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Transportation Study & Parking Justification Study

PROPOSED RESIDENTIAL DEVELOPMENT

1315 Silver Spear Road
Mississauga, ON

November 10, 2017
Project No: NT-17-018

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Aurora ON L4G 6W8

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NextEng Consulting Group Inc.

November 10, 2017

Mr. Ms. Ashley Burke, Development Manager

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

**Re: Transportation Impact Study & Parking Justification Study
1315 Silver Spear Road, Mississauga, ON
Our Project No. NT-17-018**

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) is pleased to present the enclosed Transportation and Parking Justification Study for the above noted site in support of a proposed Site Plan Application.

The subject site is located on the north side of Silver Spear Road in the City of Mississauga. The site is currently occupied by an 8-storey residential apartment rental building providing 8,091 m² of gross floor area (GFA). Based on the preliminary site plan prepared by Architecture Unfolded, dated May 2017, the development proposal is to construct a second 8-storey residential building to provide an additional 10,577.4 m² of gross floor area (GFA) and 252 residential units. The lot is zoned RA2-4 (Apartment Dwelling). A full movement unsignalized entrance to the surface and underground parking area is provided via Silver Spear Road. The preliminary site plan provides for a total of 258 parking spaces.

The study concludes that the development proposal can adequately be accommodated by the existing transportation network with manageable traffic impact to the adjacent public roadways. We trust the enclosed sufficiently addresses your needs. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Nextrans Consulting Engineers

A Division of NextEng Consulting Group Inc.

Prepared by:

A handwritten signature in blue ink that reads "Zara Georgis".

Zara Georgis, EIT
Engineer-in-Training

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A handwritten signature in black ink that reads "R. Pernicky".

Richard Pernicky, CET, MITE
Principal

EXECUTIVE SUMMARY

Nextrans Consulting Engineers was retained by Starlight Investments (the 'Client') to undertake a Traffic Impact Study for a Site Plan Application in support of a proposed residential development located at 1315 Silver Spear Road in Mississauga, Ontario.

Development Proposal

The development proposal is to construct an 8-storey residential building to provide 10,577.4 m² of gross floor area (GFA) as an addition to the existing 8-storey residential building providing 8,091 m² of gross floor area (GFA). A full movement unsignalized entrance to the surface and underground parking area is provided via Silver Spear Road.

Capacity Analysis

The proposed development is anticipated to generate 56 two-way trips (10 inbound and 46 outbound) during the AM peak hours and 98 two-way trips (66 inbound and 32 outbound) during the PM peak hours.

The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study intersection and proposed access are expected to operate with excellent levels of service. However, it is recommended that the City review the need and justification for providing exclusive right turn lanes for the eastbound and westbound approaches on Winding Trail to Dixie Road to alleviate existing capacity issues.

Access/Parking Review

Given the low traffic volumes along Silver Spear Road during the AM and PM peak hours, it is anticipated that the proposed vehicular access location will not have any negative impact on the operation of Silver Spear Road. It is recommended that a STOP sign be installed at the proposed entrance onto Silver Spear Road.

Based on City of Mississauga Zoning By-Law No. 0207-2008, a total of 372 parking spaces will be required for the proposed building residential use with 252 rental dwelling units. The preliminary site plan provides for a total of 258 parking spaces, which results in a technical deficiency of 115 parking spaces. Based on parking utilization surveys, our findings are that the site will require 230 tenant parking spaces and 28 visitor parking spaces, for a total of 258 parking spaces. As indicated on the proposed site plan, 258 parking spaces will be provided. On this basis, the future parking demand with the addition of 159 rental dwelling units is completely satisfied with the proposed parking provision.

Loading Area Review

AutoTURN software was used (HSU TAC - 1999) to generate vehicular turning template to confirm and demonstrate the accessibility of the proposed loading space.

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1.0 INTRODUCTION

NexTrans Consulting Engineers was retained by Starlight Investments (the 'Client') to undertake a Traffic Impact Study for a Site Plan Application in support of a proposed residential development located at 1315 Silver Spear Road in Mississauga, Ontario. The subject site is located on the north side of Silver Spear Road in the City of Mississauga.

The location of the proposed development is illustrated in **Figure 1-1**.

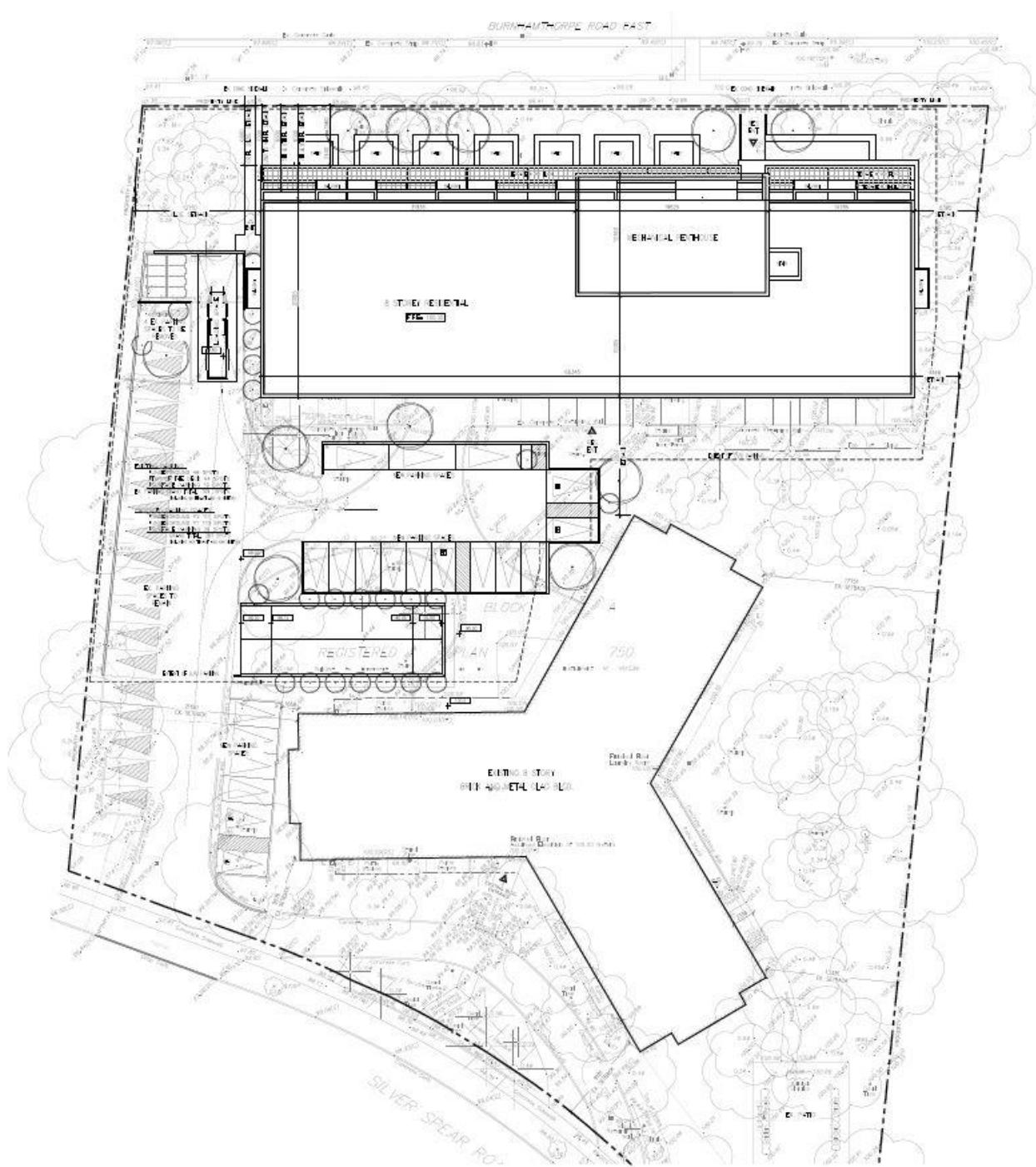
Figure 1-1 – Site Location



The site is currently occupied by an 8-storey residential apartment rental building providing 8,091 m² of gross floor area (GFA). Based on the preliminary site plan prepared by Architecture Unfolded, dated May 2017, the development proposal is to construct a second 8-storey residential building to provide an additional 10,577.4 m² of gross floor area (GFA) and 252 residential units. The lot is zoned RA2-4 (Apartment Dwelling). A full movement unsignalized entrance to the surface and underground parking area is provided via Silver Spear Road. The preliminary site plan is provided in **Figure 1-2; Appendix A** also provides a larger scale version of the proposed site plan.

The preliminary site plan provides for a total of 258 parking spaces.

Given the residential based nature of the development proposal, the analysis will include the weekday morning and afternoon peak periods for traffic assessment purposes.

Figure 1-2 – Proposed Site Plan

2.0 EXISTING TRAFFIC CONDITIONS

2.1. Existing Road Network

The existing subject lands are generally located south of Burnhamthorpe Road East and west of Dixie Road in the City of Mississauga. The road network is described as follows:

Silver Spear Road: is classified as a local road. It has a two-lane cross section and maintains an unposted speed limit of 40 km/h in the vicinity of the subject site.

Golden Orchard Drive: is classified as a local road. It has a two-lane cross section and maintains an unposted speed limit of 40 km/h in the vicinity of the subject site.

Winding Trail: is classified as a local road. It has a two-lane cross section and maintains an unposted speed limit of 40 km/h in the vicinity of the subject site.

Burnhamthorpe Road East: is classified as an Arterial Road. It has a five-lane cross section and maintains an unposted speed limit of 60 km/h in the vicinity of the subject site. Exclusive turning lanes are provided on approach to Golden Orchard Drive.

Dixie Road: is classified as an Arterial Road. It has a seven-lane cross section and maintains a speed limit of 60 km/h in the vicinity of the subject site. Exclusive turning lanes are provided on approach to Golden Orchard Drive.

2.2. Existing Active Transportation Network

Sidewalks

The area surrounding the proposed development is serviced with dedicated walkways. Currently, sidewalks are available on both sides of Silver Spear Road, Golden Orchard Drive, Winding Trail, Burnhamthorpe Road East and Dixie Road.

Bicycle Lanes

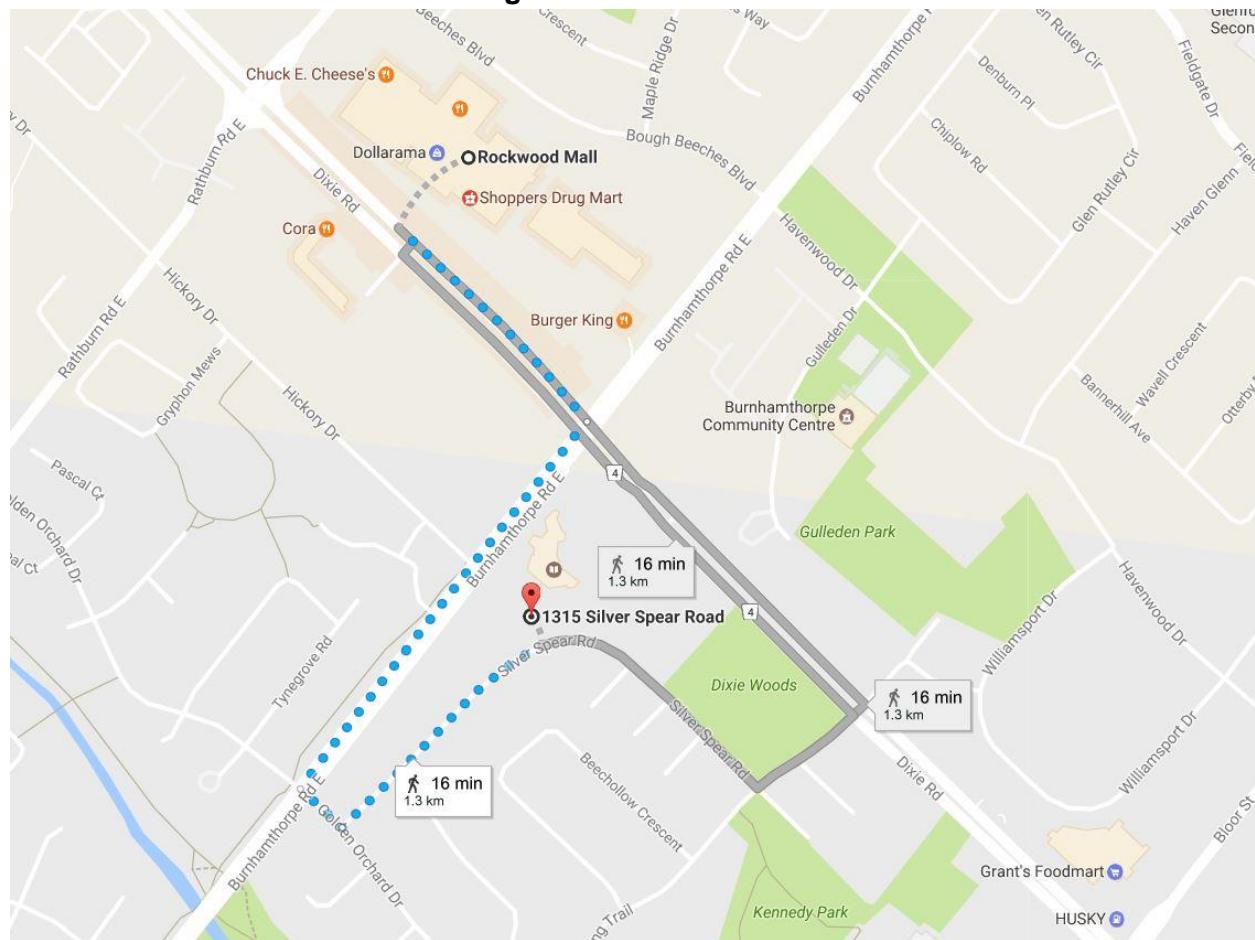
There are no dedicated bicycle lanes within the vicinity of the subject site however, there is a high density of amenities indicating many necessities are within walking distance.

2.3. Active Transportation Mode and Assessment

Existing Conditions

The review of the area surrounding the proposed development indicates numerous retail, food, and service establishments in the vicinity of the proposed development, many of which can be easily reached by pedestrian traffic and non-auto options. Rockwood Mall is approximately 1.3 km away (about a 15-minute walk or 6-minute bike ride). **Figure 2-1** illustrates the location of existing retail, food and service establishments from the proposed development. Amenities include a Winners, Shoppers Drug Mart, Burger King, Little Caesars etc.

The public transportation services operated by MiWay provide a reliable, cost effective alternative mode of travelling through the comprehensive and continually growing transit network system. Pedestrian sidewalks are provided on both sides of the roadways, and sidewalk connectivity is provided throughout the municipal roads to ensure a complete sidewalk network.

Figure 2-1 – Amenities

2.4. Existing Traffic Volumes

Existing traffic volumes at the study area intersections were undertaken by Spectrum Traffic on behalf of NexTrans Consulting Engineers on Wednesday, May 10, 2017 during the morning (7:00 a.m. to 10:00 a.m.) and afternoon (4:00 p.m. to 7:00 p.m.) peak periods. Detailed existing traffic data are provided in **Appendix B**.

2.5. Existing Traffic Assessment

The existing volumes are illustrated in **Figure 2-2**, and were analyzed using Synchro 9 software. The methodology of the software follows the procedures described and outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board. The detailed results are provided in **Appendix C** and summarized in **Table 2.1**.

Table 2.1 – Level of Service – Existing Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS (v/c)	Delay (s)	LOS (v/c)	Delay (s)
Golden Orchard Drive & Burnhamthorpe Road East (Signalized)	OVERALL	B (0.49)	15.9	B (0.53)	14.6
	EBL	A (0.06)	7.6	B (0.15)	10.1
	EBT	B (0.52)	11.9	B (0.41)	10.4
	EBR	A (0.09)	7.7	A (0.09)	7.7
	WBL	B (0.25)	11.3	B (0.30)	11.3
	WBT	A (0.29)	9.2	B (0.64)	14.0
	WBR	A (0.01)	7.1	A (0.01)	7.1
	NBL	E (0.38)	55.7	D (0.19)	52.8
	NBTR	D (0.30)	54.3	D (0.09)	51.5
	SBLTR	D (0.15)	52.2	D (0.13)	52.0
Dixie Road & Winding Trail (Signalized)	OVERALL	A (0.53)	9.9	A (0.63)	7.6
	EBLTR	F (0.70)	91.2	E (0.55)	77.4
	WBLTR	E (0.51)	73.9	E (0.31)	71.9
	NBL	A (0.05)	2.6	B (0.47)	13.6
	NBT	A (0.51)	4.5	A (0.42)	3.4
	NBR	A (0.01)	2.2	A (0.01)	2.0
	SBL	A (0.14)	3.6	A (0.19)	3.6
	SBT	A (0.46)	4.1	A (0.64)	5.3
	SBR	A (0.02)	2.3	A (0.03)	2.0
Silver Spear Road & Golden Orchard Drive (Unsignalized)	WBLR	A (0.10)	10.0	A (0.05)	9.2
	SBLT	A (0.03)	1.6	A (0.05)	2.7
Residential Driveway / Silver Spear Road & Winding Trail (Unsignalized)	EBLTR	A (0.01)	1.4	A (0.01)	1.7
	WBLTR	A (0.00)	0.2	A (0.00)	0.1
	NBLTR	B (0.00)	10.1	A (0.00)	8.7
	SBLTR	B (0.08)	10.1	A (0.05)	9.6
Silver Spear Road & Site Access (Unsignalized)	EBLT	A (0.00)	1.1	A (0.01)	1.3
	SBLR	A (0.02)	8.7	A (0.02)	9.4

As summarized in **Table 2.1**, under existing conditions the study area intersections are operating at excellent levels of service. The intersections are operating at overall ‘LOS B’ or better during the peak hour time periods. However, the eastbound left-through-right turning movement at the Dixie Road and Winding Trail intersection is experiencing a failing level of service during both peak hour time periods but maintains acceptable v/c ratios. This is a result of Winding Trail only providing a single lane for all three movements. On this basis, we recommend that the city investigate the provision of an exclusive right turn lane to mitigate this failing level of service.

3.0 FUTURE BACKGROUND CONDITIONS

A 5-year (2022) horizon period was selected and assumed in this analysis, which generally coincides with the full build out of the proposed development. For a conservative analysis, we have assumed a standard 2% growth rate per annum for the north-south and east-west through traffic volumes.

The future (2022) background traffic volumes are provided in **Figure 3-1**. **Table 3.1** summarizes the level of service at the given intersections under future background traffic conditions. Detailed output analysis can be found in **Appendix D**.

Table 3.1: Future (2022) Background Traffic Levels of Service

Intersection	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS (v/c)	Delay (s)	LOS (v/c)	Delay (s)
Golden Orchard Drive & Burnhamthorpe Road East (Signalized)	OVERALL	B (0.53)	16.2	B (0.53)	14.6
	EBL	A (0.06)	7.7	B (0.15)	10.1
	EBT	B (0.58)	12.8	B (0.41)	10.4
	EBR	A (0.09)	7.7	A (0.09)	7.7
	WBL	B (0.31)	13.4	B (0.30)	11.3
	WBT	A (0.32)	9.5	B (0.64)	14.0
	WBR	A (0.01)	7.1	A (0.01)	7.1
	NBL	E (0.39)	55.7	D (0.19)	52.8
	NBTR	D (0.34)	54.8	D (0.10)	51.6
	SBLTR	D (0.16)	52.3	D (0.14)	52.0
Dixie Road & Winding Trail (Signalized)	OVERALL	B (0.58)	10.2	A (0.70)	8.5
	EBLTR	F (0.72)	92.4	E (0.58)	78.6
	WBLTR	F (0.63)	81.0	E (0.32)	71.5
	NBL	A (0.06)	2.8	C (0.63)	29.1
	NBT	A (0.56)	5.0	A (0.46)	3.8
	NBR	A (0.01)	2.3	A (0.01)	2.1
	SBL	A (0.17)	4.3	A (0.23)	4.3
	SBT	A (0.51)	4.5	A (0.71)	6.5
	SBR	A (0.02)	2.3	A (0.03)	2.1
Silver Spear Road & Golden Orchard Drive (Unsignalized)	WBLR	B (0.10)	10.1	A (0.06)	9.3
	SBLT	A (0.03)	1.5	A (0.05)	2.5
Residential Driveway / Silver Spear Road & Winding Trail (Unsignalized)	EBLTR	A (0.01)	1.3	A (0.01)	1.6
	WBLTR	A (0.00)	0.2	A (0.00)	0.1
	NBLTR	B (0.00)	10.2	A (0.00)	8.7
	SBLTR	B (0.09)	10.2	A (0.05)	9.7
Silver Spear Road & Site Access (Unsignalized)	EBLT	A (0.00)	1.0	A (0.01)	1.2
	SBLR	A (0.02)	8.7	A (0.02)	9.4

As summarized in **Table 3.1**, it is shown that during future background traffic conditions the subject study area intersections continue to operate at excellent level of services with no changes to expected operations. During future background traffic conditions, the intersections are operating at overall LOS 'B' during the peak hour periods. The westbound left-through-right turning movement at the Dixie Road and Winding Trail intersection is continuing to operate at a failing level of service during both peak hour time periods.

4.0 SITE TRAFFIC

The development proposal is to construct an 8-storey residential building to provide an additional 10,577.4 m² of gross floor area (GFA). Trip rates and site generated trips were derived from the information contained in the *Trip Generation Manual, 9th Edition* published by the Institute of Transportation Engineers (ITE) for “Residential Condominium/Townhouse” (LUC 230). The trip generation summary is provided in **Appendix E** and shown in **Table 4.1**.

Table 4.1 – Site Traffic Trip Generation (Based on ITE)

ITE Land Use	Parameter	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Residential Condominium/Townhouse (LUC 230) 159 units	Gross New Trips	13	62	75	88	43	131
	Trip Rate	0.08	0.39	0.47	0.55	0.27	0.82
	Non-Auto (25%)	3	16	19	22	11	33
Total	New Trips	10	46	56	66	32	98
	New Rate	0.06	0.29	0.35	0.42	0.20	0.62

Based on the information contained in the 2011 Transportation Tomorrow Survey (TTS), a non-auto modal split for the subject area is approximately 25%. As shown in **Table 4.1**, the proposed development is anticipated to generate 56 two-way trips (10 inbound and 46 outbound) during the AM peak hours and 98 two-way trips (66 inbound and 32 outbound) during the PM peak hours.

Furthermore, based on the existing site traffic trends, the Apartment Building is generating a trip rate of 0.34 trips per occupied unit during the AM peak hours and 0.49 trips per occupied unit during the PM peak hours. Therefore, the ITE rate applied to this land use is conservative. **Table 4.2** shows the existing site traffic and trip rates for the AM and PM peak hours.

Table 4.2 – Existing Site Traffic Trip Generation

Land Use	Parameter	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Apartment Building 93 units	Total Trips	10	22	32	29	17	46
	Trip Rate	0.11	0.24	0.34	0.31	0.18	0.49

The assumptions for the trip distribution rates are based on the information extracted from the 2011 Transportation Tomorrow Survey (TTS) and existing traffic patterns and routes that drivers would likely take to access the subject site and engineering judgement based on ease of site access. As a result, site trip distribution is summarized for the inbound and outbound site traffic movements during the morning and afternoon peak hours in **Table 4.3** with the trip assignment illustrated in **Figure 4-2**.

Table 4.3 – Site Traffic Trip Distribution

Direction	Via	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
North	Dixie Road	20%	20%	20%	20%
South	Dixie Road	35%	35%	35%	35%
East	Burnhamthorpe Road East	15%	15%	15%	15%
West	Burnhamthorpe Road East	30%	30%	30%	30%
Total		100%	100%	100%	100%

5.0 FUTURE TOTAL TRAFFIC CONDITIONS

The forecasted 2022 future total traffic volumes (existing traffic volumes plus site generated traffic volumes) are illustrated in **Figure 5-1**, and were analyzed using Synchro 9 software. The detailed calculations are provided in **Appendix F** and summarized in **Table 5.1**.

