	105	23
Ideal Flow (vphpl)	1900	2005	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	*1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1518	3975	1480	1675	3180		1672	1724	1546	1581	3309	
Flt Permitted	0.25	1.00	1.00	0.06	1.00		0.67	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	402	3975	1480	111	3180		1176	1724	1546	1204	3309	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	22	1968	195	127	879	86	155	52	285	314	108	24
RTOR Reduction (vph)	0	0	96	0	5	0	0	0	183	0	16	0
Lane Group Flow (vph)	22	1968	99	127	960	0	155	52	102	314	116	0
Confl. Peds. (#/hr)			1	1			4					4
Heavy Vehicles (%)	11%	2%	2%	3%	12%	7%	4%	9%	1%	4%	2%	10%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	Perm	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	63.9	59.7	59.7	74.3	66.1		33.0	33.0	33.0	33.0	33.0	
Effective Green, g (s)	65.9	60.7	60.7	75.3	67.1		34.0	34.0	34.0	34.0	34.0	
Actuated g/C Ratio	0.55	0.51	0.51	0.63	0.56		0.28	0.28	0.28	0.28	0.28	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	269	2010	748	220	1778		333	488	438	341	937	
v/s Ratio Prot	0.00	c0.50		c0.06	0.30			0.03			0.03	
v/s Ratio Perm	0.04		0.07	0.31			0.13		0.07	c0.26		
v/c Ratio	0.08	0.98	0.13	0.58	0.54		0.47	0.11	0.23	0.92	0.12	
Uniform Delay, d1	12.7	29.0	15.7	28.3	16.7		35.5	31.8	33.0	41.7	31.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	15.7	0.4	3.6	1.2		1.0	0.1	0.3	29.4	0.1	
Delay (s)	12.9	44.7	16.1	32.0	17.9		36.5	31.9	33.3	71.0	32.0	
Level of Service	B	D	B	C	B		D	C	C	E	C	
Approach Delay (s)		41.9			19.5			34.2			59.5	
Approach LOS		D			B			C			E	
Intersection Summary												
HCM 2000 Control Delay			37.0			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			98.9%			ICU Level of Service			F			
Analysis Period (min)			15									

c Critical Lane Group

Queues

Existing (AM)

6: Sixth Line & Upper Middle Road

EX (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗
Traffic Volume (vph)	129	1174	133	170	665	62	190	209	110	292	467
Future Volume (vph)	129	1174	133	170	665	62	190	209	110	292	467
Lane Group Flow (vph)	136	1236	140	179	700	65	200	220	116	307	605
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	35.5	35.5	11.5	35.5	35.5	11.5	35.4	35.4	11.5	35.4
Total Split (s)	12.0	50.0	50.0	12.0	50.0	50.0	12.0	46.0	46.0	12.0	46.0
Total Split (%)	10.0%	41.7%	41.7%	10.0%	41.7%	41.7%	10.0%	38.3%	38.3%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-3.0	-1.0	-1.0	-3.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	1.0	4.3	4.3	1.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None
v/c Ratio	0.46	0.93	0.23	0.89	0.53	0.12	0.90	0.37	0.22	0.66	0.95
Control Delay	22.3	49.0	5.1	68.9	30.3	2.3	68.4	32.1	6.0	31.4	63.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	49.0	5.1	68.9	30.3	2.3	68.4	32.1	6.0	31.4	63.9
Queue Length 50th (m)	18.2	153.0	0.2	30.4	70.5	0.0	32.4	40.7	0.0	48.9	141.7
Queue Length 95th (m)	30.8	#199.3	13.4	#76.4	89.7	4.2	#77.8	62.9	13.0	72.3	#214.8
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	297	1327	605	202	1317	546	221	606	540	468	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.93	0.23	0.89	0.53	0.12	0.90	0.36	0.21	0.66	0.93

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

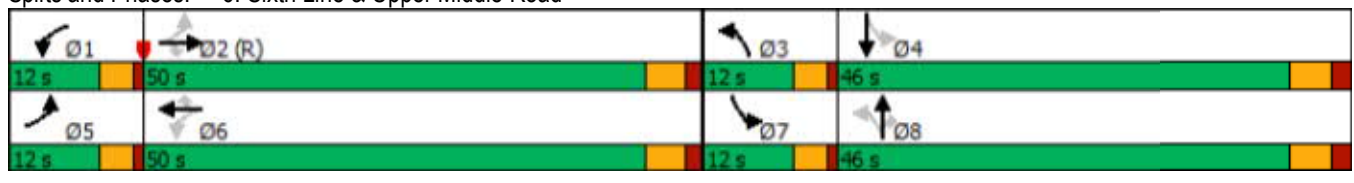
Natural Cycle: 95

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

























Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis

6: Sixth Line & Upper Middle Road

Existing (AM)
EX (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	1174	133	170	665	62	190	209	110	292	467	107
Future Volume (vph)	129	1174	133	170	665	62	190	209	110	292	467	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2050	1900	1900	1900	2005	1900
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5
Total Lost time (s)	3.0	4.3	4.3	1.0	4.3	4.3	1.0	4.7	4.7	3.0	4.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1595	3486	1363	1509	3386	1252	1727	1763	1350	1749	1870	
Flt Permitted	0.27	1.00	1.00	0.08	1.00	1.00	0.09	1.00	1.00	0.52	1.00	
Satd. Flow (perm)	455	3486	1363	130	3386	1252	171	1763	1350	962	1870	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	136	1236	140	179	700	65	200	220	116	307	492	113
RTOR Reduction (vph)	0	0	86	0	0	40	0	0	77	0	7	0
Lane Group Flow (vph)	136	1236	54	179	700	25	200	220	39	307	598	0
Confl. Peds. (#/hr)	7		1	1		7	3		2	2		3
Heavy Vehicles (%)	3%	2%	6%	9%	5%	14%	4%	3%	14%	2%	2%	6%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	52.6	44.7	44.7	54.6	45.7	45.7	47.4	39.4	39.4	47.4	39.4	
Effective Green, g (s)	54.6	45.7	45.7	60.6	46.7	46.7	53.4	40.4	40.4	49.4	40.4	
Actuated g/C Ratio	0.46	0.38	0.38	0.51	0.39	0.39	0.44	0.34	0.34	0.41	0.34	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	291	1327	519	202	1317	487	218	593	454	455	629	
v/s Ratio Prot	0.03	c0.35		c0.09	0.21		c0.08	0.12		0.05	c0.32	
v/s Ratio Perm	0.18		0.04	0.36		0.02	0.32		0.03	0.23		
v/c Ratio	0.47	0.93	0.10	0.89	0.53	0.05	0.92	0.37	0.09	0.67	0.95	
Uniform Delay, d1	20.5	35.6	23.9	32.6	28.2	22.8	31.2	30.2	27.2	28.0	38.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	13.0	0.4	33.8	1.5	0.2	38.5	0.4	0.1	3.9	24.2	
Delay (s)	21.6	48.6	24.4	66.4	29.8	23.1	69.7	30.6	27.3	31.9	63.0	
Level of Service	C	D	C	E	C	C	E	C	C	C	E	
Approach Delay (s)		43.9			36.2			44.5			52.5	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			44.2		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			95.3%		ICU Level of Service					F		
Analysis Period (min)			15									

c Critical Lane Group

Queues
1: Sixth Line & Munn's Ave

Existing (PM)
EX (PM)

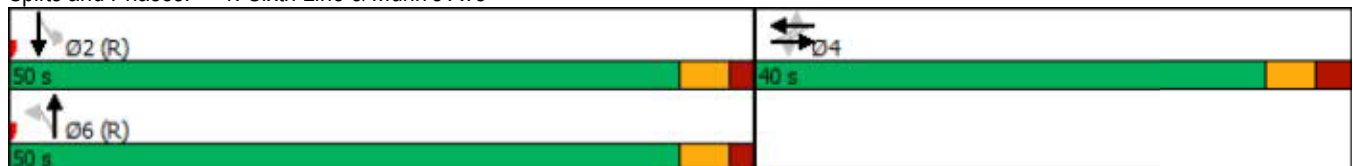


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		+		+	↑	↑	↑	↑
Traffic Volume (vph)	84	3	7	6	37	494	7	352
Future Volume (vph)	84	3	7	6	37	494	7	352
Lane Group Flow (vph)	0	106	0	22	39	541	7	446
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	23.1	23.1	23.1	23.1
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.50		0.09	0.07	0.39	0.01	0.33
Control Delay		39.4		23.6	4.0	5.1	3.7	4.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		39.4		23.6	4.0	5.1	3.7	4.4
Queue Length 50th (m)		16.2		2.1	1.4	27.1	0.2	19.9
Queue Length 95th (m)		30.8		8.4	5.1	55.5	1.6	41.5
Internal Link Dist (m)		178.9		139.7		138.7		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		528		620	574	1376	590	1371
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		0.20		0.04	0.07	0.39	0.01	0.33

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave





















HCM Signalized Intersection Capacity Analysis

Existing (PM)

1: Sixth Line & Munn's Ave

EX (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	14	7	6	9	37	494	20	7	352	71
Future Volume (vph)	84	3	14	7	6	9	37	494	20	7	352	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		1.00	1.00	
Frt		0.98			0.94		1.00	0.99		1.00	0.97	
Flt Protected		0.96			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1720			1699		1414	1733		1637	1722	
Flt Permitted		0.75			0.91		0.49	1.00		0.43	1.00	
Satd. Flow (perm)		1338			1577		722	1733		743	1722	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	3	15	7	6	9	39	520	21	7	371	75
RTOR Reduction (vph)	0	10	0	0	8	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	96	0	0	14	0	39	540	0	7	442	0
Confl. Peds. (#/hr)	6		2	2		6	6		3	3		6
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		10.5			10.5		68.5	68.5		68.5	68.5	
Effective Green, g (s)		11.5			11.5		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.13			0.13		0.77	0.77		0.77	0.77	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170			201		557	1338		573	1329	
v/s Ratio Prot								c0.31				0.26
v/s Ratio Perm		c0.07			0.01		0.05			0.01		
v/c Ratio		0.57			0.07		0.07	0.40		0.01	0.33	
Uniform Delay, d1		36.9			34.5		2.5	3.4		2.4	3.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3			0.1		0.2	0.9		0.0	0.7	
Delay (s)		41.2			34.7		2.7	4.3		2.4	3.8	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		41.2			34.7			4.2			3.8	
Approach LOS		D			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.0									A
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			90.0							9.0		
Intersection Capacity Utilization			51.2%									A
ICU Level of Service												A
Analysis Period (min)			15									

c Critical Lane Group

Queues

Existing (PM)

2: Sixth Line & River Oaks Blvd W

EX (PM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	42	32	25	38	37	394	29	352
Future Volume (vph)	42	32	25	38	37	394	29	352
Lane Group Flow (vph)	42	56	25	61	37	425	29	395
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	23.9	23.9	23.9	23.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.18	0.17	0.13	0.22	0.05	0.32	0.04	0.29
Control Delay	27.8	18.5	27.2	20.4	3.4	4.3	3.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	18.5	27.2	20.4	3.4	4.3	3.4	4.1
Queue Length 50th (m)	5.1	3.9	3.0	4.6	1.3	17.8	1.0	15.9
Queue Length 95th (m)	13.4	13.2	9.5	14.6	3.6	29.4	3.1	26.5
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	530	709	453	592	702	1333	650	1346
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08	0.06	0.10	0.05	0.32	0.04	0.29

Intersection Summary

Cycle Length: 70

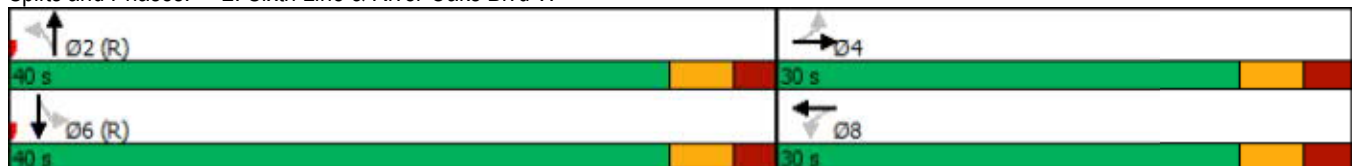
Actuated Cycle Length: 70

Offset: 22.5 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Splits and Phases: 2: Sixth Line & River Oaks Blvd W
























HCM Signalized Intersection Capacity Analysis

Existing (PM)

2: Sixth Line & River Oaks Blvd W










EX (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	32	24	25	38	23	37	394	27	29	352	39
Future Volume (vph)	42	32	24	25	38	23	37	394	27	29	352	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.94		1.00	0.94		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1915	1912		1627	1597		1664	1741		1602	1756	
Flt Permitted	0.72	1.00		0.72	1.00		0.52	1.00		0.50	1.00	
Satd. Flow (perm)	1446	1912		1234	1597		916	1741		849	1756	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	42	32	24	25	38	23	37	398	27	29	356	39
RTOR Reduction (vph)	0	21	0	0	20	0	0	2	0	0	3	0
Lane Group Flow (vph)	42	35	0	25	41	0	37	423	0	29	392	0
Confl. Peds. (#/hr)	10		11	11		10	7		10	10		7
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0		8.0	8.0		50.5	50.5		50.5	50.5	
Effective Green, g (s)	9.0	9.0		9.0	9.0		51.5	51.5		51.5	51.5	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.74	0.74	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	245		158	205		673	1280		624	1291	
v/s Ratio Prot		0.02			0.03			c0.24			0.22	
v/s Ratio Perm	c0.03			0.02			0.04			0.03		
v/c Ratio	0.23	0.14		0.16	0.20		0.05	0.33		0.05	0.30	
Uniform Delay, d1	27.4	27.1		27.1	27.3		2.5	3.2		2.5	3.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		0.5	0.5		0.2	0.7		0.1	0.6	
Delay (s)	28.0	27.3		27.6	27.8		2.7	3.9		2.7	3.8	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.6			27.7			3.8			3.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.9				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			47.7%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
 3: Sixth Line & North Site Access

Existing (PM)
 EX (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	1	441	9	2	388
Future Volume (Veh/h)	17	1	441	9	2	388
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	1	479	10	2	422
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	197			163		
pX, platoon unblocked	0.98	0.96			0.96	
vC, conflicting volume	910	484			489	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	810	444			450	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	100			100	
cM capacity (veh/h)	341	591			1069	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	19	489	424			
Volume Left	18	0	2			
Volume Right	1	10	0			
cSH	349	1700	1069			
Volume to Capacity	0.05	0.29	0.00			
Queue Length 95th (m)	1.4	0.0	0.0			
Control Delay (s)	15.9	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	15.9	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			33.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 4: Sixth Line & South Site Access

Existing (PM)
 EX (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	0	450	9	2	403
Future Volume (Veh/h)	17	0	450	9	2	403
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	489	10	2	438
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	936	494			499	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	883	417			423	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	100			100	
cM capacity (veh/h)	294	591			1056	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	499	440			
Volume Left	18	0	2			
Volume Right	0	10	0			
cSH	294	1700	1056			
Volume to Capacity	0.06	0.29	0.00			
Queue Length 95th (m)	1.6	0.0	0.0			
Control Delay (s)	18.0	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	18.0	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			34.2%	ICU Level of Service		A
Analysis Period (min)			15			

Queues

Existing (PM)

5: Sixth Line & Dundas Street West/Dundas Street East

EX (PM)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↘	↑	↗	↘	↑↑
Traffic Volume (vph)	22	1289	155	182	2110	183	111	169	155	47
Future Volume (vph)	22	1289	155	182	2110	183	111	169	155	47
Lane Group Flow (vph)	23	1357	163	192	2444	193	117	178	163	72
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	40.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	12.0	61.5	61.5	18.0	67.5	40.5	40.5	40.5	40.5	40.5
Total Split (%)	10.0%	51.3%	51.3%	15.0%	56.3%	33.8%	33.8%	33.8%	33.8%	33.8%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.13	0.68	0.17	0.60	0.96	0.74	0.31	0.40	0.72	0.10
Control Delay	8.8	22.5	3.1	19.8	31.8	60.6	41.0	7.7	61.3	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	22.5	3.1	19.8	31.8	60.6	41.0	7.7	61.3	25.5
Queue Length 50th (m)	1.4	121.5	0.0	12.9	~297.0	45.3	24.9	0.0	38.1	5.2
Queue Length 95th (m)	4.9	179.6	11.9	42.1	#399.7	65.5	38.4	17.1	57.4	10.6
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	187	2002	934	343	2557	377	548	571	327	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.68	0.17	0.56	0.96	0.51	0.21	0.31	0.50	0.07

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

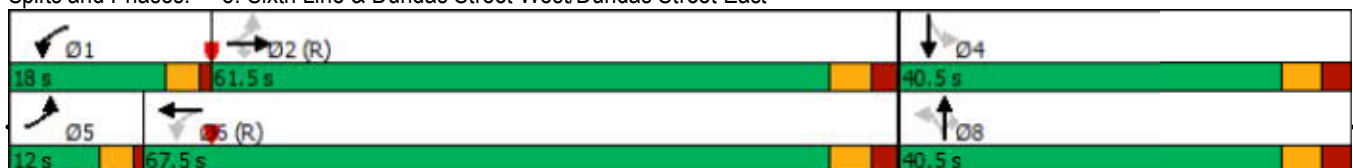
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis

5: Sixth Line & Dundas Street West/Dundas Street East

Existing (PM)
EX (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1289	155	182	2110	212	183	111	169	155	47	22
Future Volume (vph)	22	1289	155	182	2110	212	183	111	169	155	47	22
Ideal Flow (vphpl)	1900	1900	1900	1900	2050	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	*1.00		1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3544	1528	1708	3908		1738	1879	1526	1643	3343	
Flt Permitted	0.06	1.00	1.00	0.11	1.00		0.71	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	105	3544	1528	197	3908		1295	1879	1526	1123	3343	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	1357	163	192	2221	223	193	117	178	163	49	23
RTOR Reduction (vph)	0	0	71	0	5	0	0	0	142	0	18	0
Lane Group Flow (vph)	23	1357	92	192	2439	0	193	117	36	163	54	0
Confl. Peds. (#/hr)	3					3	4		1	1		4
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	0%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	Perm	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	71.0	66.8	66.8	84.0	75.8		23.3	23.3	23.3	23.3	23.3	
Effective Green, g (s)	73.0	67.8	67.8	85.0	76.8		24.3	24.3	24.3	24.3	24.3	
Actuated g/C Ratio	0.61	0.56	0.56	0.71	0.64		0.20	0.20	0.20	0.20	0.20	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	132	2002	863	318	2501		262	380	309	227	676	
v/s Ratio Prot	0.01	0.38		c0.07	c0.62			0.06			0.02	
v/s Ratio Perm	0.10		0.06	0.36			c0.15		0.02	0.15		
v/c Ratio	0.17	0.68	0.11	0.60	0.98		0.74	0.31	0.12	0.72	0.08	
Uniform Delay, d1	26.5	18.4	12.1	15.0	20.7		44.9	40.7	39.1	44.7	38.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.9	0.2	3.2	13.0		10.3	0.5	0.2	10.3	0.1	
Delay (s)	27.1	20.3	12.3	18.2	33.7		55.1	41.2	39.3	55.0	38.8	
Level of Service	C	C	B	B	C		E	D	D	D	D	
Approach Delay (s)		19.5			32.6			46.0			50.0	
Approach LOS		B			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			30.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			95.6%			ICU Level of Service			F			
Analysis Period (min)			15									

c Critical Lane Group

Queues

Existing (PM)

6: Sixth Line & Upper Middle Road

EX (PM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	207	595	47	84	1030	155	140	193	47	68	158
Future Volume (vph)	207	595	47	84	1030	155	140	193	47	68	158
Lane Group Flow (vph)	230	661	52	93	1144	172	156	214	52	76	312
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	34.3	34.3	11.5	34.3	34.3	11.5	34.7	34.7	11.5	34.7
Total Split (s)	13.0	48.0	48.0	12.0	47.0	47.0	14.0	48.0	48.0	12.0	46.0
Total Split (%)	10.8%	40.0%	40.0%	10.0%	39.2%	39.2%	11.7%	40.0%	40.0%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
v/c Ratio	0.62	0.39	0.07	0.24	0.86	0.29	0.62	0.47	0.12	0.21	0.78
Control Delay	33.9	22.2	0.7	14.3	42.6	13.5	37.8	41.2	1.6	26.1	51.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	22.2	0.7	14.3	42.6	13.5	37.8	41.2	1.6	26.1	51.7
Queue Length 50th (m)	35.6	53.2	0.0	9.2	137.2	12.2	27.5	46.4	0.0	12.7	65.4
Queue Length 95th (m)	#83.6	83.0	1.2	20.4	#182.2	30.3	39.9	64.5	1.9	21.4	90.1
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	370	1684	745	387	1334	592	254	642	560	367	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.39	0.07	0.24	0.86	0.29	0.61	0.33	0.09	0.21	0.51

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 45 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

