8885 Lundy's Lane
Niagara Falls
Transportation Impact Study

Paradigm Transportation Solutions Limited

August 2023

Project Summary

Project Number
220571

August 2023

Client
Linda Ford
M5V Developments
501 Queen Street West,
Toronto, Ontario, M5V 2B4,

Consultant Project Team
Stew Elkins, B.E.S., MITE
Adam J. Makarewicz, C.E.T., MITE
Erica Bayley, P.Eng.

8885 Lundy's Lane
Niagara Falls
Transportation Impact Study

Erica Bayley, P.Eng.

Disclaimer

Paradigm Transportation Solutions Limited
5A-105 Pinebush Road
Cambridge ON N1R 8J8
p: 905.381.2229
www.ptsl.com

Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) for a residential development located on the northeast corner of Lundy's Lane and Garner Road in the City of Niagara Falls, Ontario.

This study aims to determine the impacts of the development traffic on the surrounding road network and identify any improvements necessary to accommodate this traffic.

Conclusions

This study evaluated the impacts of background traffic growth and the proposed development of 184 residential units and 15,709 square feet of commercial space. Full build-out is expected at or before 2025 for this report.

A new driveway connection proposes access to the Development through Garner Road. The connection is located at the northern terminus of the property. The proposed new Site Driveway will be designed with adequate width to provide for reasonable entry and exit from the development and accommodate emergency response vehicles; the proposed locations afford safe sight lines for all turning movements and approaches.

The development is projected to generate approximately 106-176 new vehicle trips during the weekday AM and PM peak hours.

Detailed traffic analysis was conducted for each study area intersection under existing traffic conditions and 2025 and 2030 background and total traffic conditions. Based on traffic data and analyses completed, the study area's intersections presently operate at a level of service (LOS) C or better during the weekday peak hours. LOS D or better is generally considered a well-functioning intersection in urban environments. With additional trips generated by the development, the impact on the study area's intersections is expected to be minimal as the intersections are forecast to continue to operate at LOS D or better.

The exception is the westbound left turn movement at the intersection of Lundy's Lane and Kalar Road. Increased delay is projected during the weekday PM peak hour under the 2030 Background and Total horizon caused by increased opposing volumes. However, it is recognized that the left-turn volume will not build a significant queue that would require a storage extension.

The analysis has further determined that an auxiliary left turn lane is not warranted under 2030 Total Horizon along Garner Road at the Site Driveway.

Additionally, an auxiliary right turn lane is not recommended as it would offer no tangible benefits in traffic operations.

Overall, the study finds that development-generated traffic should not significantly impact traffic operations within the study area and that the existing transportation infrastructure in the area can adequately accommodate the traffic volumes projected to be generated by the proposed development.

Recommendations

Based on the findings of this study, it is recommended that:

- That the Region and City monitor the future traffic volumes at the intersection of Lundy's Lane with Garner Road and Kalar Road and adjust signal timings as needed to correspond to changing traffic volumes; and
- The development implements a Transportation Demand Management program that will include the following at a minimum:
  - Transportation Information Package
  - Unbundled Parking
  - Bicycle Parking supply

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) for a residential development located on the northeast corner of Lundy's Lane and Garner Road in the City of Niagara Falls, Ontario.

Figure 1.1 illustrates the location of the subject site.

1.2 Purpose and Scope

This study aims to determine the impacts of the development traffic on the surrounding road network and identify any improvements necessary to accommodate the increase in traffic generated by this development. The scope of this study is to:

- Forecast traffic from the proposed development utilizing trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation and assignment to the surrounding road network;
- Assess the impact of existing and future traffic conditions with and without the proposed Development (2025 and 2030); and
- Recommend any improvements required to alleviate any operational or safety concerns (if required).