Table 5.1 – Level of Service – Future Total Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
		LOS (v/c)	Delay (s)	LOS (v/c)	Delay (s)
Golden Orchard Drive & Burnhamthorpe Road East (Signalized)	OVERALL	B (0.54)	16.7	B (0.59)	15.8
	EBL	A (0.06)	7.7	B (0.20)	12.3
	EBT	B (0.58)	12.8	B (0.45)	10.9
	EBR	A (0.09)	7.7	A (0.11)	7.9
	WBL	B (0.33)	14.0	B (0.42)	14.7
	WBT	A (0.32)	9.5	B (0.70)	15.6
	WBR	A (0.01)	7.1	A (0.01)	7.1
	NBL	E (0.44)	56.6	D (0.22)	53.2
	NBTR	E (0.39)	55.5	D (0.11)	51.7
	SBLTR	D (0.16)	52.3	D (0.15)	52.2
	OVERALL	B (0.58)	10.8	A (0.84)	10.0
Dixie Road & Winding Trail (Signalized)	EBLTR	F (0.74)	92.4	E (0.62)	80.0
	WBLTR	E (0.60)	78.2	E (0.31)	70.5
	NBL	A (0.07)	3.1	E (0.87)	64.9
	NBT	A (0.57)	5.3	A (0.47)	4.1
	NBR	A (0.01)	2.4	A (0.01)	2.2
	SBL	A (0.17)	4.6	A (0.23)	4.6
	SBT	A (0.51)	4.8	A (0.72)	6.9
	SBR	A (0.02)	2.5	A (0.03)	2.3
Silver Spear Road & Golden Orchard Drive (Unsignalized)	WBLR	B (0.14)	10.3	A (0.08)	9.4
	SBLT	A (0.03)	1.8	A (0.08)	3.4
Residential Driveway / Silver Spear Road & Winding Trail (Unsignalized)	EBLTR	A (0.01)	1.3	A (0.01)	1.6
	WBLTR	A (0.00)	0.1	A (0.00)	0.1
	NBLTR	B (0.00)	10.2	A (0.00)	8.7
	SBLTR	B (0.11)	10.4	A (0.06)	8.7
Silver Spear Road & Site Access (Unsignalized)	EBLT	A (0.01)	1.8	A (0.04)	3.3
	SBLR	A (0.07)	9.0	A (0.06)	9.8

Under future total traffic condition, the study intersection and proposed access are expected to continue operating with excellent level of service during both peak periods.

6.0 PARKING ASSESSMENT

The City-wide Zoning By-law No. 0207-2008 has been adopted by the City of Mississauga Council and it was enacted on June 4, 2008. The Zoning By-law is a comprehensive By-law covering the entire amalgamated City of Mississauga.

Based on the information contained in the Zoning By-law, the subject site is governed by the requirement stipulated in 'Rental Apartment Dwelling'. The existing development with the addition of 159 dwelling units will provide a total of 252 units. The dwelling units are comprised of the following: one (1) bachelor unit, 122 one-bedroom units, 116 two-bedroom units and 13 three-bedroom units.

The technical parking requirement for the proposed development is detailed in **Table 6.1**.

Table 6.1 – Vehicle Parking Requirements (Zoning By-law No. 0207-2008)

Unit Type	Number of Units	Rate/Unit	Parking Requirement	Parking Provided	Difference
Bachelor	1	1.0	1	222 (Underground)	-101
1-Bedroom	122	1.18	144		
2-Bedroom	116	1.36	158		
3-Bedroom	13	1.50	20		
Visitor	252	0.20	50	36 (Surface)	-14
Total			372	258	-115

In accordance with the City's parking provisions outlined in the City's By-law, the site requires 372 vehicular parking spaces. In comparing the provided parking supply with By-Law requirements, the subject site has a technical deficiency of 101 tenant parking spaces and 14 visitors, for a total parking deficiency of 115 vehicle parking spaces.

6.1. Tenant Occupancy List & Tenant Parking Assessment

Based on information received from the client, at the time of the survey, all rental dwelling units were rented and occupied. Due to the uncertainty of the time frames for the parking survey to capture peak resident parking demands, the owner provided the master tenant parking audit for the subject site. **Table 6.2**, summarizes the number of tenant occupied and vacant parking spaces based on the existing 99 tenant parking spaces.

Table 6.2 – Tenant Vacant and Occupied Parking Spaces

Location	Parking Spaces Provided	Occupied Spaces	Vacant Spaces
Surface/Outdoor	99	85	14

As summarized in above, the existing 93 occupied rental dwelling units require a total of 85 tenant parking spaces or a parking demand ratio of 0.91 spaces / occupied unit. The aforementioned subject site is subjected to City of Mississauga's Zoning By-laws which require highly conservative rates for vehicle parking requirements. On this basis, the parking requirements for tenants for the proposed development is summarized in **Table 3.2**.

Table 6.3 – Parking Requirement for Tenants

	Maximum Peak Parking Demand	
	Existing 93 Units	Proposed Additional 159 Units
Parking Rate Applied	0.91 spaces / unit	0.91 spaces / unit
Parking Spaces Required	85	145
Total Parking Required	$(85+145) = 230$	
Total Parking Provided	222	
Difference	-8	

6.2. Parking Utilization Survey & Visitor Parking Assessment

To capture peak visitor parking demand for the development, NexTrans Consulting conducted parking utilization surveys at the existing rental apartment building on Friday, February 10, 2017 and Sunday, February 26, 2017 between 5:00 p.m. - 12:00 p.m. and 2:00 p.m. - 8:00 p.m. at 30-minute intervals, respectively. Based on information received from the client, at the time of survey, all rental dwelling units were rented and occupied. The selected survey methodologies (i.e. date and duration) were selected to reflect the anticipated peak parking demand for the existing land use. Detailed information is provided in Table 4.1 and Table 4.2.

Table 6.4 – Parking Utilization Survey Results

Time Period (starting)	Friday, February 10, 2017		
	Visitor	Utilization Rate	Available Spaces
Existing Parking Supply	10 Spaces		
5:00 PM	10	100%	0
5:30 PM	10	100%	0
6:00 PM	10	100%	0
6:30 PM	10	100%	0
7:00 PM	10	100%	0
7:30 PM	10	100%	0
8:00 PM	10	100%	0
8:30 PM	9	90%	1
9:00 PM	10	100%	0
9:30 PM	10	100%	0
10:00 PM	9	90%	1
10:30 PM	10	100%	0
11:00 PM	8	80%	2
11:30 PM	9	90%	1
12:00 PM	10	100%	0
Maximum	10	100%	0

Table 6.5 – Parking Utilization Survey Results

Time Period (starting)	Sunday, February 26, 2017		
	Visitor	Utilization Rate	Available Spaces
Existing Parking Supply	10 Spaces		
2:00 PM	9	90	1
2:30 PM	9	90	1
3:00 PM	9	90	1
3:30 PM	10	100	0
4:00 PM	10	100	0
4:30 PM	9	90	1
5:00 PM	8	80	2
5:30 PM	9	90	1
6:00 PM	9	90	1
6:30 PM	8	80	2
7:00 PM	7	70	3
7:30 PM	7	70	3
8:00 PM	7	70	3
Maximum	10	100	0

The survey results above indicate that of the existing 10 parking spaces made available to visitors in the rental apartment, a peak parking demand of 10 parking spaces (or approximately 100%) were utilized during the highest peak parking demands over the course of two survey days.

As summarized in **Table 4.1** and **Table 4.2**, the existing 93 occupied rental dwelling units require a total of 10 visitor parking spaces or a parking demand ratio of 0.11 spaces / occupied unit. The aforementioned subject site is subjected to City of Mississauga's Zoning By-laws which require highly conservative rates for vehicle parking requirements. On this basis, the parking requirements for tenants for the proposed development is summarized in **Table 4.3**.

Table 6.6 – Parking Requirement for Visitors

	Maximum Peak Parking Demand	
	Existing 93 Units	Proposed Additional 159 Units
Parking Rate Applied	0.11 spaces / unit	0.11 spaces / unit
Parking Spaces Required	10	18
Total Parking Required	$(10+18) = 28$	
Total Parking Provided	36	
Difference	+8	

6.3. Parking Conclusion

The review and investigation of existing parking supply and demand trends within the City indicate that the current by-law parking requirements for apartment buildings are in excess and incomparable to the existing travel patterns and behaviors as well as the City's TDM initiatives. Parking utilization surveys indicate a tenant parking demand of equal to or less than 0.91 spaces per occupied dwelling unit and a visitor parking demand of equal to or less than 0.11 spaces per occupied dwelling unit.

As summarized in **Table 6.3** and **Table 6.6**, with the addition of 159 rental dwelling units, the site will require 230 tenant parking spaces and 28 visitor parking spaces, for a total of 258 parking spaces. As indicated on the proposed site plan, 258 parking spaces will be provided. On this basis, the future parking demand with the addition of 159 rental dwelling units is completely satisfied with the proposed parking provision.

7.0 SITE PLAN REVIEW

AutoTURN software was used (HSU TAC – 1999) to generate a vehicular turning template to confirm and demonstrate the accessibility of the proposed loading space. As illustrated in **Figure 7-1**, the AutoTURN analysis demonstrates that an 11.5 m long Garbage Truck (HSU TAC – 1999) can effectively maneuver through the parking lot.

8.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. Typically, TDM strategies are for residential and office developments where large quantities of people congregate in one origin or destination. However, TDM strategies for rental buildings can be arranged but on a lesser scale.

8.1. Parking Management

Based on our experience, excessive parking supply imposes environmental costs, contradicts community development objectives for more livable and walkable communities, and tends to increase driving and discourage the use of alternative mode of travel. It is anticipated that the combination of reduced parking supply and an efficient public transit system will encourage the use of alternative modes of travel.

8.2. Transit and Active Transportation Mode Assessment

The proposed development is situated in a transit supportive neighbourhood with bus stops located approximately 5-minutes to the subject site within comfortable walking distance. The route services are illustrated in **Appendix G**. The route services in the immediate area are described below:

- **26 Burnhamthorpe:** The 26 Burnhamthorpe bus route operates every 15 minutes between South Common Mall Bus Terminal Platform K and Islington Subway Bus Terminal Platform D, generally in an east-west direction. The 26 Burnhamthorpe bus route provides service 7 days a week. Weekend service operates every 33 minutes. Accessible service and bike racks are provided on the route.

- **76 City Centre-Subway:** The 76 City Center route operates every 15 minutes between the City Centre Transit Terminal Platform and the Islington Subway Bus Terminal Platform D, generally in an east-west direction. The 76 City Centre-Subway service is provided from Monday to Friday, only. Accessible service is provided on this route.
- **5 Dixie:** The 5 Dixie Bus route operates approximately every 15 minutes between Dixie Road at Sherway Drive and Lorimar Drive at Cardiff Boulevard, generally in a north-south direction. The 5 Dixie bus route provides service 7 days a week. Weekend service operates every 25 minutes. Accessible service and bike racks are available on this route.

Based on the study prepared by the Ministry of Transportation Ontario entitled: ‘Transit Supportive Guidelines’, dated January 2012, transit users are generally willing to walk 400 meters to a local stop or 800 meters to a rapid transit station. The Burnhamthorpe Road East at Golden Orchard Drive bus stop is approximately 400 meters from the proposed subject site.

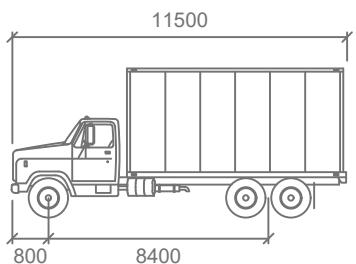
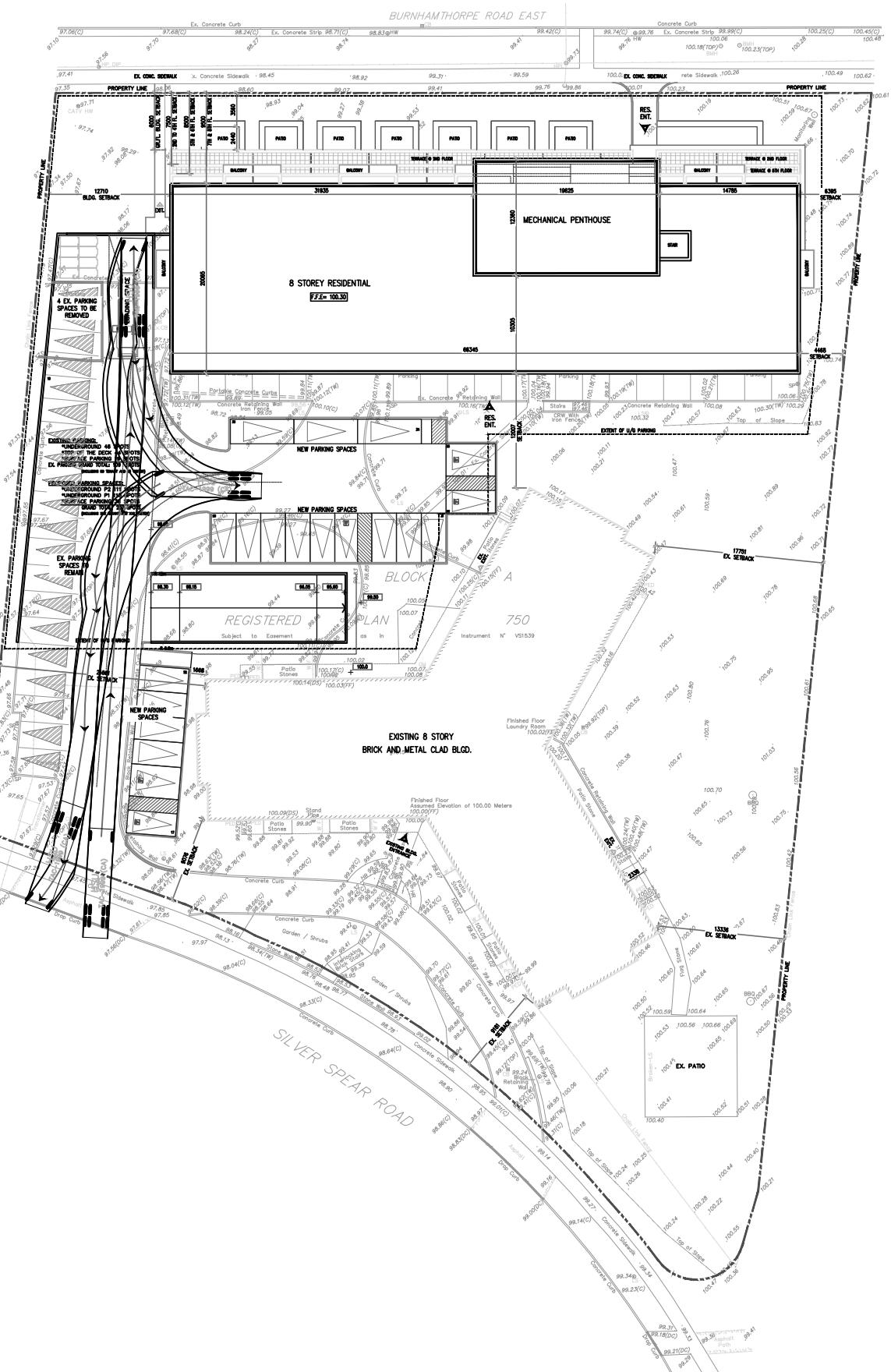
8.3. TDM Implementation

The owner is committed to promote sustainable transportation systems. It actively encourages its tenants to explore and take advantage of the alternative modes of travelling available within their neighbourhood. The City of Toronto Smart Commute webpage can provide a comprehensive list of items including materials, e-resources, links and PDF brochures on the following categories: Public Transit, Smart Commute, Cycling Information, and Active Transportation.

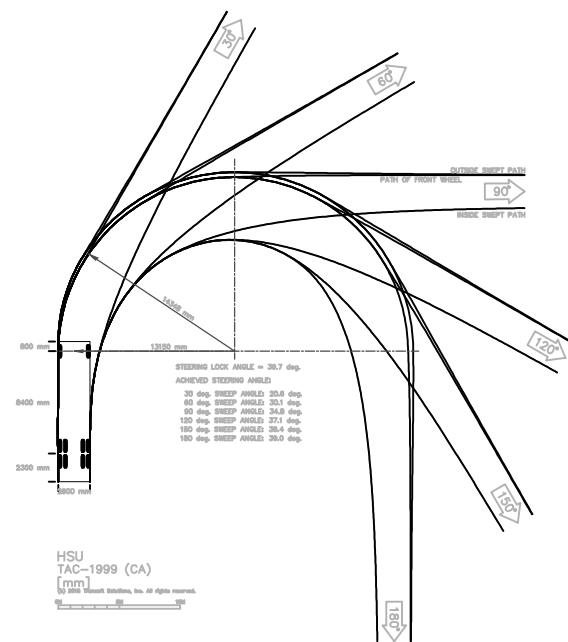
9.0 CONCLUSION

The findings and conclusions of our analysis are as follows:

- The development proposal is to construct an 8-storey residential building to provide 10,577.4 m² of gross floor area (GFA) as an addition to the existing 8-storey residential building providing 8,091 m² of gross floor area (GFA). A full movement unsignalized entrance to the surface and underground parking area is provided via Silver Spear Road.
- The proposed development is anticipated to generate 56 two-way trips (10 inbound and 46 outbound) during the AM peak hours and 98 two-way trips (66 inbound and 32 outbound) during the PM peak hours.
- The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study intersection and proposed access are expected to operate with excellent levels of service. However, it is recommended that the City look into providing an exclusive right turn lane for the eastbound and westbound traffic on Winding Trail.
- To ensure safe traffic operation in the area, it is recommended that a STOP sign be installed at the proposed site entrance onto Silver Spear Road.
- Based on parking utilization surveys, the site will require 230 tenant parking spaces and 28 visitor parking spaces, for a total of 258 parking spaces. As indicated on the proposed site plan, 258 parking spaces will be provided. On this basis, the future parking demand with the addition of 159 rental dwelling units is completely satisfied with the proposed parking provision.
- The proposed loading spaces are accessible from a circulation perspective.



HSU mm
 Width : 2600
 Track : 2600
 Lock to Lock Time : 6.0
 Steering Angle : 39.7



BENCHMARK

REVISONS

NO	REVISION	DATE	BY

STAMP

CIVIL CONSULTANT:



PROJECT NAME:

RESIDENTIAL DEVELOPMENT
 1315 SILVER SPEAR RD
 (MISSISSAUGA, ON)

DRAWING TITLE:

AutoTURN Analysis
 (HSU TAC-1999)

DESIGN BY: A.S.	DATE: April 6, 2017
CHECKED BY: R.P.	PROJECT NO.
DRAWN BY: A.S.	NT-17-018
SCALE: NTS	DRAWING NO.

Appendix A - Proposed Site Plan

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Drawing set to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the work and report any discrepancies with the Contract Documents to the architect before commencing work.

Portions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on architectural drawings. The locations of these items and their locations will be indicated on the electrical and mechanical drawings. Those contractors involved in the installation of these items shall be responsible for the location and placement of these items.

These drawings are not to be used for construction unless noted below as "Used for Construction".

All work to be carried out in conformance with the Code and bylaws of the authorities having jurisdiction.

The Designer of these plans and specifications gives no warranty or representation to the Contractor or Subcontractor as to the accuracy of the plans or specifications. Contractors or subcontractors must satisfy themselves when bidding and at all times that they can properly construct the work represented by these plans.

notes:

LEGEND	EXISTING	PROPOSED
LANDSCAPE - SOFT	4289.2 m ² SOFT HABITAT SOFT HABITAT LANDSCAPE OPEN AREA	2570.0 m ² SOFT HABITAT LANDSCAPE OPEN AREA
LANDSCAPE - HARD	350.0 m ²	503.0 m ²
TOTAL	4639.2 m ²	3073.0 m ²

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notes:

10.27.16

10.12.16

10.06.16

04.04.16

06.25.15

5. issued for client review

4. pre-submission meeting

3. issued for client review

2. issued for client review

1. pre-submission meeting

revisions:

architectural team :

mark zwicker
morteza rasekhplanning:
John d. rogers and associates inc.
structural:
electrical:
mechanical:
landscape:
site services:project:
1315 SILVER SPEAR RD.
mississauga, ontario

site plan, statistics & general notes

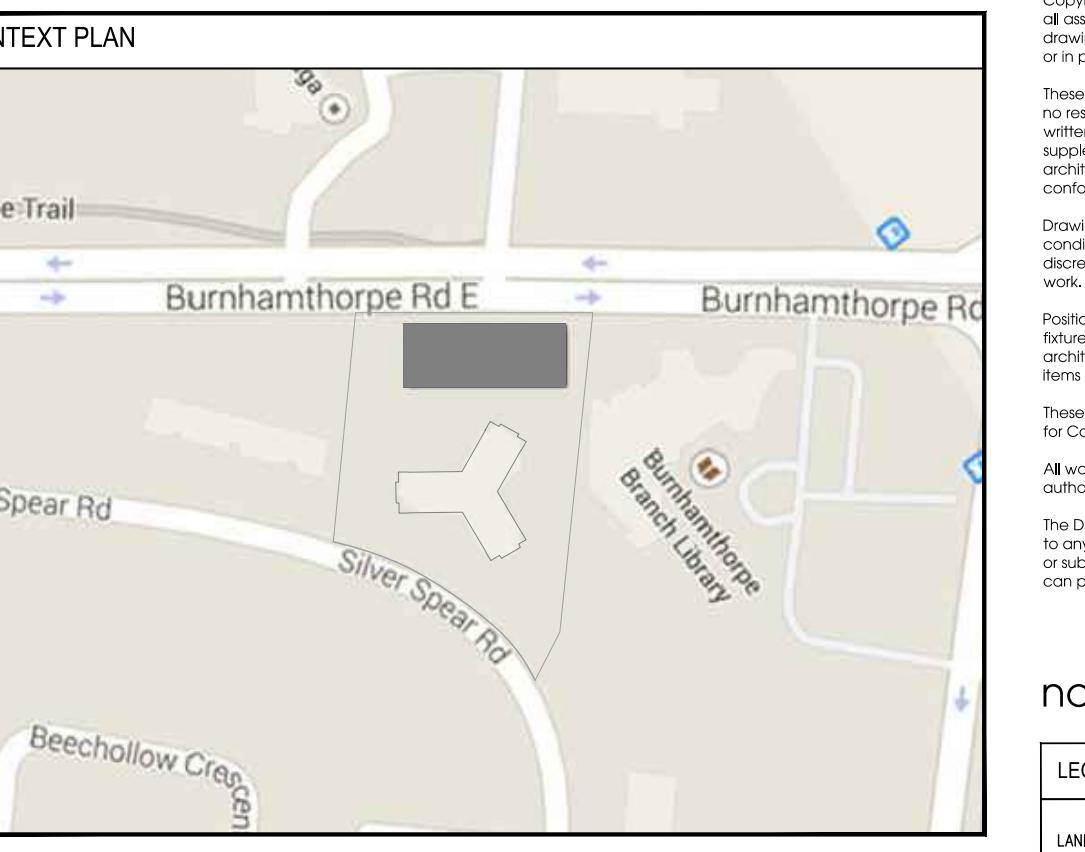
date:

scale:

project:

drawn by:

A100



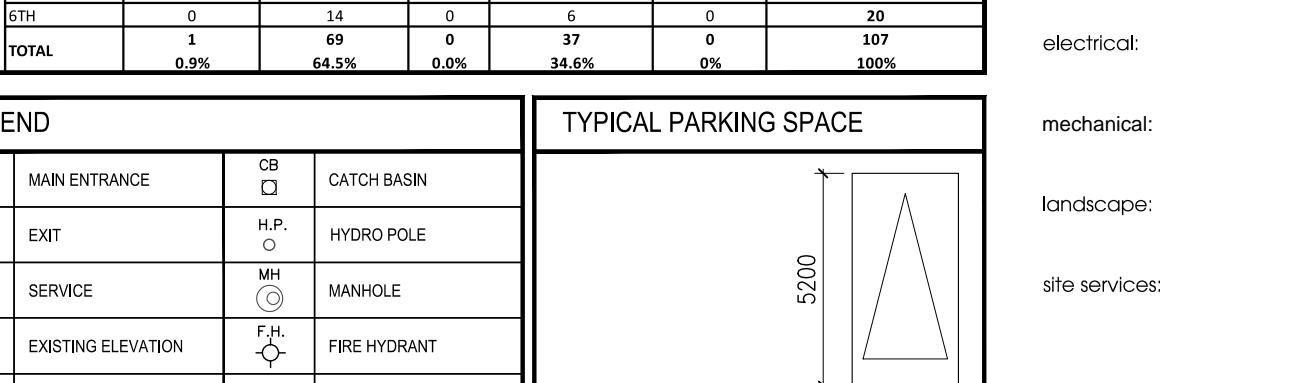
STATISTICS		OCTOBER 27TH 2016
1. ZONING:	RA-2	
2. SITE AREA:	8404 m ²	90,460 ft ²
3. EXISTING BUILDING		
GFA	8,091 m ²	87,091 ft ²
GROUND FLOOR AREA	1,134 m ²	12,206 ft ²
DENSITY	0.96 FSI (GFA / SA)	
BUILDING COVERAGE	13.49 %	
UNITS	93	
PARKING	109	
AMENITY SPACE (INDOOR)	69.64 m ²	750 ft ²
AMENITY SPACE (LANDSCAPED)	1,350 m ²	14,533 ft ²
LANDSCAPE OPEN AREA	1000m ² TREED AREA +HARDSCAPED	1,350 m ²
TOTAL	4,639.2 m ²	49,936 ft ²
		57.3%