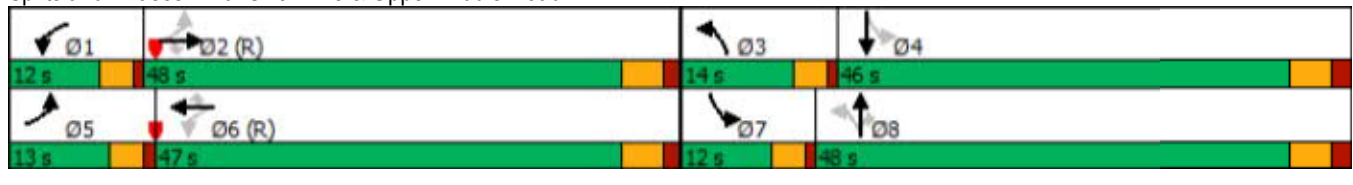
Natural Cycle: 95

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



























Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis

6: Sixth Line & Upper Middle Road

Existing (PM)
EX (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	207	595	47	84	1030	155	140	193	47	68	158	122
Future Volume (vph)	207	595	47	84	1030	155	140	193	47	68	158	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5
Total Lost time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1628	3486	1439	1565	3556	1416	1664	1780	1386	1783	1716	
Flt Permitted	0.08	1.00	1.00	0.40	1.00	1.00	0.23	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	145	3486	1439	660	3556	1416	407	1780	1386	1004	1716	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	230	661	52	93	1144	172	156	214	52	76	176	136
RTOR Reduction (vph)	0	0	27	0	0	61	0	0	39	0	27	0
Lane Group Flow (vph)	230	661	25	93	1144	111	156	214	13	76	285	0
Confl. Peds. (#/hr)	6		3	3		6	4		2	2		4
Heavy Vehicles (%)	1%	2%	0%	5%	0%	1%	0%	2%	11%	0%	2%	1%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	69.1	56.2	56.2	52.1	43.2	43.2	39.4	29.5	29.5	32.4	26.0	
Effective Green, g (s)	70.1	57.2	57.2	54.1	44.2	44.2	40.9	30.5	30.5	34.4	27.0	
Actuated g/C Ratio	0.58	0.48	0.48	0.45	0.37	0.37	0.34	0.25	0.25	0.29	0.22	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	367	1661	685	372	1309	521	252	452	352	335	386	
v/s Ratio Prot	c0.12	0.19		0.02	c0.32		c0.06	0.12		0.01	c0.17	
v/s Ratio Perm	0.25		0.02	0.09		0.08	0.15		0.01	0.05		
v/c Ratio	0.63	0.40	0.04	0.25	0.87	0.21	0.62	0.47	0.04	0.23	0.74	
Uniform Delay, d1	28.7	20.3	16.7	19.2	35.3	26.0	30.3	37.9	33.7	32.0	43.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.7	0.1	0.4	8.3	0.9	4.5	0.8	0.0	0.3	7.2	
Delay (s)	32.0	21.0	16.8	19.6	43.6	26.9	34.8	38.7	33.7	32.3	50.4	
Level of Service	C	C	B	B	D	C	C	D	C	C	D	
Approach Delay (s)		23.5			40.0			36.7			46.9	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			35.5		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			78.8%		ICU Level of Service					D		
Analysis Period (min)			15									

c Critical Lane Group



APPENDIX E

Intersection Capacity Analysis – Future Background
Conditions

Queues
1: Sixth Line & Munn's Ave

Future Background (AM)
FB (AM)

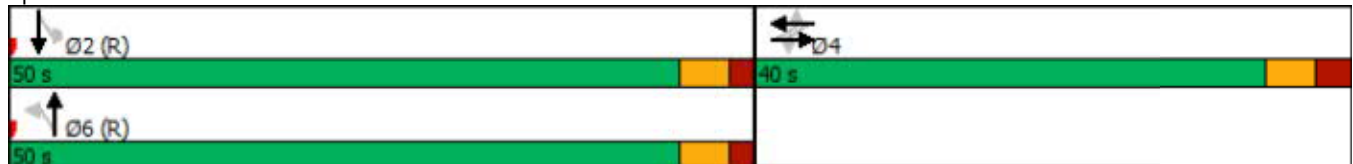


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		+		+	↑	↑	↑	↑
Traffic Volume (vph)	164	3	27	18	18	470	9	549
Future Volume (vph)	164	3	27	18	18	470	9	549
Lane Group Flow (vph)	0	242	0	59	21	574	11	778
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	22.5	22.5	22.5	22.5
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.72		0.16	0.09	0.51	0.03	0.70
Control Delay		40.7		22.5	9.3	11.6	8.3	16.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		40.7		22.5	9.3	11.6	8.3	16.2
Queue Length 50th (m)		37.9		7.5	1.3	48.5	0.6	79.1
Queue Length 95th (m)		52.1		14.2	5.4	89.0	3.2	144.9
Internal Link Dist (m)		178.9		139.7		158.4		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		514		582	240	1128	413	1112
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		0.47		0.10	0.09	0.51	0.03	0.70

Intersection Summary



















Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave



HCM Signalized Intersection Capacity Analysis
1: Sixth Line & Munn's Ave

Future Background (AM)
FB (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	3	38	27	18	5	18	470	18	9	549	112
Future Volume (vph)	164	3	38	27	18	5	18	470	18	9	549	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		0.99	1.00	
Frt		0.97			0.99		1.00	0.99		1.00	0.97	
Flt Protected		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1785		1425	1732		1627	1700	
Flt Permitted		0.73			0.81		0.25	1.00		0.37	1.00	
Satd. Flow (perm)		1294			1485		368	1732		629	1700	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	193	4	45	32	21	6	21	553	21	11	646	132
RTOR Reduction (vph)	0	11	0	0	5	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	231	0	0	54	0	21	573	0	11	772	0
Confl. Peds. (#/hr)	4		7	7		4	32		11	11		32
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		21.4			21.4		57.6	57.6		57.6	57.6	
Effective Green, g (s)		22.4			22.4		58.6	58.6		58.6	58.6	
Actuated g/C Ratio		0.25			0.25		0.65	0.65		0.65	0.65	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		322			369		239	1127		409	1106	
v/s Ratio Prot								0.33			c0.45	
v/s Ratio Perm		c0.18			0.04		0.06			0.02		
v/c Ratio		0.72			0.15		0.09	0.51		0.03	0.70	
Uniform Delay, d1		30.9			26.4		5.8	8.2		5.6	10.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.4			0.2		0.7	1.6		0.1	3.7	
Delay (s)		38.3			26.5		6.5	9.8		5.7	13.7	
Level of Service		D			C		A	A		A	B	
Approach Delay (s)		38.3			26.5			9.7			13.6	
Approach LOS		D			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.2								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			90.0								Sum of lost time (s)	9.0
Intersection Capacity Utilization			61.5%								ICU Level of Service	B
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Background (AM)

2: Sixth Line & River Oaks Blvd W

FB (AM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	45	39	27	49	28	289	40	327
Future Volume (vph)	45	39	27	49	28	289	40	327
Lane Group Flow (vph)	50	80	30	98	31	357	44	407
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	15.9	15.9	15.9	15.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	None
v/c Ratio	0.22	0.23	0.15	0.33	0.05	0.27	0.06	0.30
Control Delay	27.8	17.6	26.9	19.3	3.6	4.2	3.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	17.6	26.9	19.3	3.6	4.2	3.7	4.4
Queue Length 50th (m)	6.1	5.2	3.6	6.6	1.0	13.9	1.5	16.4
Queue Length 95th (m)	14.9	15.9	10.5	18.8	3.5	26.4	4.6	30.8
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	512	713	444	595	685	1315	698	1336
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.07	0.16	0.05	0.27	0.06	0.30

Intersection Summary

Cycle Length: 70

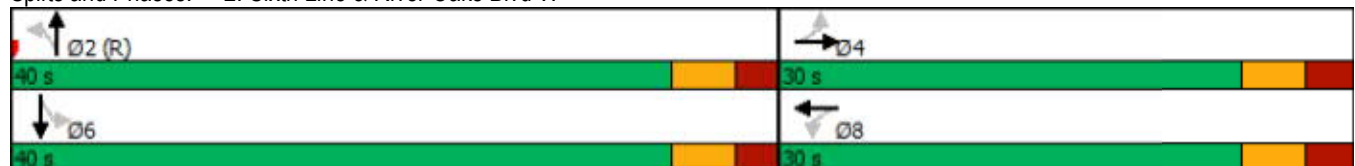
Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Splits and Phases: 2: Sixth Line & River Oaks Blvd W
























HCM Signalized Intersection Capacity Analysis

Future Background (AM)

2: Sixth Line & River Oaks Blvd W










FB (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	39	33	27	49	40	28	289	32	40	327	40
Future Volume (vph)	45	39	33	27	49	40	28	289	32	40	327	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.93		1.00	0.93		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1909	1900		1632	1562		1666	1727		1594	1754	
Flt Permitted	0.69	1.00		0.70	1.00		0.51	1.00		0.55	1.00	
Satd. Flow (perm)	1393	1900		1211	1562		901	1727		917	1754	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	43	37	30	54	44	31	321	36	44	363	44
RTOR Reduction (vph)	0	32	0	0	38	0	0	3	0	0	4	0
Lane Group Flow (vph)	50	48	0	30	60	0	31	354	0	44	403	0
Confl. Peds. (#/hr)	12		11	11		12	6		14	14		6
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		8.4	8.4		50.1	50.1		50.1	50.1	
Effective Green, g (s)	9.4	9.4		9.4	9.4		51.1	51.1		51.1	51.1	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.73	0.73		0.73	0.73	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	255		162	209		657	1260		669	1280	
v/s Ratio Prot		0.03			c0.04			0.20			c0.23	
v/s Ratio Perm	0.04			0.02			0.03			0.05		
v/c Ratio	0.27	0.19		0.19	0.29		0.05	0.28		0.07	0.32	
Uniform Delay, d1	27.2	26.9		26.9	27.3		2.6	3.2		2.7	3.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4		0.6	0.8		0.1	0.6		0.0	0.1	
Delay (s)	28.0	27.3		27.5	28.0		2.8	3.8		2.7	3.5	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.5			27.9			3.7			3.4	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.2				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			50.3%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
3: Sixth Line & North Site Access

Future Background (AM)
FB (AM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	356	9	3	402
Future Volume (Veh/h)	4	0	356	9	3	402
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	387	10	3	437
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			176			182
pX, platoon unblocked	0.99	0.99			0.99	
vC, conflicting volume	835	392			397	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	829	382			387	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	337	659			1161	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	397	440			
Volume Left	4	0	3			
Volume Right	0	10	0			
cSH	337	1700	1161			
Volume to Capacity	0.01	0.23	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s)	15.8	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	15.8	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			33.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Sixth Line & South Site Access

Future Background (AM)
FB (AM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	365	9	3	403
Future Volume (Veh/h)	4	0	365	9	3	403
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	397	10	3	438
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			106			252
pX, platoon unblocked	0.96	0.96			0.96	
vC, conflicting volume	846	402			407	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816	352			358	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	330	661			1149	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	407	441			
Volume Left	4	0	3			
Volume Right	0	10	0			
cSH	330	1700	1149			
Volume to Capacity	0.01	0.24	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s)	16.0	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	16.0	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			33.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues

Future Background (AM)

5: Sixth Line & Dundas Street West/Dundas Street East

FB (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↗	↖	↕	↗	↕	↗	↖	↕
Traffic Volume (vph)	21	2108	189	123	942	150	55	276	305	116
Future Volume (vph)	21	2108	189	123	942	150	55	276	305	116
Lane Group Flow (vph)	22	2173	195	127	1057	155	57	285	314	144
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	20.0	59.0	59.0	20.0	59.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	16.7%	49.2%	49.2%	16.7%	49.2%	34.2%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.08	1.20	0.23	0.57	0.58	0.47	0.12	0.46	0.93	0.15
Control Delay	9.2	125.0	4.2	29.3	19.1	40.5	31.8	8.4	75.2	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	125.0	4.2	29.3	19.1	40.5	31.8	8.4	75.2	27.5
Queue Length 50th (m)	1.9	~347.7	2.1	14.1	93.8	31.2	10.3	5.3	74.3	11.8
Queue Length 95th (m)	5.1	#413.7	15.9	34.2	116.7	52.8	21.1	27.8	#128.8	20.2
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	388	1809	836	293	1824	344	510	636	354	996
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	1.20	0.23	0.43	0.58	0.45	0.11	0.45	0.89	0.14

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

~ 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.



























Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis

5: Sixth Line & Dundas Street West/Dundas Street East

Future Background (AM)
FB (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	21	2108	189	123	942	83	150	55	276	305	116	23
Future Volume (vph)	21	2108	189	123	942	83	150	55	276	305	116	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1518	3579	1480	1675	3183		1672	1724	1546	1581	3322	
Flt Permitted	0.22	1.00	1.00	0.06	1.00		0.66	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	347	3579	1480	111	3183		1163	1724	1546	1198	3322	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	22	2173	195	127	971	86	155	57	285	314	120	24
RTOR Reduction (vph)	0	0	88	0	4	0	0	0	183	0	14	0
Lane Group Flow (vph)	22	2173	107	127	1053	0	155	57	102	314	130	0
Confl. Peds. (#/hr)			1	1			4					4
Heavy Vehicles (%)	11%	2%	2%	3%	12%	7%	4%	9%	1%	4%	2%	10%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	63.9	59.7	59.7	74.3	66.1		33.0	33.0	33.0	33.0	33.0	
Effective Green, g (s)	65.9	60.7	60.7	75.3	67.1		34.0	34.0	34.0	34.0	34.0	
Actuated g/C Ratio	0.55	0.51	0.51	0.63	0.56		0.28	0.28	0.28	0.28	0.28	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	241	1810	748	220	1779		329	488	438	339	941	
v/s Ratio Prot	0.00	c0.61		c0.06	0.33			0.03			0.04	
v/s Ratio Perm	0.05		0.07	0.31			0.13		0.07	c0.26		
v/c Ratio	0.09	1.20	0.14	0.58	0.59		0.47	0.12	0.23	0.93	0.14	
Uniform Delay, d1	13.0	29.6	15.8	28.3	17.4		35.6	31.9	33.0	41.8	32.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	95.9	0.4	3.6	1.5		1.1	0.1	0.3	30.4	0.1	
Delay (s)	13.2	125.5	16.2	32.0	18.9		36.6	32.0	33.3	72.1	32.1	
Level of Service	B	F	B	C	B		D	C	C	E	C	
Approach Delay (s)		115.6			20.3			34.2			59.6	
Approach LOS		F			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			76.1			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			107.1%			ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Background (AM)

6: Sixth Line & Upper Middle Road

FB (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗
Traffic Volume (vph)	129	1296	133	170	734	62	190	231	110	292	516
Future Volume (vph)	129	1296	133	170	734	62	190	231	110	292	516
Lane Group Flow (vph)	136	1364	140	179	773	65	200	243	116	307	656
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	35.5	35.5	11.5	35.5	35.5	11.5	35.4	35.4	11.5	35.4
Total Split (s)	12.0	50.0	50.0	12.0	50.0	50.0	12.0	46.0	46.0	12.0	46.0
Total Split (%)	10.0%	41.7%	41.7%	10.0%	41.7%	41.7%	10.0%	38.3%	38.3%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None
v/c Ratio	0.52	1.03	0.23	1.07	0.60	0.12	1.12	0.40	0.21	0.67	1.06
Control Delay	24.4	69.0	6.5	119.0	32.1	2.3	132.5	32.4	5.9	31.9	91.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	69.0	6.5	119.0	32.1	2.3	132.5	32.4	5.9	31.9	91.5
Queue Length 50th (m)	18.2	~190.1	2.2	~34.9	79.9	0.0	~41.7	45.6	0.0	48.9	~177.5
Queue Length 95th (m)	30.8	#234.3	15.7	#82.6	101.3	4.2	#91.1	69.4	13.0	72.3	#252.0
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	265	1327	597	167	1291	537	178	606	540	458	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	1.03	0.23	1.07	0.60	0.12	1.12	0.40	0.21	0.67	1.06

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

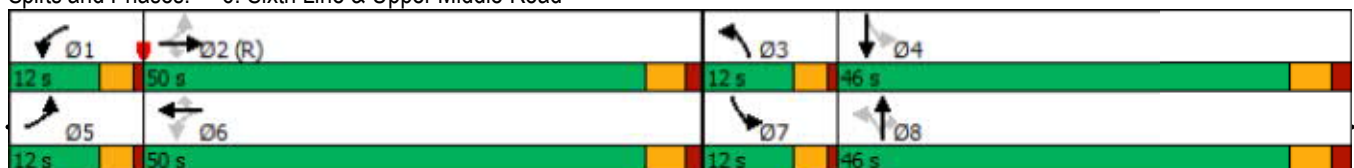
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

























Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis

6: Sixth Line & Upper Middle Road

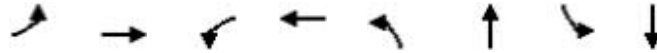
Future Background (AM)
FB (AM)

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	129	1296	133	170	734	62	190	231	110	292	516	107	
Future Volume (vph)	129	1296	133	170	734	62	190	231	110	292	516	107	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5	
Total Lost time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1596	3486	1363	1509	3386	1252	1601	1763	1350	1749	1778		
Flt Permitted	0.22	1.00	1.00	0.09	1.00	1.00	0.10	1.00	1.00	0.50	1.00		
Satd. Flow (perm)	375	3486	1363	139	3386	1252	163	1763	1350	914	1778		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	136	1364	140	179	773	65	200	243	116	307	543	113	
RTOR Reduction (vph)	0	0	78	0	0	40	0	0	76	0	7	0	
Lane Group Flow (vph)	136	1364	62	179	773	25	200	243	40	307	649	0	
Confl. Peds. (#/hr)	7		1	1		7	3		2	2		3	
Heavy Vehicles (%)	3%	2%	6%	9%	5%	14%	4%	3%	14%	2%	2%	6%	
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	52.6	44.7	44.7	52.8	44.8	44.8	48.3	40.3	40.3	48.3	40.3		
Effective Green, g (s)	54.6	45.7	45.7	54.8	45.8	45.8	50.3	41.3	41.3	50.3	41.3		
Actuated g/C Ratio	0.46	0.38	0.38	0.46	0.38	0.38	0.42	0.34	0.34	0.42	0.34		
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	261	1327	519	166	1292	477	176	606	464	445	611		
v/s Ratio Prot	0.04	0.39		c0.08	0.23		c0.09	0.14		0.05	0.37		
v/s Ratio Perm	0.20		0.05	c0.41		0.02	c0.39		0.03	0.24			
v/c Ratio	0.52	1.03	0.12	1.08	0.60	0.05	1.14	0.40	0.09	0.69	1.06		
Uniform Delay, d1	21.1	37.1	24.1	32.6	29.7	23.4	31.2	29.9	26.6	27.8	39.4		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.9	32.1	0.5	92.3	2.1	0.2	109.2	0.4	0.1	4.4	54.3		
Delay (s)	23.0	69.2	24.6	124.9	31.8	23.6	140.4	30.4	26.7	32.2	93.6		
Level of Service	C	E	C	F	C	C	F	C	C	C	F		
Approach Delay (s)		61.6			47.6			69.0			74.0		
Approach LOS		E			D			E			E		
Intersection Summary													
HCM 2000 Control Delay			62.1									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.11										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			103.6%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

Queues
1: Sixth Line & Munn's Ave

Future Background (PM)
FB (PM)

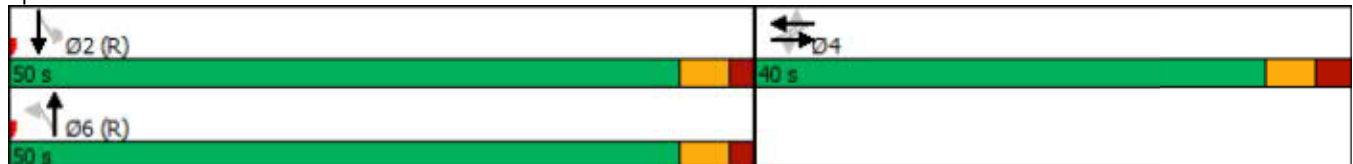


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		+		+	+	+	+	+
Traffic Volume (vph)	84	3	7	7	37	545	7	389
Future Volume (vph)	84	3	7	7	37	545	7	389
Lane Group Flow (vph)	0	106	0	23	39	595	7	484
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	23.1	23.1	23.1	23.1
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.51		0.09	0.07	0.43	0.01	0.35
Control Delay		39.5		23.7	4.0	5.5	3.7	4.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		39.5		23.7	4.0	5.5	3.7	4.7
Queue Length 50th (m)		16.2		2.3	1.4	31.3	0.2	22.4
Queue Length 95th (m)		30.8		8.7	5.1	63.8	1.6	46.5
Internal Link Dist (m)		178.9		139.7		158.4		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		527		624	548	1378	552	1374
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		0.20		0.04	0.07	0.43	0.01	0.35