1.3 Study Area

Based on a review of the proposed development's anticipated trip generation and trip distribution, a study area was established through consultation with the Region of Niagara and the Town of Niagara-on-the-Lake. The project study area includes the following intersections:

- Garner Road at Lundy's Lane (signalized);
- Garner Road at Kalar Road (signalized);
- Garner Road at Beaverdams Road (unsignalized); and

Appendix A contains the pre-study consultation material with the Region of Niagara and the City of Niagara Falls.

paradigm TRANSPORTATION SOLUTIONS LIMITED

Subject Site Location

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 1.1

2 Existing Conditions

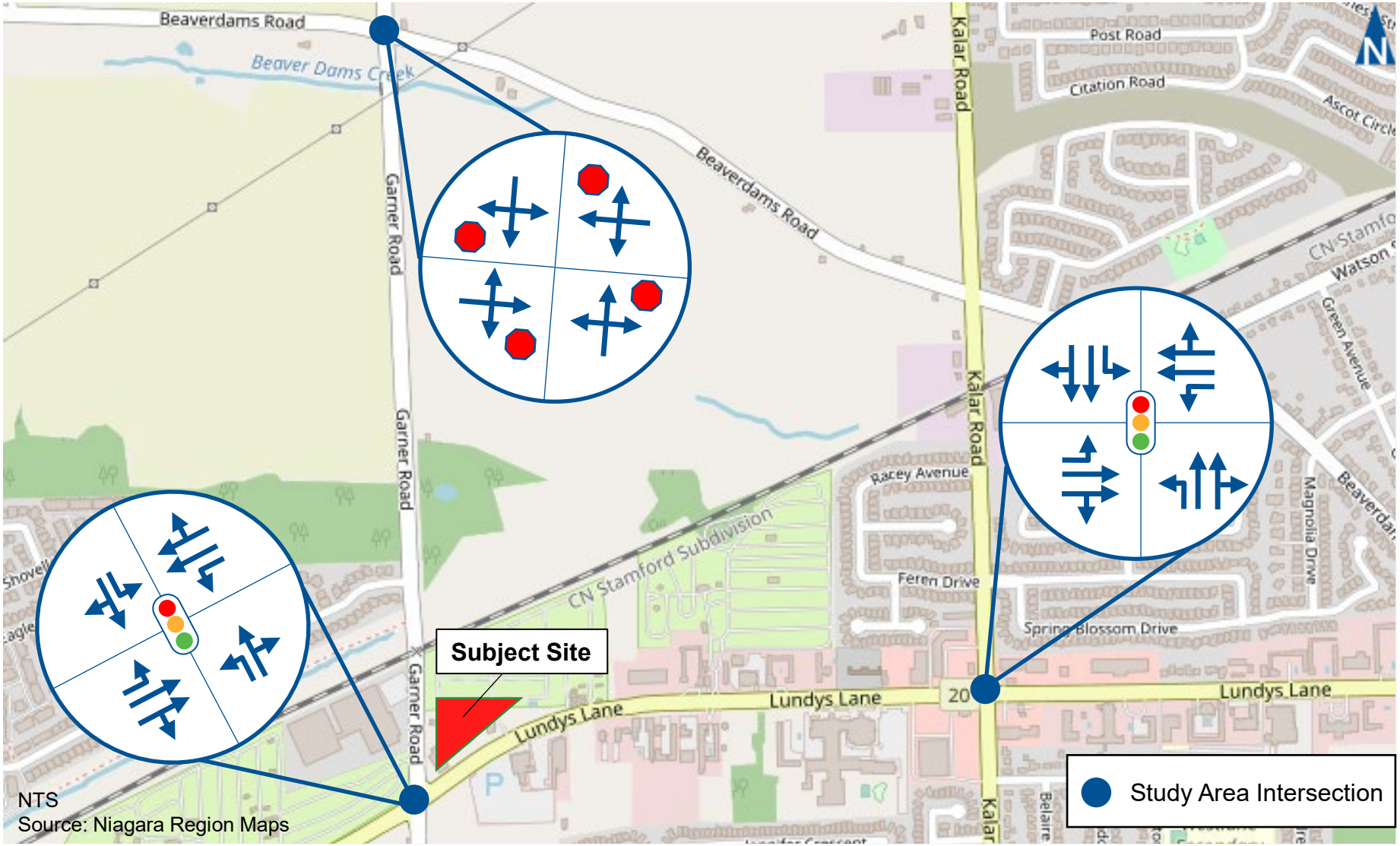
The existing conditions evaluation consisted of an inventory of the traffic control, roadway and intersection geometry in the study area and the collection of peak period traffic volumes.