4. PROPOSED BUILDING:	
GFA	7,933.9 m ²
GROUND FLOOR AREA	1,762.6 m ²
DENSITY	18.60 FSI (GFA / SA)
BUILDING COVERAGE	18.60 %
UNITS	107
PARKING - ADDITIONAL	101
AMENITY SPACE (INDOOR)	130.0 m ²
AMENITY SPACE (LANDSCAPED)	1,212.5 m ²
LANDSCAPE OPEN AREA	SOFT/HARD SCAPED
TOTAL	15,385 m ²
	165,602 ft ²
TOTAL GFA	2,897 m ²
	31,179 ft ²
TOTAL DENSITY	MIN. FSI PERMITTED = 1.0 (8488 m ²) MAX. FSI PERMITTED = 1.5 (12747 m ²)
	1.83 FSI
TOTAL UNITS	200
TOTAL BUILDING COVERAGE	32.09 %
TOTAL PARKING	210
TOTAL LANDSCAPED AREA	SOFT/HARD SCAPED
	3,073.0 m ²
	33,077 ft ²
	36.6%

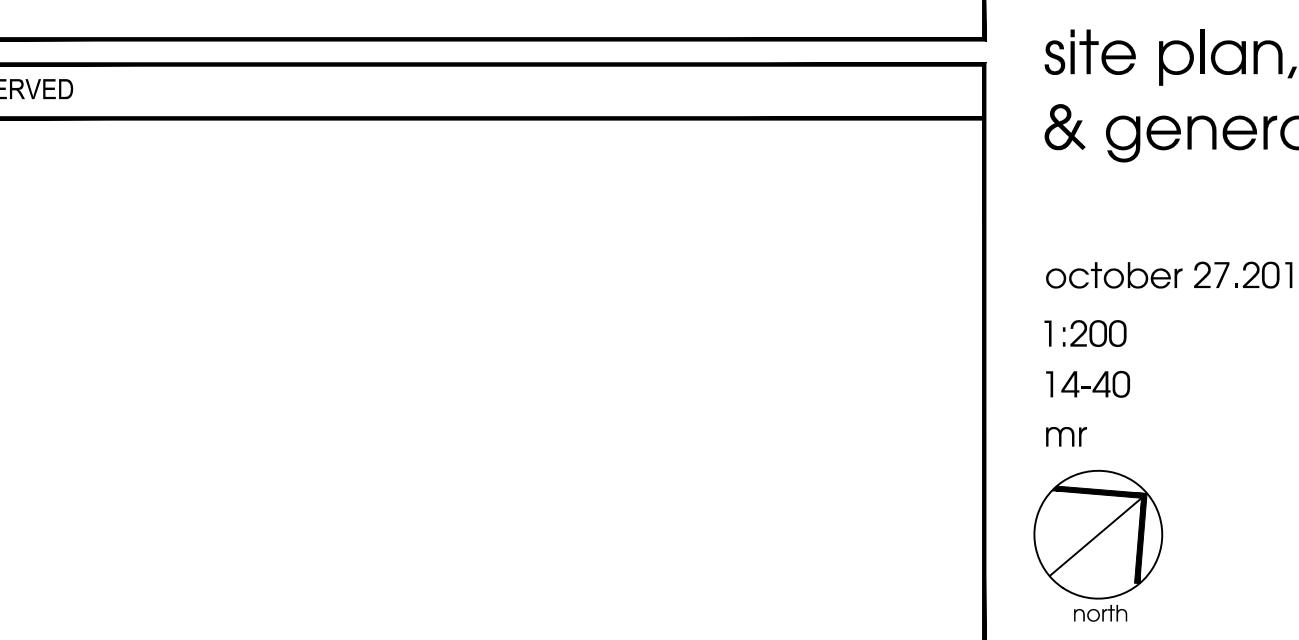
5. TOTAL:	
TOTAL GFA	15,385 m ²
	165,602 ft ²
TOTAL GROUND FLOOR AREA	2,897 m ²
	31,179 ft ²
TOTAL DENSITY	MIN. FSI PERMITTED = 1.0 (8488 m ²) MAX. FSI PERMITTED = 1.5 (12747 m ²)
	1.83 FSI
TOTAL UNITS	200
TOTAL BUILDING COVERAGE	32.09 %
TOTAL PARKING	210
TOTAL LANDSCAPED AREA	SOFT/HARD SCAPED
	3,073.0 m ²
	33,077 ft ²
	36.6%

6. HEIGHT:		PERMITTED:	PROPOSED:			
7. PARKING :	REQUERED:	8 STOREYS (26.0m)	5 STOREYS (15.85m)			
	EXISTING:	109				
	PROPOSED:	94				
	GROUND	94				
	P1 LEVEL	26				
	TOTAL	210				
	TOTAL (ADDITIONAL):	153				
	TOTAL (ADDITIONAL):	101				
8. LOCKERS:	P1	0	0			
9. CYCLE:	GROUND FLOOR	10	45			
	P1	35				
10. AMENITY:	REQUIRED:		PROPOSED: 130 m ²			
11. LOADING SPACES:			1,399 ft ²			
12. PROPOSED BUILDING FLOOR AREA SUMMARY:						
LEVEL	TOTAL FL. AREA (ft ²)	GROSS FL. AREA (GFA)	LEASABLE FL. AREA (LSA)			
P1	4,029.9 m ²	41,378 ft ²	0 m ²			
GRD	1,742.6 m ²	18,972 ft ²	675.4 m ²			
2ND TO 4TH	4,132.4 m ²	44,481 ft ²	4,026.0 m ²			
5TH & 6TH	2,663.4 m ²	28,669 ft ²	2,592.5 m ²			
GRAND TOTAL	12,588.4 m ²	135,500 ft ²	72,959 m ²			
			62,572.9 m ²			
			70266 ft ²			
13. EFFICIENCY (NSA/ICA)			86.99%			
14. UNIT SUMMARY						
FLOOR	B4	I8	1B40	2B	3B	TOTAL
GRD	1	0	12	0	8	20
2ND	0	12	0	8	0	20
3RD	0	12	0	8	0	20
4TH	0	14	0	6	0	20
5TH	0	14	0	6	0	20
6TH	0	14	0	6	0	20
TOTAL	1	69	0	37	0	107
	0.9%	64.5%	0.0%	34.6%	0%	100%

LEGEND	
▼	MAIN ENTRANCE
△	EXIT
▲	SERVICE
◆	EXISTING ELEVATION
+188.00	PROPOSED ELEVATION
±000.00	SLAB ELEVATION



SURVEY DATA	
TOPOGRAPHY OF: 1315 SILVER SPEAR RD. BEING BLOCK A REGISTERED PLAN 750 CITY OF MISSISSAUGA REGIONAL MUNICIPALITY OF PEEL	PREPARED BY: LLOYD & PURCELL LTD., ONTARIO LAND SURVEYORS 1228 GORHAM STREET, UNIT 28, NEWMARKET, ONTARIO L3Y 4Z1, (905) 895-6416 24/06/13



GENERAL NOTES

- ALL SURFACE DRAINAGE WILL BE SELF-CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
- THE CITY OF MISSISSAUGA REQUIRES THAT ALL WORKING DRAWINGS BE SUBMITTED TO THE BUILDER FOR REVIEW AND APPROVAL PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. SHALL BE CERTIFIED BY THE ARCHITECT OR ENGINEER AS BEING IN CONFORMITY WITH THE SITE DEVELOPMENT PLAN AS APPROVED BY THE CITY OF MISSISSAUGA.
- ALL EXISTING PROPERTY LINES SHALL BE FORCED FROM NEW BY THE APPLICANT.
- ALL THE ENTRANCES TO THE SITE, MUNICIPAL SIDEWALK AND CURB WILL BE CONTINUOUS THROUGH THE DRIVEWAY. THE DRIVEWAY GRADE WILL BE COMPATIBLE WITH THE EXISTING OR FUTURE GRADE OF THE DRIVEWAY.
- ON SITE WASTE COLLECTION IS TO BE ARRANGED THROUGH A PRIVATE CONTRACTOR.
- THE DRIVEWAYS ARE TO BE LOCATED WITHIN THE MUNICIPAL LANDS AND PAVED BY THE APPLICANT.
- DRIVEWAYS AND EMERGENCY SERVICES ACCESS ROUTES SHALL BE DESIGNATED AS PER BY-LAW 506-13, AS AMENDED. PRIOR TO OCCUPANCY OF THE BUILDING, ALL FIRE AND EMERGENCY SERVICES ACCESS ROUTES ARE TO BE MAINTAINED IN SUPPORT OF NOT LESS THAN 11,163 kg per axle AND HAVE A CHANGE IN SLOPE OF NOT MORE THAN 1% IN 12.0 METERS.
- THE TOPS OF ANY CURBS BORDERING DRIVEWAYS WITHIN THE MUNICIPAL BOULEVARD WILL BE TURED TO THE DRIVEWAY GRADE.
- PARKING SPACES RESERVED FOR PEOPLE WITH DISABILITIES MUST BE IDENTIFIED BY A SIGN INSTALLED AT THE APPLICANT'S EXPENSE, IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS FOR ACCESSIBILITY.
- GRADE WILL BE MET WITHIN A 3.3% MAXIMUM SLOPE AT THE PROPERTY LINES AND WITHIN 1.5% ON THE DRIVEWAYS.
- ALL DAMAGED AREAS ARE TO BE REINSTATED WITH TOPSOIL AND SOD PRIOR TO THE RELEASE OF SECURITIES.
- ALL INFORMATION ON THE DEVELOPMENT PLANS IS FOR INFORMATION PURPOSES ONLY. ALL SIGNS WILL BE SUBJECT TO THE PROVISIONS OF SIGN BY-LAW 504-2012, AS AMENDED, AND A SIGN PERMIT WILL BE REQUIRED FOR THE INSTALLATION OF ANY SIGN.
- ALL SIGNS ARE SUBJECT TO FURTHER REVIEW AND APPROVALS BY THE PLANNING AND BUILDING DEPARTMENTS WHICH MAY INCLUDE A SIGN REVIEW THROUGH THE SIGN PERMIT PROCESS.
- THE APPLICANT WILL BE RESPONSIBLE FOR ENSURING THAT ALL PLANS CONFORM TO THE APPROPRIATE BY-LAW.
- THE APPLICANT IS RESPONSIBLE FOR ENSURING THAT TREE PROTECTION IS MAINTAINED THROUGHOUT ALL PHASE OF DEMOLITION AND CONSTRUCTION IN THE LOCATION AND NUMBER INDICATED ON THE SITE PLAN. THE APPLICANT IS RESPONSIBLE FOR THE PROTECTION OF BUILDING MATERIALS, SOIL, ETC. MAY BE STOCKPILE WITH

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notes:

P1 FL		
FLOOR AREA	4029.94 m ²	43379.37 ft ²
SALEABLE FLOOR AREA	0	0

info@unfolded.ca

219 dufferin street, suite 201b, toronto, on. m6k 1y9 tel (416)601-5416

10.27.16
10.12.16
10.06.16
04.04.16
06.25.15

5. issued for client review
 4. pre-submission meeting
 3. issued for client review
 2. issued for client review
 1. pre-submission meeting

revisions:

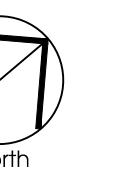
architectural team :

mark zwicker
morteza rasekh

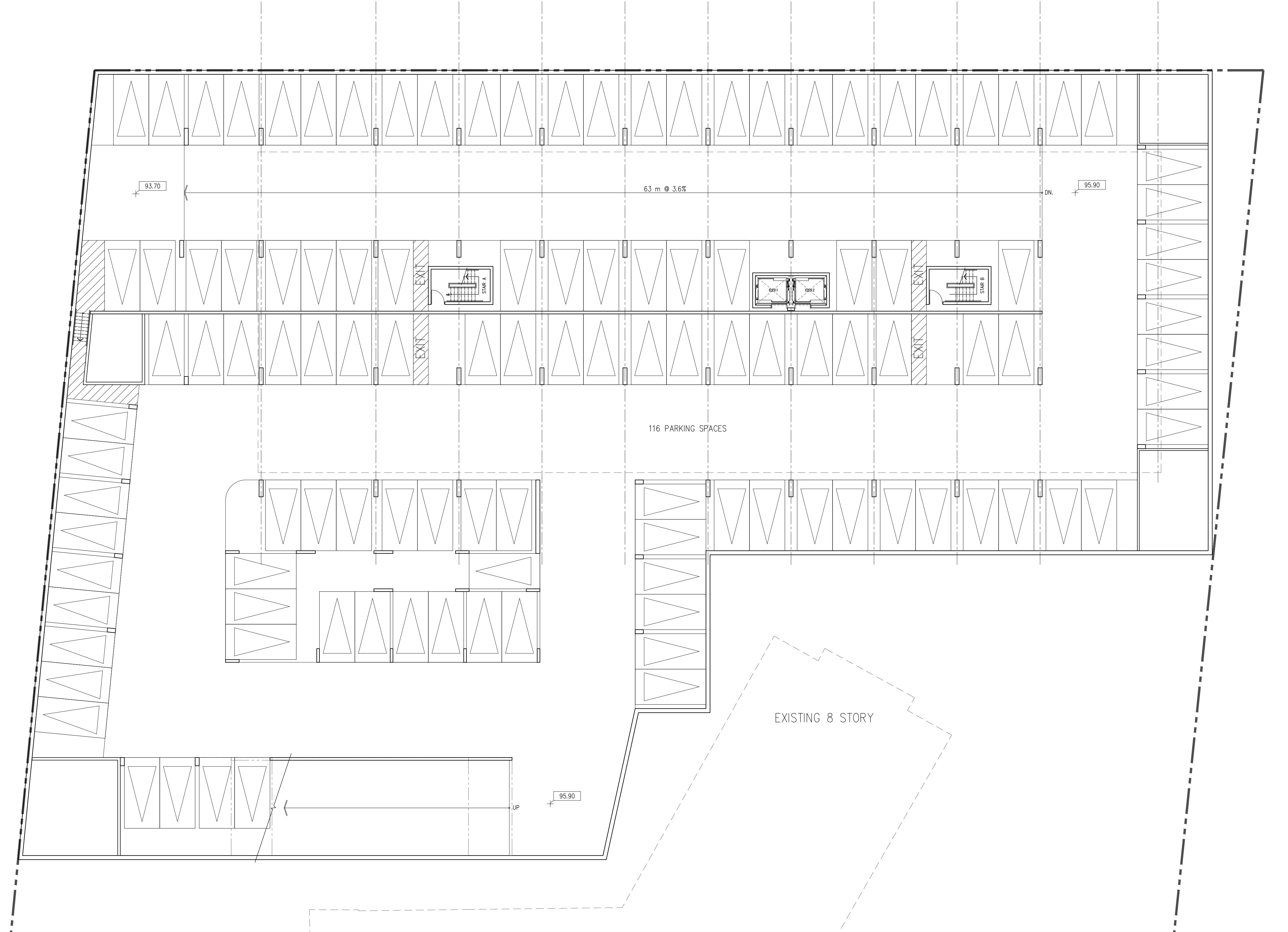
planning:
john d. rogers and associates inc.
structural:
electrical:
mechanical:
landscape:
site services:

project:
1315 SILVER SPEAR RD.
mississauga, ontario

underground parking plan

october 27.2016
1:150
14-40mr
drawn by:date:
scale:
project:
drawing number:

A201



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The plans are not to be used for construction unless they are checked by the project engineer.

All work to be carried out in conformance with the Code and bylaws of the authorities having jurisdiction.

The Designer of these plans and specifications gives no warranty or representation to subcontractors or the public as to the suitability of the plans for all contractors or subcontractors may protect themselves when bidding and at all times that they can properly construct the work represented by these plans.

notes:

GR. FL.		
FLOOR AREA	1762.59 m ²	18972.96 ft ²
AMENITY	130.05 m ²	1399.65 ft ²
LEASABLE FLOOR AREA	313.71 m ²	3376.84 ft ²
PARKING AREA	1054.49 m ²	11350.81 ft ²

info@unfolded.ca

tel: (416) 601-5416

mok ly9

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 2. issued for client review
 1. pre-submission meeting

revisions:

architectural team :
 mark zwicker
 morteza rasekh

planning:
 john d. rogers and associates inc.
 structural:
 electrical:
 mechanical:
 landscape:
 site services:

project:
 1315 SILVER SPEAR RD.
 mississauga, ontario

gr. fl. plan

october 27.2016

date:

scale:

project:

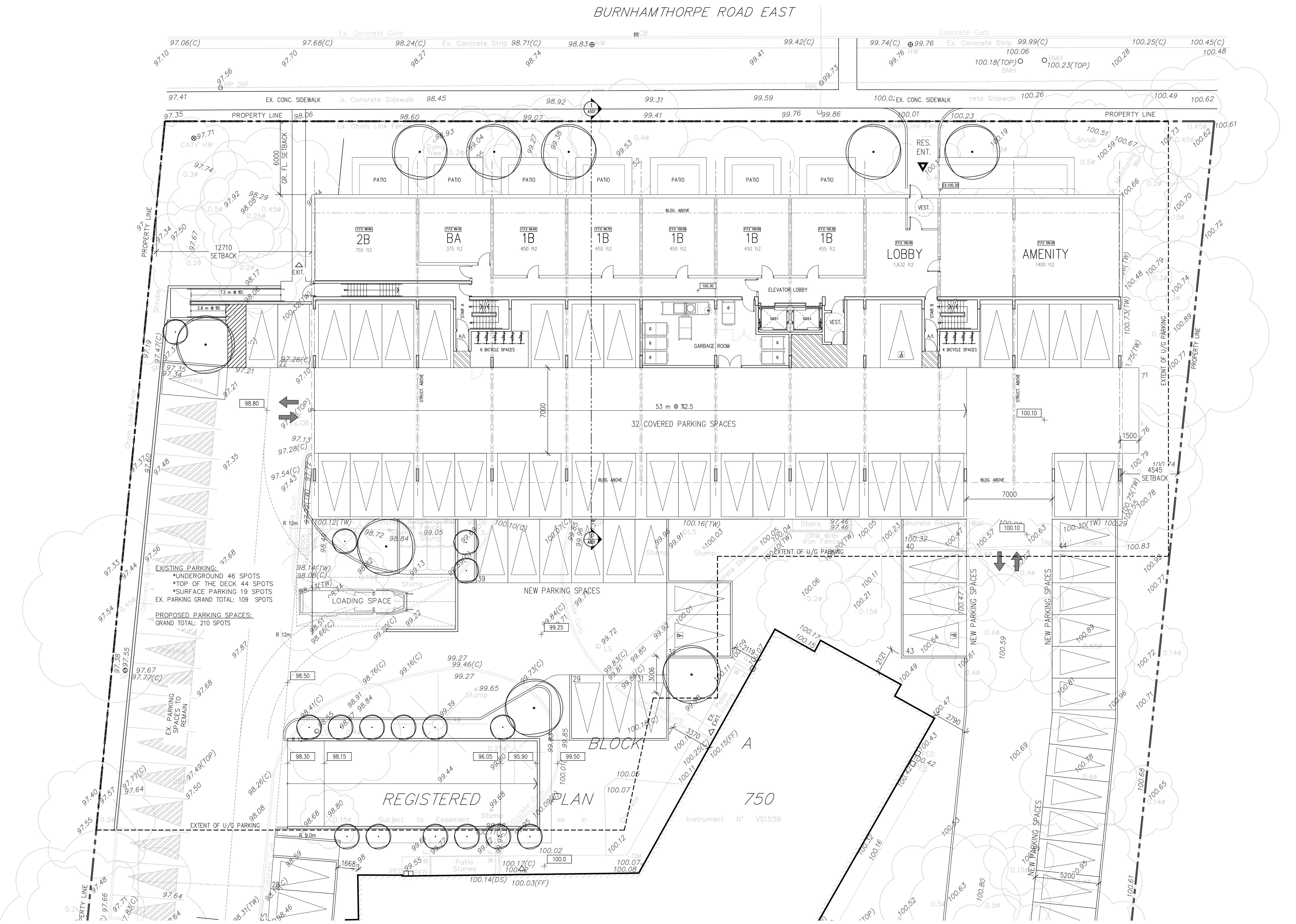
mr

drawn by:

A301

drawing number:

north



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Drawing are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the work and report any discrepancies with the Contract Documents to the architect before commencing work.

Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on architectural drawings. The locations shown on the architect's drawings are general. Mechanical and electrical drawings, those from other disciplines, will be located directly on the contractor's drawings.

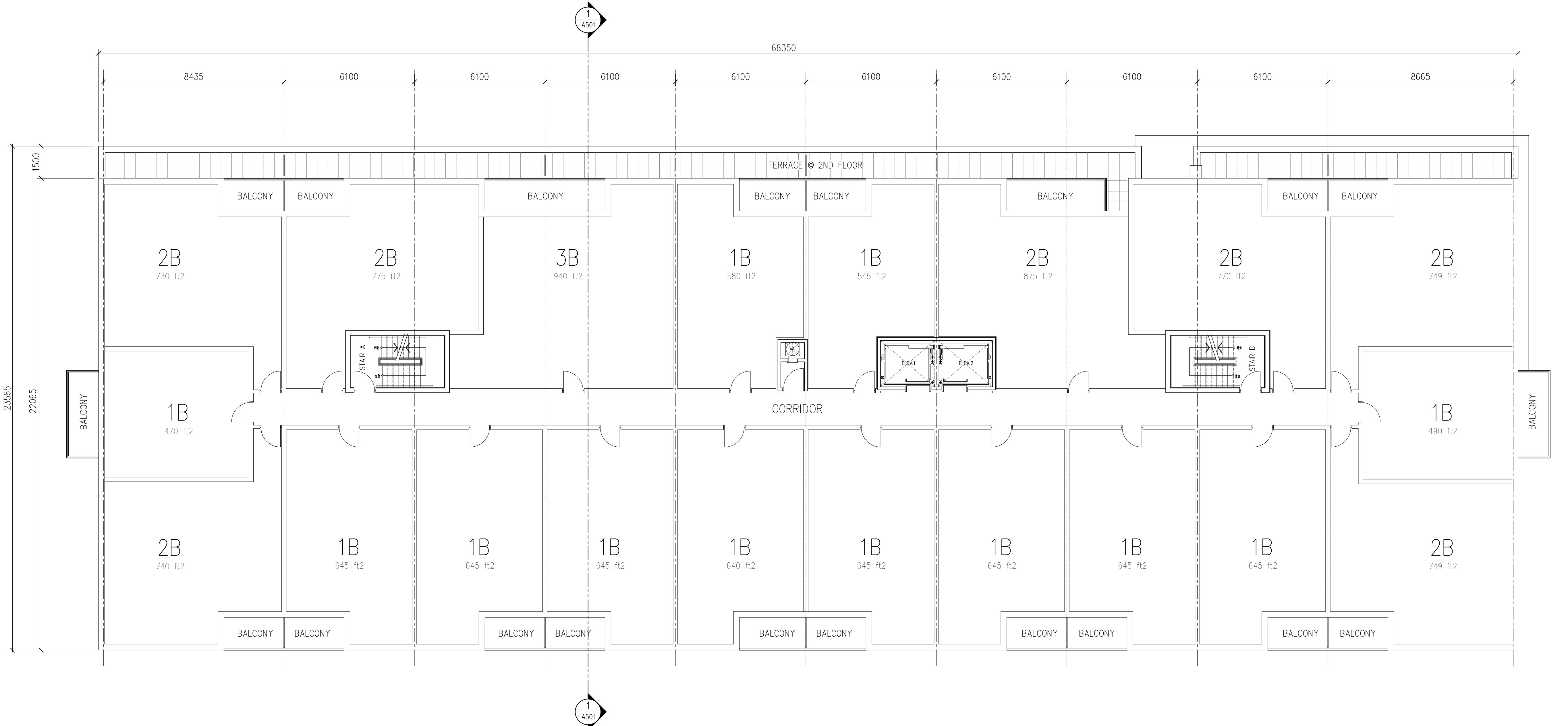
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The Designer of these plans and specifications shall be exonerated or represented to by his/her firm from liability of the consequences resulting off contractors or subcontractors must satisfy themselves when bidding and at all times that they can properly construct the work represented by these plans.

notes:

2ND TO 4TH FL.		
FLOOR AREA	1377.48 m ²	14827.60 ft ²
LEASABLE FLOOR AREA	1261.15 m ²	13575.40 ft ²
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4. pre-submission meeting
3. issued for client review
2. issued for client review
1. pre-submission meeting
revisions:

10.27.16
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04.04.16
06.25.15

architectural team :
mark zwicker
morteza rasekh

planning:
john d. rogers and associates inc.
structural:

electrical:

mechanical:

landscape:

site services:

project:
1315 SILVER SPEAR RD.
mississauga, ontario

2nd - 4th fl. plan

october 27.2016

date:

1:100

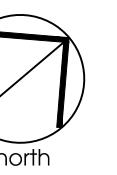
scale:

14-40

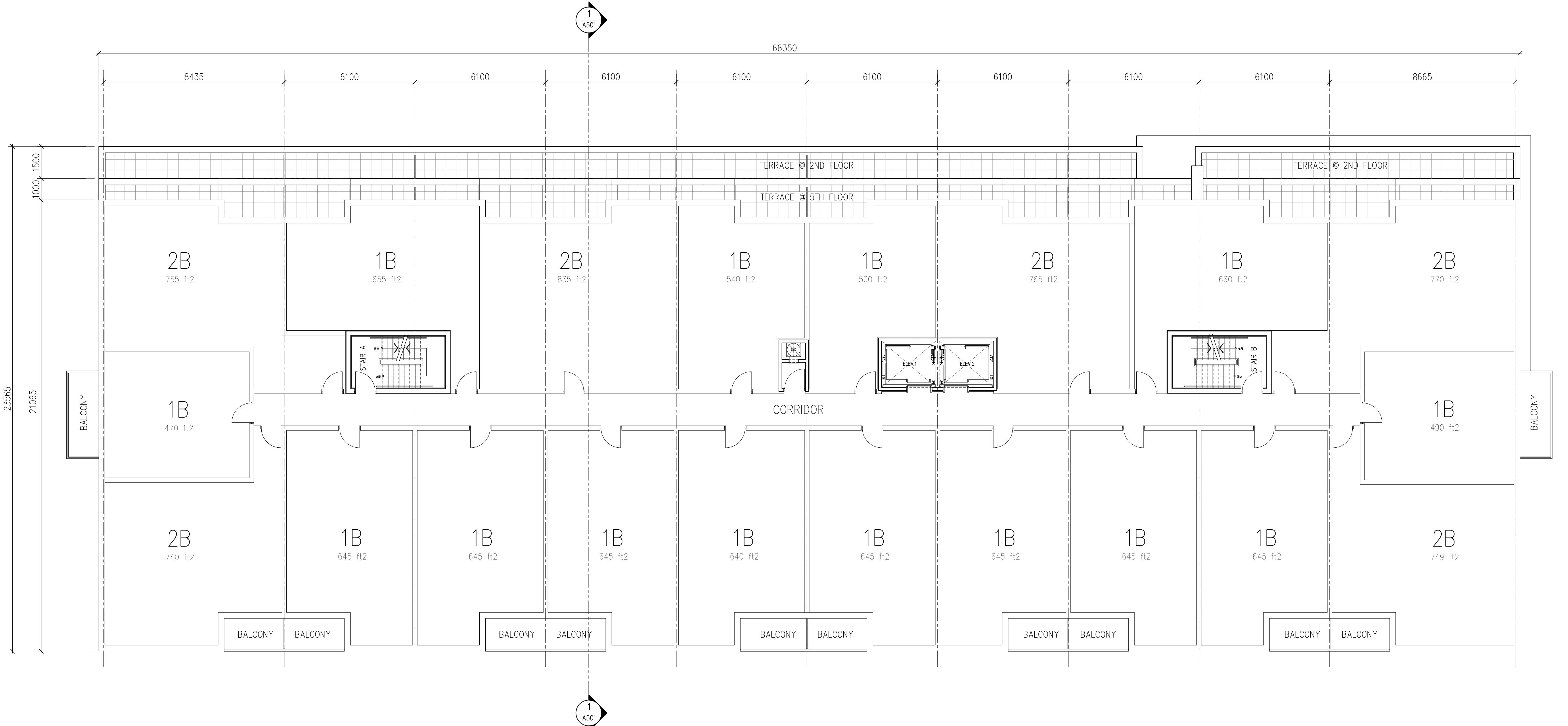
project:

mr

drawn by:



A302
drawing number:
north



5th and 6th fl. plan

october 27.2016

date:

1:100

scale:

14-40

project:

mr

drawn by:

drawing number:
A303
north

info@unfolded.ca

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06.25.15

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Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the work and report any discrepancies with the Contract Documents to the architect before commencing work.

Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on architectural drawings. The locations shown on the architectural drawings are approximate. Mechanical and electrical drawings, those items not clearly located, will be located during the erection of the structure.

These drawings are not to be used for construction unless noted below as "furnished for Construction". All work to be carried out in conformance with the Code and bylaws of the authorities having jurisdiction. The Designer of these plans and specifications shall be exonerated or represented to by his/her firm from liability of the consequences resulting off contractors or subcontractors that signify themselves when bidding and at all times that they can properly construct the work represented by these plans.

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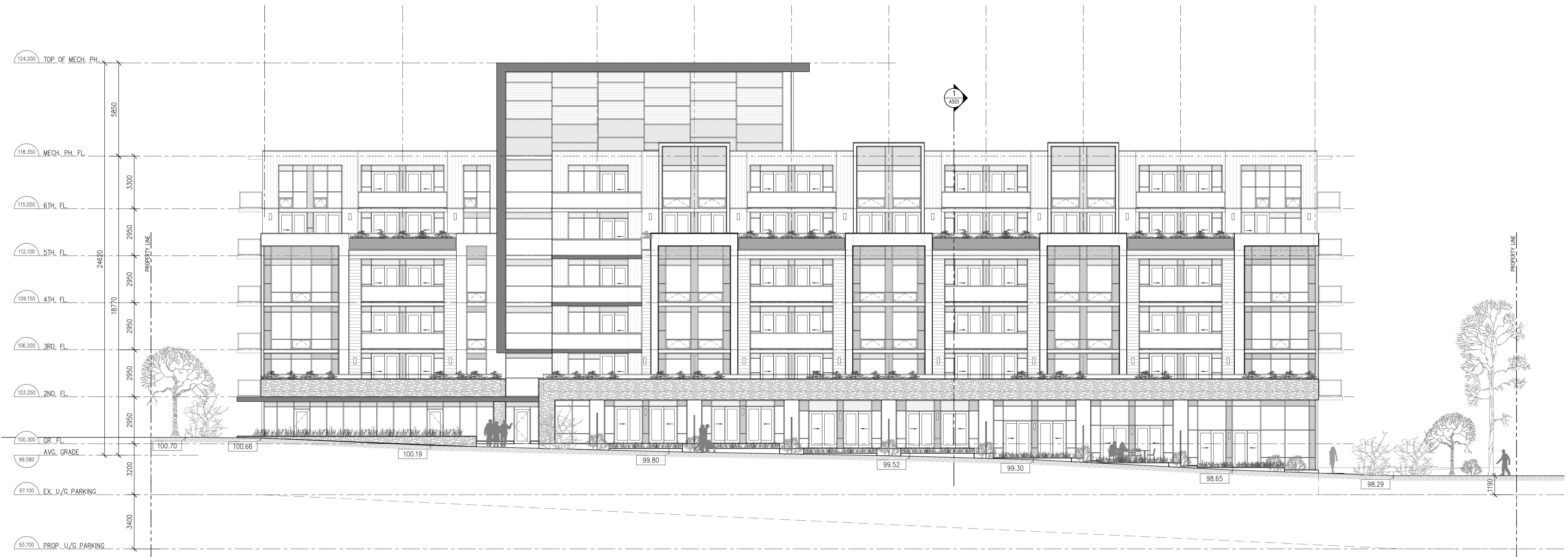
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Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on architectural drawings. The locations shown on the architectural drawings are approximate. Mechanical and electrical drawings, those showing exact locations will be located and checked by the contractor.

These drawings are not to be used for construction unless noted below "Used for Construction".
All work to be carried out in conformance with the Code and bylaws of the authorities having jurisdiction.
The Designer of these plans and specifications shall be exonerated or represented to by the Contractor from liability of the consequences resulting if contractors or subcontractors must satisfy themselves when bidding and at all times that they can properly construct the work represented by these plans.

notes:



5. issued for client review
4. pre-submission meeting
3. issued for client review
2. issued for client review
1. pre-submission meeting
revisions:

10.27.16
10.12.16
10.06.16
04.04.16
06.25.15

architectural team :
mark zwicker
morteza rasekh

planning: john d. rogers and associates inc.
structural:
electrical:
mechanical:
landscape:
site services:

project:
1315 SILVER SPEAR RD.
mississauga, ontario

north elevation

date:
october 27.2016
1:125
scale:
14-40
project:
mr
drawn by:

drawing number:

A401

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These Contract Documents are the property of the architect. The architect bears no responsibility for the interpretation of these documents by the Contractor. Upon written request, the architect will supply the Contract Documents and supplementary information regarding the intent of the Contract Documents. The architect will review Shop Drawings submitted by the Contractor for design compliance.

Drawing are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the work and report any discrepancies with the Contract Documents to the architect before commencing work.

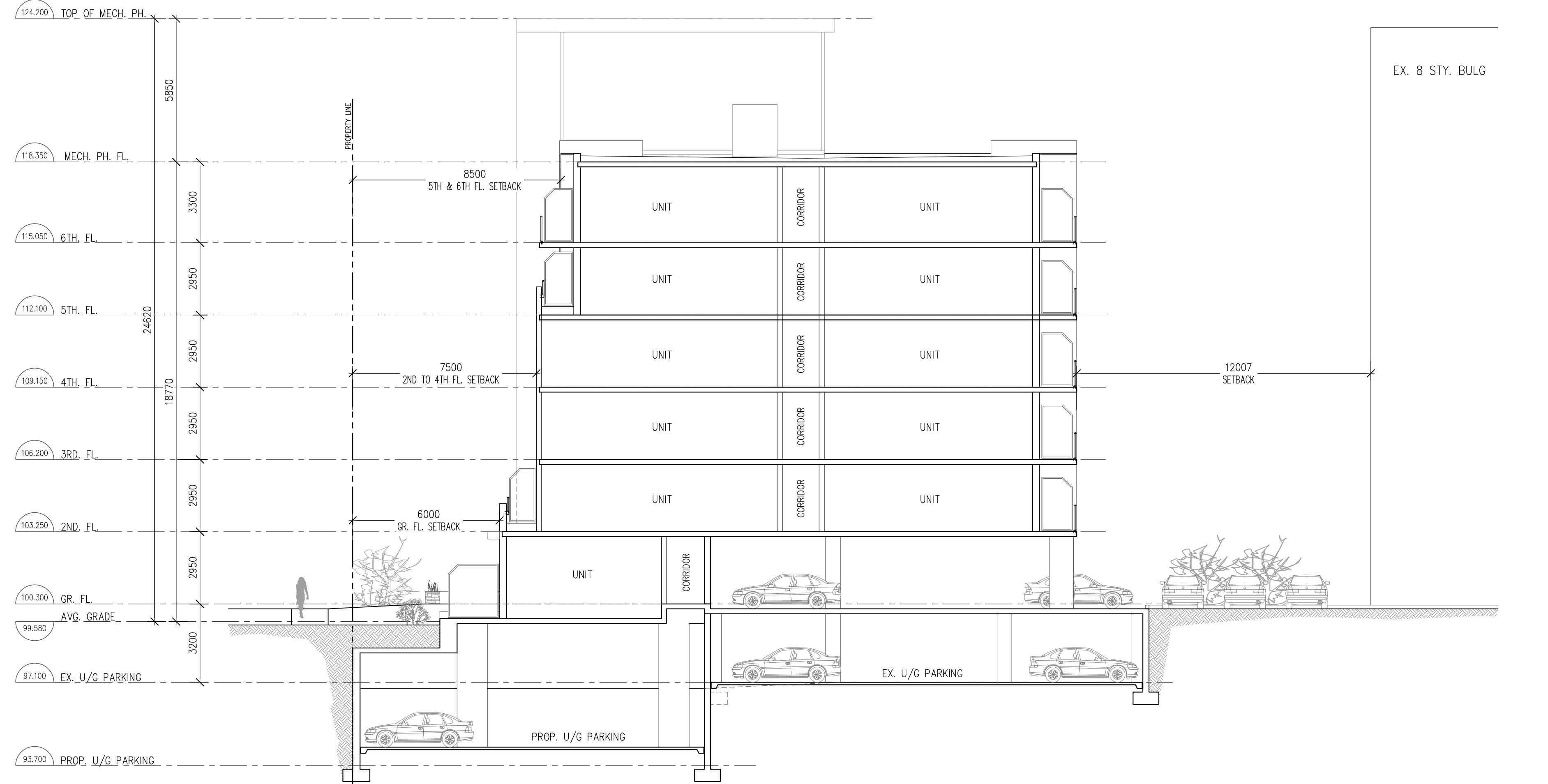
Positions of exposed or finished mechanical or electrical devices, fittings, and fixtures are indicated on architectural drawings. The locations shown on the architect's drawings are general. The Mechanical and Electrical drawings, those items of which location will be located during the erection of the structure.

These drawings are not to be used for construction unless noted below. Issued for Construction.

All work to be carried out in conformance with the Code and bylaws of the authorities having jurisdiction.

The Designer of these plans and specifications shall be exonerated or represented to by his/her firm from liability of the consequences of any acts of contractors or subcontractors must satisfy themselves when bidding and at all times that they can properly construct the work represented by these plans.

notes:



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4. pre-submission meeting
3. issued for client review
2. issued for client review
1. pre-submission meeting

revisions:

10.27.16
10.12.16
10.06.16
04.04.16
06.25.15

architectural team :

mark zwicker
morteza rasekh

planning:
john d. rogers and associates inc.

structural:

electrical:

mechanical:

landscape:

site services:

project:
1315 SILVER SPEAR RD.
mississauga, ontario

section

date:
october 27.2016
scale:
1:125
14-40
drawn by:
mr

Appendix B - Existing Traffic Data



Turning Movement Count (1 . BURNHAMTHORPE RD E & GOLDEN ORCHARD DR)

Start Time	N Approach GOLDEN ORCHARD DR						E Approach BURNHAMTHORPE RD E						S Approach GOLDEN ORCHARD DR						W Approach BURNHAMTHORPE RD E						Int. Total (15 min)		Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total				
07:00:00	2	1	2	0	0	5	0	82	5	0	2	87	14	1	9	0	0	24	10	211	1	0	0	222	338			
07:15:00	5	1	3	0	0	9	1	104	7	0	0	112	17	1	15	0	0	33	10	320	3	0	0	333	487			
07:30:00	1	4	6	0	3	11	2	144	8	0	2	154	16	2	27	0	0	45	24	317	2	0	0	343	553			
07:45:00	14	3	2	0	2	19	2	143	7	0	1	152	15	6	22	0	2	43	25	389	3	0	0	417	631	2009		
08:00:00	6	7	2	0	4	15	1	183	10	0	1	194	38	3	25	0	3	66	25	321	6	0	0	352	627	2298		
08:15:00	3	4	6	0	2	13	2	188	15	0	0	205	20	2	21	0	1	43	29	368	2	0	0	399	660	2471		
08:30:00	9	1	6	0	0	16	5	196	9	0	0	210	21	0	21	0	0	42	24	297	7	0	0	328	596	2514		
08:45:00	13	12	3	0	8	28	3	166	20	0	5	189	34	11	35	0	3	80	27	313	10	0	0	350	647	2530		
09:00:00	5	4	1	0	1	10	1	169	13	0	0	183	28	9	12	0	1	49	7	268	5	0	0	280	522	2425		
09:15:00	4	6	2	0	0	12	5	186	3	1	3	195	12	1	9	0	1	22	14	215	5	0	0	234	463	2228		
09:30:00	5	3	3	0	5	11	2	130	3	0	1	135	10	2	12	0	2	24	9	213	2	0	0	224	394	2026		
09:45:00	6	3	4	0	1	13	2	145	5	0	0	152	6	0	18	0	1	24	11	188	2	0	0	201	390	1769		
BREAK																												
16:00:00	4	3	1	0	2	8	8	325	9	1	0	343	16	4	21	0	1	41	16	229	5	0	0	250	642			
16:15:00	6	3	7	0	2	16	5	359	19	1	1	384	20	8	17	0	3	45	29	212	4	0	0	245	690			
16:30:00	6	4	0	0	4	10	3	407	17	0	1	427	9	4	13	0	3	26	23	234	9	0	0	266	729			
16:45:00	6	3	3	0	4	12	2	371	23	0	1	396	10	8	13	0	2	31	26	272	3	0	0	301	740	2801		
17:00:00	8	10	3	0	0	21	4	383	27	0	3	414	18	5	15	0	3	38	30	214	5	0	2	249	722	2881		
17:15:00	5	6	2	0	8	13	9	438	28	0	1	475	9	5	11	0	2	25	30	303	4	0	0	337	850	3041		
17:30:00	4	6	1	0	3	11	4	404	19	1	2	428	10	3	20	0	3	33	21	220	6	0	1	247	719	3031		
17:45:00	8	10	4	0	4	22	1	362	38	0	3	401	11	8	20	0	6	39	18	206	6	0	1	230	692	2983		
18:00:00	7	6	7	0	6	20	5	336	26	0	2	367	12	4	26	0	3	42	28	233	2	0	0	263	692	2953		
18:15:00	2	6	4	0	5	12	6	324	23	1	1	354	7	1	17	0	2	25	23	210	6	0	0	239	630	2733		
18:30:00	6	6	2	0	1	14	3	288	17	0	0	308	7	0	8	0	2	15	15	199	8	0	0	222	559	2573		
18:45:00	7	4	6	0	4	17	5	220	18	0	2	243	12	5	18	0	1	35	10	190	5	0	0	205	500	2381		
Grand Total	142	116	80	0	69	338	81	6053	369	5	32	6508	372	93	425	0	45	890	484	6142	111	0	4	6737	14473	-	-	



Turning Movement Count
Location Name: BURNHAMTHORPE RD E & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6



Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)

Start Time	N Approach GOLDEN ORCHARD DR						E Approach BURNHAMTHORPE RD E						S Approach GOLDEN ORCHARD DR						W Approach BURNHAMTHORPE RD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	6	7	2	0	4	15	1	183	10	0	1	194	38	3	25	0	3	66	25	321	6	0	0	352	627
08:15:00	3	4	6	0	2	13	2	188	15	0	0	205	20	2	21	0	1	43	29	368	2	0	0	399	660
08:30:00	9	1	6	0	0	16	5	196	9	0	0	210	21	0	21	0	0	42	24	297	7	0	0	328	596
08:45:00	13	12	3	0	8	28	3	166	20	0	5	189	34	11	35	0	3	80	27	313	10	0	0	350	647
Grand Total	31	24	17	0	14	72	11	733	54	0	6	798	113	16	102	0	7	231	105	1299	25	0	0	1429	2530
Approach%	43.1%	33.3%	23.6%	0%		-	1.4%	91.9%	6.8%	0%		-	48.9%	6.9%	44.2%	0%		-	7.3%	90.9%	1.7%	0%		-	-
Totals %	1.2%	0.9%	0.7%	0%		2.8%	0.4%	29%	2.1%	0%		31.5%	4.5%	0.6%	4%	0%		9.1%	4.2%	51.3%	1%	0%		56.5%	-
PHF	0.6	0.5	0.71	0		0.64	0.55	0.93	0.68	0		0.95	0.74	0.36	0.73	0		0.72	0.91	0.88	0.63	0		0.9	-
Heavy	1	1	0	0		2	3	22	2	0		27	1	1	8	0		10	3	34	1	0		38	-
Heavy %	3.2%	4.2%	0%	0%		2.8%	27.3%	3%	3.7%	0%		3.4%	0.9%	6.3%	7.8%	0%		4.3%	2.9%	2.6%	4%	0%		2.7%	-
Lights	30	23	17	0		70	8	711	52	0		771	112	15	94	0		221	102	1265	24	0		1391	-
Lights %	96.8%	95.8%	100%	0%		97.2%	72.7%	97%	96.3%	0%		96.6%	99.1%	93.8%	92.2%	0%		95.7%	97.1%	97.4%	96%	0%		97.3%	-
Single-Unit Trucks	0	0	0	0		0	0	7	2	0		9	1	0	0	0		1	1	12	1	0		14	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1%	3.7%	0%		1.1%	0.9%	0%	0%	0%		0.4%	1%	0.9%	4%	0%		1%	-
Buses	1	1	0	0		2	3	14	0	0		17	0	1	8	0		9	2	22	0	0		24	-
Buses %	3.2%	4.2%	0%	0%		2.8%	27.3%	1.9%	0%	0%		2.1%	0%	6.3%	7.8%	0%		3.9%	1.9%	1.7%	0%	0%		1.7%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-	0	-	
Pedestrians%	-	-	-	-	29.6%	-	-	-	-	-	18.5%	-	-	-	-	-	22.2%	-	-	-	-	-	-	0%	-
Bicycles on Crosswalk	-	-	-	-	6	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	
Bicycles on Crosswalk%	-	-	-	-	22.2%	-	-	-	-	-	3.7%	-	-	-	-	-	3.7%	-	-	-	-	-	-	0%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	-	
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-



Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (13.5 °C)

Start Time	N Approach GOLDEN ORCHARD DR						E Approach BURNHAMTHORPE RD E						S Approach GOLDEN ORCHARD DR						W Approach BURNHAMTHORPE RD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	6	4	0	0	4	10	3	407	17	0	1	427	9	4	13	0	3	26	23	234	9	0	0	266	729
16:45:00	6	3	3	0	4	12	2	371	23	0	1	396	10	8	13	0	2	31	26	272	3	0	0	301	740
17:00:00	8	10	3	0	0	21	4	383	27	0	3	414	18	5	15	0	3	38	30	214	5	0	2	249	722
17:15:00	5	6	2	0	8	13	9	438	28	0	1	475	9	5	11	0	2	25	30	303	4	0	0	337	850
Grand Total	25	23	8	0	16	56	18	1599	95	0	6	1712	46	22	52	0	10	120	109	1023	21	0	2	1153	3041
Approach%	44.6%	41.1%	14.3%	0%		-	1.1%	93.4%	5.5%	0%		-	38.3%	18.3%	43.3%	0%		-	9.5%	88.7%	1.8%	0%		-	-
Totals %	0.8%	0.8%	0.3%	0%		1.8%	0.6%	52.6%	3.1%	0%		56.3%	1.5%	0.7%	1.7%	0%		3.9%	3.6%	33.6%	0.7%	0%		37.9%	-
PHF	0.78	0.58	0.67	0		0.67	0.5	0.91	0.85	0		0.9	0.64	0.69	0.87	0		0.79	0.91	0.84	0.58	0		0.86	-
Heavy	2	0	0	0		2	0	24	1	0		25	1	1	0	0		2	2	20	0	0		22	-
Heavy %	8%	0%	0%	0%		3.6%	0%	1.5%	1.1%	0%		1.5%	2.2%	4.5%	0%	0%		1.7%	1.8%	2%	0%	0%		1.9%	-
Lights	23	23	8	0		54	18	1575	94	0		1687	45	21	52	0		118	107	1003	21	0		1131	-
Lights %	92%	100%	100%	0%		96.4%	100%	98.5%	98.9%	0%		98.5%	97.8%	95.5%	100%	0%		98.3%	98.2%	98%	100%	0%		98.1%	-
Single-Unit Trucks	2	0	0	0		2	0	8	1	0		9	1	1	0	0		2	2	3	0	0		5	-
Single-Unit Trucks %	8%	0%	0%	0%		3.6%	0%	0.5%	1.1%	0%		0.5%	2.2%	4.5%	0%	0%		1.7%	1.8%	0.3%	0%	0%		0.4%	-
Buses	0	0	0	0		0	0	16	0	0		16	0	0	0	0		0	0	17	0	0		17	-
Buses %	0%	0%	0%	0%		0%	0%	1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	1.7%	0%	0%		1.5%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-		11	-	-	-	-		5	-	-	-	-		9	-	-	-	-		2	-
Pedestrians%	-	-	-	-		32.4%	-	-	-	-		14.7%	-	-	-	-		26.5%	-	-	-	-		5.9%	-
Bicycles on Crosswalk	-	-	-	-		5	-	-	-	-		1	-	-	-	-		1	-	-	-	-		0	-
Bicycles on Crosswalk%	-	-	-	-		14.7%	-	-	-	-		2.9%	-	-	-	-		2.9%	-	-	-	-		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		-	0	0	0	0		-	0	1	0	0		-	
Bicycles on Road%	-	-	-	-		0%	-	-	-	-		0%	-	-	-	-		0%	-	-	-	-		0%	-