Intersection Summary



















Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave



HCM Signalized Intersection Capacity Analysis
1: Sixth Line & Munn's Ave

Future Background (PM)
FB (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	14	7	7	9	37	545	20	7	389	71
Future Volume (vph)	84	3	14	7	7	9	37	545	20	7	389	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		1.00	1.00	
Frt		0.98			0.95		1.00	0.99		1.00	0.98	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1720			1706		1414	1734		1638	1726	
Flt Permitted		0.75			0.92		0.46	1.00		0.40	1.00	
Satd. Flow (perm)		1337			1588		690	1734		692	1726	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	3	15	7	7	9	39	574	21	7	409	75
RTOR Reduction (vph)	0	10	0	0	8	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	96	0	0	15	0	39	594	0	7	481	0
Confl. Peds. (#/hr)	6		2	2		6	6		3	3		6
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		10.5			10.5		68.5	68.5		68.5	68.5	
Effective Green, g (s)		11.5			11.5		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.13			0.13		0.77	0.77		0.77	0.77	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170			202		532	1339		534	1332	
v/s Ratio Prot								c0.34			0.28	
v/s Ratio Perm		c0.07			0.01		0.06			0.01		
v/c Ratio		0.57			0.07		0.07	0.44		0.01	0.36	
Uniform Delay, d1		36.9			34.6		2.5	3.6		2.4	3.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3			0.2		0.3	1.1		0.0	0.8	
Delay (s)		41.2			34.7		2.7	4.6		2.4	4.0	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		41.2			34.7			4.5			4.0	
Approach LOS		D			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.0								HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			90.0								Sum of lost time (s)	9.0
Intersection Capacity Utilization			51.2%								ICU Level of Service	A
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Background (PM)

2: Sixth Line & River Oaks Blvd W

FB (PM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	42	35	25	42	37	435	29	389
Future Volume (vph)	42	35	25	42	37	435	29	389
Lane Group Flow (vph)	42	59	25	65	37	466	29	432
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	23.9	23.9	23.9	23.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.18	0.18	0.13	0.24	0.06	0.35	0.05	0.32
Control Delay	27.7	18.9	27.1	20.9	3.5	4.6	3.4	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	18.9	27.1	20.9	3.5	4.6	3.4	4.3
Queue Length 50th (m)	5.1	4.2	3.0	5.1	1.2	20.2	1.0	18.0
Queue Length 95th (m)	13.4	13.8	9.5	15.3	3.6	33.7	3.1	30.1
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	529	712	453	596	669	1333	616	1347
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08	0.06	0.11	0.06	0.35	0.05	0.32

Intersection Summary

Cycle Length: 70

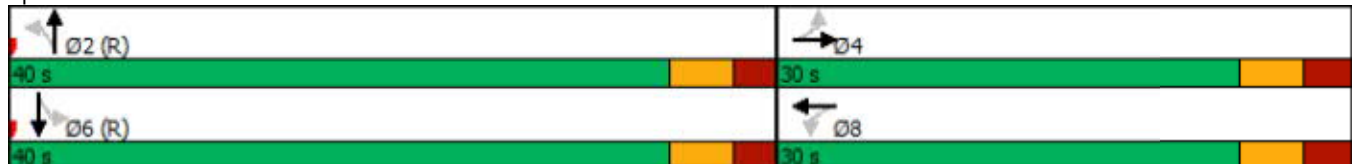
Actuated Cycle Length: 70

Offset: 22.5 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated






















Splits and Phases: 2: Sixth Line & River Oaks Blvd W



HCM Signalized Intersection Capacity Analysis

2: Sixth Line & River Oaks Blvd W










Future Background (PM)
FB (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	35	24	25	42	23	37	435	27	29	389	39
Future Volume (vph)	42	35	24	25	42	23	37	435	27	29	389	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1916	1922		1628	1608		1665	1743		1603	1759	
Flt Permitted	0.71	1.00		0.72	1.00		0.50	1.00		0.48	1.00	
Satd. Flow (perm)	1442	1922		1231	1608		874	1743		805	1759	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	42	35	24	25	42	23	37	439	27	29	393	39
RTOR Reduction (vph)	0	21	0	0	20	0	0	2	0	0	3	0
Lane Group Flow (vph)	42	38	0	25	45	0	37	464	0	29	429	0
Confl. Peds. (#/hr)	10		11	11		10	7		10	10		7
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.1	8.1		8.1	8.1		50.4	50.4		50.4	50.4	
Effective Green, g (s)	9.1	9.1		9.1	9.1		51.4	51.4		51.4	51.4	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.73	0.73		0.73	0.73	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	249		160	209		641	1279		591	1291	
v/s Ratio Prot		0.02			0.03			c0.27			0.24	
v/s Ratio Perm	c0.03			0.02			0.04			0.04		
v/c Ratio	0.22	0.15		0.16	0.22		0.06	0.36		0.05	0.33	
Uniform Delay, d1	27.3	27.0		27.0	27.3		2.6	3.4		2.6	3.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		0.5	0.5		0.2	0.8		0.2	0.7	
Delay (s)	27.9	27.3		27.5	27.8		2.8	4.2		2.7	4.0	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.6			27.7			4.1			3.9	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.9				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)				9.5	
Intersection Capacity Utilization			47.7%				ICU Level of Service				A	
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
3: Sixth Line & North Site Access

Future Background (PM)
FB (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	1	482	9	2	425
Future Volume (Veh/h)	17	1	482	9	2	425
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	1	524	10	2	462
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	176			182		
pX, platoon unblocked	0.96	0.93			0.93	
vC, conflicting volume	995	529			534	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	856	461			466	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	100			100	
cM capacity (veh/h)	314	561			1023	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	19	534	464			
Volume Left	18	0	2			
Volume Right	1	10	0			
cSH	322	1700	1023			
Volume to Capacity	0.06	0.31	0.00			
Queue Length 95th (m)	1.5	0.0	0.0			
Control Delay (s)	16.9	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	16.9	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			35.9%	ICU Level of Service	A	
Analysis Period (min)			15			

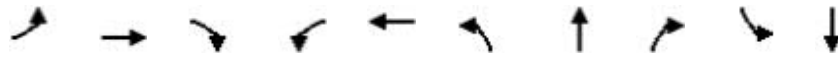
HCM Unsignalized Intersection Capacity Analysis
4: Sixth Line & South Site Access

Future Background (PM)
FB (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	17	0	491	9	2	440
Future Volume (Veh/h)	17	0	491	9	2	440
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	534	10	2	478
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked	0.93	0.91			0.91	
vC, conflicting volume	1021	539			544	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	922	448			454	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	100			100	
cM capacity (veh/h)	277	558			1011	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	544	480			
Volume Left	18	0	2			
Volume Right	0	10	0			
cSH	277	1700	1011			
Volume to Capacity	0.06	0.32	0.00			
Queue Length 95th (m)	1.7	0.0	0.0			
Control Delay (s)	18.9	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	18.9	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			36.4%	ICU Level of Service		A
Analysis Period (min)			15			

Queues
5: Sixth Line & Dundas Street West/Dundas Street East

Future Background (PM)
FB (PM)

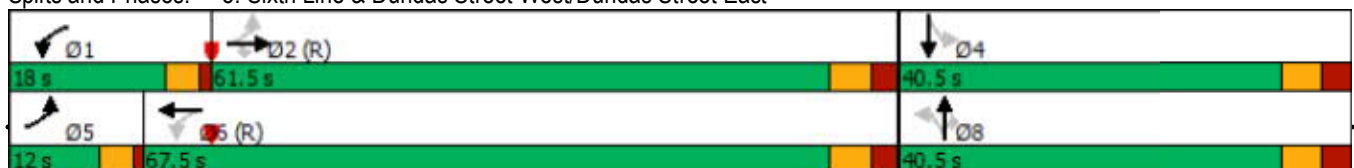


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↘	↖	↗	↖	↗	↘	↖	↗
Traffic Volume (vph)	22	1423	155	182	2330	183	123	169	155	52
Future Volume (vph)	22	1423	155	182	2330	183	123	169	155	52
Lane Group Flow (vph)	23	1498	163	192	2676	193	129	178	163	78
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	40.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	12.0	61.5	61.5	18.0	67.5	40.5	40.5	40.5	40.5	40.5
Total Split (%)	10.0%	51.3%	51.3%	15.0%	56.3%	33.8%	33.8%	33.8%	33.8%	33.8%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.13	0.75	0.17	0.67	1.19	0.74	0.34	0.39	0.75	0.11
Control Delay	8.8	24.7	3.1	31.2	112.2	60.7	41.6	7.6	64.4	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	24.7	3.1	31.2	112.2	60.7	41.6	7.6	64.4	26.0
Queue Length 50th (m)	1.4	143.7	0.0	21.9	~439.4	45.3	27.6	0.0	38.3	5.8
Queue Length 95th (m)	4.9	211.4	11.9	51.1	#519.3	65.6	41.7	17.1	58.0	11.5
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	187	2000	933	310	2251	375	548	571	313	995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.75	0.17	0.62	1.19	0.51	0.24	0.31	0.52	0.08

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 ~ 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.



























Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis

5: Sixth Line & Dundas Street West/Dundas Street East

Future Background (PM)
FB (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	22	1423	155	182	2330	212	183	123	169	155	52	22
Future Volume (vph)	22	1423	155	182	2330	212	183	123	169	155	52	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3544	1528	1708	3446		1738	1879	1526	1643	3358	
Flt Permitted	0.06	1.00	1.00	0.08	1.00		0.70	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	105	3544	1528	142	3446		1287	1879	1526	1076	3358	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	1498	163	192	2453	223	193	129	178	163	55	23
RTOR Reduction (vph)	0	0	71	0	4	0	0	0	142	0	18	0
Lane Group Flow (vph)	23	1498	92	192	2672	0	193	129	36	163	60	0
Confl. Peds. (#/hr)	3					3	4		1	1		4
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	0%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	70.9	66.7	66.7	83.9	75.7		23.4	23.4	23.4	23.4	23.4	
Effective Green, g (s)	72.9	67.7	67.7	84.9	76.7		24.4	24.4	24.4	24.4	24.4	
Actuated g/C Ratio	0.61	0.56	0.56	0.71	0.64		0.20	0.20	0.20	0.20	0.20	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	132	1999	862	285	2202		261	382	310	218	682	
v/s Ratio Prot	0.01	0.42		c0.08	c0.78			0.07			0.02	
v/s Ratio Perm	0.10		0.06	0.40			0.15		0.02	c0.15		
v/c Ratio	0.17	0.75	0.11	0.67	1.21		0.74	0.34	0.12	0.75	0.09	
Uniform Delay, d1	26.5	19.7	12.1	25.9	21.6		44.8	40.9	39.0	44.9	38.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	2.6	0.2	6.2	100.4		10.5	0.5	0.2	13.1	0.1	
Delay (s)	27.1	22.4	12.4	32.0	122.1		55.3	41.4	39.2	58.0	38.8	
Level of Service	C	C	B	C	F		E	D	D	E	D	
Approach Delay (s)		21.5			116.0			46.0			51.8	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			76.4				HCM 2000 Level of Service				E	
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				13.7	
Intersection Capacity Utilization			114.8%				ICU Level of Service				H	
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Background (PM)

6: Sixth Line & Upper Middle Road

FB (PM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↗	↖	↕	↗	↖	↕	↗	↖	↗
Traffic Volume (vph)	207	657	47	84	1137	155	140	213	47	68	174
Future Volume (vph)	207	657	47	84	1137	155	140	213	47	68	174
Lane Group Flow (vph)	230	730	52	93	1263	172	156	237	52	76	329
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	34.3	34.3	11.5	34.3	34.3	11.5	34.7	34.7	11.5	34.7
Total Split (s)	13.0	48.0	48.0	12.0	47.0	47.0	14.0	48.0	48.0	12.0	46.0
Total Split (%)	10.8%	40.0%	40.0%	10.0%	39.2%	39.2%	11.7%	40.0%	40.0%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
v/c Ratio	0.63	0.44	0.07	0.26	0.96	0.30	0.62	0.50	0.12	0.21	0.79
Control Delay	35.1	23.9	0.7	15.1	55.5	13.7	36.8	41.0	1.5	25.3	51.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	23.9	0.7	15.1	55.5	13.7	36.8	41.0	1.5	25.3	51.9
Queue Length 50th (m)	36.0	61.7	0.0	9.5	162.7	12.5	27.1	51.3	0.0	12.5	70.0
Queue Length 95th (m)	#89.3	95.1	1.3	20.9	#215.1	30.3	39.0	70.1	1.9	20.9	94.8
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	363	1644	730	364	1309	582	254	642	560	362	613
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.44	0.07	0.26	0.96	0.30	0.61	0.37	0.09	0.21	0.54

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 45 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

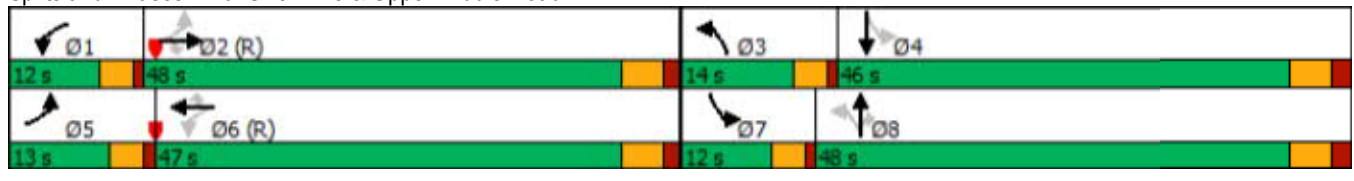
Natural Cycle: 95

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis

6: Sixth Line & Upper Middle Road

Future Background (PM)
FB (PM)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	207	657	47	84	1137	155	140	213	47	68	174	122	
Future Volume (vph)	207	657	47	84	1137	155	140	213	47	68	174	122	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5	
Total Lost time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00		
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1628	3486	1439	1565	3556	1416	1664	1780	1386	1784	1723		
Flt Permitted	0.09	1.00	1.00	0.37	1.00	1.00	0.22	1.00	1.00	0.50	1.00		
Satd. Flow (perm)	148	3486	1439	606	3556	1416	393	1780	1386	938	1723		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	230	730	52	93	1263	172	156	237	52	76	193	136	
RTOR Reduction (vph)	0	0	28	0	0	62	0	0	38	0	24	0	
Lane Group Flow (vph)	230	730	24	93	1263	110	156	237	14	76	305	0	
Confl. Peds. (#/hr)	6		3	3		6	4		2	2		4	
Heavy Vehicles (%)	1%	2%	0%	5%	0%	1%	0%	2%	11%	0%	2%	1%	
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases	2		2	6		6	8		8	4			
Actuated Green, G (s)	67.8	54.8	54.8	51.4	42.4	42.4	40.7	30.8	30.8	33.7	27.3		
Effective Green, g (s)	68.8	55.8	55.8	53.4	43.4	43.4	42.2	31.8	31.8	35.7	28.3		
Actuated g/C Ratio	0.57	0.46	0.46	0.44	0.36	0.36	0.35	0.27	0.27	0.30	0.24		
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	361	1620	669	349	1286	512	253	471	367	331	406		
v/s Ratio Prot	c0.12	0.21		0.02	c0.36		c0.06	0.13		0.01	c0.18		
v/s Ratio Perm	0.25		0.02	0.10		0.08	0.16		0.01	0.05			
v/c Ratio	0.64	0.45	0.04	0.27	0.98	0.22	0.62	0.50	0.04	0.23	0.75		
Uniform Delay, d1	29.6	21.7	17.5	19.7	37.9	26.5	29.6	37.4	32.7	31.0	42.6		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	3.7	0.9	0.1	0.4	21.2	1.0	4.4	0.8	0.0	0.4	7.6		
Delay (s)	33.3	22.6	17.6	20.1	59.1	27.5	34.0	38.2	32.8	31.4	50.2		
Level of Service	C	C	B	C	E	C	C	D	C	C	D		
Approach Delay (s)		24.8			53.2			36.1			46.6		
Approach LOS		C			D			D			D		
Intersection Summary													
HCM 2000 Control Delay			41.7									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			82.5%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group



APPENDIX F

Detailed TTS Calculations

Wed Aug 11 2021 19:43:02 GMT-0400 (Eastern Daylight Time) - Run Time: 2714ms

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 zone of destination - gta06_dest In 4035 4036 4037 4038
and
Start time of trip - start_time In 600-900
and
Trip purpose - trip_purp In 1 3
and
Primary travel mode of trip - mode_prime In D M

Trip 2016

Table:

	4035	4036	4037	4038
90	0	17	0	0
125	14	0	0	0
290	0	0	0	16
2258	8	0	0	0
3102	0	0	10	0
3619	0	0	22	0
3629	144	0	0	0
3637	35	0	0	0
3644	23	0	0	0
3650	0	26	0	0
3655	0	14	0	0
3662	0	8	10	0
3669	46	0	0	0
3683	0	10	0	0
3691	20	0	0	0
3702	10	0	0	0
3709	12	37	0	0
3809	0	0	0	25
3811	30	0	0	0
4001	0	32	0	0
4005	12	16	33	0
4007	0	9	38	0
4012	0	0	25	0
4014	10	19	63	0
4017	0	33	24	0
4020	10	0	0	0
4023	0	0	11	0
4025	0	16	26	0
4026	0	48	0	0
4028	7	0	0	0
4029	43	15	0	0
4030	29	35	27	33
4031	43	28	23	25
4032	20	13	0	0

4033	23	0	130	37
4034	0	34	65	0
4035	0	36	22	0
4036	0	63	63	0
4037	61	6	248	0
4038	14	17	37	40
4039	0	17	6	0
4041	69	8	0	0
4042	49	0	75	0
4045	12	0	0	0
4052	23	0	0	0
4057	0	0	32	0
4065	26	0	0	0
4068	0	0	0	14
4069	0	0	27	0
4072	0	12	0	0
4080	0	0	0	6
4083	21	0	0	0
4084	20	0	0	0
4088	0	0	18	0
4105	13	0	0	0
4120	22	0	20	0
4126	19	0	0	0
4127	63	0	13	0
4183	18	37	21	12
4186	47	0	38	23
4189	31	15	0	0
5067	0	0	34	0
5170	0	0	60	0
5232	0	0	25	0
6067	13	0	0	0
6366	58	0	0	0
7213	27	0	0	0
7378	16	0	0	0
7517	59	0	0	0

Wed Aug 11 2021 19:34:51 GMT-0400 (Eastern Daylight Time) - Run Time: 2966ms

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 zone of origin - gta06_orig In 4035 4036 4037 4038

and

Start time of trip - start_time In 600-900

and

Trip purpose - trip_purp In 1 3

and

Primary travel mode of trip - mode_prime In D M

Trip 2016

Table:

	4035	4036	4037	4038
43	0	0	10	0
52	0	0	0	22
53	0	0	0	55
57	0	0	0	37
58	0	0	35	0
65	0	0	0	19
67	43	0	0	0
69	0	0	32	0
89	0	0	0	32
125	0	0	0	26
204	0	23	0	0
218	13	0	0	0
227	0	0	16	0
228	0	10	0	0
230	0	0	0	24
292	0	0	29	0
307	0	0	24	0
308	14	0	0	0
323	0	38	0	0
327	0	11	0	0
335	10	0	0	0
362	0	0	12	0
371	0	0	0	57
388	0	0	83	0
393	0	0	0	20
401	12	11	0	0
430	0	9	0	0
444	0	0	24	0
2083	0	0	49	16
2119	0	0	0	16
2270	0	0	56	0
2373	13	0	0	0
2385	13	0	0	0
3332	0	0	40	0

3338	0	9	0	0
3343	0	0	47	0
3419	0	0	44	0
3420	0	0	0	29
3425	0	7	0	0
3495	17	0	0	0
3603	16	0	0	0
3605	25	23	0	18
3606	0	0	96	0
3607	0	8	0	0
3609	9	44	0	0
3611	0	15	0	0
3612	0	8	17	0
3616	0	0	0	48
3618	20	15	0	0
3621	0	0	12	0
3629	0	15	0	0
3631	11	0	0	0
3632	0	21	0	0
3633	0	32	0	11
3634	0	0	0	29
3635	0	9	19	16
3639	0	0	0	48
3642	0	0	28	0
3646	12	0	0	0
3650	10	26	0	74
3658	11	0	0	0
3662	0	8	27	58
3663	0	12	0	0
3665	0	10	0	0
3671	0	0	38	0
3688	0	0	0	29
3692	0	0	12	0
3693	33	29	96	0
3698	0	11	0	0
3699	9	0	40	0
3700	0	0	36	0
3701	0	0	85	0
3702	10	14	0	0
3703	0	0	37	0
3704	0	0	48	0
3709	10	0	0	0
3710	0	0	39	0
3809	22	0	0	0
3815	0	40	0	0
3821	12	0	0	0
3831	0	0	24	0
3835	0	29	37	0
3841	0	0	38	0
3842	0	0	0	24
3847	0	12	0	0
3850	0	0	43	0
3851	0	10	0	0
3853	0	16	0	0
3854	14	0	11	0

3864	7	0	0	0
3868	9	0	0	17
3870	0	14	0	0
3879	10	0	0	0
4002	0	0	18	0
4005	20	0	0	0
4006	26	0	0	0
4007	0	0	0	24
4008	16	12	56	0
4009	20	25	32	29
4011	0	0	12	20
4012	0	17	51	0
4014	26	19	79	17
4016	10	0	0	24
4017	0	68	24	0
4019	11	0	40	0
4023	30	0	51	0
4024	33	10	0	0
4025	0	23	43	0
4026	0	46	0	0
4027	18	14	0	51
4029	0	35	0	0
4030	38	45	37	17
4031	11	23	74	57
4032	0	14	0	0
4033	0	0	87	0
4034	43	13	133	0
4035	0	0	61	14
4036	36	63	6	17
4037	22	63	248	37
4038	0	0	0	40
4039	0	0	44	29
4040	13	15	38	0
4041	0	0	16	101
4042	0	0	16	0
4045	0	0	44	0
4052	0	0	38	0
4057	0	9	0	0
4060	10	0	0	0
4068	43	0	0	14
4069	0	30	27	10
4072	0	0	12	0
4077	0	0	49	0
4078	6	9	0	0
4086	0	0	0	11
4088	0	0	24	0
4096	18	0	0	0
4099	0	6	0	0
4111	0	0	19	0
4119	0	0	23	0
4162	22	0	26	0
4164	0	4	0	0
4182	0	0	32	0
4183	0	18	21	40
4184	0	0	24	0