2.1 Roadway Characteristics

The main roadways near the subject site considered in assessing the traffic impacts of the development include:

- **Garner Road** is a north-south arterial road under the City of Niagara Falls jurisdiction. The road has two travel lanes with variable shoulder widths through a rural cross-section south of Lundy's Lane. North of Lundy's Lane, an urban cross-section is provided with a sidewalk on the west side of the road. The posted speed limit on Garner Road is 60 km/h.
- **Regional Road 20 (Lundy's Lane)** is an east-west regional arterial roadway[1]. The road has a four-lane cross-section east and a two-lane cross-section west of Garner Road. Sidewalks are provided on both sides of the road, east of Garner Road. The posted speed limit is 60 km/h.
- **Kalar Road** is a two-lane arterial road running north-south under the City of Niagara Falls jurisdiction. The road has a four-lane cross-section south and a two-lane cross-section north of Lundy's Lane. The posted speed limit on Kalar Road is 50 km/h. It is understood that the City of Niagara Falls is planning to upgrade Kalar Road to a four-lane urban cross-section with on-street cycling lanes from Lundy's Lane to Beaverdam Road. These improvements are currently being designed and are waiting for Council approval of the construction costs.
- **Beaverdams Road** is an east-west arterial roadway under the City of Niagara Falls jurisdiction. The road has a two-lane cross-section with variable shoulder widths through a rural cross-section. East of Kalar Road, a sidewalk is provided on the north side. The posted speed limit on Beaverdams Road is 60 km/h

Figure 2.1 illustrates the lane configurations and traffic control at the study area intersections.