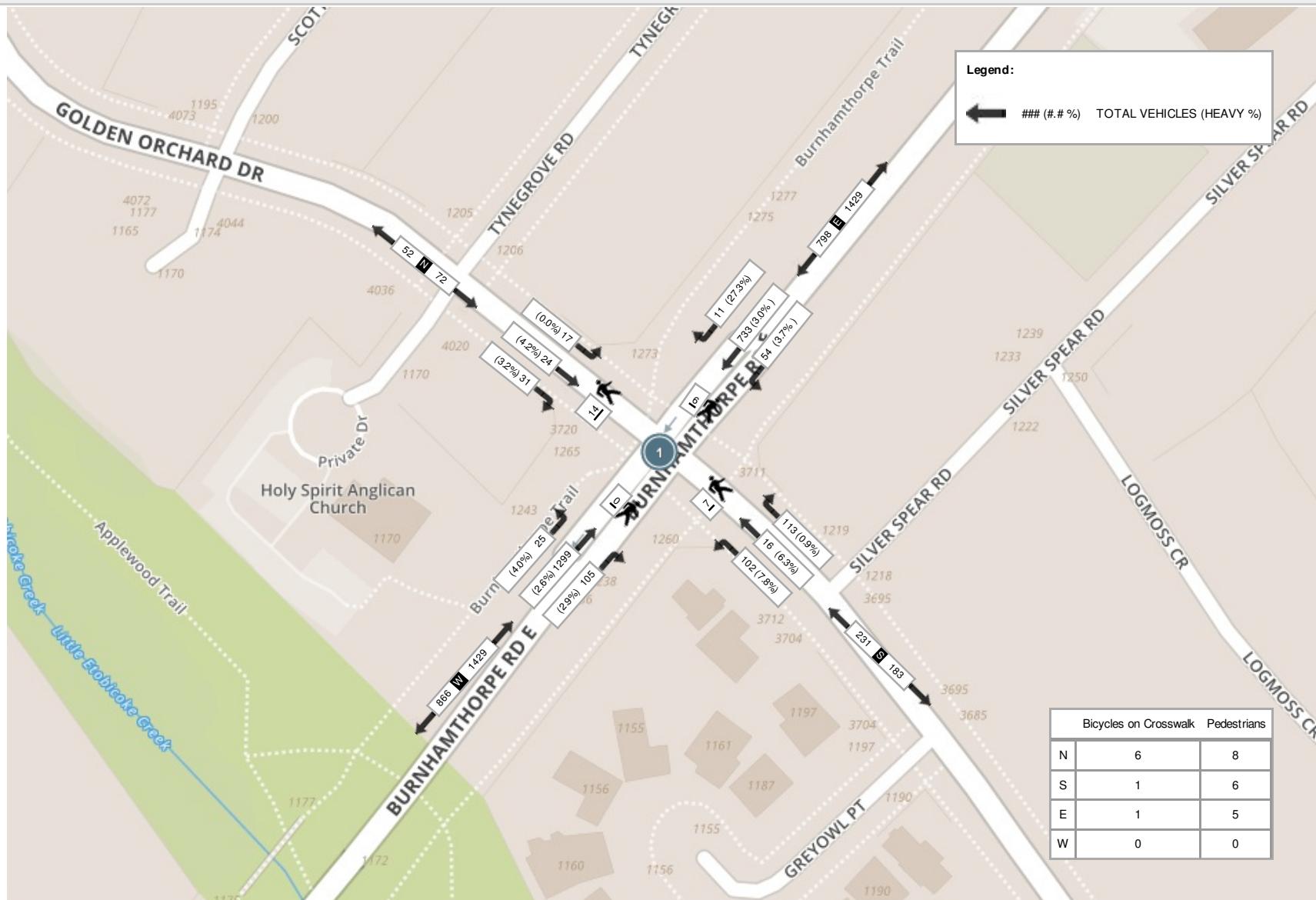


Spectrum

Turning Movement Count
Location Name: BURNHAMTHORPE RD E & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)



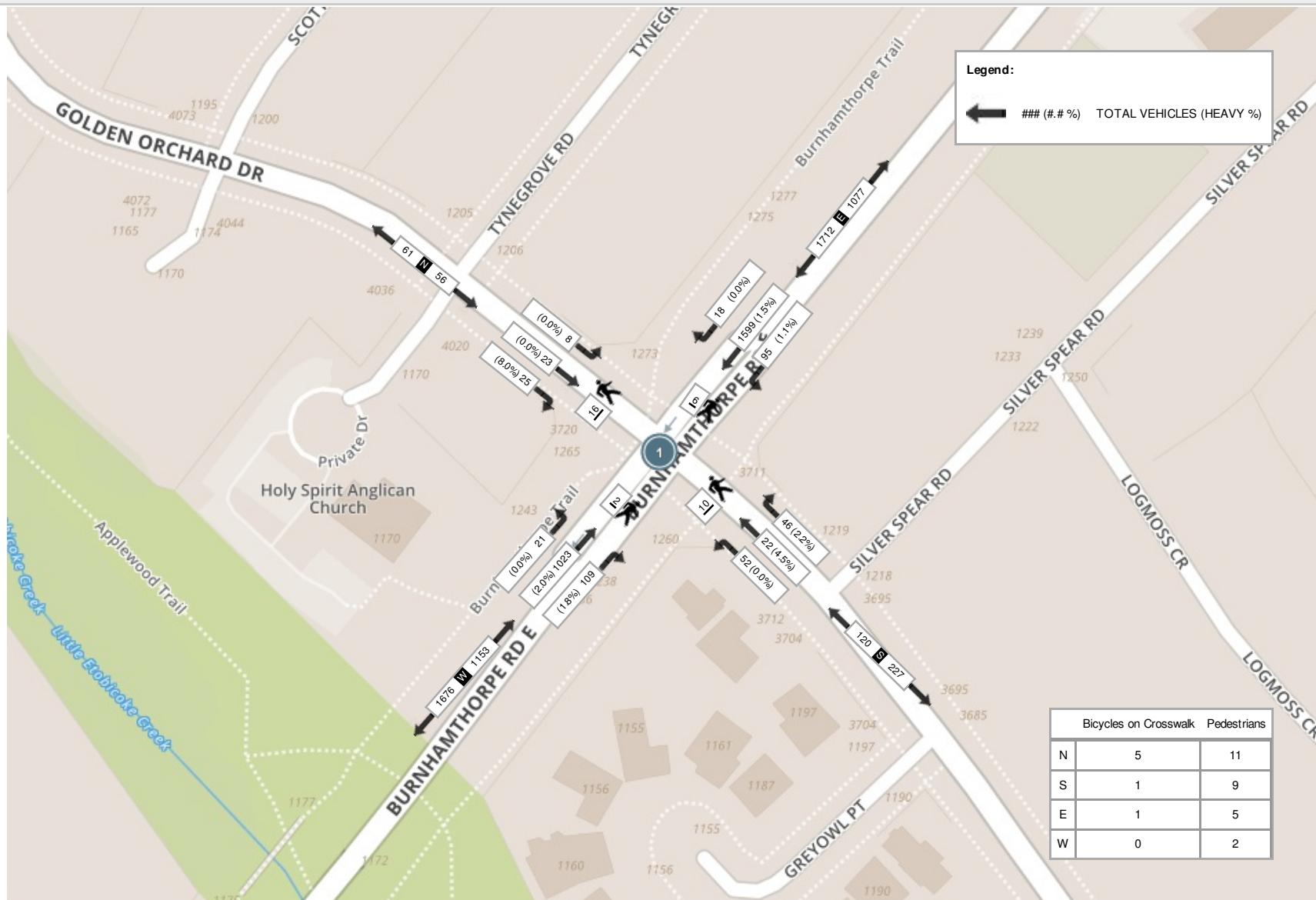


Spectrum

Turning Movement Count
Location Name: BURNHAMTHORPE RD E & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (13.5 °C)





Turning Movement Count (2 . DIXIE RD & WINDING TRAIL)

Start Time	N Approach DIXIE RD						E Approach WINDING TRAIL						S Approach DIXIE RD						W Approach WINDING TRAIL						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	6	248	9	0	2	263	20	0	2	0	0	22	2	200	1	0	0	203	12	0	7	0	1	19	507	
07:15:00	3	319	9	0	2	331	16	2	3	0	0	21	0	235	6	0	0	241	16	2	10	0	0	28	621	
07:30:00	7	302	7	0	2	316	21	1	4	0	9	26	2	297	5	0	0	304	27	4	5	0	1	36	682	
07:45:00	7	388	8	0	3	403	19	1	3	0	3	23	1	343	4	0	1	348	18	1	9	0	5	28	802	2612
08:00:00	4	319	7	0	1	330	15	2	5	0	0	22	3	345	3	0	2	351	16	3	10	0	4	29	732	2837
08:15:00	2	304	12	0	2	318	30	2	5	0	0	37	4	401	2	0	5	407	22	6	10	0	4	38	800	3016
08:30:00	9	289	7	0	1	305	19	1	3	0	9	23	4	374	5	0	3	383	14	0	6	0	3	20	731	3065
08:45:00	3	310	9	0	1	322	10	3	1	0	2	14	7	327	8	0	6	342	14	6	16	0	4	36	714	2977
09:00:00	2	256	13	0	0	271	23	1	2	0	3	26	4	294	9	0	3	307	11	4	9	0	4	24	628	2873
09:15:00	3	241	5	1	1	250	9	0	4	0	4	13	0	246	4	0	2	250	13	0	6	0	2	19	532	2605
09:30:00	5	241	5	0	1	251	8	1	2	0	6	11	1	209	1	0	5	211	7	0	5	0	4	12	485	2359
09:45:00	0	296	4	0	2	300	10	0	2	0	5	12	2	245	4	0	1	251	7	3	7	0	1	17	580	2225
BREAK																										
16:00:00	9	368	10	0	1	387	17	5	1	0	7	23	1	341	8	0	3	350	9	2	6	0	2	17	777	
16:15:00	12	404	21	0	4	437	13	7	2	0	4	22	5	336	11	0	2	352	14	0	7	0	4	21	832	
16:30:00	15	463	18	0	0	496	12	0	1	0	2	13	4	316	11	1	2	332	10	2	4	0	3	16	857	
16:45:00	13	528	10	0	4	551	9	1	2	0	3	12	5	291	20	0	5	316	7	0	5	0	6	12	891	3357
17:00:00	12	456	9	0	3	477	10	1	2	0	2	13	9	279	18	0	0	306	5	2	8	0	3	15	811	3391
17:15:00	6	528	25	0	5	559	9	3	2	0	4	14	6	314	16	0	4	336	8	1	4	0	4	13	922	3481
17:30:00	10	459	11	0	1	480	9	3	6	0	4	18	1	283	11	0	4	295	17	2	6	0	6	25	818	3442
17:45:00	14	452	13	0	6	479	10	7	6	0	3	23	5	346	21	0	4	372	7	2	7	0	6	16	890	3441
18:00:00	11	482	16	0	4	509	13	1	3	0	5	17	4	305	21	0	4	330	10	4	5	0	4	19	875	3505
18:15:00	8	453	18	0	1	479	12	0	3	0	5	15	5	337	8	0	5	350	11	1	4	0	12	16	860	3443
18:30:00	12	387	12	0	0	411	8	2	0	0	3	10	6	322	18	0	4	346	12	1	4	0	4	17	784	3409
18:45:00	8	319	18	0	3	345	10	0	3	0	3	13	8	291	14	0	4	313	8	1	7	0	9	16	687	3206
Grand Total	181	8812	276	1	50	9270	332	44	67	0	86	443	89	7277	229	1	69	7596	295	47	167	0	96	509	17818	-



Turning Movement Count
Location Name: DIXIE RD & WINDING TRAIL
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6



Peak Hour: 07:45 AM - 08:45 AM Weather: Mostly Cloudy (7.1 °C)

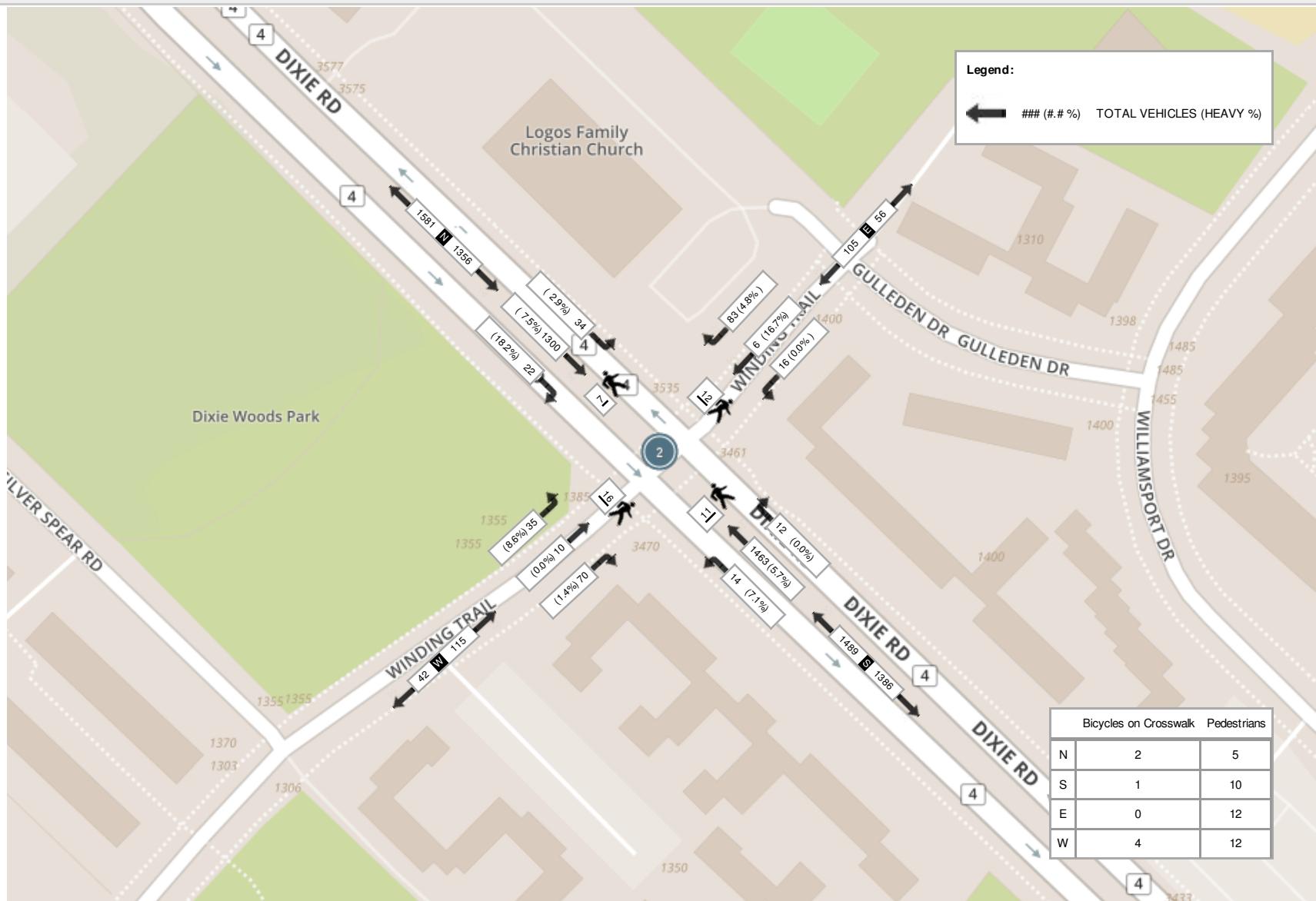
Start Time	N Approach DIXIE RD						E Approach WINDING TRAIL						S Approach DIXIE RD						W Approach WINDING TRAIL						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	7	388	8	0	3	403	19	1	3	0	3	23	1	343	4	0	1	348	18	1	9	0	5	28	802
08:00:00	4	319	7	0	1	330	15	2	5	0	0	22	3	345	3	0	2	351	16	3	10	0	4	29	732
08:15:00	2	304	12	0	2	318	30	2	5	0	0	37	4	401	2	0	5	407	22	6	10	0	4	38	800
08:30:00	9	289	7	0	1	305	19	1	3	0	9	23	4	374	5	0	3	383	14	0	6	0	3	20	731
Grand Total	22	1300	34	0	7	1356	83	6	16	0	12	105	12	1463	14	0	11	1489	70	10	35	0	16	115	3065
Approach%	1.6%	95.9%	2.5%	0%	-	79%	5.7%	15.2%	0%	-	0.8%	98.3%	0.9%	0%	-	60.9%	8.7%	30.4%	0%	-	-	-	-	-	-
Totals %	0.7%	42.4%	1.1%	0%	44.2%	2.7%	0.2%	0.5%	0%	3.4%	0.4%	47.7%	0.5%	0%	48.6%	2.3%	0.3%	1.1%	0%	3.8%	-	-	-	-	-
PHF	0.61	0.84	0.71	0	0.84	0.69	0.75	0.8	0	0.71	0.75	0.91	0.7	0	0.91	0.8	0.42	0.88	0	0.76	-	-	-	-	-
Heavy	4	97	1	0	102	4	1	0	0	5	0	84	1	0	85	1	0	3	0	4	-	-	-	-	-
Heavy %	18.2%	7.5%	2.9%	0%	7.5%	4.8%	16.7%	0%	0%	4.8%	0%	5.7%	7.1%	0%	5.7%	1.4%	0%	8.6%	0%	3.5%	-	-	-	-	-
Lights	18	1203	33	0	1254	79	5	16	0	100	12	1379	13	0	1404	69	10	32	0	111	-	-	-	-	-
Lights %	81.8%	92.5%	97.1%	0%	92.5%	95.2%	83.3%	100%	0%	95.2%	100%	94.3%	92.9%	0%	94.3%	98.6%	100%	91.4%	0%	96.5%	-	-	-	-	-
Single-Unit Trucks	1	64	0	0	65	0	0	0	0	0	0	58	0	0	58	1	0	1	0	2	-	-	-	-	-
Single-Unit Trucks %	4.5%	4.9%	0%	0%	4.8%	0%	0%	0%	0%	0%	0%	4%	0%	0%	3.9%	1.4%	0%	2.9%	0%	1.7%	-	-	-	-	-
Buses	3	14	1	0	18	4	1	0	0	5	0	18	1	0	19	0	0	1	0	1	-	-	-	-	-
Buses %	13.6%	1.1%	2.9%	0%	1.3%	4.8%	16.7%	0%	0%	4.8%	0%	1.2%	7.1%	0%	1.3%	0%	0%	2.9%	0%	0.9%	-	-	-	-	-
Articulated Trucks	0	19	0	0	19	0	0	0	0	0	0	8	0	0	8	0	0	1	0	1	-	-	-	-	-
Articulated Trucks %	0%	1.5%	0%	0%	1.4%	0%	0%	0%	0%	0%	0%	0.5%	0%	0%	0.5%	0%	0%	2.9%	0%	0.9%	-	-	-	-	-
Pedestrians	-	-	-	-	5	-	-	-	-	12	-	-	-	-	10	-	-	-	-	12	-	-	-	-	-
Pedestrians%	-	-	-	-	10.9%	-	-	-	-	26.1%	-	-	-	-	21.7%	-	-	-	-	26.1%	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-	-	-	4	-	-	-	-	-
Bicycles on Crosswalk%	-	-	-	-	4.3%	-	-	-	-	0%	-	-	-	-	2.2%	-	-	-	-	8.7%	-	-	-	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-	-	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-



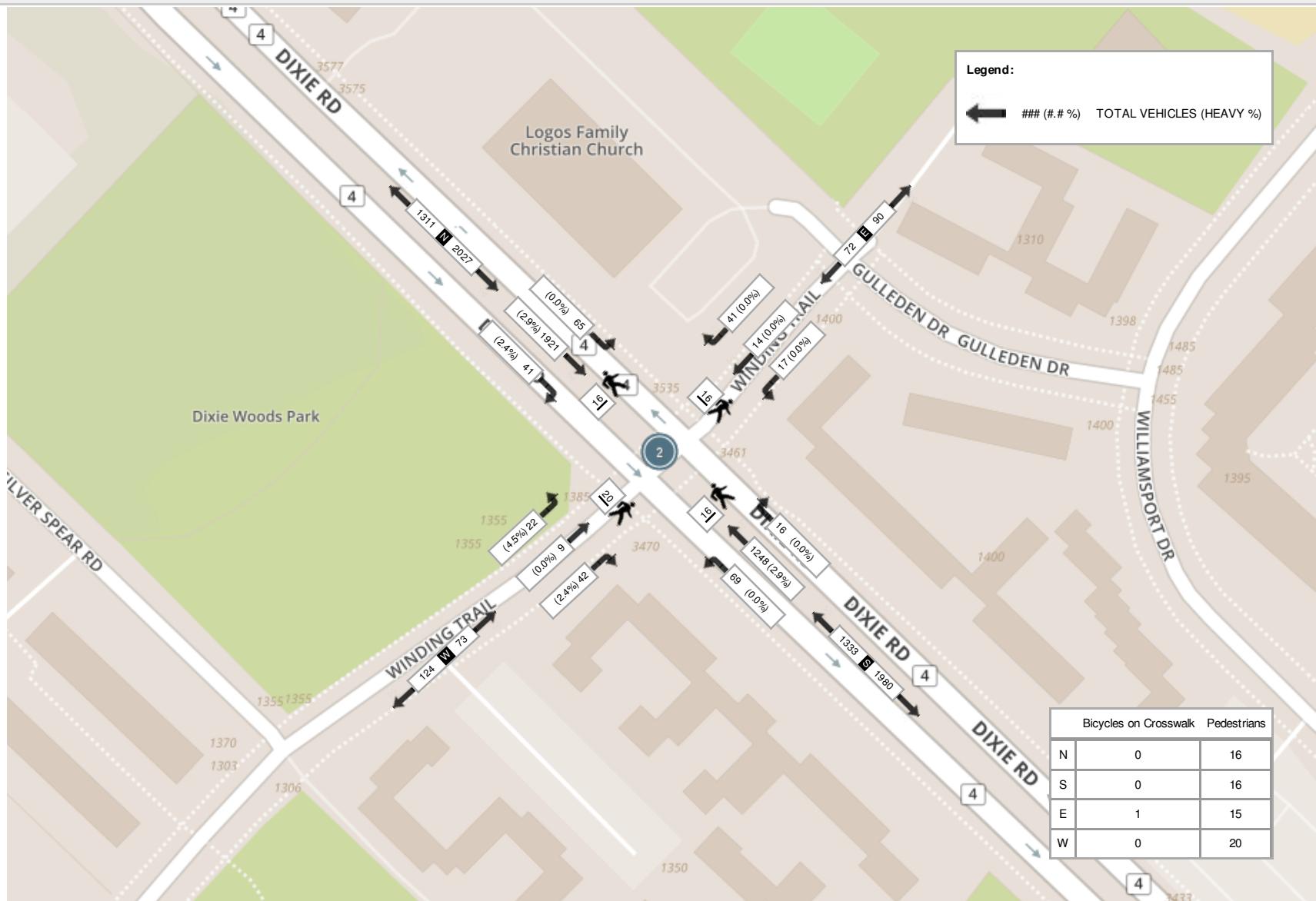
Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)