4185	40	25	52	25
4186	70	0	0	0
5188	0	0	0	17
5198	0	0	39	29
6016	26	0	0	0
6219	0	0	29	0
7318	0	0	32	0
7390	0	10	0	0
8056	0	0	42	0
8074	0	12	0	0
8087	11	0	0	0
8912	0	0	0	36
9998	0	15	8	0

Wed Aug 11 2021 19:41:14 GMT-0400 (Eastern Daylight Time) - Run Time: 2727ms

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 zone of destination - gta06_dest In 4035 4036 4037 4038
and

Start time of trip - start_time In 1600-1800
and

Trip purpose - trip_purp In 1 3
and

Primary travel mode of trip - mode_prime In D M

Trip 2016

Table:

	4035	4036	4037	4038
21	0	0	0	25
36	0	0	32	0
43	0	0	10	0
57	0	0	16	37
58	0	0	35	0
65	0	0	0	19
67	43	0	0	0
70	11	0	0	0
89	0	0	0	32
125	8	0	0	0
126	0	18	0	0
230	0	0	0	24
308	14	0	0	0
327	0	11	0	0
362	0	0	12	0
371	0	0	0	29
388	0	0	27	0
393	0	0	0	20
401	12	11	0	0
416	0	0	15	0
465	12	0	0	0
2083	0	0	49	0
2094	0	0	39	0
2119	0	0	0	16
2270	0	0	56	0
2373	13	0	0	0
2385	13	0	0	0
3338	0	9	0	0
3343	0	0	47	0
3419	0	0	44	0
3420	0	0	0	29
3425	0	7	0	0
3431	0	15	0	0
3480	29	0	0	0

3605	12	8	0	18
3606	0	0	96	0
3607	0	17	0	0
3609	0	9	0	0
3612	0	8	0	0
3616	0	0	0	48
3618	20	15	0	0
3632	0	29	0	0
3633	0	32	0	11
3635	0	0	19	0
3639	0	0	0	48
3642	0	0	28	0
3644	69	0	0	0
3650	10	0	0	74
3658	11	0	0	0
3662	0	0	27	16
3663	0	12	12	0
3665	0	0	16	0
3686	13	0	0	0
3688	0	0	0	29
3693	12	29	96	0
3698	0	11	0	0
3699	9	0	0	0
3700	0	0	36	0
3701	0	0	85	0
3702	0	0	17	0
3704	0	0	32	0
3720	0	0	49	0
3813	17	0	0	0
3815	0	40	0	0
3821	12	0	0	0
3831	0	0	24	34
3840	0	35	0	0
3847	0	12	0	0
3850	0	0	86	0
3853	0	16	0	0
3854	14	0	11	0
3868	9	0	0	17
3874	0	23	0	0
3877	0	0	22	0
3879	10	0	0	0
4002	0	0	26	0
4005	20	0	0	0
4006	0	16	0	0
4008	0	22	161	0
4009	12	16	34	29
4011	0	0	0	7
4012	15	39	25	0
4014	16	15	81	0
4016	43	0	0	0
4017	0	0	14	0
4018	0	0	14	0
4019	11	0	0	0
4023	0	0	51	0
4024	23	38	0	0

4025	17	20	0	0
4026	0	39	0	0
4027	0	14	0	51
4029	35	0	29	0
4030	0	15	14	17
4031	13	0	74	0
4032	0	14	0	0
4033	23	0	73	0
4034	51	9	47	36
4035	51	41	99	28
4036	84	68	27	0
4037	35	18	156	12
4038	0	0	65	0
4039	0	0	0	29
4040	13	0	0	0
4041	0	8	41	0
4042	18	0	16	0
4052	0	0	38	0
4068	43	0	0	0
4069	0	30	0	10
4077	22	0	0	0
4078	6	9	0	0
4086	0	0	0	11
4088	0	0	24	0
4110	0	35	14	0
4119	0	0	23	0
4125	9	0	0	0
4162	0	0	26	0
4183	0	14	16	0
4184	0	0	24	0
4185	40	0	0	0
4186	7	0	0	0
5023	0	0	32	0
5159	0	0	0	14
5188	0	0	0	17
5198	0	0	39	0
5230	0	0	17	0
6219	0	0	29	0
7042	0	10	0	0
7318	0	0	32	0
8056	0	0	42	0
8063	0	0	0	14

Wed Aug 11 2021 19:38:52 GMT-0400 (Eastern Daylight Time) - Run Time: 2717ms

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 zone of origin - gta06_orig In 4035 4036 4037 4038

and

Start time of trip - start_time In 1600-1800

and

Trip purpose - trip_purp In 1 3

and

Primary travel mode of trip - mode_prime In D M

Trip 2016

Table:

	4035	4036	4037	4038
59	0	0	19	0
84	17	0	0	0
90	0	17	0	0
125	14	0	0	0
300	20	0	0	0
335	0	0	19	0
341	0	8	0	0
1181	22	0	0	0
1208	0	0	9	0
2258	8	0	0	0
2420	8	0	0	0
2563	0	0	0	4
3357	0	0	22	0
3369	0	0	21	0
3436	0	0	10	0
3615	0	0	55	0
3629	144	0	0	0
3637	35	0	0	0
3639	0	0	0	14
3662	6	0	10	0
3663	0	0	12	0
3691	20	0	0	0
3809	0	0	0	25
3847	0	0	63	0
3870	0	0	24	0
3874	0	23	0	0
4001	0	32	0	0
4005	17	14	0	0
4007	0	0	38	0
4008	0	0	30	0
4009	0	6	0	0
4012	0	22	25	0
4014	0	0	12	0
4016	43	0	0	11

4020	17	0	0	0
4024	0	23	0	0
4025	60	20	8	0
4026	0	41	34	19
4029	106	0	29	0
4030	14	0	25	33
4031	42	4	0	0
4032	22	0	0	0
4033	82	0	73	0
4034	0	0	16	29
4035	51	84	35	0
4036	41	68	18	0
4037	99	27	156	65
4038	28	0	12	0
4039	22	5	57	0
4040	0	0	13	0
4041	0	8	0	0
4042	15	0	75	0
4052	23	0	0	0
4057	0	0	32	0
4060	0	0	11	0
4064	34	0	26	0
4065	26	0	0	0
4073	0	0	58	0
4074	22	0	0	0
4080	0	0	0	6
4082	0	0	27	0
4105	13	0	0	0
4120	22	0	0	0
4126	19	0	0	0
4127	0	0	13	0
4181	0	6	0	0
4182	0	0	52	0
4183	31	14	0	12
4186	103	0	62	13
4189	0	0	36	0
5164	71	0	0	0
5170	0	0	60	0
5188	0	0	41	0
5210	0	0	24	0
5232	33	0	0	0
6004	15	0	0	0
6067	13	0	0	0
6366	58	0	0	0
8119	0	0	39	0

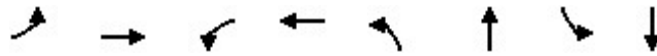


APPENDIX G

Intersection Capacity Analysis – Future Total
Conditions

Queues
1: Sixth Line & Munn's Ave

Future Total (AM)
FT (AM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↖	↗	↖
Traffic Volume (vph)	164	3	27	18	18	471	9	557
Future Volume (vph)	164	3	27	18	18	471	9	557
Lane Group Flow (vph)	0	242	0	59	21	575	11	787
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	22.5	22.5	22.5	22.5
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.72		0.16	0.09	0.51	0.03	0.71
Control Delay		40.7		22.5	9.4	11.6	8.3	16.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		40.7		22.5	9.4	11.6	8.3	16.5
Queue Length 50th (m)		37.9		7.5	1.3	48.6	0.6	81.0
Queue Length 95th (m)		52.1		14.2	5.4	89.0	3.2	148.3
Internal Link Dist (m)		178.9		139.7		158.4		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		514		582	234	1128	413	1112
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		0.47		0.10	0.09	0.51	0.03	0.71

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave





















HCM Signalized Intersection Capacity Analysis

Future Total (AM)

1: Sixth Line & Munn's Ave

FT (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	3	38	27	18	5	18	471	18	9	557	112
Future Volume (vph)	164	3	38	27	18	5	18	471	18	9	557	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		0.99	1.00	
Frt		0.97			0.99		1.00	0.99		1.00	0.97	
Flt Protected		0.96			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1703			1785		1425	1732		1627	1701	
Flt Permitted		0.73			0.81		0.24	1.00		0.37	1.00	
Satd. Flow (perm)		1294			1485		361	1732		628	1701	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	193	4	45	32	21	6	21	554	21	11	655	132
RTOR Reduction (vph)	0	11	0	0	5	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	231	0	0	54	0	21	574	0	11	781	0
Confl. Peds. (#/hr)	4		7	7		4	32		11	11		32
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		21.4			21.4		57.6	57.6		57.6	57.6	
Effective Green, g (s)		22.4			22.4		58.6	58.6		58.6	58.6	
Actuated g/C Ratio		0.25			0.25		0.65	0.65		0.65	0.65	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		322			369		235	1127		408	1107	
v/s Ratio Prot								0.33			c0.46	
v/s Ratio Perm		c0.18			0.04		0.06			0.02		
v/c Ratio		0.72			0.15		0.09	0.51		0.03	0.71	
Uniform Delay, d1		30.9			26.4		5.8	8.2		5.6	10.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.4			0.2		0.8	1.6		0.1	3.8	
Delay (s)		38.3			26.5		6.6	9.8		5.7	13.9	
Level of Service		D			C		A	A		A	B	
Approach Delay (s)		38.3			26.5			9.7			13.8	
Approach LOS		D			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.3									B
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			90.0							9.0		
Intersection Capacity Utilization			61.9%									B
Analysis Period (min)			15									

c Critical Lane Group

Queues
2: Sixth Line & River Oaks Blvd W

Future Total (AM)
FT (AM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	48	39	27	49	28	312	44	387
Future Volume (vph)	48	39	27	49	28	312	44	387
Lane Group Flow (vph)	53	80	30	101	31	383	49	477
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	15.9	15.9	15.9	15.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	None	None
v/c Ratio	0.23	0.23	0.15	0.34	0.05	0.29	0.07	0.36
Control Delay	28.0	17.5	26.8	18.9	3.7	4.3	3.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	17.5	26.8	18.9	3.7	4.3	3.8	4.8
Queue Length 50th (m)	6.5	5.2	3.6	6.6	1.0	15.3	1.7	20.5
Queue Length 95th (m)	15.5	15.8	10.5	18.9	3.6	29.0	5.0	38.1
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	511	713	444	594	625	1317	675	1337
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.07	0.17	0.05	0.29	0.07	0.36

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated





















Splits and Phases: 2: Sixth Line & River Oaks Blvd W



HCM Signalized Intersection Capacity Analysis

2: Sixth Line & River Oaks Blvd W










Future Total (AM)
FT (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	39	33	27	49	42	28	312	32	44	387	42
Future Volume (vph)	48	39	33	27	49	42	28	312	32	44	387	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.93		1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1909	1900		1632	1554		1667	1729		1595	1756	
Flt Permitted	0.69	1.00		0.70	1.00		0.47	1.00		0.53	1.00	
Satd. Flow (perm)	1390	1900		1211	1554		823	1729		889	1756	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	43	37	30	54	47	31	347	36	49	430	47
RTOR Reduction (vph)	0	32	0	0	41	0	0	3	0	0	3	0
Lane Group Flow (vph)	53	48	0	30	60	0	31	380	0	49	474	0
Confl. Peds. (#/hr)	12		11	11		12	6		14	14		6
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4	8.4		8.4	8.4		50.1	50.1		50.1	50.1	
Effective Green, g (s)	9.4	9.4		9.4	9.4		51.1	51.1		51.1	51.1	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.73	0.73		0.73	0.73	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	255		162	208		600	1262		648	1281	
v/s Ratio Prot		0.03			c0.04			0.22			c0.27	
v/s Ratio Perm	0.04			0.02			0.04			0.06		
v/c Ratio	0.28	0.19		0.19	0.29		0.05	0.30		0.08	0.37	
Uniform Delay, d1	27.3	26.9		26.9	27.3		2.7	3.3		2.7	3.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.4		0.6	0.8		0.2	0.6		0.0	0.2	
Delay (s)	28.1	27.3		27.5	28.1		2.8	3.9		2.8	3.7	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.6			27.9			3.8			3.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.0				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			53.8%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
 3: Sixth Line & North Site Access

Future Total (AM)
 FT (AM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	1	374	14	4	411
Future Volume (Veh/h)	33	1	374	14	4	411
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1	407	15	4	447
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	176			182		
pX, platoon unblocked	0.98	0.98			0.98	
vC, conflicting volume	870	414			422	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	395			402	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	100			100	
cM capacity (veh/h)	320	643			1136	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	37	422	451			
Volume Left	36	0	4			
Volume Right	1	15	0			
cSH	325	1700	1136			
Volume to Capacity	0.11	0.25	0.00			
Queue Length 95th (m)	3.1	0.0	0.1			
Control Delay (s)	17.5	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	17.5	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			34.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
4: Sixth Line & South Site Access

Future Total (AM)
FT (AM)

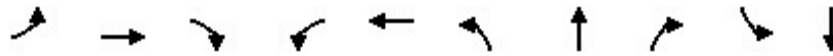
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	33	0	388	14	4	440
Future Volume (Veh/h)	33	0	388	14	4	440
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	0	422	15	4	478
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			106			252
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	916	430			437	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	883	370			378	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	100			100	
cM capacity (veh/h)	299	640			1118	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	36	437	482			
Volume Left	36	0	4			
Volume Right	0	15	0			
cSH	299	1700	1118			
Volume to Capacity	0.12	0.26	0.00			
Queue Length 95th (m)	3.2	0.0	0.1			
Control Delay (s)	18.7	0.0	0.1			
Lane LOS	C		A			
Approach Delay (s)	18.7	0.0	0.1			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			36.3%		ICU Level of Service	A
Analysis Period (min)			15			

Queues

Future Total (AM)

5: Sixth Line & Dundas Street West/Dundas Street East

FT (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↑↑	↗	↙	↑↑	↙	↑	↗	↙	↑↑
Traffic Volume (vph)	21	2108	189	123	942	150	56	276	305	124
Future Volume (vph)	21	2108	189	123	942	150	56	276	305	124
Lane Group Flow (vph)	22	2173	195	127	1057	155	58	285	314	152
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	20.0	59.0	59.0	20.0	59.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	16.7%	49.2%	49.2%	16.7%	49.2%	34.2%	34.2%	34.2%	34.2%	34.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.08	1.20	0.23	0.57	0.58	0.47	0.12	0.46	0.92	0.16
Control Delay	9.2	125.3	4.2	29.3	19.1	40.6	31.8	8.4	75.0	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	125.3	4.2	29.3	19.1	40.6	31.8	8.4	75.0	28.2
Queue Length 50th (m)	1.9	~347.7	2.1	14.1	93.8	31.2	10.5	5.3	74.3	12.7
Queue Length 95th (m)	5.1	#413.7	15.9	34.2	116.7	52.8	21.3	27.8	#128.9	21.5
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	388	1808	835	292	1823	341	510	636	354	997
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	1.20	0.23	0.43	0.58	0.45	0.11	0.45	0.89	0.15

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

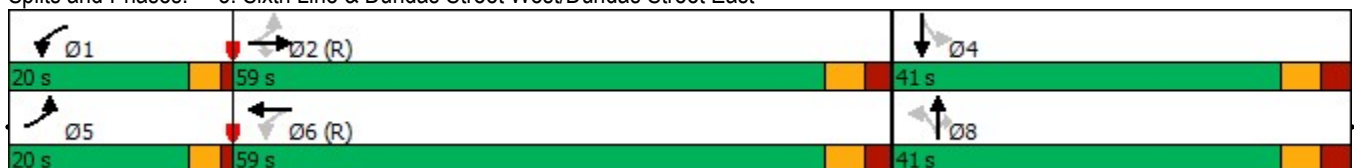
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.



























Queue shown is maximum after two cycles.

Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis
5: Sixth Line & Dundas Street West/Dundas Street East

Future Total (AM)
FT (AM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	21	2108	189	123	942	83	150	56	276	305	124	23
Future Volume (vph)	21	2108	189	123	942	83	150	56	276	305	124	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1518	3579	1480	1675	3183		1672	1724	1546	1581	3329	
Flt Permitted	0.22	1.00	1.00	0.06	1.00		0.66	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	346	3579	1480	111	3183		1154	1724	1546	1197	3329	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	22	2173	195	127	971	86	155	58	285	314	128	24
RTOR Reduction (vph)	0	0	88	0	4	0	0	0	183	0	13	0
Lane Group Flow (vph)	22	2173	107	127	1053	0	155	58	102	314	139	0
Confl. Peds. (#/hr)			1	1			4					4
Heavy Vehicles (%)	11%	2%	2%	3%	12%	7%	4%	9%	1%	4%	2%	10%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	63.8	59.6	59.6	74.2	66.0		33.1	33.1	33.1	33.1	33.1	
Effective Green, g (s)	65.8	60.6	60.6	75.2	67.0		34.1	34.1	34.1	34.1	34.1	
Actuated g/C Ratio	0.55	0.51	0.51	0.63	0.56		0.28	0.28	0.28	0.28	0.28	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	240	1807	747	220	1777		327	489	439	340	945	
v/s Ratio Prot	0.00	c0.61		c0.06	0.33			0.03			0.04	
v/s Ratio Perm	0.05		0.07	0.31			0.13		0.07	c0.26		
v/c Ratio	0.09	1.20	0.14	0.58	0.59		0.47	0.12	0.23	0.92	0.15	
Uniform Delay, d1	13.1	29.7	15.8	28.3	17.5		35.5	31.8	32.9	41.7	32.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	96.7	0.4	3.6	1.5		1.1	0.1	0.3	29.9	0.1	
Delay (s)	13.2	126.4	16.2	31.9	18.9		36.6	31.9	33.2	71.5	32.2	
Level of Service	B	F	B	C	B		D	C	C	E	C	
Approach Delay (s)		116.4			20.3			34.1			58.7	
Approach LOS		F			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			76.4			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			107.1%			ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Total (AM)

6: Sixth Line & Upper Middle Road

FT (AM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↘
Traffic Volume (vph)	132	1296	133	170	734	80	190	232	110	337	529
Future Volume (vph)	132	1296	133	170	734	80	190	232	110	337	529
Lane Group Flow (vph)	139	1364	140	179	773	84	200	244	116	355	672
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	35.5	35.5	11.5	35.5	35.5	11.5	35.4	35.4	11.5	35.4
Total Split (s)	12.0	50.0	50.0	12.0	50.0	50.0	12.0	46.0	46.0	12.0	46.0
Total Split (%)	10.0%	41.7%	41.7%	10.0%	41.7%	41.7%	10.0%	38.3%	38.3%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	Max	Max	None	None	None	None	None
v/c Ratio	0.53	1.03	0.23	1.07	0.60	0.16	1.12	0.40	0.21	0.78	1.09
Control Delay	24.8	69.0	6.5	119.0	32.2	4.3	132.5	32.5	5.9	38.6	100.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	69.0	6.5	119.0	32.2	4.3	132.5	32.5	5.9	38.6	100.2
Queue Length 50th (m)	18.6	~190.1	2.2	~34.9	79.9	0.0	~41.7	45.7	0.0	58.4	~186.3
Queue Length 95th (m)	31.4	#234.3	15.7	#82.6	101.3	8.4	#91.1	69.8	13.0	#90.3	#261.3
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	265	1327	597	167	1291	537	178	606	540	457	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.03	0.23	1.07	0.60	0.16	1.12	0.40	0.21	0.78	1.09

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

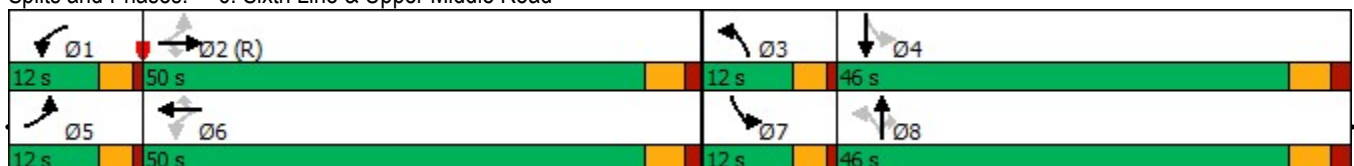
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis

6: Sixth Line & Upper Middle Road

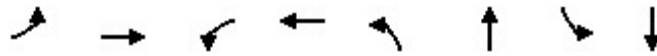
Future Total (AM)
FT (AM)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	1296	133	170	734	80	190	232	110	337	529	109
Future Volume (vph)	132	1296	133	170	734	80	190	232	110	337	529	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5
Total Lost time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1596	3486	1363	1509	3386	1252	1601	1763	1350	1749	1778	
Flt Permitted	0.22	1.00	1.00	0.09	1.00	1.00	0.10	1.00	1.00	0.49	1.00	
Satd. Flow (perm)	375	3486	1363	139	3386	1252	163	1763	1350	911	1778	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	139	1364	140	179	773	84	200	244	116	355	557	115
RTOR Reduction (vph)	0	0	78	0	0	52	0	0	76	0	6	0
Lane Group Flow (vph)	139	1364	62	179	773	32	200	244	40	355	666	0
Confl. Peds. (#/hr)	7		1	1		7	3		2	2		3
Heavy Vehicles (%)	3%	2%	6%	9%	5%	14%	4%	3%	14%	2%	2%	6%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	52.6	44.7	44.7	52.8	44.8	44.8	48.3	40.3	40.3	48.3	40.3	
Effective Green, g (s)	54.6	45.7	45.7	54.8	45.8	45.8	50.3	41.3	41.3	50.3	41.3	
Actuated g/C Ratio	0.46	0.38	0.38	0.46	0.38	0.38	0.42	0.34	0.34	0.42	0.34	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	261	1327	519	166	1292	477	176	606	464	444	611	
v/s Ratio Prot	0.04	0.39		c0.08	0.23		c0.09	0.14		0.06	0.37	
v/s Ratio Perm	0.20		0.05	c0.41		0.03	c0.39		0.03	0.27		
v/c Ratio	0.53	1.03	0.12	1.08	0.60	0.07	1.14	0.40	0.09	0.80	1.09	
Uniform Delay, d1	21.1	37.1	24.1	32.6	29.7	23.5	31.2	30.0	26.6	30.0	39.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	32.1	0.5	92.3	2.1	0.3	109.2	0.4	0.1	9.7	63.4	
Delay (s)	23.2	69.2	24.6	124.9	31.8	23.8	140.4	30.4	26.7	39.7	102.7	
Level of Service	C	E	C	F	C	C	F	C	C	D	F	
Approach Delay (s)		61.5			47.2			68.9			81.0	
Approach LOS		E			D			E			F	
Intersection Summary												
HCM 2000 Control Delay			63.7			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)					15.0			
Intersection Capacity Utilization			104.5%	ICU Level of Service			G					
Analysis Period (min)			15									

c Critical Lane Group

Queues
1: Sixth Line & Munn's Ave

Future Total (PM)
FT (PM)



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↗	↖	↗	↖
Traffic Volume (vph)	84	3	7	7	37	548	7	404
Future Volume (vph)	84	3	7	7	37	548	7	404
Lane Group Flow (vph)	0	106	0	23	39	598	7	500
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		4		6		2
Permitted Phases	4		4		6		2	
Detector Phase	4	4	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	16.0	16.0	16.0	16.0
Minimum Split (s)	30.9	30.9	30.9	30.9	23.1	23.1	23.1	23.1
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	1.8	1.8	1.8	1.8
Lost Time Adjust (s)		-1.0		-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)		4.9		4.9	4.1	4.1	4.1	4.1
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.51		0.09	0.07	0.43	0.01	0.36
Control Delay		39.5		23.7	4.0	5.5	3.7	4.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		39.5		23.7	4.0	5.5	3.7	4.8
Queue Length 50th (m)		16.2		2.3	1.4	31.6	0.2	23.5
Queue Length 95th (m)		30.8		8.7	5.1	64.2	1.6	48.8
Internal Link Dist (m)		178.9		139.7		158.4		1274.7
Turn Bay Length (m)					47.0		38.0	
Base Capacity (vph)		527		624	538	1378	549	1374
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		0.20		0.04	0.07	0.43	0.01	0.36

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Sixth Line & Munn's Ave





















HCM Signalized Intersection Capacity Analysis

Future Total (PM)

1: Sixth Line & Munn's Ave

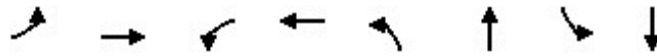
FT (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	3	14	7	7	9	37	548	20	7	404	71
Future Volume (vph)	84	3	14	7	7	9	37	548	20	7	404	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.8	3.8	3.8	3.8	3.8	3.8	3.2	3.2	3.2	3.2	3.2	3.2
Total Lost time (s)		4.9			4.9		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		1.00	1.00	
Frt		0.98			0.95		1.00	0.99		1.00	0.98	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1720			1706		1415	1734		1638	1728	
Flt Permitted		0.75			0.92		0.45	1.00		0.40	1.00	
Satd. Flow (perm)		1337			1588		676	1734		690	1728	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	3	15	7	7	9	39	577	21	7	425	75
RTOR Reduction (vph)	0	10	0	0	8	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	96	0	0	15	0	39	597	0	7	497	0
Confl. Peds. (#/hr)	6		2	2		6	6		3	3		6
Heavy Vehicles (%)	2%	6%	17%	3%	4%	7%	21%	3%	9%	5%	2%	3%
Bus Blockages (#/hr)	0	2	2	0	0	0	0	2	2	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			6			2	
Permitted Phases	4			4			6			2		
Actuated Green, G (s)		10.5			10.5		68.5	68.5		68.5	68.5	
Effective Green, g (s)		11.5			11.5		69.5	69.5		69.5	69.5	
Actuated g/C Ratio		0.13			0.13		0.77	0.77		0.77	0.77	
Clearance Time (s)		5.9			5.9		5.1	5.1		5.1	5.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		170			202		522	1339		532	1334	
v/s Ratio Prot								c0.34			0.29	
v/s Ratio Perm		c0.07			0.01		0.06			0.01		
v/c Ratio		0.57			0.07		0.07	0.45		0.01	0.37	
Uniform Delay, d1		36.9			34.6		2.5	3.6		2.4	3.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3			0.2		0.3	1.1		0.0	0.8	
Delay (s)		41.2			34.7		2.8	4.6		2.4	4.1	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		41.2			34.7			4.5			4.1	
Approach LOS		D			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.9				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)				9.0	
Intersection Capacity Utilization			51.2%				ICU Level of Service				A	
Analysis Period (min)			15									

c Critical Lane Group

Queues
2: Sixth Line & River Oaks Blvd W

Future Total (PM)
FT (PM)

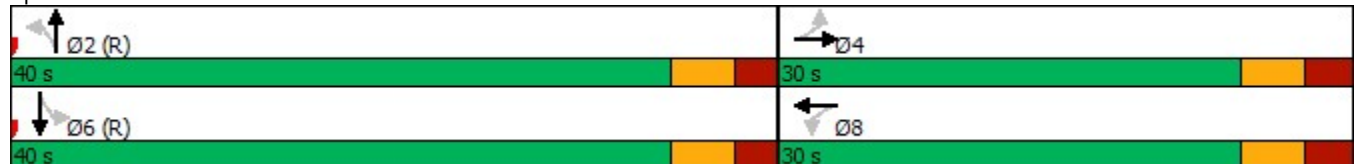


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	48	35	25	42	37	490	35	439
Future Volume (vph)	48	35	25	42	37	490	35	439
Lane Group Flow (vph)	48	59	25	66	37	522	35	486
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	25.0	25.0	25.0	25.0
Minimum Split (s)	23.9	23.9	23.9	23.9	30.6	30.6	30.6	30.6
Total Split (s)	30.0	30.0	30.0	30.0	40.0	40.0	40.0	40.0
Total Split (%)	42.9%	42.9%	42.9%	42.9%	57.1%	57.1%	57.1%	57.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.9	4.9	4.9	4.9	4.6	4.6	4.6	4.6
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.21	0.18	0.12	0.24	0.06	0.39	0.06	0.36
Control Delay	28.1	18.8	26.9	20.7	3.5	4.9	3.6	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	18.8	26.9	20.7	3.5	4.9	3.6	4.6
Queue Length 50th (m)	5.9	4.2	3.0	5.1	1.2	23.7	1.2	21.0
Queue Length 95th (m)	14.8	13.7	9.4	15.4	3.7	40.1	3.6	35.7
Internal Link Dist (m)		292.3		261.5		480.8		81.8
Turn Bay Length (m)	56.0		66.0		50.0		52.0	
Base Capacity (vph)	528	712	453	595	623	1334	572	1347
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.08	0.06	0.11	0.06	0.39	0.06	0.36

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 22.5 (32%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated





















Splits and Phases: 2: Sixth Line & River Oaks Blvd W



HCM Signalized Intersection Capacity Analysis

2: Sixth Line & River Oaks Blvd W










Future Total (PM)
FT (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	35	24	25	42	24	37	490	27	35	439	43
Future Volume (vph)	48	35	24	25	42	24	37	490	27	35	439	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.8	4.8	4.8	3.3	3.3	3.3	3.2	3.2	3.2	3.3	3.3	3.3
Total Lost time (s)	4.9	4.9		4.9	4.9		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		0.96	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1916	1922		1628	1603		1666	1745		1604	1759	
Flt Permitted	0.71	1.00		0.72	1.00		0.46	1.00		0.44	1.00	
Satd. Flow (perm)	1440	1922		1231	1603		815	1745		748	1759	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	48	35	24	25	42	24	37	495	27	35	443	43
RTOR Reduction (vph)	0	21	0	0	21	0	0	2	0	0	3	0
Lane Group Flow (vph)	48	38	0	25	45	0	37	520	0	35	483	0
Confl. Peds. (#/hr)	10		11	11		10	7		10	10		7
Heavy Vehicles (%)	3%	3%	2%	3%	3%	9%	3%	3%	4%	8%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	2	2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.1	8.1		8.1	8.1		50.4	50.4		50.4	50.4	
Effective Green, g (s)	9.1	9.1		9.1	9.1		51.4	51.4		51.4	51.4	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.73	0.73		0.73	0.73	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.6	5.6		5.6	5.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	249		160	208		598	1281		549	1291	
v/s Ratio Prot		0.02			0.03			c0.30			0.27	
v/s Ratio Perm	c0.03			0.02			0.05			0.05		
v/c Ratio	0.26	0.15		0.16	0.22		0.06	0.41		0.06	0.37	
Uniform Delay, d1	27.4	27.0		27.0	27.3		2.6	3.5		2.6	3.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3		0.5	0.5		0.2	1.0		0.2	0.8	
Delay (s)	28.1	27.3		27.5	27.8		2.8	4.5		2.8	4.2	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.7			27.7			4.4			4.1	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			7.9									A
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			70.0								9.5	
Intersection Capacity Utilization			48.0%									A
Analysis Period (min)			15									

c Critical Lane Group










HCM Unsignalized Intersection Capacity Analysis
3: Sixth Line & North Site Access

Future Total (PM)
FT (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	3	500	31	8	465
Future Volume (Veh/h)	30	3	500	31	8	465
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	3	543	34	9	505
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			176			182
pX, platoon unblocked	0.95	0.92			0.92	
vC, conflicting volume	1083	560			577	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	924	475			494	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	99			99	
cM capacity (veh/h)	280	541			981	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	36	577	514			
Volume Left	33	0	9			
Volume Right	3	34	0			
cSH	292	1700	981			
Volume to Capacity	0.12	0.34	0.01			
Queue Length 95th (m)	3.3	0.0	0.2			
Control Delay (s)	19.0	0.0	0.3			
Lane LOS	C		A			
Approach Delay (s)	19.0	0.0	0.3			
Approach LOS	C					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			40.9%		ICU Level of Service	A
Analysis Period (min)			15			

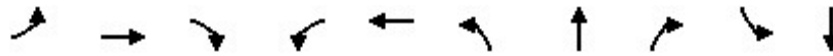
HCM Unsignalized Intersection Capacity Analysis
4: Sixth Line & South Site Access

Future Total (PM)
FT (PM)

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	0	531	31	8	487
Future Volume (Veh/h)	30	0	531	31	8	487
Sign Control	Yield		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	0	577	34	9	529
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			106			252
pX, platoon unblocked	0.91	0.89			0.89	
vC, conflicting volume	1141	594			611	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1031	485			504	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	100			99	
cM capacity (veh/h)	232	519			947	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	33	611	538			
Volume Left	33	0	9			
Volume Right	0	34	0			
cSH	232	1700	947			
Volume to Capacity	0.14	0.36	0.01			
Queue Length 95th (m)	3.9	0.0	0.2			
Control Delay (s)	23.1	0.0	0.3			
Lane LOS	C		A			
Approach Delay (s)	23.1	0.0	0.3			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			42.0%		ICU Level of Service	A
Analysis Period (min)			15			

Queues
5: Sixth Line & Dundas Street West/Dundas Street East

Future Total (PM)
FT (PM)

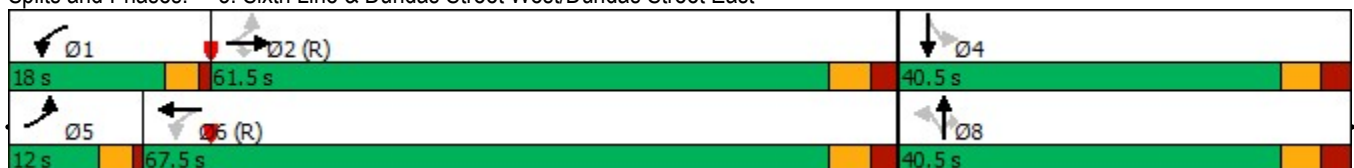


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↑↑	↗	↙	↑↑	↙	↑	↗	↙	↑↑
Traffic Volume (vph)	22	1423	155	182	2330	183	126	169	155	67
Future Volume (vph)	22	1423	155	182	2330	183	126	169	155	67
Lane Group Flow (vph)	23	1498	163	192	2676	193	133	178	163	94
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2		1	6		8			4
Permitted Phases	2		2	6		8		8	4	
Detector Phase	5	2	2	1	6	8	8	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	40.2	40.5	40.5	40.5	40.5	40.5
Total Split (s)	12.0	61.5	61.5	18.0	67.5	40.5	40.5	40.5	40.5	40.5
Total Split (%)	10.0%	51.3%	51.3%	15.0%	56.3%	33.8%	33.8%	33.8%	33.8%	33.8%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	5.2	5.2	3.0	5.2	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None	None
v/c Ratio	0.13	0.75	0.18	0.67	1.19	0.74	0.34	0.39	0.75	0.13
Control Delay	8.9	24.9	3.1	32.1	114.1	60.9	41.5	7.5	64.2	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	24.9	3.1	32.1	114.1	60.9	41.5	7.5	64.2	27.4
Queue Length 50th (m)	1.4	144.6	0.0	22.4	~440.6	45.2	28.5	0.0	38.3	7.5
Queue Length 95th (m)	5.0	211.4	11.9	51.7	#521.0	65.5	42.6	17.0	58.0	13.6
Internal Link Dist (m)		647.8			926.4		1274.7			665.0
Turn Bay Length (m)	194.0		146.0	106.0		84.0		48.0	88.0	
Base Capacity (vph)	187	1995	931	308	2244	369	548	571	310	1003
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.75	0.18	0.62	1.19	0.52	0.24	0.31	0.53	0.09

Intersection Summary



























Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 ~ 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.

Splits and Phases: 5: Sixth Line & Dundas Street West/Dundas Street East



HCM Signalized Intersection Capacity Analysis
 5: Sixth Line & Dundas Street West/Dundas Street East

Future Total (PM)
 FT (PM)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	22	1423	155	182	2330	212	183	126	169	155	67	22
Future Volume (vph)	22	1423	155	182	2330	212	183	126	169	155	67	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.7	3.2	3.2	3.6	3.6	3.3	3.5	3.3	2.8	3.4	4.0
Total Lost time (s)	3.0	5.2	5.2	3.0	5.2		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3544	1528	1708	3446		1738	1879	1526	1643	3387	
Flt Permitted	0.06	1.00	1.00	0.08	1.00		0.69	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	105	3544	1528	141	3446		1268	1879	1526	1063	3387	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	1498	163	192	2453	223	193	133	178	163	71	23
RTOR Reduction (vph)	0	0	71	0	4	0	0	0	141	0	18	0
Lane Group Flow (vph)	23	1498	92	192	2672	0	193	133	37	163	76	0
Confl. Peds. (#/hr)	3					3	4		1	1		4
Heavy Vehicles (%)	0%	3%	1%	1%	3%	1%	0%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm	Perm	Perm	NA
Protected Phases	5	2		1	6			8				4
Permitted Phases	2		2	6			8		8	4		
Actuated Green, G (s)	70.7	66.5	66.5	83.6	75.4		23.7	23.7	23.7	23.7	23.7	
Effective Green, g (s)	72.7	67.5	67.5	84.6	76.4		24.7	24.7	24.7	24.7	24.7	
Actuated g/C Ratio	0.61	0.56	0.56	0.70	0.64		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	132	1993	859	283	2193		260	386	314	218	697	
v/s Ratio Prot	0.01	0.42		c0.08	c0.78			0.07				0.02
v/s Ratio Perm	0.10		0.06	0.40			0.15		0.02	c0.15		
v/c Ratio	0.17	0.75	0.11	0.68	1.22		0.74	0.34	0.12	0.75	0.11	
Uniform Delay, d1	26.5	19.9	12.2	26.2	21.8		44.7	40.7	38.8	44.7	38.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	2.7	0.3	6.3	102.6		10.9	0.5	0.2	13.1	0.1	
Delay (s)	27.1	22.6	12.5	32.5	124.4		55.5	41.3	38.9	57.8	38.8	
Level of Service	C	C	B	C	F		E	D	D	E	D	
Approach Delay (s)		21.7			118.2			45.9			50.8	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			77.5			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.08									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.7			
Intersection Capacity Utilization			114.8%			ICU Level of Service			H			
Analysis Period (min)			15									

c Critical Lane Group

Queues

Future Total (PM)

6: Sixth Line & Upper Middle Road

FT (PM)



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑	↗	↘	↗
Traffic Volume (vph)	213	657	47	84	1137	204	140	213	47	105	183
Future Volume (vph)	213	657	47	84	1137	204	140	213	47	105	183
Lane Group Flow (vph)	237	730	52	93	1263	227	156	237	52	117	343
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	11.5	34.3	34.3	11.5	34.3	34.3	11.5	34.7	34.7	11.5	34.7
Total Split (s)	13.0	48.0	48.0	12.0	47.0	47.0	14.0	48.0	48.0	12.0	46.0
Total Split (%)	10.8%	40.0%	40.0%	10.0%	39.2%	39.2%	11.7%	40.0%	40.0%	10.0%	38.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.7
All-Red Time (s)	1.0	1.6	1.6	1.0	1.6	1.6	1.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None
v/c Ratio	0.65	0.45	0.07	0.26	0.99	0.39	0.62	0.53	0.12	0.33	0.79
Control Delay	36.4	24.6	0.8	15.7	62.1	17.1	36.5	41.8	1.5	26.9	51.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	24.6	0.8	15.7	62.1	17.1	36.5	41.8	1.5	26.9	51.7
Queue Length 50th (m)	38.1	62.8	0.0	9.7	163.3	21.0	26.7	50.7	0.0	19.4	73.1
Queue Length 95th (m)	#97.6	96.2	1.3	21.4	#215.1	43.5	38.3	69.1	1.8	29.2	98.4
Internal Link Dist (m)		287.5			417.2			547.8			480.8
Turn Bay Length (m)	101.0		99.0	46.0		46.0	28.0		70.0	77.0	
Base Capacity (vph)	366	1616	719	358	1273	575	252	642	560	353	614
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.45	0.07	0.26	0.99	0.39	0.62	0.37	0.09	0.33	0.56

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 45 (38%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Sixth Line & Upper Middle Road



HCM Signalized Intersection Capacity Analysis
6: Sixth Line & Upper Middle Road

Future Total (PM)
FT (PM)