Existing Lane Configuration & Traffic Control

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 2.1

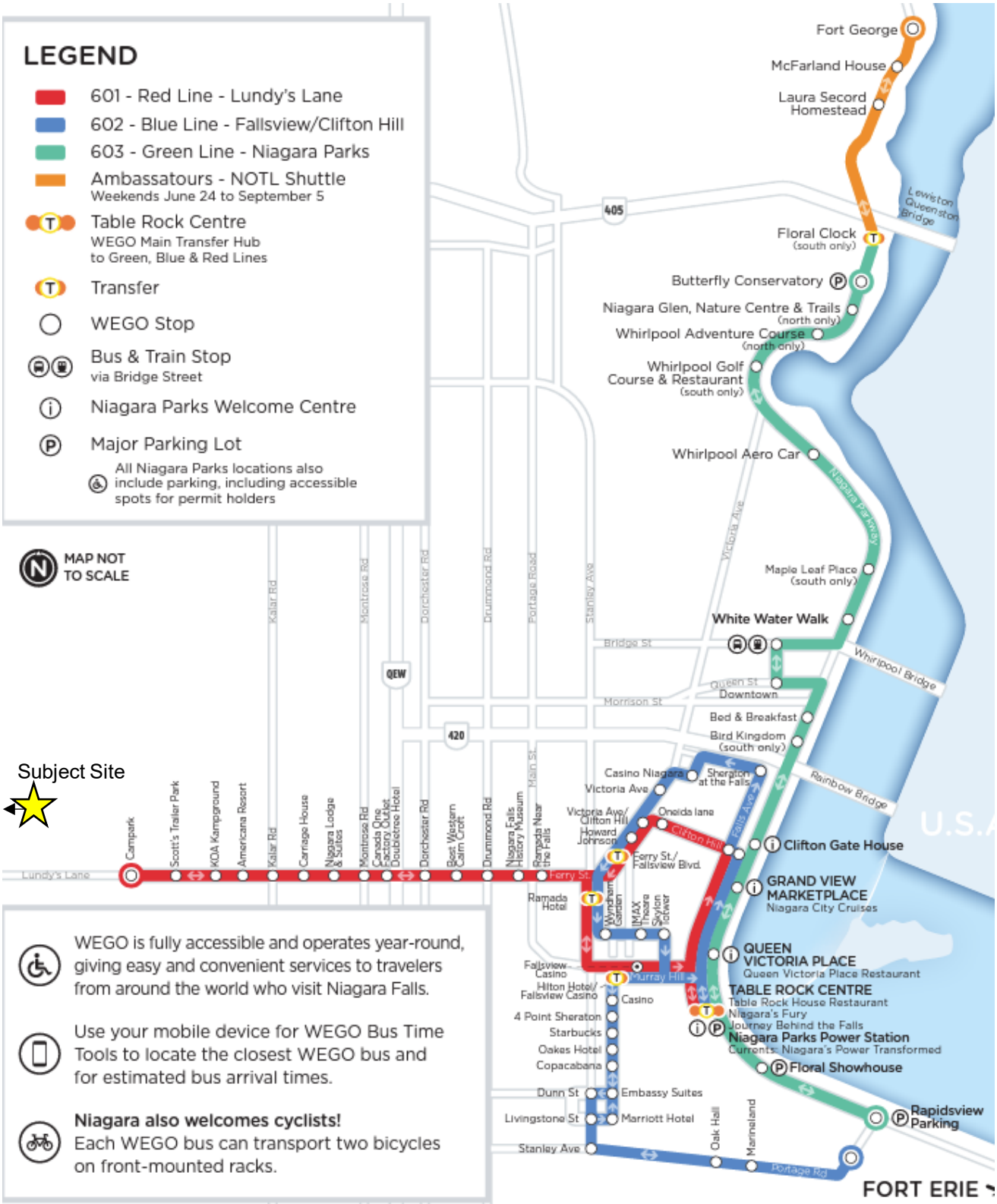
2.2 Transit Network

Transit service in Niagara Falls is provided by two operators: Niagara Falls Transit (NFT) and Niagara Region Transit (NRT). NFT operates local transit routes within the city, while NRT provides regional service between various municipalities. NRT does not currently operate any routes within the study area. NFT operates the following routes, which provide connections with proximity to the subject site are as follows:

- **WEGO Red Line** operates along Lundy's Lane/Ferry Street to the Table Rock Welcome Centre. Headways range between 30 to 60 minutes. Service is provided seven days a week from approximately 6:00 AM to 10:00 PM Sunday to Thursday and 6:00 AM to 12:30 AM Friday and Saturday.

Figure 2.2 illustrates the existing public transit network within the study area. The closest bus stops are approximately 150 metres east of Garner Road.

.