Start Time	N Approach DIXIE RD						E Approach WINDING TRAIL						S Approach DIXIE RD						W Approach WINDING TRAIL						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:15:00	6	528	25	0	5	559	9	3	2	0	4	14	6	314	16	0	4	336	8	1	4	0	4	13	922
17:30:00	10	459	11	0	1	480	9	3	6	0	4	18	1	283	11	0	4	295	17	2	6	0	6	25	818
17:45:00	14	452	13	0	6	479	10	7	6	0	3	23	5	346	21	0	4	372	7	2	7	0	6	16	890
18:00:00	11	482	16	0	4	509	13	1	3	0	5	17	4	305	21	0	4	330	10	4	5	0	4	19	875
Grand Total	41	1921	65	0	16	2027	41	14	17	0	16	72	16	1248	69	0	16	1333	42	9	22	0	20	73	3505
Approach%	2%	94.8%	3.2%	0%	-	56.9%	19.4%	23.6%	0%	-	1.2%	93.6%	5.2%	0%	-	57.5%	12.3%	30.1%	0%	-	-	-	-	-	-
Totals %	1.2%	54.8%	1.9%	0%	57.8%	1.2%	0.4%	0.5%	0%	2.1%	0.5%	35.6%	2%	0%	38%	1.2%	0.3%	0.6%	0%	2.1%	-	-	-	-	-
PHF	0.73	0.91	0.65	0	0.91	0.79	0.5	0.71	0	0.78	0.67	0.9	0.82	0	0.9	0.62	0.56	0.79	0	0.73	-	-	-	-	-
Heavy	1	55	0	0	56	0	0	0	0	0	0	36	0	0	36	1	0	1	0	2	-	-	-	-	-
Heavy %	2.4%	2.9%	0%	0%	2.8%	0%	0%	0%	0%	0%	0%	2.9%	0%	0%	2.7%	2.4%	0%	4.5%	0%	2.7%	-	-	-	-	-
Lights	40	1866	65	0	1971	41	14	17	0	72	16	1212	69	0	1297	41	9	21	0	71	-	-	-	-	-
Lights %	97.6%	97.1%	100%	0%	97.2%	100%	100%	100%	0%	100%	100%	97.1%	100%	0%	97.3%	97.6%	100%	95.5%	0%	97.3%	-	-	-	-	-
Single-Unit Trucks	1	32	0	0	33	0	0	0	0	0	0	20	0	0	20	1	0	1	0	2	-	-	-	-	-
Single-Unit Trucks %	2.4%	1.7%	0%	0%	1.6%	0%	0%	0%	0%	0%	0%	1.6%	0%	0%	1.5%	2.4%	0%	4.5%	0%	2.7%	-	-	-	-	-
Buses	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	-	-	-	-	-
Buses %	0%	0.4%	0%	0%	0.3%	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0.5%	0%	0%	0%	0%	0%	-	-	-	-	-
Articulated Trucks	0	16	0	0	16	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	-	-	-	-	-
Articulated Trucks %	0%	0.8%	0%	0%	0.8%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.7%	0%	0%	0%	0%	0%	-	-	-	-	-
Pedestrians	-	-	-	-	16	-	-	-	-	15	-	-	-	-	16	-	-	-	-	20	-	-	-	-	-
Pedestrians%	-	-	-	-	23.5%	-	-	-	-	22.1%	-	-	-	-	23.5%	-	-	-	-	29.4%	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	1.5%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-	-	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-

Peak Hour: 07:45 AM - 08:45 AM Weather: Mostly Cloudy (7.1 °C)



Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)





Turning Movement Count (3 . SILVER SPEAR RD & GOLDEN ORCHARD DR)

Start Time	N Approach GOLDEN ORCHARD DR					E Approach SILVER SPEAR RD					S Approach GOLDEN ORCHARD DR					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	U-Turn S:S	Peds S:	Approach Total		
07:00:00	11	5	0	0	16	13	0	0	0	13	1	12	0	0	13	42	
07:15:00	11	6	1	0	18	10	2	0	0	12	3	23	0	0	26	56	
07:30:00	22	13	0	1	35	15	4	0	0	19	0	30	0	0	30	84	
07:45:00	29	7	0	2	36	16	1	0	0	17	1	26	0	1	27	80	262
08:00:00	35	8	0	1	43	18	3	0	3	21	3	48	0	0	51	115	335
08:15:00	36	12	0	2	48	10	1	0	0	11	0	32	0	0	32	91	370
08:30:00	29	5	0	0	34	23	4	0	0	27	1	22	0	0	23	84	370
08:45:00	49	10	0	1	59	19	3	0	0	22	1	61	0	0	62	143	433
09:00:00	17	5	0	1	22	13	1	0	0	14	2	40	0	3	42	78	396
09:15:00	19	5	1	0	25	3	1	0	1	4	0	10	0	0	10	39	344
09:30:00	11	4	0	0	15	11	2	0	0	13	1	14	0	0	15	43	303
09:45:00	12	7	0	1	19	4	0	0	0	4	0	19	0	0	19	42	202
BREAK																	
16:00:00	20	9	0	0	29	14	3	0	0	17	0	27	0	0	27	73	
16:15:00	33	17	0	0	50	11	1	0	1	12	0	34	0	0	34	96	
16:30:00	30	13	0	0	43	14	1	0	0	15	2	15	0	1	17	75	
16:45:00	39	13	0	1	52	14	2	0	1	16	1	14	0	0	15	83	327
17:00:00	44	23	0	0	67	12	0	0	0	12	0	24	0	0	24	103	357
17:15:00	43	18	1	0	62	6	0	0	1	6	0	20	0	0	20	88	349
17:30:00	31	16	0	2	47	10	1	0	1	11	1	21	0	0	22	80	354
17:45:00	49	17	0	1	66	9	1	0	1	10	0	31	0	0	31	107	378
18:00:00	37	23	0	3	60	21	1	0	0	22	1	21	0	0	22	104	379
18:15:00	35	16	0	0	51	6	2	0	2	8	2	17	0	0	19	78	369
18:30:00	22	16	0	0	38	9	3	0	0	12	0	8	0	0	8	58	347



Turning Movement Count
Location Name: SILVER SPEAR RD & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

18:45:00	21	10	0	0	31	13	2	0	0	15	3	22	0	0	25	71	311
Grand Total	685	278	3	16	966	294	39	0	11	333	23	591	0	5	614	1913	-
Approach%	70.9%	28.8%	0.3%		-	88.3%	11.7%	0%		-	3.7%	96.3%	0%		-	-	-
Totals %	35.8%	14.5%	0.2%		50.5%	15.4%	2%	0%		17.4%	1.2%	30.9%	0%		32.1%	-	-
Heavy	22	6	0		-	14	7	0		-	2	20	0		-	-	-
Heavy %	3.2%	2.2%	0%		-	4.8%	17.9%	0%		-	8.7%	3.4%	0%		-	-	-
Bicycles	0	0	0		-	0	0	0		-	0	0	0		-	-	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0%	0%	0%		-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)

Start Time	N Approach GOLDEN ORCHARD DR					E Approach SILVER SPEAR RD					S Approach GOLDEN ORCHARD DR					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
08:00:00	35	8	0	1	43	18	3	0	3	21	3	48	0	0	51	115
08:15:00	36	12	0	2	48	10	1	0	0	11	0	32	0	0	32	91
08:30:00	29	5	0	0	34	23	4	0	0	27	1	22	0	0	23	84
08:45:00	49	10	0	1	59	19	3	0	0	22	1	61	0	0	62	143
Grand Total	149	35	0	4	184	70	11	0	3	81	5	163	0	0	168	433
Approach%	81%	19%	0%	-	86.4%	13.6%	0%	-	3%	97%	0%	-	-	-	-	-
Totals %	34.4%	8.1%	0%	42.5%	16.2%	2.5%	0%	18.7%	1.2%	37.6%	0%	38.8%	-	-	-	-
PHF	0.76	0.73	0	0.78	0.76	0.69	0	0.75	0.42	0.67	0	0.68	-	-	-	-
Heavy	5	1	0	6	4	1	0	5	0	7	0	7	-	-	-	-
Heavy %	3.4%	2.9%	0%	3.3%	5.7%	9.1%	0%	6.2%	0%	4.3%	0%	4.2%	-	-	-	-
Lights	144	34	0	178	66	10	0	76	5	156	0	161	-	-	-	-
Lights %	96.6%	97.1%	0%	96.7%	94.3%	90.9%	0%	93.8%	100%	95.7%	0%	95.8%	-	-	-	-
Single-Unit Trucks	2	1	0	3	2	1	0	3	0	1	0	1	-	-	-	-
Single-Unit Trucks %	1.3%	2.9%	0%	1.6%	2.9%	9.1%	0%	3.7%	0%	0.6%	0%	0.6%	-	-	-	-
Buses	3	0	0	3	2	0	0	2	0	6	0	6	-	-	-	-
Buses %	2%	0%	0%	1.6%	2.9%	0%	0%	2.5%	0%	3.7%	0%	3.6%	-	-	-	-
Pedestrians	-	-	-	3	-	-	-	3	-	-	-	0	-	-	-	-
Pedestrians%	-	-	-	42.9%	-	-	-	42.9%	-	-	-	0%	-	-	-	-
Bicycles on Crosswalk	-	-	-	1	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	14.3%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	-	0	0	0	-	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)

Start Time	N Approach GOLDEN ORCHARD DR					E Approach SILVER SPEAR RD					S Approach GOLDEN ORCHARD DR					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
17:15:00	43	18	1	0	62	6	0	0	1	6	0	20	0	0	20	88
17:30:00	31	16	0	2	47	10	1	0	1	11	1	21	0	0	22	80
17:45:00	49	17	0	1	66	9	1	0	1	10	0	31	0	0	31	107
18:00:00	37	23	0	3	60	21	1	0	0	22	1	21	0	0	22	104
Grand Total	160	74	1	6	235	46	3	0	3	49	2	93	0	0	95	379
Approach%	68.1%	31.5%	0.4%	-	93.9%	6.1%	0%	-	2.1%	97.9%	0%	-	-	-	-	-
Totals %	42.2%	19.5%	0.3%	62%	12.1%	0.8%	0%	12.9%	0.5%	24.5%	0%	25.1%	-	-	-	-
PHF	0.82	0.8	0.25	0.89	0.55	0.75	0	0.56	0.5	0.75	0	0.77	-	-	-	-
Heavy	3	0	0	3	3	0	0	3	0	0	0	0	-	-	-	-
Heavy %	1.9%	0%	0%	1.3%	6.5%	0%	0%	6.1%	0%	0%	0%	0%	-	-	-	-
Lights	157	74	1	232	43	3	0	46	2	93	0	95	-	-	-	-
Lights %	98.1%	100%	100%	98.7%	93.5%	100%	0%	93.9%	100%	100%	0%	100%	-	-	-	-
Single-Unit Trucks	3	0	0	3	3	0	0	3	0	0	0	0	-	-	-	-
Single-Unit Trucks %	1.9%	0%	0%	1.3%	6.5%	0%	0%	6.1%	0%	0%	0%	0%	-	-	-	-
Buses	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-
Pedestrians	-	-	-	6	-	-	-	3	-	-	-	0	-	-	-	-
Pedestrians%	-	-	-	66.7%	-	-	-	33.3%	-	-	-	0%	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	-	0	0	0	-	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

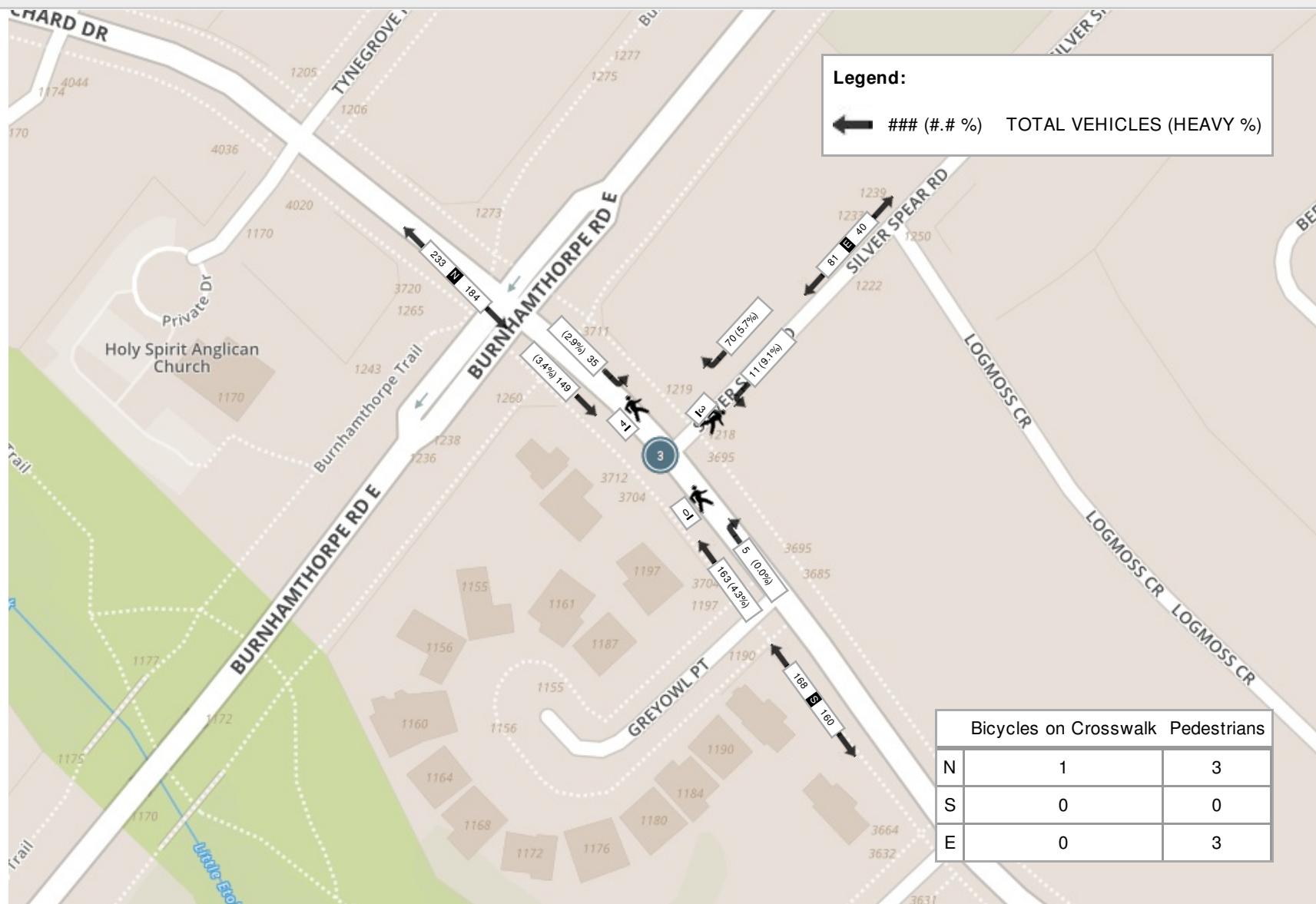


Spectrum

Turning Movement Count
Location Name: SILVER SPEAR RD & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)



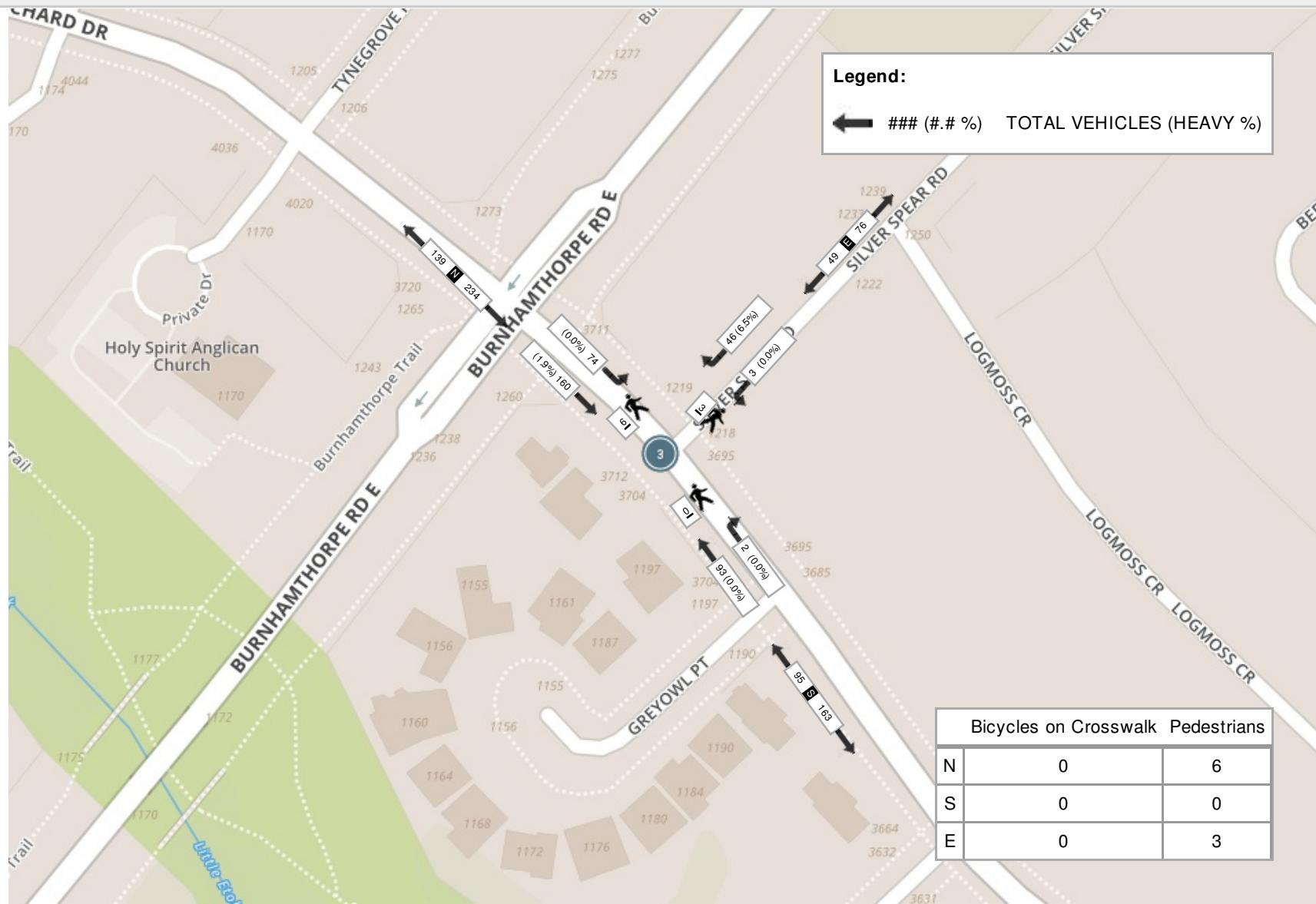


Spectrum

Turning Movement Count
Location Name: SILVER SPEAR RD & GOLDEN ORCHARD DR
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)





Turning Movement Count (4 . SILVER SPEAR RD & WINDING TRAIL)

Start Time	N Approach SILVER SPEAR RD						E Approach WINDING TRAIL						S Approach SOUTH DRIVEWAY						W Approach WINDING TRAIL						Int. Total (15 min)	Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total			
07:00:00	1	0	6	0	1	7	1	6	0	0	1	7	0	0	0	0	0	0	0	6	0	0	1	6	20		
07:15:00	4	0	12	0	2	16	6	5	0	0	1	11	0	0	0	0	0	0	0	11	3	0	0	14	41		
07:30:00	2	0	13	0	0	15	3	9	0	0	1	12	0	0	0	0	2	0	0	15	1	0	0	0	16	43	
07:45:00	2	0	12	0	2	14	1	9	1	1	1	12	0	0	0	0	3	0	0	13	1	0	5	14	40	144	
08:00:00	6	0	10	0	4	16	3	10	0	0	4	13	0	0	0	0	4	0	0	17	6	0	3	23	52	176	
08:15:00	4	0	15	0	3	19	3	4	0	0	0	7	0	1	0	0	1	1	0	25	3	0	2	28	55	190	
08:30:00	5	0	9	0	0	14	4	9	0	0	2	13	0	0	1	0	6	1	1	11	4	0	7	16	44	191	
08:45:00	10	0	6	0	1	16	5	7	1	0	42	13	1	0	0	0	19	1	0	17	3	0	5	20	50	201	
09:00:00	4	0	10	0	0	14	4	8	1	0	8	13	2	0	0	0	5	2	0	11	4	0	4	15	44	193	
09:15:00	1	0	6	0	0	7	3	4	0	0	4	7	0	0	0	0	3	0	0	10	1	0	1	11	25	163	
09:30:00	0	0	7	0	0	7	6	1	0	0	3	7	0	0	0	0	3	0	0	5	0	0	0	5	19	138	
09:45:00	2	0	10	0	3	12	3	2	0	0	1	5	0	0	0	0	3	0	0	4	0	0	0	4	21	109	
BREAK																											
16:00:00	2	0	7	0	1	9	9	13	0	0	5	22	0	0	0	0	5	0	0	12	5	0	0	17	48		
16:15:00	3	0	11	0	1	14	9	18	1	1	7	29	2	0	0	0	5	2	0	7	1	1	3	9	54		
16:30:00	2	0	6	0	1	8	17	7	1	0	4	25	1	0	0	0	11	1	0	6	1	0	0	7	41		
16:45:00	1	0	8	0	2	9	15	10	1	0	3	26	0	0	1	0	3	1	0	6	3	0	0	9	45	188	
17:00:00	1	0	6	0	3	7	13	16	0	1	1	30	0	0	0	0	4	0	1	6	3	0	0	10	47	187	
17:15:00	1	0	9	0	2	10	10	16	1	0	0	27	0	0	0	0	7	0	0	9	5	0	3	14	51	184	
17:30:00	2	0	12	0	2	14	6	17	0	0	2	23	0	0	0	0	4	0	0	7	1	0	2	8	45	188	
17:45:00	4	0	8	0	0	12	23	14	0	0	3	37	0	0	0	0	5	0	0	6	1	0	0	7	56	199	
18:00:00	1	0	5	0	0	6	17	12	0	1	6	30	1	0	0	0	4	1	0	9	2	0	0	11	48	200	
18:15:00	2	0	7	0	0	9	11	4	0	0	1	15	0	0	0	0	1	0	0	9	0	0	1	9	33	182	
18:30:00	1	0	10	0	2	11	15	11	1	0	1	27	1	0	0	0	1	1	0	7	1	0	3	8	47	184	
18:45:00	4	0	7	0	0	11	9	10	0	1	5	20	0	0	0	0	6	0	0	7	2	0	0	9	40	168	
Grand Total	65	0	212	0	30	277	196	222	8	5	106	431	8	1	2	0	105	11	2	236	51	1	40	290	1009	-	

Approach% 23.5% 0% 76.5% 0%

Totals% 6.4% 0% 21% 0%

Heavy 1 0 4 0

Heavy % 1.5% 0% 1.9% 0%

Bicycles 2 0 0 0

Bicycle % 3.1% 0% 0% 0%



Turning Movement Count
Location Name: SILVER SPEAR RD & WINDING TRAIL
Date: Wed, May 10, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6



Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)

Start Time	N Approach SILVER SPEAR RD						E Approach WINDING TRAIL						S Approach SOUTH DRIVEWAY						W Approach WINDING TRAIL						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	6	0	10	0	4	16	3	10	0	0	4	13	0	0	0	0	4	0	0	17	6	0	3	23	52
08:15:00	4	0	15	0	3	19	3	4	0	0	0	7	0	1	0	0	1	1	0	25	3	0	2	28	55
08:30:00	5	0	9	0	0	14	4	9	0	0	2	13	0	0	1	0	6	1	1	11	4	0	7	16	44
08:45:00	10	0	6	0	1	16	5	7	1	0	42	13	1	0	0	0	19	1	0	17	3	0	5	20	50
Grand Total	25	0	40	0	8	65	15	30	1	0	48	46	1	1	1	0	30	3	1	70	16	0	17	87	201
Approach%	38.5%	0%	61.5%	0%	-	32.6%	65.2%	2.2%	0%	-	33.3%	33.3%	33.3%	0%	-	1.1%	80.5%	18.4%	0%	-	-	-	-	-	-
Totals %	12.4%	0%	19.9%	0%	32.3%	7.5%	14.9%	0.5%	0%	22.9%	0.5%	0.5%	0.5%	0%	1.5%	0.5%	34.8%	8%	0%	43.3%	-	-	-	-	-
PHF	0.63	0	0.67	0	0.86	0.75	0.75	0.25	0	0.88	0.25	0.25	0.25	0	0.75	0.25	0.7	0.67	0	0.78	-	-	-	-	-
Heavy	0	0	1	0	1	0	3	0	0	0	3	0	0	0	0	0	0	0	2	4	0	0	6	-	-
Heavy %	0%	0%	2.5%	0%	1.5%	0%	10%	0%	0%	6.5%	0%	0%	0%	0%	0%	0%	2.9%	25%	0%	6.9%	-	-	-	-	-
Lights	25	0	39	0	64	15	27	1	0	43	1	1	1	0	-	3	1	68	12	0	81	-	-	-	-
Lights %	100%	0%	97.5%	0%	98.5%	100%	90%	100%	0%	93.5%	100%	100%	100%	0%	100%	100%	97.1%	75%	0%	93.1%	-	-	-	-	-
Single-Unit Trucks	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	-	-	-
Single-Unit Trucks %	0%	0%	2.5%	0%	1.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.4%	6.3%	0%	2.3%	-	-	-	-	-
Buses	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	3	0	0	4	-	-	-
Buses %	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	6.5%	0%	0%	0%	0%	0%	1.4%	18.8%	0%	4.6%	-	-	-	-	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	6	-	-	-	-	47	-	-	-	-	-	29	-	-	-	-	-	14	-	-	-
Pedestrians%	-	-	-	-	5.8%	-	-	-	-	45.6%	-	-	-	-	-	28.2%	-	-	-	-	-	13.6%	-	-	-
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-
Bicycles on Crosswalk%	-	-	-	-	1.9%	-	-	-	-	1%	-	-	-	-	-	1%	-	-	-	-	-	2.9%	-	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-

Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)