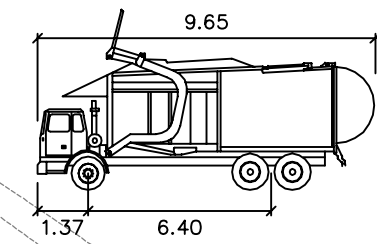
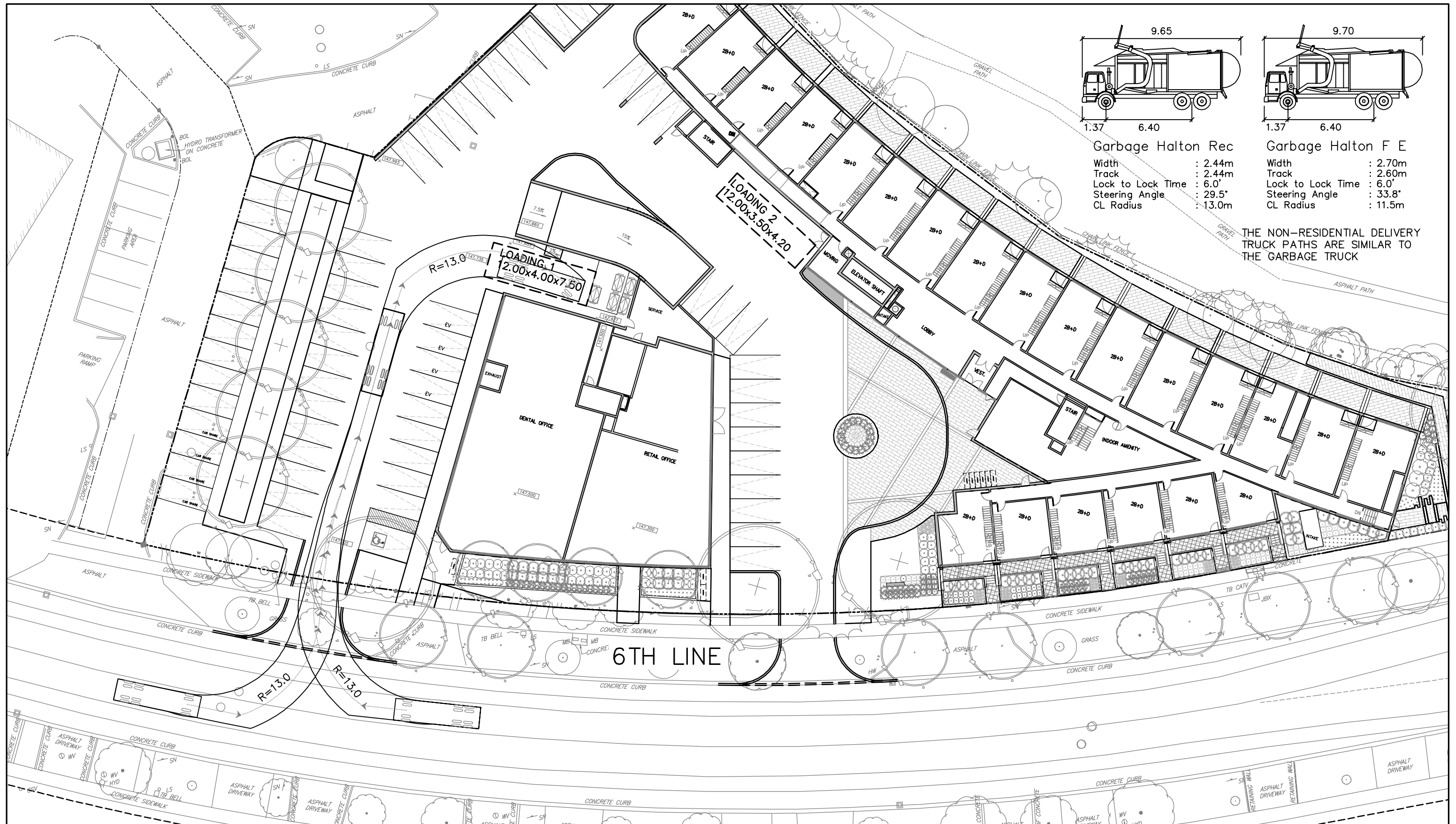
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	657	47	84	1137	204	140	213	47	105	183	126
Future Volume (vph)	213	657	47	84	1137	204	140	213	47	105	183	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	2.8	3.5	2.9	2.8	3.5	2.9	2.9	3.2	3.3	3.5	3.5	3.5
Total Lost time (s)	3.0	4.3	4.3	3.0	4.3	4.3	3.0	4.7	4.7	3.0	4.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1628	3486	1439	1565	3556	1416	1664	1780	1386	1784	1724	
Flt Permitted	0.09	1.00	1.00	0.37	1.00	1.00	0.21	1.00	1.00	0.46	1.00	
Satd. Flow (perm)	149	3486	1439	610	3556	1416	371	1780	1386	871	1724	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	237	730	52	93	1263	227	156	237	52	117	203	140
RTOR Reduction (vph)	0	0	28	0	0	69	0	0	39	0	24	0
Lane Group Flow (vph)	237	730	24	93	1263	158	156	237	13	117	319	0
Confl. Peds. (#/hr)	6		3	3		6	4		2	2		4
Heavy Vehicles (%)	1%	2%	0%	5%	0%	1%	0%	2%	11%	0%	2%	1%
Bus Blockages (#/hr)	0	2	2	0	2	2	0	0	0	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	67.6	54.6	54.6	50.9	41.9	41.9	39.4	29.5	29.5	35.4	27.5	
Effective Green, g (s)	68.6	55.6	55.6	52.9	42.9	42.9	41.4	30.5	30.5	37.4	28.5	
Actuated g/C Ratio	0.57	0.46	0.46	0.44	0.36	0.36	0.34	0.25	0.25	0.31	0.24	
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	5.7	5.7	4.0	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	364	1615	666	348	1271	506	245	452	352	339	409	
v/s Ratio Prot	c0.12	0.21		0.02	c0.36		c0.06	0.13		0.03	c0.18	
v/s Ratio Perm	0.25		0.02	0.10		0.11	0.16		0.01	0.08		
v/c Ratio	0.65	0.45	0.04	0.27	0.99	0.31	0.64	0.52	0.04	0.35	0.78	
Uniform Delay, d1	29.9	21.9	17.6	19.9	38.4	27.9	30.2	38.5	33.7	30.6	42.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	0.9	0.1	0.4	23.8	1.6	5.3	1.1	0.0	0.6	9.1	
Delay (s)	34.0	22.8	17.7	20.4	62.2	29.5	35.5	39.6	33.7	31.3	51.9	
Level of Service	C	C	B	C	E	C	D	D	C	C	D	
Approach Delay (s)		25.1			55.1			37.5			46.6	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.0			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)				15.0		
Intersection Capacity Utilization			83.5%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

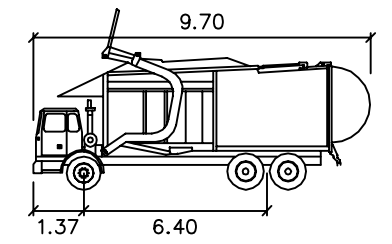


APPENDIX H

Swept Path Analysis



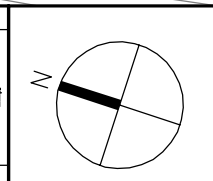
Garbage Halton Rec
 Width : 2.44m
 Track : 2.44m
 Lock to Lock Time : 6.0'
 Steering Angle : 29.5°
 CL Radius : 13.0m



Garbage Halton F E
 Width : 2.70m
 Track : 2.60m
 Lock to Lock Time : 6.0'
 Steering Angle : 33.8°
 CL Radius : 11.5m

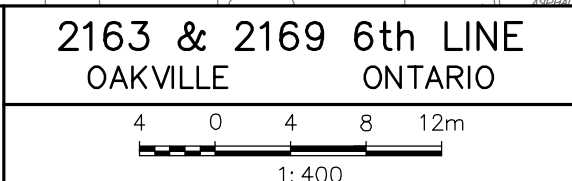
THE NON-RESIDENTIAL DELIVERY TRUCK PATHS ARE SIMILAR TO THE GARBAGE TRUCK

LEA Consulting Ltd.
 Consulting Engineers and Planners
 www.LEA.ca



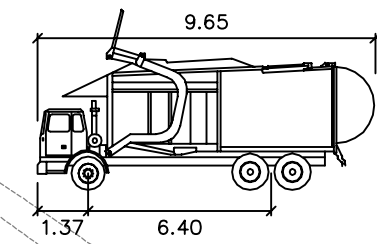
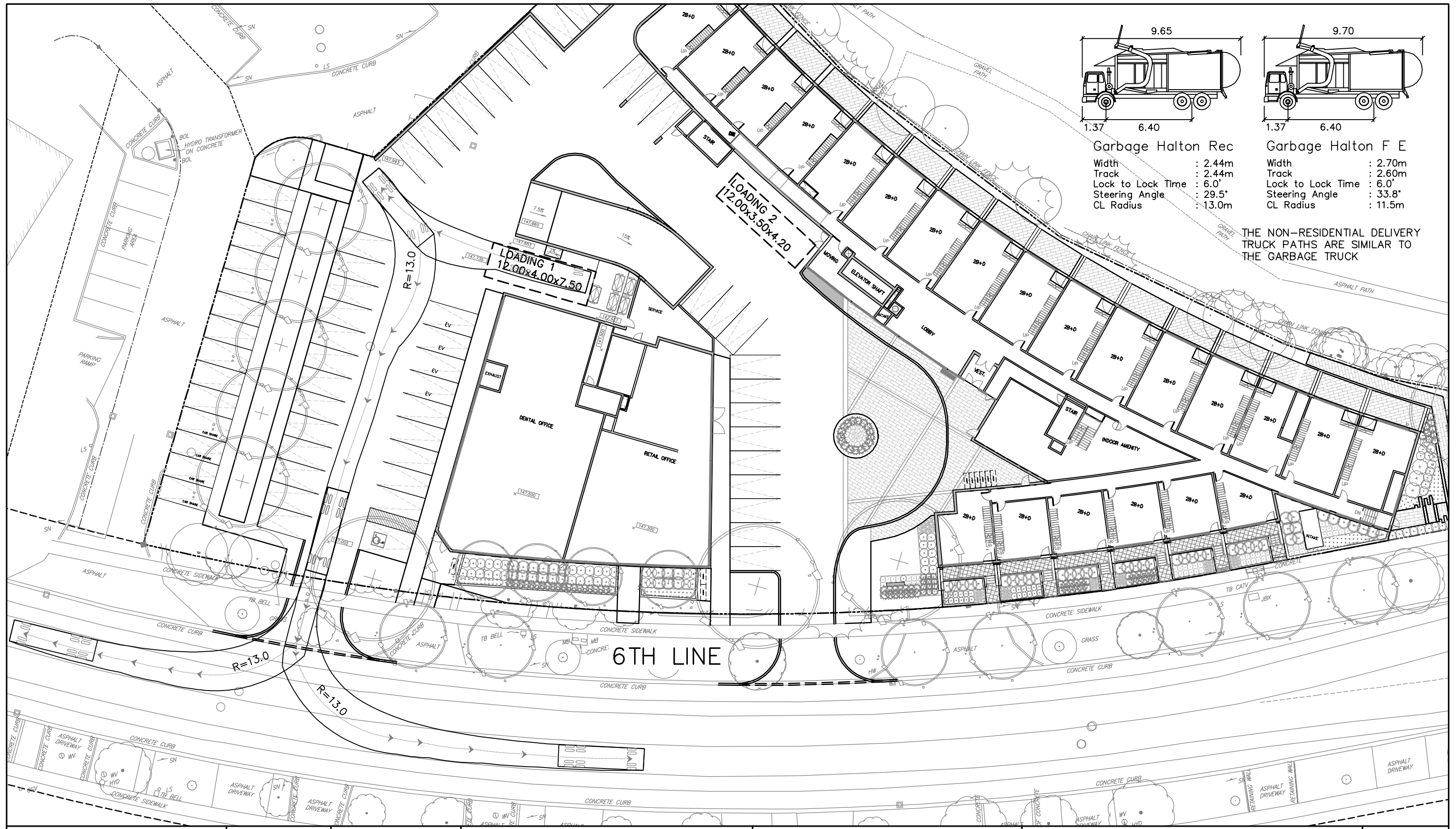
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
 OAKVILLE ONTARIO

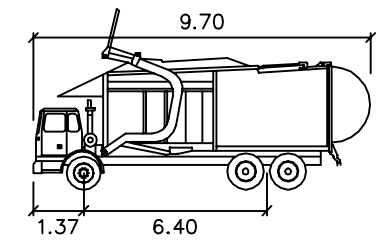


GROUND FLOOR- LOADING AREA
HALTON GARBAGE TRUCK
ENTRY PATHS

Drawing No.
P1



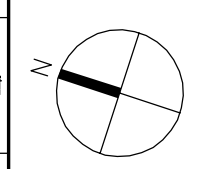
Garbage Halton Rec
 Width : 2.44m
 Track : 2.44m
 Lock to Lock Time : 6.0'
 Steering Angle : 29.5°
 CL Radius : 13.0m



Garbage Halton F E
 Width : 2.70m
 Track : 2.60m
 Lock to Lock Time : 6.0'
 Steering Angle : 33.8°
 CL Radius : 11.5m

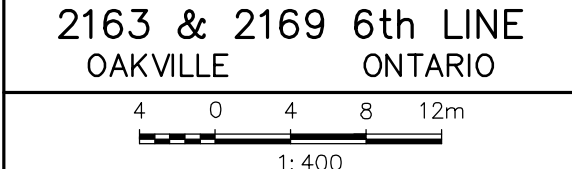
THE NON-RESIDENTIAL DELIVERY TRUCK PATHS ARE SIMILAR TO THE GARBAGE TRUCK

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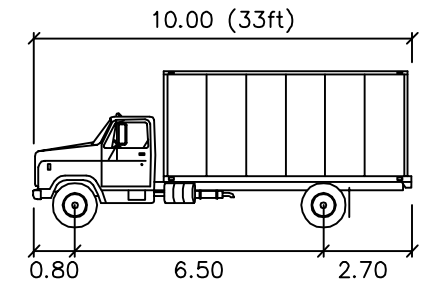
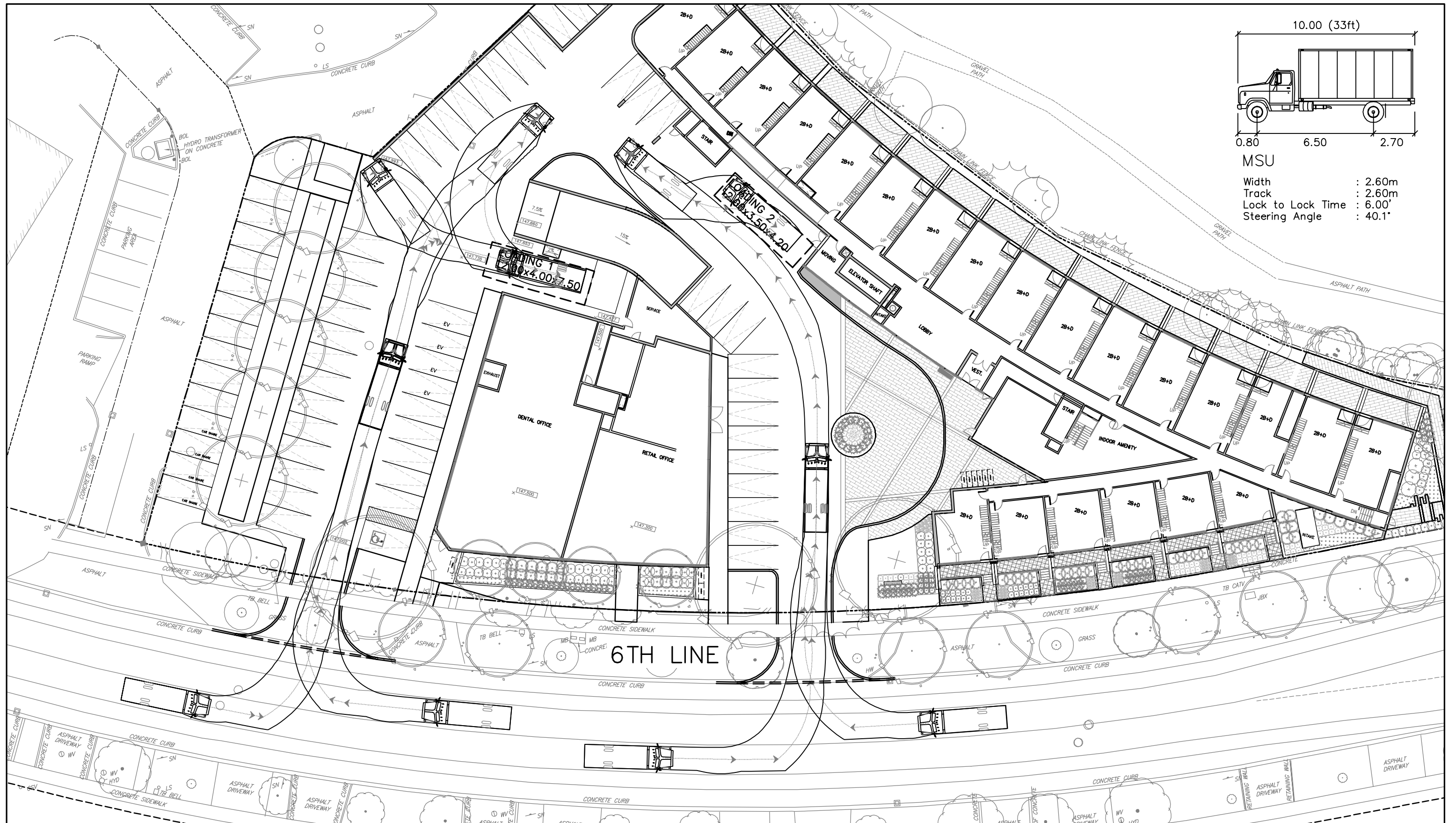
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
 OAKVILLE ONTARIO



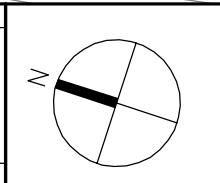
GROUND FLOOR- LOADING AREA
HALTON GARBAGE TRUCK
EXIT PATHS

Drawing No.
P2



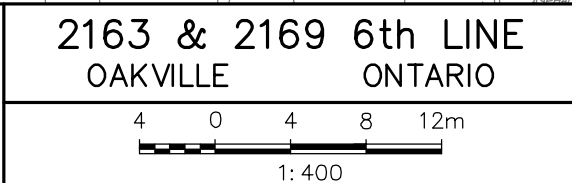
MSU
 Width : 2.60m
 Track : 2.60m
 Lock to Lock Time : 6.00'
 Steering Angle : 40.1°

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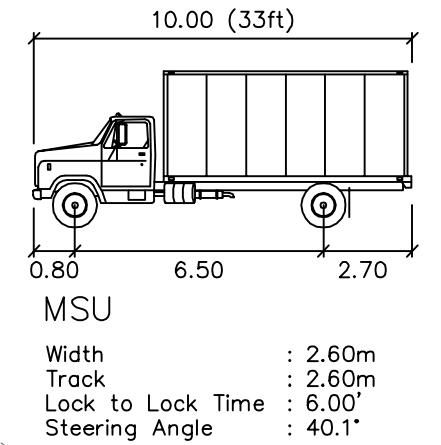
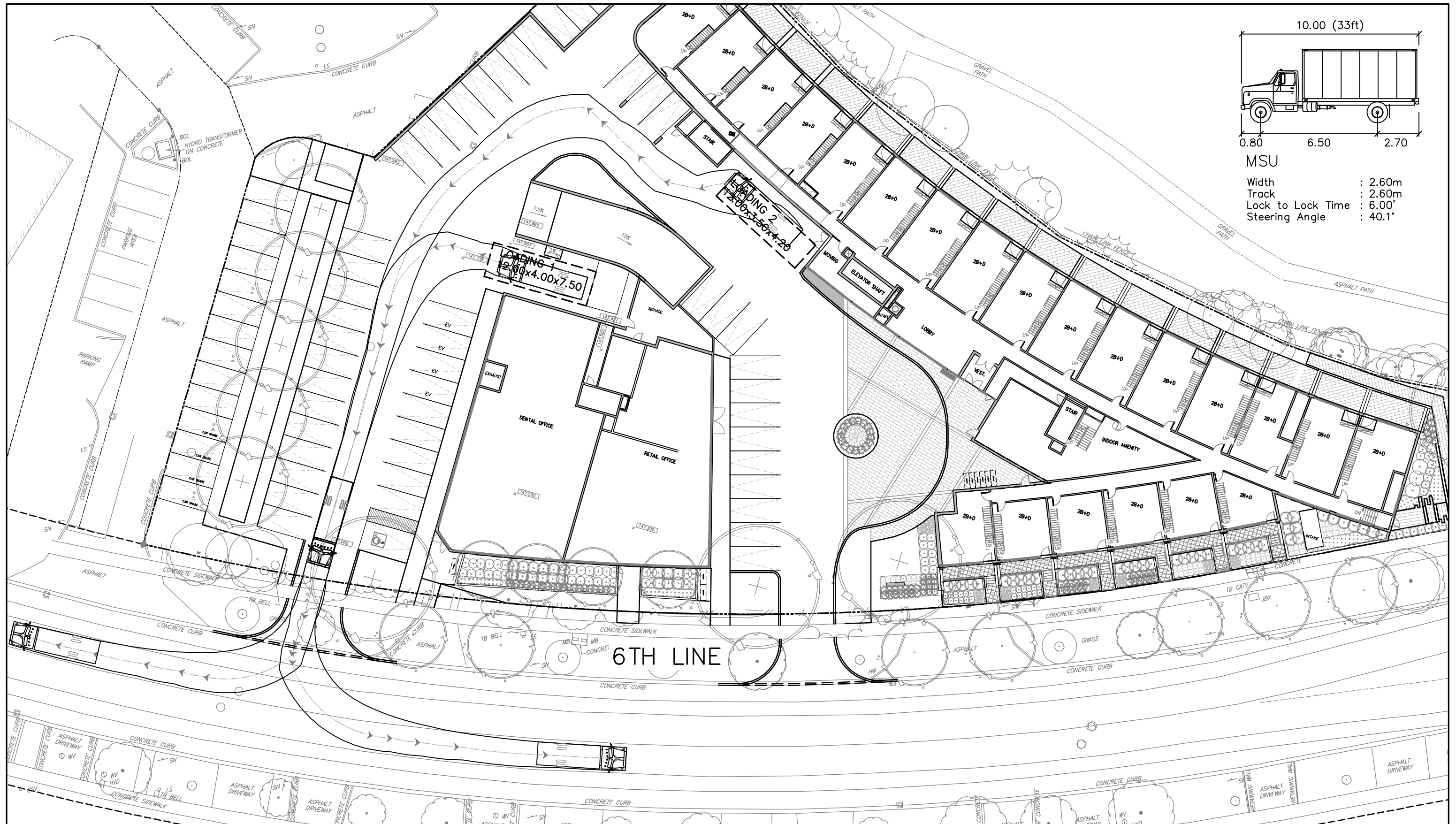
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
OAKVILLE ONTARIO