paradigm TRANSPORTATION SOLUTIONS LIMITED

Transit Network

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 2.2

2.3 Pedestrian and Cycling Environment

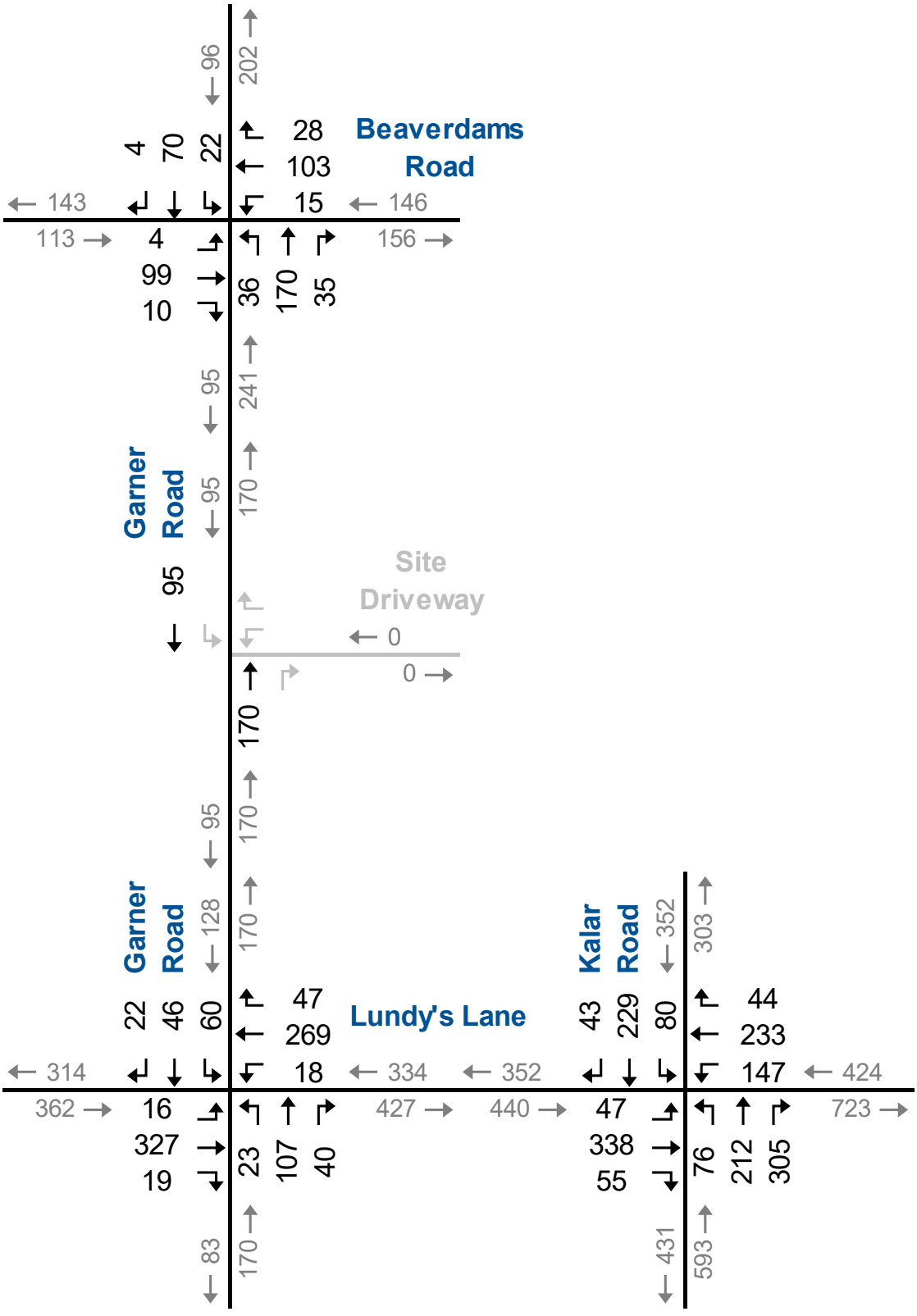
Pedestrian infrastructure typically consists of sidewalks or multi-use paths parallel to the roadway. Cycling infrastructure typically consists of on-street and off-street facilities. On-street facilities comprise cycling lanes, signed cycling routes, and paved shoulders. Off-street facilities are in the form of multi-use or informal trails.

Pedestrian infrastructure within the study area consists of sidewalks on both sides of Lundy's Lane (east of Garner Road) and a pedestrian sidewalk on the west side of Garner Road (north of Lundy's Lane). There are no cycling facilities within the study area.

2.4 Traffic Volumes

Turning Movement Counts (TMC) are used to assess intersection operations and quantify vehicle movement. The traffic counts are usually collected during peak periods at an intersection to complete the level of service analysis. Existing traffic counts at an intersection or road section form the foundation for analysis.