Start Time	N Approach SILVER SPEAR RD						E Approach WINDING TRAIL						S Approach SOUTH DRIVEWAY						W Approach WINDING TRAIL						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:15:00	1	0	9	0	2	10	10	16	1	0	0	27	0	0	0	0	7	0	0	9	5	0	3	14	51
17:30:00	2	0	12	0	2	14	6	17	0	0	2	23	0	0	0	0	4	0	0	7	1	0	2	8	45
17:45:00	4	0	8	0	0	12	23	14	0	0	3	37	0	0	0	0	5	0	0	6	1	0	0	7	56
18:00:00	1	0	5	0	0	6	17	12	0	1	6	30	1	0	0	0	4	1	0	9	2	0	0	11	48
Grand Total	8	0	34	0	4	42	56	59	1	1	11	117	1	0	0	0	20	1	0	31	9	0	5	40	200
Approach%	19%	0%	81%	0%	-	47.9%	50.4%	0.9%	0.9%	-	100%	0%	0%	0%	-	0%	77.5%	22.5%	0%	-	-	-	-	-	
Totals %	4%	0%	17%	0%	21%	28%	29.5%	0.5%	0.5%	58.5%	0.5%	0%	0%	0%	0.5%	0%	15.5%	4.5%	0%	20%	-	-	-	-	
PHF	0.5	0	0.71	0	0.75	0.61	0.87	0.25	0.25	0.79	0.25	0	0	0	0.25	0	0.86	0.45	0	0.71	-	-	-	-	
Heavy	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	-
Heavy %	0%	0%	0%	0%	0%	3.6%	0%	0%	0%	1.7%	0%	0%	0%	0%	0%	0%	3.2%	0%	0%	2.5%	-	-	-	-	
Lights	8	0	34	0	42	54	59	1	1	115	1	0	0	0	1	0	30	9	0	39	-	-	-	-	
Lights %	100%	0%	100%	0%	100%	96.4%	100%	100%	100%	98.3%	100%	0%	0%	0%	100%	0%	96.8%	100%	0%	97.5%	-	-	-	-	
Single-Unit Trucks	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	0	0	1	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	3.6%	0%	0%	0%	1.7%	0%	0%	0%	0%	0%	0%	3.2%	0%	0%	2.5%	-	-	-	-	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	4	-	-	-	-	11	-	-	-	-	20	-	-	-	-	-	-	-	5	-	-
Pedestrians%	-	-	-	-	10%	-	-	-	-	27.5%	-	-	-	-	50%	-	-	-	-	-	-	-	12.5%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	-	-	
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	-	0%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (7.1 °C)



Peak Hour: 05:15 PM - 06:15 PM Weather: Partly Cloudy (13.5 °C)



Appendix C - Existing Traffic Level of Service Calculations

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	10	70	16	6	83	14	1463	12	34	1300	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.98				0.98		1.00	1.00	0.93	1.00	1.00	0.91
Flpb, ped/bikes	1.00				1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	0.92				0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1629				1593		1692	3444	1519	1764	3380	1463
Flt Permitted	0.73				0.85		0.20	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	1202				1362		349	3444	1519	300	3380	1463
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	10	70	16	6	83	14	1463	12	34	1300	22
RTOR Reduction (vph)	0	44	0	0	47	0	0	0	2	0	0	4
Lane Group Flow (vph)	0	71	0	0	58	0	14	1463	10	34	1300	18
Confl. Peds. (#/hr)	7		11	11		7	16		12	12		16
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	9%	0%	2%	0%	2%	5%	7%	6%	0%	3%	8%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.5				13.5		133.4	133.4	133.4	133.4	133.4	133.4
Effective Green, g (s)	13.5				13.5		133.4	133.4	133.4	133.4	133.4	133.4
Actuated g/C Ratio	0.08				0.08		0.83	0.83	0.83	0.83	0.83	0.83
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	101			114			290	2871	1266	250	2818	1219
v/s Ratio Prot							c0.42					0.38
v/s Ratio Perm	c0.06			0.04			0.04		0.01	0.11		0.01
v/c Ratio	0.70			0.51			0.05	0.51	0.01	0.14	0.46	0.02
Uniform Delay, d1	71.3			70.1			2.3	3.8	2.2	2.5	3.6	2.2
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.9			3.8			0.3	0.6	0.0	1.1	0.5	0.0
Delay (s)	91.2			73.9			2.6	4.5	2.2	3.6	4.1	2.3
Level of Service	F			E			A	A	A	A	A	A
Approach Delay (s)	91.2			73.9				4.5				4.1
Approach LOS	F			E				A				A

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	1299	105	54	733	11	102	16	113	17	24	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.94	1.00	0.98				1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1696	3544	1491	1713	3544	1474	1653	1611				1740
Flt Permitted	0.35	1.00	1.00	0.17	1.00	1.00	0.74	1.00				0.91
Satd. Flow (perm)	628	3544	1491	306	3544	1474	1285	1611				1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	1299	105	54	733	11	102	16	113	17	24	31
RTOR Reduction (vph)	0	0	10	0	0	3	0	28	0	0	22	0
Lane Group Flow (vph)	25	1299	95	54	733	8	102	101	0	0	50	0
Confl. Peds. (#/hr)	14		7	7		14			6	6		
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	4%	3%	3%	4%	3%	2%	8%	6%	1%	0%	4%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	441	2491	1048	215	2491	1036	265	332				330
v/s Ratio Prot		c0.37			0.21			0.06				
v/s Ratio Perm	0.04		0.06	0.18		0.01	c0.08					0.03
v/c Ratio	0.06	0.52	0.09	0.25	0.29	0.01	0.38	0.30				0.15
Uniform Delay, d1	7.3	11.1	7.5	8.6	8.9	7.1	54.7	53.8				52.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	0.2	0.8	0.2	2.8	0.3	0.0	0.9	0.5				0.2
Delay (s)	7.6	11.9	7.7	11.3	9.2	7.1	55.7	54.3				52.2
Level of Service	A	B	A	B	A	A	E	D				D
Approach Delay (s)		11.5			9.3			54.9				52.2
Approach LOS		B			A			D				D
Intersection Summary												
HCM 2000 Control Delay				15.9						B		
HCM 2000 Volume to Capacity ratio				0.49								
Actuated Cycle Length (s)				160.0						14.5		
Intersection Capacity Utilization				84.5%						E		
Analysis Period (min)				15								
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	70	163	5	35	149
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	70	163	5	35	149
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	1.00					
vC, conflicting volume	388	172		171		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385	172		171		
tC, single (s)	6.5	6.3		4.1		
tC, 2 stage (s)						
tF (s)	3.6	3.4		2.2		
p0 queue free %	98	92		97		
cM capacity (veh/h)	586	856		1396		
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	81	168	184			
Volume Left	11	0	35			
Volume Right	70	5	0			
cSH	805	1700	1396			
Volume to Capacity	0.10	0.10	0.03			
Queue Length 95th (m)	2.7	0.0	0.6			
Control Delay (s)	10.0	0.0	1.6			
Lane LOS	A		A			
Approach Delay (s)	10.0	0.0	1.6			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		35.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	70	1	1	30	15	1	1	1	40	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	70	1	1	30	15	1	1	1	40	0	25
Pedestrians		48			48			30			8	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	53			101			245	188	148	200	180	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53			101			245	188	148	200	180	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	94	100	97
cM capacity (veh/h)	1542			1465			627	680	844	696	686	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	87	46	3	65								
Volume Left	16	1	1	40								
Volume Right	1	15	1	25								
cSH	1542	1465	706	768								
Volume to Capacity	0.01	0.00	0.00	0.08								
Queue Length 95th (m)	0.3	0.0	0.1	2.2								
Control Delay (s)	1.4	0.2	10.1	10.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.4	0.2	10.1	10.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization		31.5%		ICU Level of Service				A				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	40	32	3	8	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	7	40	32	3	8	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	35			88	34	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	35			88	34	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			99	99	
cM capacity (veh/h)	1576			909	1040	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	47	35	22			
Volume Left	7	0	8			
Volume Right	0	3	14			
cSH	1576	1700	988			
Volume to Capacity	0.00	0.02	0.02			
Queue Length 95th (m)	0.1	0.0	0.5			
Control Delay (s)	1.1	0.0	8.7			
Lane LOS	A		A			
Approach Delay (s)	1.1	0.0	8.7			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization	18.1%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	9	42	17	14	41	69	1248	16	65	1921	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.97				0.97		1.00	1.00	0.91	1.00	1.00	0.90
Flpb, ped/bikes	0.99				0.99		1.00	1.00	1.00	0.99	1.00	1.00
Frt	0.92				0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1642				1693		1825	3544	1492	1808	3544	1437
Flt Permitted	0.85				0.88		0.09	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1422				1511		175	3544	1492	400	3544	1437
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	9	42	17	14	41	69	1248	16	65	1921	41
RTOR Reduction (vph)	0	17	0	0	38	0	0	0	2	0	0	4
Lane Group Flow (vph)	0	56	0	0	34	0	69	1248	14	65	1921	37
Confl. Peds. (#/hr)	16		16	16		16	20		16	16		20
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	3%	0%	0%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.7				11.7		135.2	135.2	135.2	135.2	135.2	135.2
Effective Green, g (s)	11.7				11.7		135.2	135.2	135.2	135.2	135.2	135.2
Actuated g/C Ratio	0.07				0.07		0.84	0.84	0.84	0.84	0.84	0.84
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	103			110			147	2994	1260	338	2994	1214
v/s Ratio Prot							0.35					c0.54
v/s Ratio Perm	c0.04			0.02			0.39		0.01	0.16		0.03
v/c Ratio	0.55			0.31			0.47	0.42	0.01	0.19	0.64	0.03
Uniform Delay, d1	71.6			70.3			3.2	3.0	1.9	2.3	4.2	2.0
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8			1.6			10.4	0.4	0.0	1.3	1.1	0.0
Delay (s)	77.4			71.9			13.6	3.4	2.0	3.6	5.3	2.0
Level of Service	E			E			B	A	A	A	A	A
Approach Delay (s)	77.4			71.9				3.9				5.1
Approach LOS	E			E				A				A

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↓	↑
Volume (vph)	21	1023	109	95	1599	18	52	22	46	8	23	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	0.99				0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1785	3579	1494	1759	3579	1496	1780	1652				1717
Flt Permitted	0.11	1.00	1.00	0.25	1.00	1.00	0.72	1.00				0.96
Satd. Flow (perm)	202	3579	1494	455	3579	1496	1350	1652				1663
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1023	109	95	1599	18	52	22	46	8	23	25
RTOR Reduction (vph)	0	0	12	0	0	5	0	37	0	0	11	0
Lane Group Flow (vph)	21	1023	97	95	1599	13	52	31	0	0	45	0
Confl. Peds. (#/hr)	16		10	10		16	2		6	6		2
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	0%	2%	2%	1%	2%	0%	0%	5%	2%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	142	2516	1050	319	2516	1051	278	340				342
v/s Ratio Prot		0.29			c0.45			0.02				
v/s Ratio Perm	0.10		0.07	0.21		0.01	c0.04					0.03
v/c Ratio	0.15	0.41	0.09	0.30	0.64	0.01	0.19	0.09				0.13
Uniform Delay, d1	7.9	9.9	7.5	8.9	12.7	7.1	52.4	51.4				51.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	2.2	0.5	0.2	2.4	1.2	0.0	0.3	0.1				0.2
Delay (s)	10.1	10.4	7.7	11.3	14.0	7.1	52.8	51.5				52.0
Level of Service	B	B	A	B	B	A	D	D				D
Approach Delay (s)		10.1			13.8			52.0				52.0
Approach LOS		B			B			D				D
Intersection Summary												
HCM 2000 Control Delay		14.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		93.4%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	46	93	2	74	160
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	46	93	2	74	160
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	0.99					
vC, conflicting volume	405	101			98	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	391	101			98	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	99	95			95	
cM capacity (veh/h)	578	935			1504	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	95	234			
Volume Left	3	0	74			
Volume Right	46	2	0			
cSH	901	1700	1504			
Volume to Capacity	0.05	0.06	0.05			
Queue Length 95th (m)	1.4	0.0	1.2			
Control Delay (s)	9.2	0.0	2.7			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	2.7			
Approach LOS	A					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		30.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	31	0	1	59	56	0	0	1	34	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	31	0	1	59	56	0	0	1	34	0	8
Pedestrians		5			11			20			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			1			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	119			51			171	190	62	154	162	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119			51			171	190	62	154	162	96
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	99
cM capacity (veh/h)	1476			1541			757	689	982	789	714	959
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	40	116	1	42								
Volume Left	9	1	0	34								
Volume Right	0	56	1	8								
cSH	1476	1541	982	817								
Volume to Capacity	0.01	0.00	0.00	0.05								
Queue Length 95th (m)	0.1	0.0	0.0	1.3								
Control Delay (s)	1.7	0.1	8.7	9.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.7	0.1	8.7	9.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization		27.1%		ICU Level of Service					A			
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	76	65	14	13	4
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	76	65	14	13	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	79			178	72	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	79			178	72	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			98	100	
cM capacity (veh/h)	1519			804	990	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	91	79	17			
Volume Left	15	0	13			
Volume Right	0	14	4			
cSH	1519	1700	841			
Volume to Capacity	0.01	0.05	0.02			
Queue Length 95th (m)	0.2	0.0	0.5			
Control Delay (s)	1.3	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	1.3	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization	21.5%		ICU Level of Service		A	
Analysis Period (min)	15					

Appendix D - Future Background Traffic Level of Service Calculations

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	11	70	16	7	83	14	1615	12	34	1435	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.98				0.98		1.00	1.00	0.93	1.00	1.00	0.91
Flpb, ped/bikes	1.00				1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	0.92				0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1631				1596		1695	3444	1519	1767	3380	1463
Flt Permitted	0.73				0.85		0.17	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1201				1364		298	3444	1519	248	3380	1463
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	11	70	16	7	83	14	1615	12	34	1435	22
RTOR Reduction (vph)	0	43	0	0	34	0	0	0	2	0	0	4
Lane Group Flow (vph)	0	73	0	0	72	0	14	1615	10	34	1435	18
Confl. Peds. (#/hr)	7		11	11		7	16		12	12		16
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	9%	0%	2%	0%	2%	5%	7%	6%	0%	3%	8%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.6				13.6		133.3	133.3	133.3	133.3	133.3	133.3
Effective Green, g (s)	13.6				13.6		133.3	133.3	133.3	133.3	133.3	133.3
Actuated g/C Ratio	0.08				0.08		0.83	0.83	0.83	0.83	0.83	0.83
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	102			115			248	2869	1265	206	2815	1218
v/s Ratio Prot							c0.47				0.42	
v/s Ratio Perm	c0.06			0.05			0.05		0.01	0.14		0.01
v/c Ratio	0.72			0.63			0.06	0.56	0.01	0.17	0.51	0.02
Uniform Delay, d1	71.3			70.8			2.3	4.2	2.2	2.6	3.9	2.3
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.1			10.2			0.4	0.8	0.0	1.7	0.7	0.0
Delay (s)	92.4			81.0			2.8	5.0	2.3	4.3	4.5	2.3
Level of Service	F			F			A	A	A	A	A	A
Approach Delay (s)	92.4			81.0				5.0			4.5	
Approach LOS	F			F				A			A	

Intersection Summary

HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↔	↓
Volume (vph)	25	1434	105	54	809	11	102	18	113	17	26	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.94	1.00	0.98				1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1699	3544	1491	1714	3544	1474	1653	1614				1743
Flt Permitted	0.32	1.00	1.00	0.14	1.00	1.00	0.73	1.00				0.91
Satd. Flow (perm)	574	3544	1491	252	3544	1474	1277	1614				1606
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	1434	105	54	809	11	102	18	113	17	26	31
RTOR Reduction (vph)	0	0	10	0	0	3	0	19	0	0	21	0
Lane Group Flow (vph)	25	1434	95	54	809	8	102	112	0	0	53	0
Confl. Peds. (#/hr)	14		7	7		14			6	6		
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	4%	3%	3%	4%	3%	2%	8%	6%	1%	0%	4%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	403	2491	1048	177	2491	1036	263	332				331
v/s Ratio Prot		c0.40			0.23			0.07				
v/s Ratio Perm	0.04		0.06	0.21		0.01	c0.08					0.03
v/c Ratio	0.06	0.58	0.09	0.31	0.32	0.01	0.39	0.34				0.16
Uniform Delay, d1	7.4	11.8	7.5	9.0	9.1	7.1	54.8	54.2				52.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	0.3	1.0	0.2	4.4	0.3	0.0	1.0	0.6				0.2
Delay (s)	7.7	12.8	7.7	13.4	9.5	7.1	55.7	54.8				52.3
Level of Service	A	B	A	B	A	A	E	D				D
Approach Delay (s)		12.4			9.7			55.2				52.3
Approach LOS		B			A			E				D
Intersection Summary												
HCM 2000 Control Delay		16.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		84.5%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	70	180	5	35	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	70	180	5	35	165
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	1.00					
vC, conflicting volume	420	190			188	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418	190			188	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	98	92			97	
cM capacity (veh/h)	561	837			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	81	185	200			
Volume Left	11	0	35			
Volume Right	70	5	0			
cSH	785	1700	1377			
Volume to Capacity	0.10	0.11	0.03			
Queue Length 95th (m)	2.8	0.0	0.6			
Control Delay (s)	10.1	0.0	1.5			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	1.5			
Approach LOS	B					
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization		37.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	77	1	1	33	15	1	1	1	40	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	77	1	1	33	15	1	1	1	40	0	25
Pedestrians		48			48			30			8	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	56			108			255	198	156	210	190	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	56			108			255	198	156	210	190	96
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	94	100	97
cM capacity (veh/h)	1538			1457			617	671	837	685	677	919
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	94	49	3	65								
Volume Left	16	1	1	40								
Volume Right	1	15	1	25								
cSH	1538	1457	697	760								
Volume to Capacity	0.01	0.00	0.00	0.09								
Queue Length 95th (m)	0.3	0.0	0.1	2.2								
Control Delay (s)	1.3	0.2	10.2	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.3	0.2	10.2	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization		31.7%		ICU Level of Service				A				
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	44	35	3	8	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	7	44	35	3	8	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	38			94	36	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38			94	36	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			99	99	
cM capacity (veh/h)	1572			901	1036	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	51	38	22			
Volume Left	7	0	8			
Volume Right	0	3	14			
cSH	1572	1700	982			
Volume to Capacity	0.00	0.02	0.02			
Queue Length 95th (m)	0.1	0.0	0.5			
Control Delay (s)	1.0	0.0	8.7			
Lane LOS	A		A			
Approach Delay (s)	1.0	0.0	8.7			
Approach LOS			A			
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		18.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	10	42	17	15	41	69	1378	16	65	2121	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.97				0.97		1.00	1.00	0.91	1.00	1.00	0.90
Flpb, ped/bikes	0.99				0.99		1.00	1.00	1.00	0.99	1.00	1.00
Frt	0.92				0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1646				1696		1825	3544	1492	1812	3544	1437
Flt Permitted	0.85				0.88		0.07	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1425				1514		130	3544	1492	343	3544	1437
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	10	42	17	15	41	69	1378	16	65	2121	41
RTOR Reduction (vph)	0	11	0	0	36	0	0	0	3	0	0	4
Lane Group Flow (vph)	0	63	0	0	37	0	69	1378	13	65	2121	37
Confl. Peds. (#/hr)	16		16	16		16	20		16	16		20
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	3%	0%	0%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	12.3				12.3		134.6	134.6	134.6	134.6	134.6	134.6
Effective Green, g (s)	12.3				12.3		134.6	134.6	134.6	134.6	134.6	134.6
Actuated g/C Ratio	0.08				0.08		0.84	0.84	0.84	0.84	0.84	0.84
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	109			116			109	2981	1255	288	2981	1208
v/s Ratio Prot							0.39				c0.60	
v/s Ratio Perm	c0.04			0.02			0.53		0.01	0.19		0.03
v/c Ratio	0.58			0.32			0.63	0.46	0.01	0.23	0.71	0.03
Uniform Delay, d1	71.3			69.9			4.3	3.3	2.0	2.5	5.0	2.1
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2			1.6			24.8	0.5	0.0	1.8	1.5	0.0
Delay (s)	78.6			71.5			29.1	3.8	2.1	4.3	6.5	2.1
Level of Service	E			E			C	A	A	A	A	A
Approach Delay (s)	78.6			71.5				5.0			6.4	
Approach LOS	E			E				A			A	

Intersection Summary

HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↔	↓
Volume (vph)	21	1023	109	95	1599	18	52	24	46	8	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	0.99				0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1785	3579	1494	1759	3579	1496	1780	1657				1724
Flt Permitted	0.11	1.00	1.00	0.25	1.00	1.00	0.72	1.00				0.96
Satd. Flow (perm)	202	3579	1494	455	3579	1496	1348	1657				1671
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1023	109	95	1599	18	52	24	46	8	25	25
RTOR Reduction (vph)	0	0	12	0	0	5	0	37	0	0	11	0
Lane Group Flow (vph)	21	1023	97	95	1599	13	52	33	0	0	47	0
Confl. Peds. (#/hr)	16		10	10		16	2		6	6		2
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	0%	2%	2%	1%	2%	0%	0%	5%	2%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	142	2516	1050	319	2516	1051	278	341				344
v/s Ratio Prot		0.29			c0.45			0.02				
v/s Ratio Perm	0.10		0.07	0.21		0.01	c0.04					0.03
v/c Ratio	0.15	0.41	0.09	0.30	0.64	0.01	0.19	0.10				0.14
Uniform Delay, d1	7.9	9.9	7.5	8.9	12.7	7.1	52.4	51.4				51.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	2.2	0.5	0.2	2.4	1.2	0.0	0.3	0.1				0.2
Delay (s)	10.1	10.4	7.7	11.3	14.0	7.1	52.8	51.6				52.0
Level of Service	B	B	A	B	B	A	D	D				D
Approach Delay (s)		10.1			13.8			52.1				52.0
Approach LOS		B			B			D				D
Intersection Summary												
HCM 2000 Control Delay		14.6								B		
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		160.0								14.5		
Intersection Capacity Utilization		93.4%								F		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	46	103	2	74	177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	46	103	2	74	177
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	0.99					
vC, conflicting volume	432	111			108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418	111			108	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	99	95			95	
cM capacity (veh/h)	557	923			1491	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	49	105	251			
Volume Left	3	0	74			
Volume Right	46	2	0			
cSH	888	1700	1491			
Volume to Capacity	0.06	0.06	0.05			
Queue Length 95th (m)	1.4	0.0	1.3			
Control Delay (s)	9.3	0.0	2.5			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	2.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

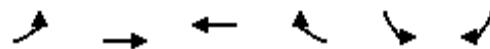
2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	34	0	1	65	56	0	0	1	34	0	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	34	0	1	65	56	0	0	1	34	0	8
Pedestrians		5			11			20			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			1			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	125			54			180	199	65	163	171	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	125			54			180	199	65	163	171	102
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	99
cM capacity (veh/h)	1469			1537			747	681	978	779	706	951
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	43	122	1	42								
Volume Left	9	1	0	34								
Volume Right	0	56	1	8								
cSH	1469	1537	978	807								
Volume to Capacity	0.01	0.00	0.00	0.05								
Queue Length 95th (m)	0.1	0.0	0.0	1.3								
Control Delay (s)	1.6	0.1	8.7	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.6	0.1	8.7	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization		27.2%		ICU Level of Service					A			
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

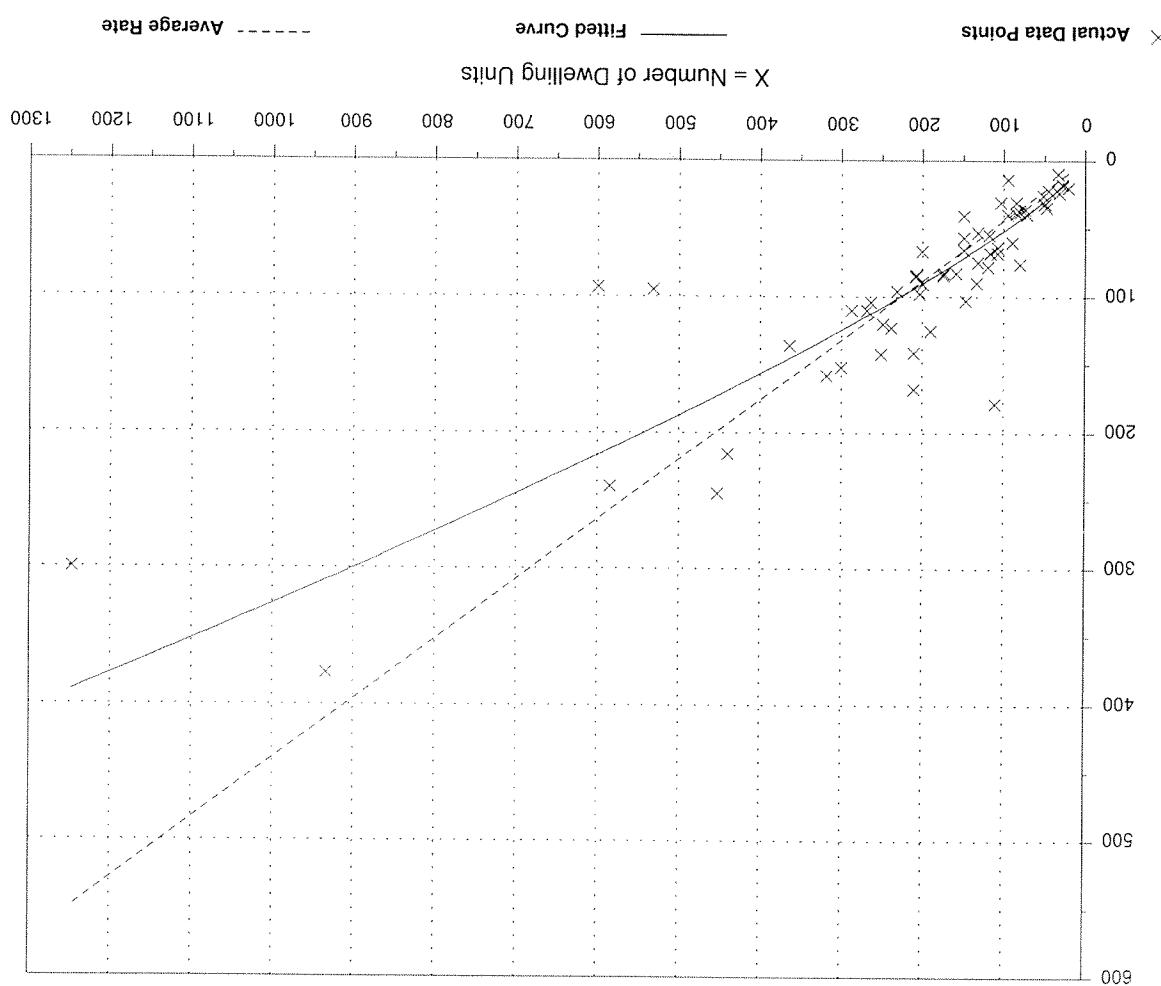
2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	84	72	14	13	4
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	84	72	14	13	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	86			193	79	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	86			193	79	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			98	100	
cM capacity (veh/h)	1510			788	981	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	99	86	17			
Volume Left	15	0	13			
Volume Right	0	14	4			
cSH	1510	1700	826			
Volume to Capacity	0.01	0.05	0.02			
Queue Length 95th (m)	0.2	0.0	0.5			
Control Delay (s)	1.2	0.0	9.4			
Lane LOS	A		A			
Approach Delay (s)	1.2	0.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		21.9%		ICU Level of Service		A
Analysis Period (min)		15				

Appendix E – Site Traffic Trip Generation (Based on ITE)

Fitted Curve Equation: $\ln(T) = 0.80 \ln(X) + 0.26$ $R^2 = 0.76$



~~Plot and Equation~~

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.61	0.69

~~Generation per Dwelling Unit~~

Directional Distribution: 17% entering, 83% exiting

Avg. Number of Dwelling Units: 213

Number of Studies: 59

One Hour Between 7 and 9 a.m.