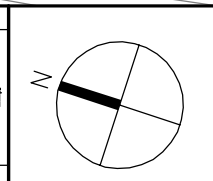


GROUND FLOOR— LOADING AREA
DELIVERY/ MOVING TRUCK
ENTRY PATHS— REVERSE

Drawing No.
P3

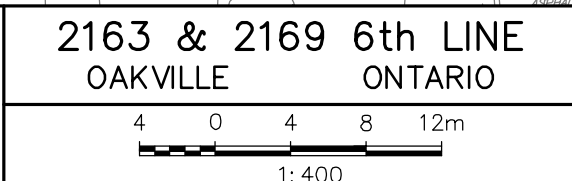


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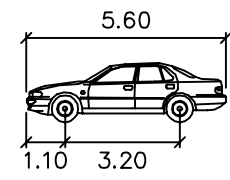
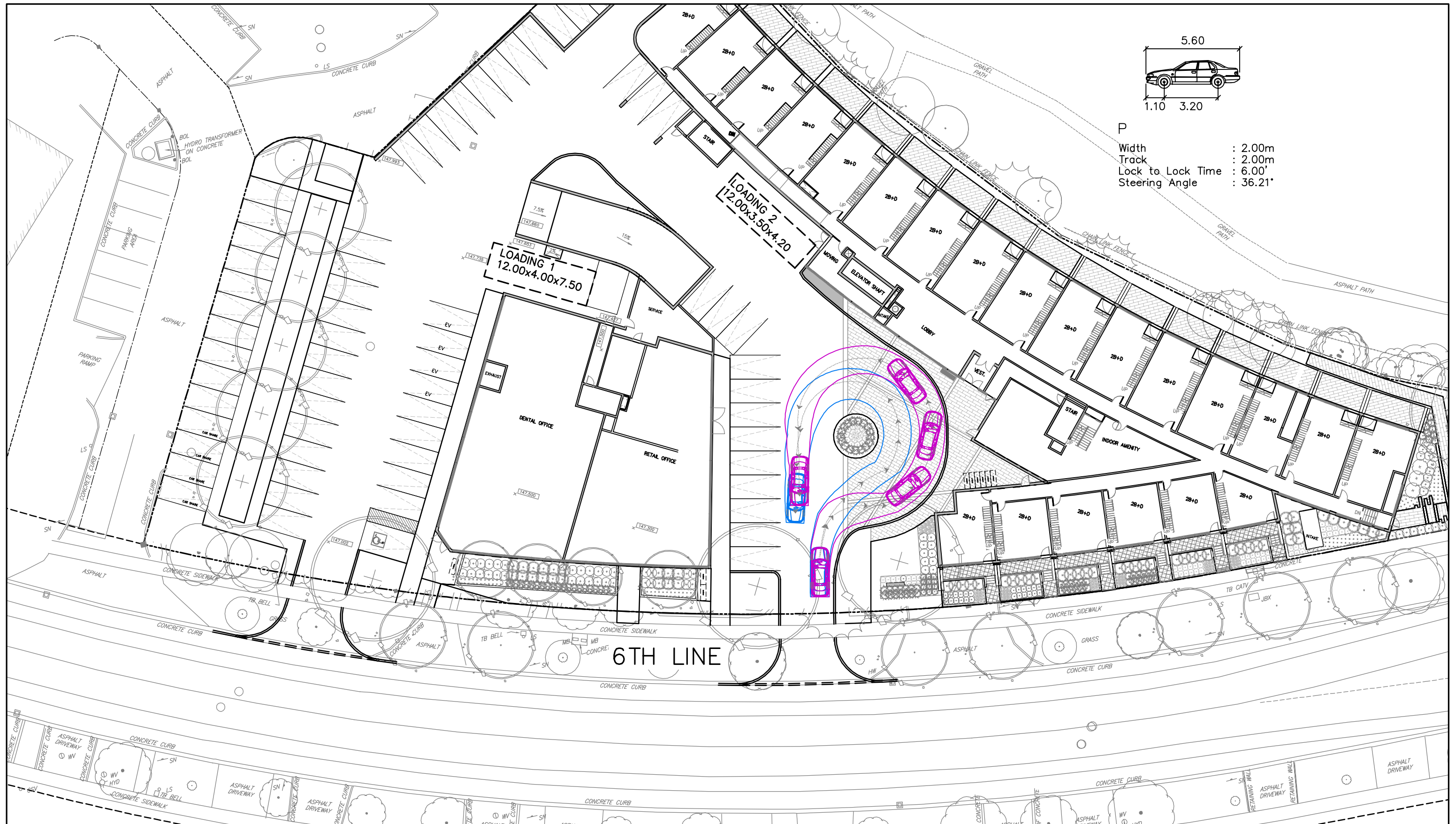
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
OAKVILLE ONTARIO



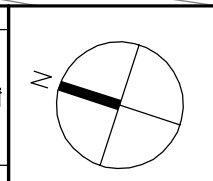
GROUND FLOOR— LOADING AREA
DELIVERY/ MOVING TRUCK
EXIT PATHS— FORWARD

Drawing No.
P4



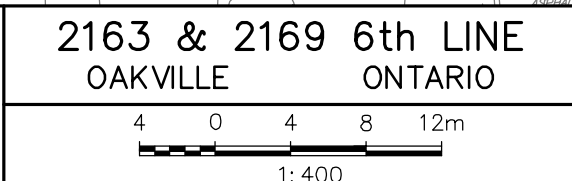
P
 Width : 2.00m
 Track : 2.00m
 Lock to Lock Time : 6.00'
 Steering Angle : 36.21°

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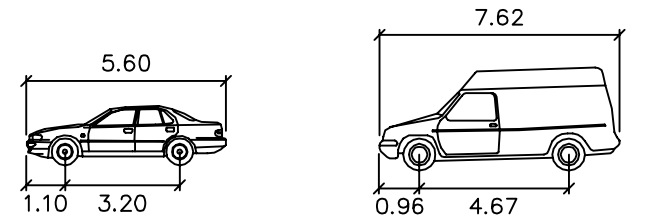
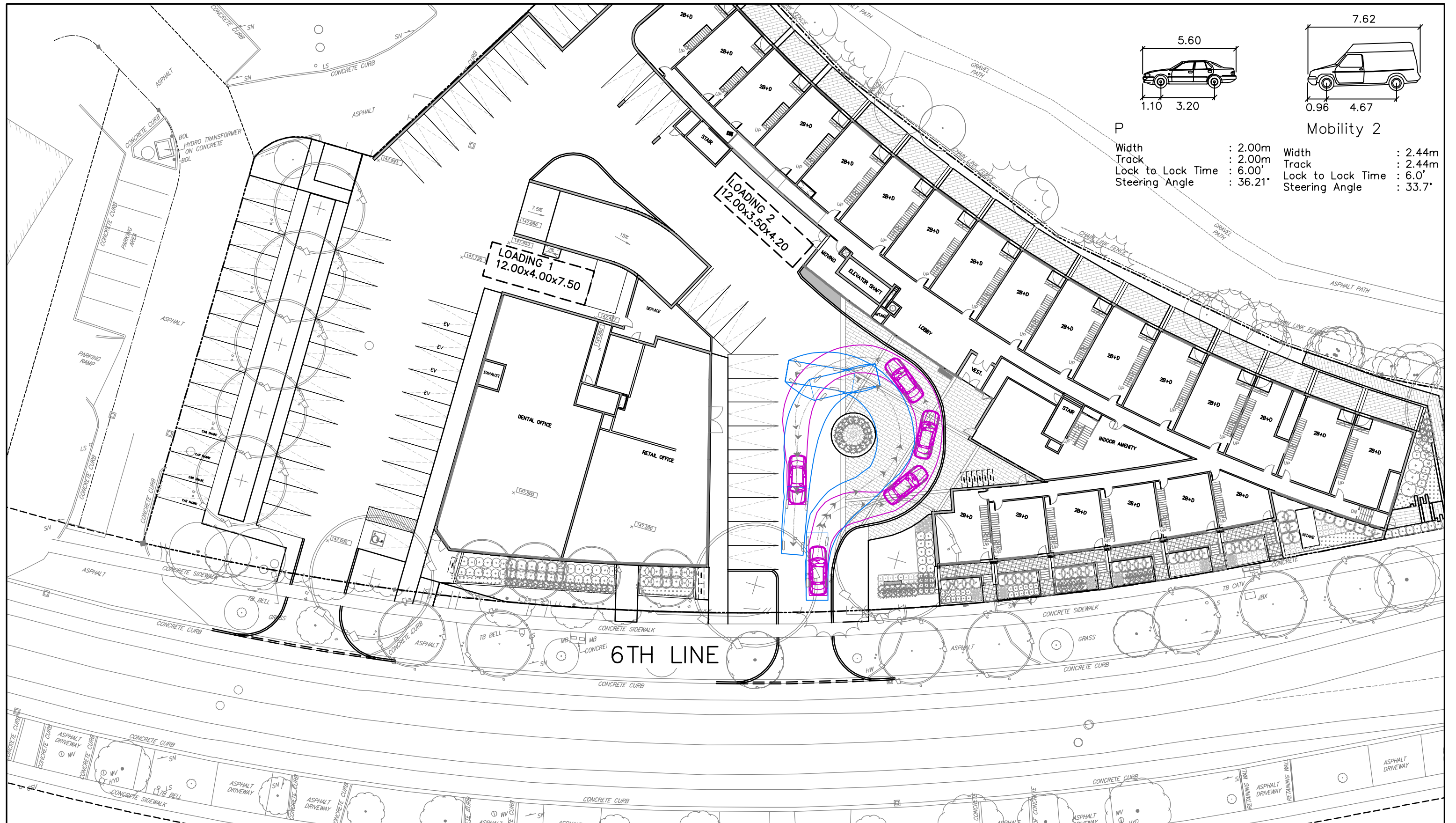
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
OAKVILLE ONTARIO



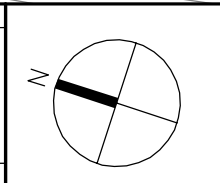
GROUND FLOOR— DROP OFF AREA
PASSENGER CAR
ENTRY/ EXIT PATHS

Drawing No.
P5



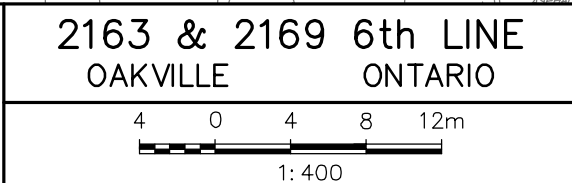
P		Mobility 2	
Width	: 2.00m	Width	: 2.44m
Track	: 2.00m	Track	: 2.44m
Lock to Lock Time	: 6.00'	Lock to Lock Time	: 6.0'
Steering Angle	: 36.21°	Steering Angle	: 33.7°

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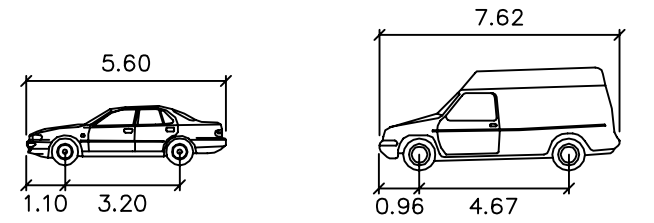
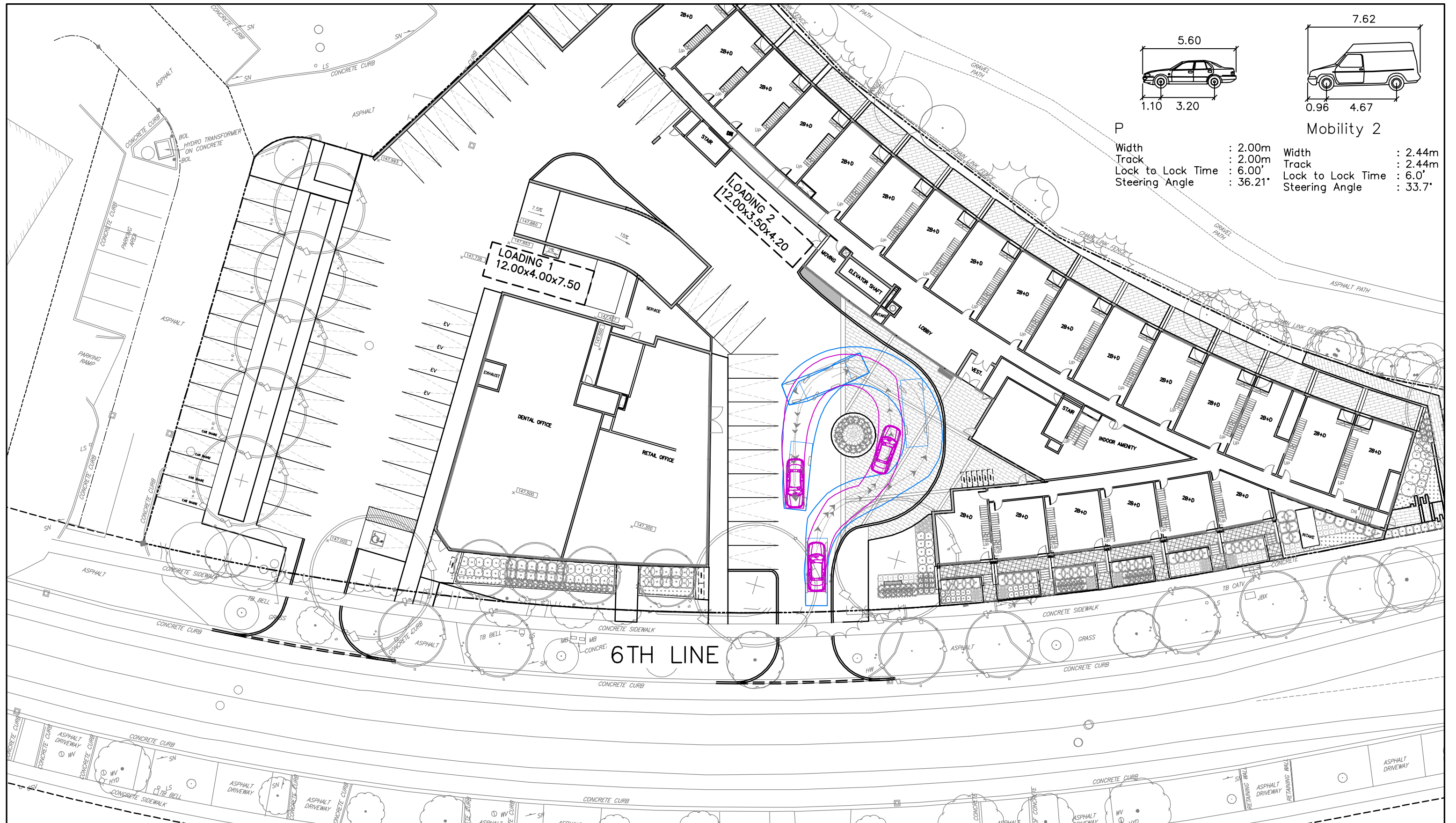
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
 OAKVILLE ONTARIO



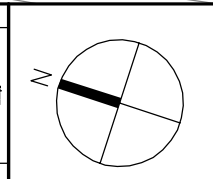
GROUND FLOOR- DROP OFF AREA
PASSENGER CAR/ MOBILITY VEHICLE
ENTRY/ EXIT PATHS 1

Drawing No.
P6



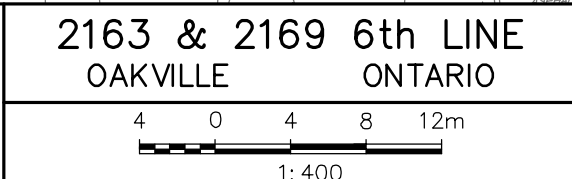
P		Mobility 2	
Width	: 2.00m	Width	: 2.44m
Track	: 2.00m	Track	: 2.44m
Lock to Lock Time	: 6.00'	Lock to Lock Time	: 6.0'
Steering Angle	: 36.21°	Steering Angle	: 33.7°

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Project No. **21304**
 Date
 REV. JULY 11, 2022
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 JAN. 14, 2022

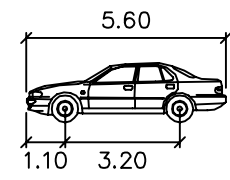
2163 & 2169 6th LINE
OAKVILLE ONTARIO



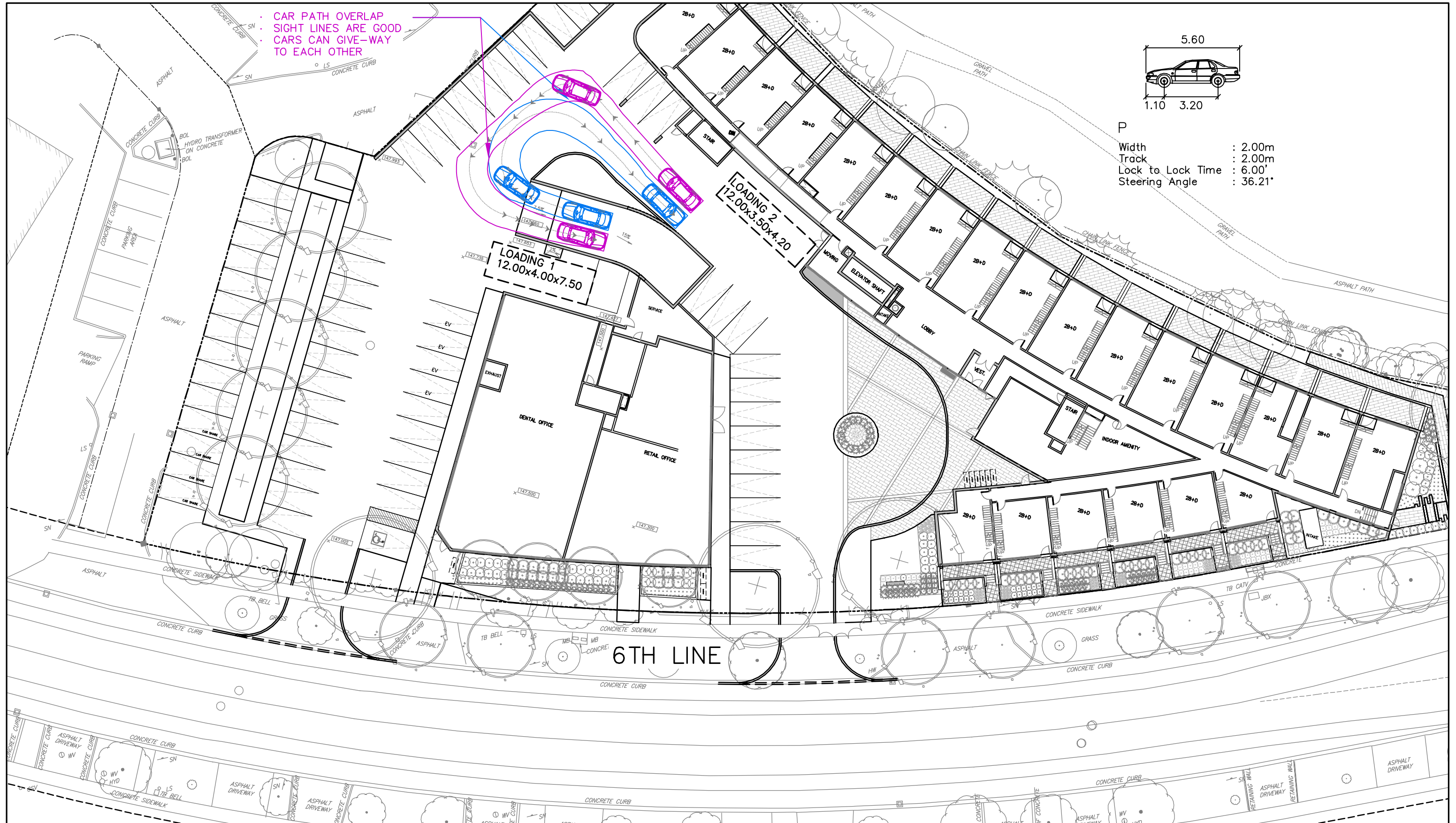
GROUND FLOOR- DROP OFF AREA
PASSENGER CAR/ MOBILITY VEHICLE
ENTRY/ EXIT PATHS 2

Drawing No.
P7

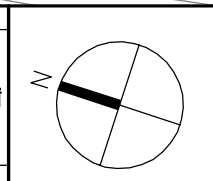
- CAR PATH OVERLAP
- SIGHT LINES ARE GOOD
- CARS CAN GIVE-WAY TO EACH OTHER



P
 Width : 2.00m
 Track : 2.00m
 Lock to Lock Time : 6.00'
 Steering Angle : 36.21°