Peak Hour of Adjacent Street Traffic,

On a: Weekday,

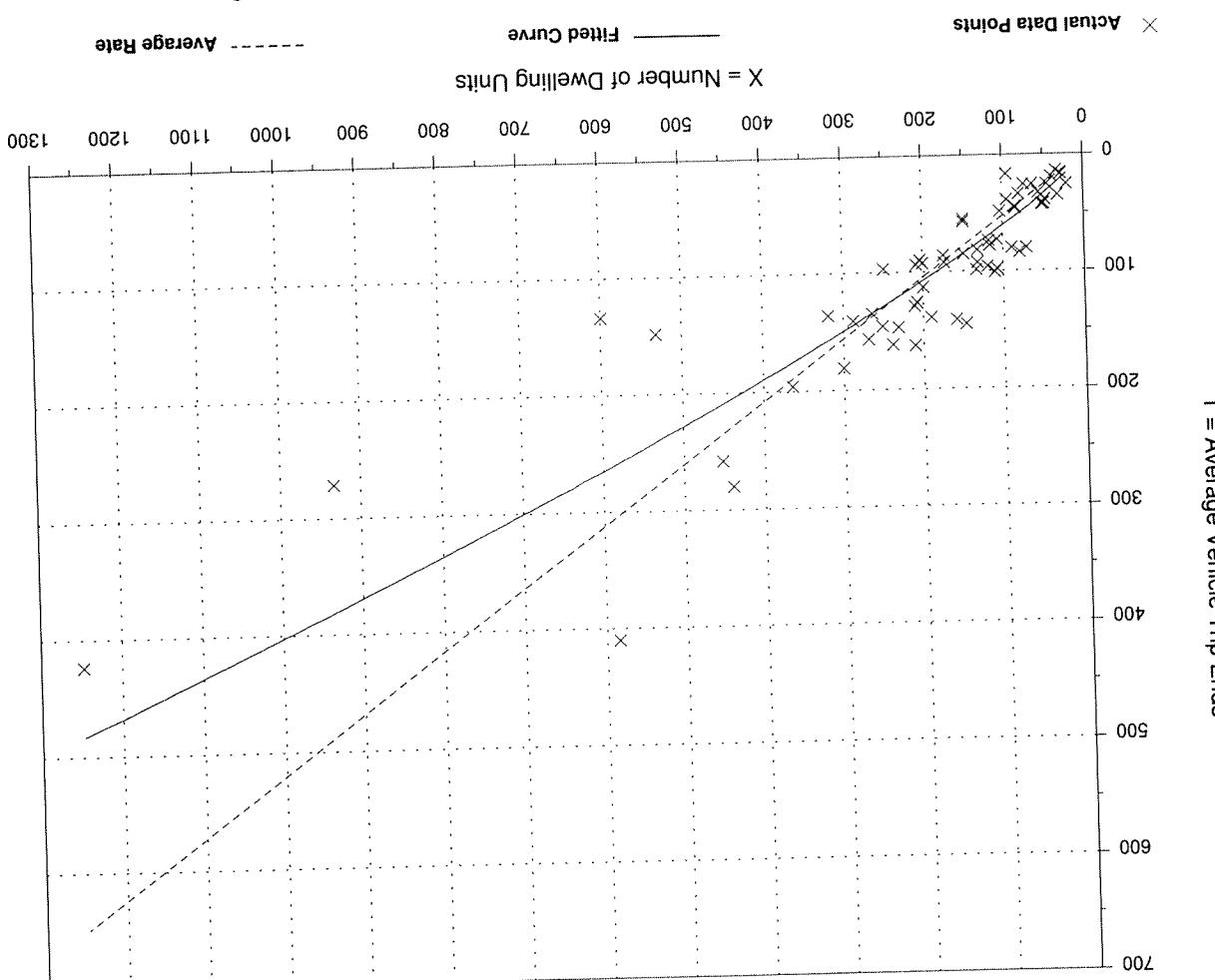
Average Vehicle Trip Ends vs: Dwelling Units

(230)

Residential Condominium/Townhouse

$$R^2 = 0.80$$

$$\text{Fitted Curve Equation: } \ln(T) = 0.82 \ln(X) + 0.32$$



Data Plot and Equation

Avg. Number of Dwelling Units:	205
Number of Studies:	62
Avg. Number of Dwelling Units:	0.52

Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 P.M.
Avg. Number of Dwelling Units: 205
Number of Studies: 62
Avg. Number of Dwelling Units: 0.52

Residential Condominium/Townhouse

(230)

Appendix F - Future Total Traffic Level of Service Calculations

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	11	86	16	7	83	17	1615	12	34	1435	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.98				0.98		1.00	1.00	0.93	1.00	1.00	0.91
Flpb, ped/bikes	1.00				1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	0.91				0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1624				1596		1696	3444	1519	1767	3380	1463
Flt Permitted	0.76				0.82		0.17	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1252				1320		296	3444	1519	246	3380	1463
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	11	86	16	7	83	17	1615	12	34	1435	22
RTOR Reduction (vph)	0	48	0	0	34	0	0	0	2	0	0	4
Lane Group Flow (vph)	0	84	0	0	72	0	17	1615	10	34	1435	18
Confl. Peds. (#/hr)	7		11	11		7	16		12	12		16
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	9%	0%	2%	0%	2%	5%	7%	6%	0%	3%	8%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	14.6				14.6		132.3	132.3	132.3	132.3	132.3	132.3
Effective Green, g (s)	14.6				14.6		132.3	132.3	132.3	132.3	132.3	132.3
Actuated g/C Ratio	0.09				0.09		0.83	0.83	0.83	0.83	0.83	0.83
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	114			120			244	2847	1256	203	2794	1209
v/s Ratio Prot							c0.47					0.42
v/s Ratio Perm	c0.07			0.05			0.06		0.01	0.14		0.01
v/c Ratio	0.74			0.60			0.07	0.57	0.01	0.17	0.51	0.02
Uniform Delay, d1	70.8			69.9			2.5	4.5	2.4	2.8	4.2	2.4
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.6			8.3			0.6	0.8	0.0	1.8	0.7	0.0
Delay (s)	92.4			78.2			3.1	5.3	2.4	4.6	4.8	2.5
Level of Service	F			E			A	A	A	A	A	A
Approach Delay (s)	92.4			78.2				5.3				4.8
Approach LOS	F			E				A				A

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	1434	108	58	809	11	116	18	129	17	26	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.94	1.00	0.98				1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1699	3544	1491	1714	3544	1474	1653	1611				1743
Flt Permitted	0.32	1.00	1.00	0.14	1.00	1.00	0.73	1.00				0.91
Satd. Flow (perm)	574	3544	1491	252	3544	1474	1277	1611				1600
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	1434	108	58	809	11	116	18	129	17	26	31
RTOR Reduction (vph)	0	0	10	0	0	3	0	19	0	0	21	0
Lane Group Flow (vph)	25	1434	98	58	809	8	116	128	0	0	53	0
Confl. Peds. (#/hr)	14		7	7		14			6	6		
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	4%	3%	3%	4%	3%	2%	8%	6%	1%	0%	4%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	403	2491	1048	177	2491	1036	263	332				330
v/s Ratio Prot		c0.40			0.23			0.08				
v/s Ratio Perm	0.04		0.07	0.23		0.01	c0.09					0.03
v/c Ratio	0.06	0.58	0.09	0.33	0.32	0.01	0.44	0.39				0.16
Uniform Delay, d1	7.4	11.8	7.5	9.2	9.1	7.1	55.4	54.8				52.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	0.3	1.0	0.2	4.9	0.3	0.0	1.2	0.7				0.2
Delay (s)	7.7	12.8	7.7	14.0	9.5	7.1	56.6	55.5				52.3
Level of Service	A	B	A	B	A	A	E	E				D
Approach Delay (s)		12.4			9.8			56.0				52.3
Approach LOS		B			A			E				D
Intersection Summary												
HCM 2000 Control Delay		16.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		87.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	100	180	5	42	165
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	11	100	180	5	42	165
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	1.00					
vC, conflicting volume	434	190			188	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	431	190			188	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	98	88			97	
cM capacity (veh/h)	548	837			1377	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	111	185	207			
Volume Left	11	0	42			
Volume Right	100	5	0			
cSH	796	1700	1377			
Volume to Capacity	0.14	0.11	0.03			
Queue Length 95th (m)	3.9	0.0	0.8			
Control Delay (s)	10.3	0.0	1.8			
Lane LOS	B		A			
Approach Delay (s)	10.3	0.0	1.8			
Approach LOS	B					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization		39.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	77	1	1	33	18	1	1	1	56	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	77	1	1	33	18	1	1	1	56	0	25
Pedestrians		48			48			30			8	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		4			4			3			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	59			108			256	200	156	211	192	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59			108			256	200	156	211	192	98
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	92	100	97
cM capacity (veh/h)	1534			1457			616	669	837	684	676	918
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	94	52	3	81								
Volume Left	16	1	1	56								
Volume Right	1	18	1	25								
cSH	1534	1457	695	742								
Volume to Capacity	0.01	0.00	0.00	0.11								
Queue Length 95th (m)	0.3	0.0	0.1	2.9								
Control Delay (s)	1.3	0.1	10.2	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.3	0.1	10.2	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization		32.1%		ICU Level of Service								
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	14	44	35	6	24	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	14	44	35	6	24	44
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	41			110	38	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	41			110	38	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	99			97	96	
cM capacity (veh/h)	1568			879	1034	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	58	41	68			
Volume Left	14	0	24			
Volume Right	0	6	44			
cSH	1568	1700	973			
Volume to Capacity	0.01	0.02	0.07			
Queue Length 95th (m)	0.2	0.0	1.8			
Control Delay (s)	1.8	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	1.8	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization		20.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

5: Dixie Rd & Winding Trail

2017-06-08



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	10	53	17	15	41	92	1378	16	65	2121	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00				1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	0.97				0.97		1.00	1.00	0.91	1.00	1.00	0.90
Flpb, ped/bikes	0.99				0.99		1.00	1.00	1.00	0.99	1.00	1.00
Frt	0.92				0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.99				0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1634				1697		1825	3544	1492	1813	3544	1437
Flt Permitted	0.87				0.85		0.07	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1445				1466		127	3544	1492	341	3544	1437
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	22	10	53	17	15	41	92	1378	16	65	2121	41
RTOR Reduction (vph)	0	11	0	0	36	0	0	0	3	0	0	5
Lane Group Flow (vph)	0	74	0	0	37	0	92	1378	13	65	2121	36
Confl. Peds. (#/hr)	16		16	16		16	20		16	16		20
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	5%	0%	2%	0%	0%	0%	0%	3%	0%	0%	3%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.3				13.3		133.6	133.6	133.6	133.6	133.6	133.6
Effective Green, g (s)	13.3				13.3		133.6	133.6	133.6	133.6	133.6	133.6
Actuated g/C Ratio	0.08				0.08		0.83	0.83	0.83	0.83	0.83	0.83
Clearance Time (s)	7.1				7.1		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0				3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	120			121			106	2959	1245	284	2959	1199
v/s Ratio Prot							0.39					0.60
v/s Ratio Perm	c0.05			0.03			c0.72		0.01	0.19		0.03
v/c Ratio	0.62			0.31			0.87	0.47	0.01	0.23	0.72	0.03
Uniform Delay, d1	70.9			69.0			7.9	3.6	2.2	2.7	5.4	2.2
Progression Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1			1.4			57.0	0.5	0.0	1.9	1.5	0.0
Delay (s)	80.0			70.5			64.9	4.1	2.2	4.6	6.9	2.3
Level of Service	E			E			E	A	A	A	A	A
Approach Delay (s)	80.0			70.5				7.8				6.8
Approach LOS	E			E				A				A

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Golden Orchard Dr & Burnhamtorpe Rd/Burnhamthorpe Rd

2017-06-08

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑	↑	↑	↑	↔	↓
Volume (vph)	21	1129	129	118	1765	18	62	24	57	8	25	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.7	3.7	3.7	3.7
Total Lost time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00				1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	0.98				0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89				0.94
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00				0.99
Satd. Flow (prot)	1785	3579	1494	1760	3579	1496	1780	1645				1724
Flt Permitted	0.08	1.00	1.00	0.21	1.00	1.00	0.72	1.00				0.96
Satd. Flow (perm)	151	3579	1494	397	3579	1496	1348	1645				1668
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	21	1129	129	118	1765	18	62	24	57	8	25	25
RTOR Reduction (vph)	0	0	12	0	0	5	0	44	0	0	7	0
Lane Group Flow (vph)	21	1129	117	118	1765	13	62	37	0	0	51	0
Confl. Peds. (#/hr)	16		10	10		16	2		6	6		2
Confl. Bikes (#/hr)			1			6			1			
Heavy Vehicles (%)	0%	2%	2%	1%	2%	0%	0%	5%	2%	0%	0%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2		2	4			4		
Actuated Green, G (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Effective Green, g (s)	112.5	112.5	112.5	112.5	112.5	112.5	33.0	33.0				33.0
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.21	0.21				0.21
Clearance Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	8.0	8.0				8.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)	106	2516	1050	279	2516	1051	278	339				344
v/s Ratio Prot		0.32			c0.49			0.02				
v/s Ratio Perm	0.14		0.08	0.30		0.01	c0.05					0.03
v/c Ratio	0.20	0.45	0.11	0.42	0.70	0.01	0.22	0.11				0.15
Uniform Delay, d1	8.2	10.3	7.6	10.0	13.9	7.1	52.8	51.6				52.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				1.00
Incremental Delay, d2	4.1	0.6	0.2	4.6	1.7	0.0	0.4	0.1				0.2
Delay (s)	12.3	10.9	7.9	14.7	15.6	7.1	53.2	51.7				52.2
Level of Service	B	B	A	B	B	A	D	D				D
Approach Delay (s)		10.6			15.4			52.4				52.2
Approach LOS		B			B			D				D
Intersection Summary												
HCM 2000 Control Delay		15.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		160.0			Sum of lost time (s)			14.5				
Intersection Capacity Utilization		98.0%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

11: Silver Spear Rd & Golden Orchard Dr

2017-06-08



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	3	67	103	2	117	177
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	3	67	103	2	117	177
Pedestrians	3					4
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					0
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						42
pX, platoon unblocked	0.98					
vC, conflicting volume	518	111			108	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	500	111			108	
tC, single (s)	6.4	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.2	
p0 queue free %	99	93			92	
cM capacity (veh/h)	482	923			1491	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	70	105	294			
Volume Left	3	0	117			
Volume Right	67	2	0			
cSH	888	1700	1491			
Volume to Capacity	0.08	0.06	0.08			
Queue Length 95th (m)	2.0	0.0	2.0			
Control Delay (s)	9.4	0.0	3.4			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	3.4			
Approach LOS	A					
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization		34.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis
13: Residential Driveway/Silver Spear Rd & Winding Trail

2017-06-08

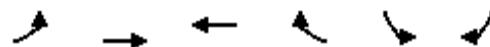


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	34	0	1	65	79	0	0	1	34	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	34	0	1	65	79	0	0	1	34	0	19
Pedestrians		5			11			20			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			1			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					98							
pX, platoon unblocked												
vC, conflicting volume	148			54			202	222	65	174	182	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148			54			202	222	65	174	182	114
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	98
cM capacity (veh/h)	1441			1537			714	662	978	765	696	937
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	43	145	1	53								
Volume Left	9	1	0	34								
Volume Right	0	79	1	19								
cSH	1441	1537	978	819								
Volume to Capacity	0.01	0.00	0.00	0.06								
Queue Length 95th (m)	0.2	0.0	0.0	1.7								
Control Delay (s)	1.6	0.1	8.7	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.6	0.1	8.7	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization		27.9%		ICU Level of Service					A			
Analysis Period (min)		15										

HCM Unsignalized Intersection Capacity Analysis

16: Silver Spear Rd & Site Access

2017-06-08



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	58	84	72	37	24	25
Sign Control	Free	Free			Stop	
Grade	0%	0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	58	84	72	37	24	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None	None				
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	109			290	90	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109			290	90	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	96			96	97	
cM capacity (veh/h)	1481			673	967	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	142	109	49			
Volume Left	58	0	24			
Volume Right	0	37	25			
cSH	1481	1700	796			
Volume to Capacity	0.04	0.06	0.06			
Queue Length 95th (m)	1.0	0.0	1.6			
Control Delay (s)	3.3	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	3.3	0.0	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization		24.3%		ICU Level of Service		A
Analysis Period (min)		15				

Appendix G - Transit

5 Dixie

Monday-Sunday Service

Effective: January 4, 2016



Legend

	TTC Subway Station		Major Transit Terminal		Shopping Centre		Public Library
	GO Train Station		Hospital		High School, University or College		Living Arts Centre
	Transitway Station		Ice Rink		Recreation or Community Centre		Civic Centre (City Hall)



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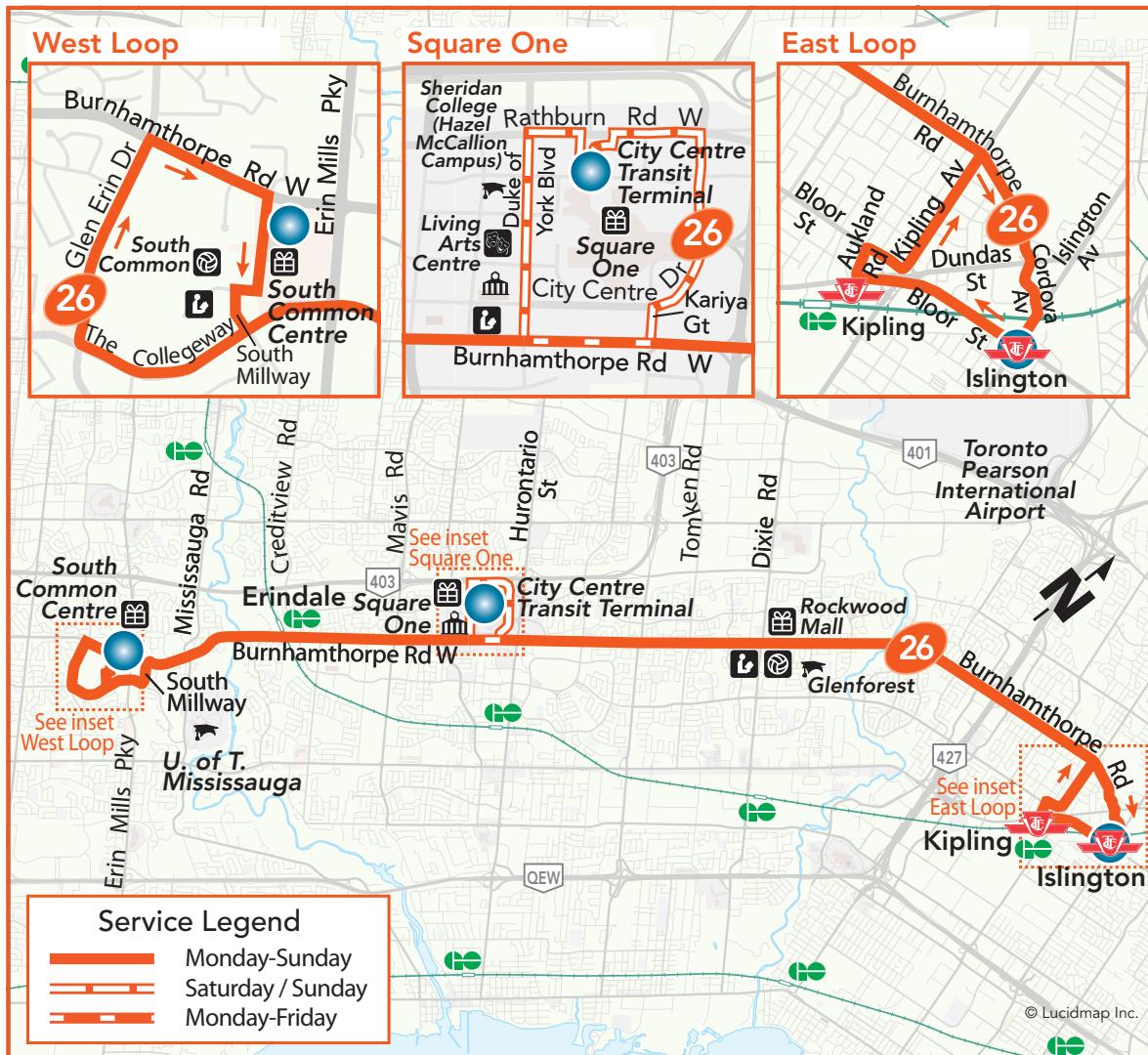


MISSISSAUGA

26 Burnhamthorpe

Monday-Sunday Service

Effective: September 5, 2016



Legend

	TTC Subway Station		Major Transit Terminal		Shopping Centre		Public Library
	GO Train Station		Hospital		High School, University or College		Living Arts Centre
	Transitway Station		Ice Rink		Recreation or Community Centre		Civic Centre (City Hall)



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76 City Centre-Subway

Monday-Friday Service

Effective: September 5, 2016



Legend

	TTC Subway Station		Major Transit Terminal		Shopping Centre		Public Library
	GO Train Station		Hospital		High School, University or College		Living Arts Centre
	Transitway Station		Ice Rink		Recreation or Community Centre		Civic Centre (City Hall)



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