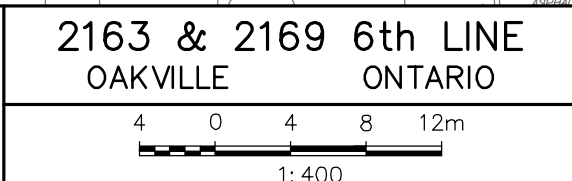


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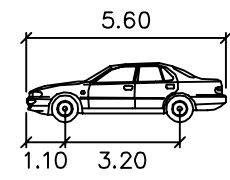
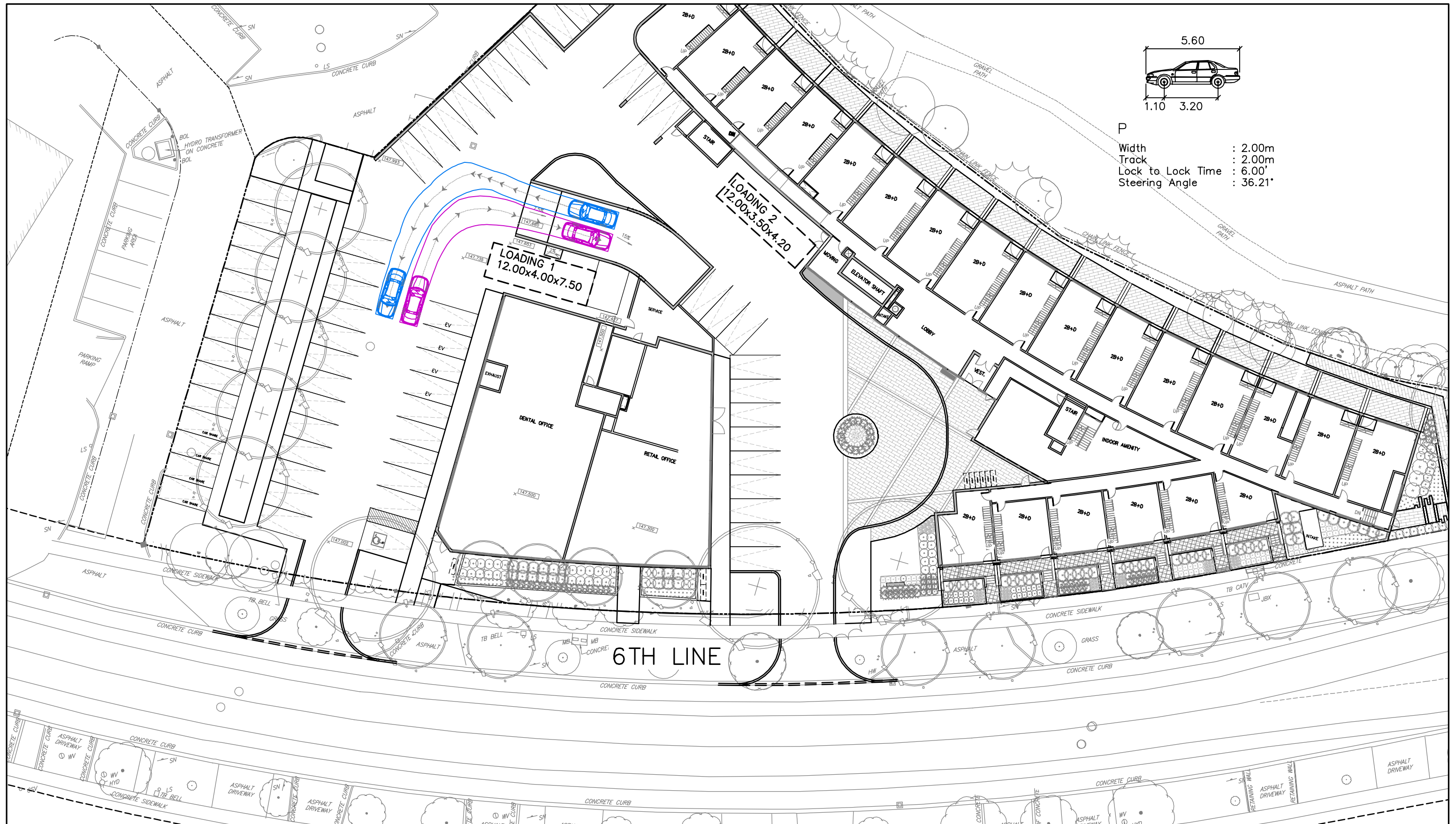
Project No. **21304**
 Date
 REV. JULY 11, 2022
 REV. MAR. 09, 2022
 JAN. 14, 2022

2163 & 2169 6th LINE
OAKVILLE ONTARIO



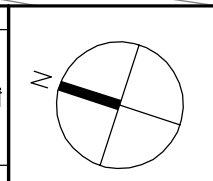
GROUND FLOOR— RAMP TO U/G
PASSENGER CAR
ENTRY/ EXIT PATHS 1

Drawing No.
P8



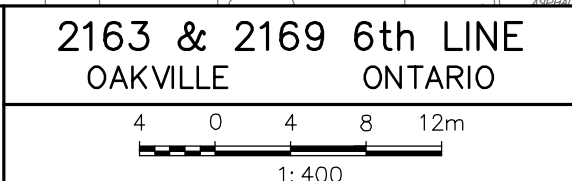
P
Width : 2.00m
Track : 2.00m
Lock to Lock Time : 6.00'
Steering Angle : 36.21°

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Project No. **21304**
Date
REV. JULY 11, 2022
REV. MAR. 09, 2022
REV. JAN. 14, 2022

2163 & 2169 6th LINE
OAKVILLE ONTARIO



GROUND FLOOR— RAMP TO U/G
PASSENGER CAR
ENTRY/ EXIT PATHS 2

Drawing No.
P9



APPENDIX I

Proxy Parking Data



August 3, 2018

Our Ref. 18018.200

Ashley Burke

Starlight Investments
1400 - 3280 Bloor Street West, Centre Tower,
Toronto, ON
M8X 2X3

RE: 2215 Sheridan Park Drive – Visitor Parking Study, September, 2018

Dear Ashley Burke,

LEA Consulting Ltd. conducted an investigation of visitor parking behaviour for 2250 Homelands Drive & 2185 Sheridan Park Drive (subject site). LEA understands that as visitor parking is charged on-site that nearby residents have concerns regarding visitors parking on public streets, encumbering residents as well as school bus operations during the weekday mornings. LEA has completed its investigation and the results are summarized below.

SURVEY METHODOLOGY

- **Fri. Sep 14, 2018:** 7:00AM – 9:00AM (*Capture school bus impact*) / 4:00PM – 1:00AM (*Capture afterwork demand*)
- **Sat. Sep 15, 2018:** 6:00PM – 1:00AM (*Capture evening demand*)
- **Trace Parking Demand:** Homelands Drive, Pyramid Crescent, Thorn Lodge Drive
- **30-Minute Interval Visitor Parking Demand (On-Site Demand)**

SURVEY RESULTS

ON-STREET PARKING

Fri. Sep 14, 2018 (7:00AM – 9:00AM)

- **Homelands Drive:** Maximum accumulation of **2** parked vehicles. Both destined for the subject site
- **Pyramid Crescent:** No vehicles parked
- **Thorn Lodge Crescent:** Maximum accumulation of **1** parked vehicle. Local resident not destined for the subject site

Fri. Sep 14, 2018 (4:00PM – 1:00AM)

- **Homelands Drive:** Maximum accumulation of **3** parked vehicles. All destined for the subject site
- **Pyramid Crescent:** Maximum accumulation of **3** parked vehicles, **2** destined for the subject site
- **Thorn Lodge Crescent:** Maximum accumulation of **1** parked vehicle. Local resident not destined for the subject site

Sat. Sep 15, 2018 (6:00PM – 1:00AM)

- **Homelands Drive:** Maximum accumulation of **4** parked vehicles, **3** destined for the subject site
- **Pyramid Crescent:** Maximum accumulation of **5** parked vehicles, **0** destined for the subject site
- **Thorn Lodge Crescent:** Maximum accumulation of **1** parked vehicle, not destined for the subject site

On-Street Parking Summary

- The number of visitors parking on-street is low (**maximum total accumulation of 5 vehicles, 6:00PM, Friday**)
- During school bus operating hours, visitor on-street parking demand is very low (**2 vehicles, Homelands Drive**)

SCHOOL BUS OPERATIONS

- During school bus operating hours, visitor on-street parking demand is very low (**2 vehicles, Homelands Drive**)
- School bus was observed to collect students on the **West** side of Homelands Drive. Visitors to the subject site are parking on the **East** side.
- No visitors to the subject site were parked on either Pyramid Crescent or Thorn Lodge Drive during school bus operations

School Bus Operations Summary

- Visitor parked on-street did not encumber school bus (**see figure below**)



ON-SITE VISITOR PARKING DEMAND

- Peak on-site visitor parking demand of **20 spaces / 0.06 spaces per unit (Saturday, 10:00PM)**
- Peak total (on-site and on-street) visitor parking demand of **22 spaces / 0.07 spaces per unit (Saturday, 10:00PM)**
- **Total on-site proposed visitor parking supply of 0.10 space per unit**

School Bus Operations Summary

- **The proposed visitor parking supply will be able to accommodate all on-site and on-street parking demand**

CONCLUSIONS

LEA has found that **the number of visitor parking on-street on the surrounding local streets is low**, and that those parked on-street **do not encumber the operations of school buses**. LEA has also confirmed that the proposed visitor parking supply rate of **0.10 spaces per unit will be sufficient** to accommodate both on-site and on-street parking demand.

If you have any questions please do not hesitate to contact Paul Grove at 905-470-0015 ext. 313, or at pgrove@lea.ca.

Yours truly,

LEA CONSULTING LTD.

Paul Grove, M.P.I.

Transportation Planner

:pg

PARKING DEMAND SUMMARY
 PROJECT NO.: 19012.200
 LOCATION: 1475 Bloor Street, Mississauga

Weather: Raining

	Friday April 13, 2018																	Saturday April 14, 2018					
Supply	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30	0:00	0:30	1:00	1:30	2:00
Tenant	60						26	24	27	29	32	34	35	35	34	33	35	37	36	37	40	40	39
Visitor	5						3	3	3	2	1	2	5	5	3	2	2	1	1	1	1	1	1
Total	65	0	0	0	0	0	29	27	30	31	33	36	40	40	37	35	37	38	37	38	41	41	40

two cars parked on side of building

41

Weather: Freezing Rain

	Saturday April 14, 2018																	Sunday April 15, 2018						
Supply	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30	0:00	0:30	1:00	1:30	2:00	
Tenant	60	34	37	36	38	41	40	40	37	38	37	40	41	42	44	44	42	40	41	41	42	43	41	41
Visitor	5	3	4	4	4	4	4	3	3	3	3	3	2	3	3	3	2	2	2	2	2	2	2	2
Total	65	37	41	40	42	45	44	43	40	41	40	43	43	45	47	47	44	42	43	43	44	45	43	43

parked on side of loading

47

60
 3

NOTES: Underground lot is not in use. Garage door is broken. *exclude 2 occupied spaces from visitor supply (3 space supply instead of 5)

PARKING DEMAND SUMMARY
 PROJECT NO.: 19012.200
 LOCATION: 1475 Bloor Street, Mississauga

Weather: Sunny

		Friday April 20, 2018																Saturday April 21, 2018						
	Supply	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30	0:00	0:30	1:00	1:30	2:00
Tenant	60									27	29	27	32	34	35	37								
Visitor	5									3	2	1	1	2	1	1								
Total	65	0	0	0	0	0	0	0	0	30	31	28	33	36	36	38	0	0	0	0	0	0	0	0

38

Weather: Freezing Rain

		Saturday April 21, 2018																Sunday April 22, 2018						
	Supply	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30	0:00	0:30	1:00	1:30	2:00
Tenant	60	28	29	28	26	27	28	27	29	29														
Visitor	5	1	2	2	3	3	3	3	1	2														
Total	65	29	31	30	29	30	31	30	30	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*exclude the two abandoned vehicles from the count

31

60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

NOTES: Underground lot is not in use. Garage door is broken.

Survey Date	Peak Demand		Utilization		Residual Supply		Demand Rates	
	Resident	Visitor	Resident	Visitor	Resident	Visitor	Resident (spaces/u nit)	Visitor (spaces/u nit)
Friday April 13 2018	40	5	67%	167%	20	-2	0.70	0.09
Saturday April 14 2018	44	4	73%	133%	16	-1	0.77	0.07
Friday April 20 2018	37	3	62%	100%	23	0	0.65	0.05
Saturday April 21 2018	29	3	48%	100%	31	0	0.51	0.05
MAX DEMAND	44	5	73%	167%	16	-2	0.77	0.09

Resident Supply 60

Visitor Supply 3

Number of units 60

Occupied units 57

3480 Havenwood Drive - Parking Demand Summary

Project # 18337.230
 Location: 3480 Havenwood Drive, Mississauga, ON
 Date: Friday August 9, 2019
 Observers: Terence Zeng

Supply	8	2	77	79	166		
TIME	Surface			Underground	Total	Tenants Total	Visitors Total
	Visitors	Staff / Trades	Tenants	Tenants			
Supply	8	2	77	79	166	-	-
17:00	1	1	20	36	58	56	2
17:30	0	2	26	36	64	62	2
18:00	2	2	27	36	67	63	4
18:30	2	2	23	35	62	58	4
19:00	3	2	28	37	70	65	5
19:30	5	2	32	40	79	72	7
20:00	5	2	29	40	76	69	7
20:30	4	1	31	41	77	72	5
21:00	4	1	34	43	82	77	5
21:30	4	1	35	47	87	82	5
22:00	4	1	36	52	93	88	5
22:30	5	1	37	51	94	88	6
23:00	6	1	37	50	94	87	7
23:30	6	0	40	51	97	91	6
0:00	6	0	42	53	101	95	6
0:30	6	0	45	54	105	99	6
1:00	6	0	46	54	106	100	6
1:30	6	0	47	56	109	103	6
2:00	6	0	48	57	111	105	6
2:30	6	0	49	58	113	107	6
3:00	6	0	50	58	114	108	6

114

Date: Saturday August 10, 2019
 Observers: Terence Zeng

Supply	8	2	77	79	166		
TIME	Surface			Underground	Total	Tenants Total	Visitors Total
	Visitors	Staff / Trades	Tenants	Tenants			
Supply	8	2	77	79	166	-	-
13:00	4	1	26	37	68	63	5
13:30	3	1	27	36	67	63	4
14:00	2	1	27	37	67	64	3
14:30	2	1	27	38	68	65	3
15:00	1	2	29	39	71	68	3
15:30	1	2	26	37	66	63	3
16:00	1	2	24	36	63	60	3
16:30	1	2	25	38	66	63	3
17:00	1	2	24	36	63	60	3
17:30	1	2	26	39	68	65	3
18:00	1	2	25	39	67	64	3
18:30	1	1	26	39	67	65	2
19:00	2	1	27	39	69	66	3
19:30	2	1	25	39	67	64	3
20:00	2	0	27	39	68	66	2
20:30	2	0	29	39	70	68	2
21:00	2	0	33	39	74	72	2
21:30	2	0	35	39	76	74	2
22:00	3	0	36	41	80	77	3
22:30	4	0	37	42	83	79	4
23:00	4	0	38	45	87	83	4
23:30	4	0	39	47	90	86	4
0:00	4	0	41	49	94	90	4
0:30	4	0	41	51	96	92	4
1:00	4	0	43	53	100	96	4
1:30	4	0	43	55	102	98	4
2:00	4	0	45	56	105	101	4
2:30	4	0	47	56	107	103	4
3:00	4	0	50	57	111	107	4

111

1485 Williamsport Drive - Parking Demand Summary

Project # 18337.230
 Location: 1485 Williamsport Drive, Mississauga, ON
 Date: Friday August 9, 2019
 Observers: Joel Xiong

TIME	Surface			Underground	Total	Tenants Total	Visitors Total
	Visitors	Staff / Trades	Tenants	Tenants			
Supply	8	2	77	78	165	-	-
17:00	6	1	32	35	74	67	7
17:30	4	0	33	37	74	70	4
18:00	3	1	35	39	78	74	4
18:30	2	1	39	43	85	82	3
19:00	2	1	38	45	86	83	3
19:30	3	1	39	48	91	87	4
20:00	4	1	37	47	89	84	5
20:30	3	1	38	46	88	84	4
21:00	4	1	40	45	90	85	5
21:30	3	1	41	46	91	87	4
22:00	2	1	45	52	100	97	3
22:30	2	1	44	52	99	96	3
23:00	2	1	46	55	104	101	3
23:30	2	1	47	57	107	104	3
0:00	3	1	49	60	113	109	4
0:30	3	1	49	61	114	110	4
1:00	3	1	50	63	117	113	4
1:30	2	1	51	69	123	120	3
2:00	2	1	55	70	128	125	3
2:30	3	1	56	70	130	126	4
3:00	3	0	56	70	129	126	3

Date: Saturday August 10, 2019
 Observers: Joel Xiong

TIME	Surface			Underground	Total	Tenants Total	Visitors Total
	Visitors	Staff / Trades	Tenants	Tenants			
Supply	8	2	77	78	165		
13:00	2	1	30	41	74	71	3
13:30	2	1	31	36	70	67	3
14:00	2	2	29	34	67	63	4
14:30	2	2	32	35	71	67	4
15:00	3	2	30	32	67	62	5
15:30	4	2	33	38	77	71	6
16:00	5	2	35	40	82	75	7
16:30	3	2	39	45	89	84	5
17:00	2	2	40	47	91	87	4
17:30	3	2	43	44	92	87	5
18:00	6	2	45	43	96	88	8
18:30	8	2	43	48	101	91	10
19:00	8	2	43	47	100	90	10
19:30	7	2	46	53	108	99	9
20:00	7	2	43	52	104	95	9
20:30	8	2	43	53	106	96	10
21:00	8	0	44	50	102	94	8
21:30	7	0	44	51	102	95	7
22:00	5	1	43	52	101	95	6
22:30	5	2	48	53	108	101	7
23:00	5	2	54	57	118	111	7
23:30	4	1	53	59	117	112	5
0:00	5	1	53	58	117	111	6
0:30	6	1	55	59	121	114	7
1:00	4	1	58	61	124	119	5
1:30	4	1	61	62	128	123	5
2:00	5	1	61	65	132	126	6
2:30	4	1	61	65	131	126	5
3:00	4	1	61	65	131	126	5

Peak Parking Survey Results (LEA)

Building	Units	Friday August 9, 2019		Saturday August 10, 2019		Max Demand Rate	
		Resident	Visitor	Resident	Visitor	Resident	Visitor
3480 Havenwood	132	108	7	107	5	0.82	0.05
1485 Williamsport	132	126	7	126	10	0.95	0.08

PARKING UTILIZATION STUDY

PARKING DEMAND AT 297 QUEENS AVE
PROJECT NO.: 18139.200

SUPPLY RESIDENT: 113 (2) HANDICAPPED VISITOR: 8 TOTAL: 121

FRIDAY, SEPT. 08, 2017			
TIME	RESIDENT	VISITOR	TOTAL
12:00	-	-	-
12:30	-	-	-
13:00	-	-	-
13:30	-	-	-
14:00	-	-	-
14:30	-	-	-
15:00	-	-	-
15:30	-	-	-
16:00	-	-	-
16:30	-	-	-
17:00	-	-	-
17:30	-	-	-
18:00	44	4	48
18:30	45	2	47
19:00	46	1	47
19:30	50	2	52
20:00	55	2	57
20:30	60	2	62
21:00	64	1	65
21:30	65	1	66
22:00	67	1	68
22:30	69	1	70
23:00	71	3	74
23:30	74	3	77
0:00	75	1	76
0:30	76	1	77
1:00	76	1	77

SATURDAY, SEPT. 09, 2017			
TIME	RESIDENT	VISITOR	TOTAL
12:00	47	1	48
12:30	45	1	46
13:00	48	1	49
13:30	46	0	46
14:00	52	4	56
14:30	52	4	56
15:00	54	2	56
15:30	50	3	53
16:00	42	3	45
16:30	46	3	49
17:00	48	3	51
17:30	51	2	53
18:00	52	2	54
18:30	54	2	56
19:00	54	1	55
19:30	55	2	57
20:00	59	2	61
20:30	64	3	67
21:00	63	2	65
21:30	65	0	65
22:00	65	0	65
22:30	70	1	71
23:00	67	1	68
23:30	71	1	72
0:00	71	1	72
0:30	73	1	74
1:00	74	1	75

FRIDAY, SEPT. 15, 2017			
TIME	RESIDENT	VISITOR	TOTAL
12:00	-	-	-
12:30	-	-	-
13:00	-	-	-
13:30	-	-	-
14:00	-	-	-
14:30	-	-	-
15:00	-	-	-
15:30	-	-	-
16:00	-	-	-
16:30	-	-	-
17:00	-	-	-
17:30	-	-	-
18:00	54	4	58
18:30	52	5	57
19:00	50	4	54
19:30	50	5	55
20:00	48	4	52
20:30	53	3	56
21:00	55	4	59
21:30	57	3	60
22:00	60	2	62
22:30	65	2	67
23:00	66	2	68
23:30	69	3	72
0:00	72	3	75
0:30	76	3	79
1:00	78	3	81

SATURDAY, SEPT. 16, 2017			
TIME	RESIDENT	VISITOR	TOTAL
12:00	53	3	56
12:30	52	3	55
13:00	53	3	56
13:30	48	1	49
14:00	48	1	49
14:30	48	2	50
15:00	49	5	54
15:30	50	5	55
16:00	50	4	54
16:30	56	5	61
17:00	54	4	58
17:30	54	3	57
18:00	53	4	57
18:30	54	3	57
19:00	54	4	58
19:30	59	2	61
20:00	59	4	63
20:30	59	5	64
21:00	58	2	60
21:30	64	3	67
22:00	66	3	69
22:30	67	3	70
23:00	72	3	75
23:30	72	3	75
0:00	78	3	81
0:30	79	3	82
1:00	79	2	81