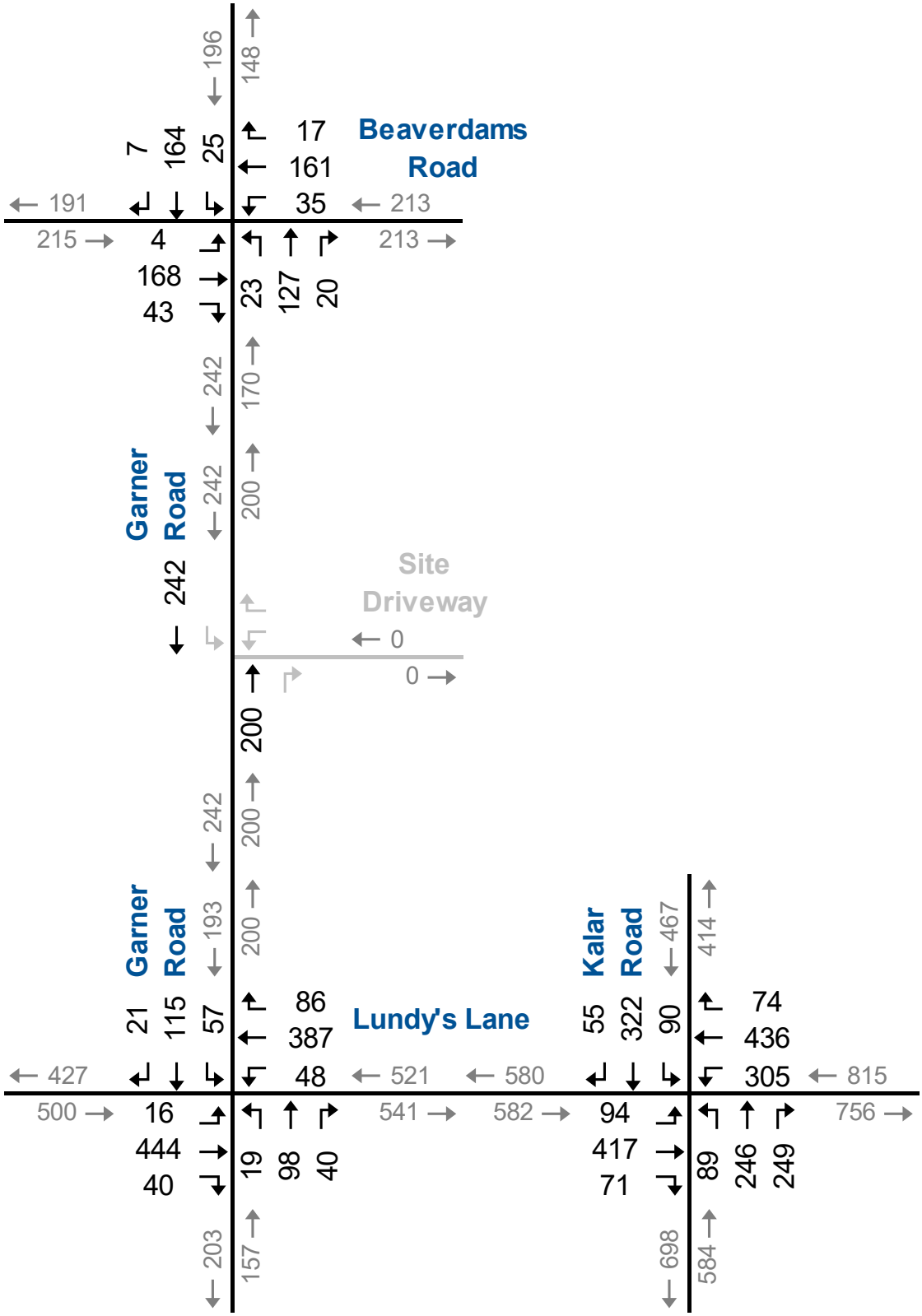
Paradigm completed traffic counts in October 2022 at the study area intersections. **Figure 2.2** illustrates the existing peak-hour traffic. **Appendix B** contains the turning movement data.



Existing Traffic Volumes AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 2.3A



Existing Traffic Volumes AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 2.3B

3 Development Concept

3.1 Development Description

The proposed development is located on a 0.95-hectare parcel of land within the northeast corner of Lundy's Lane and Garner Road. The preliminary concept plan indicates that the development will comprise 184 residential units and 15,709 square feet of commercial space. Full build-out is expected at or before 2025.

A driveway connection is proposed to Garner Road, located approximately 120 metres north of the Lundy's Lane and Garner Road intersection (centreline to centreline)

Figure 3.1 illustrates the conceptual site plan of the development.

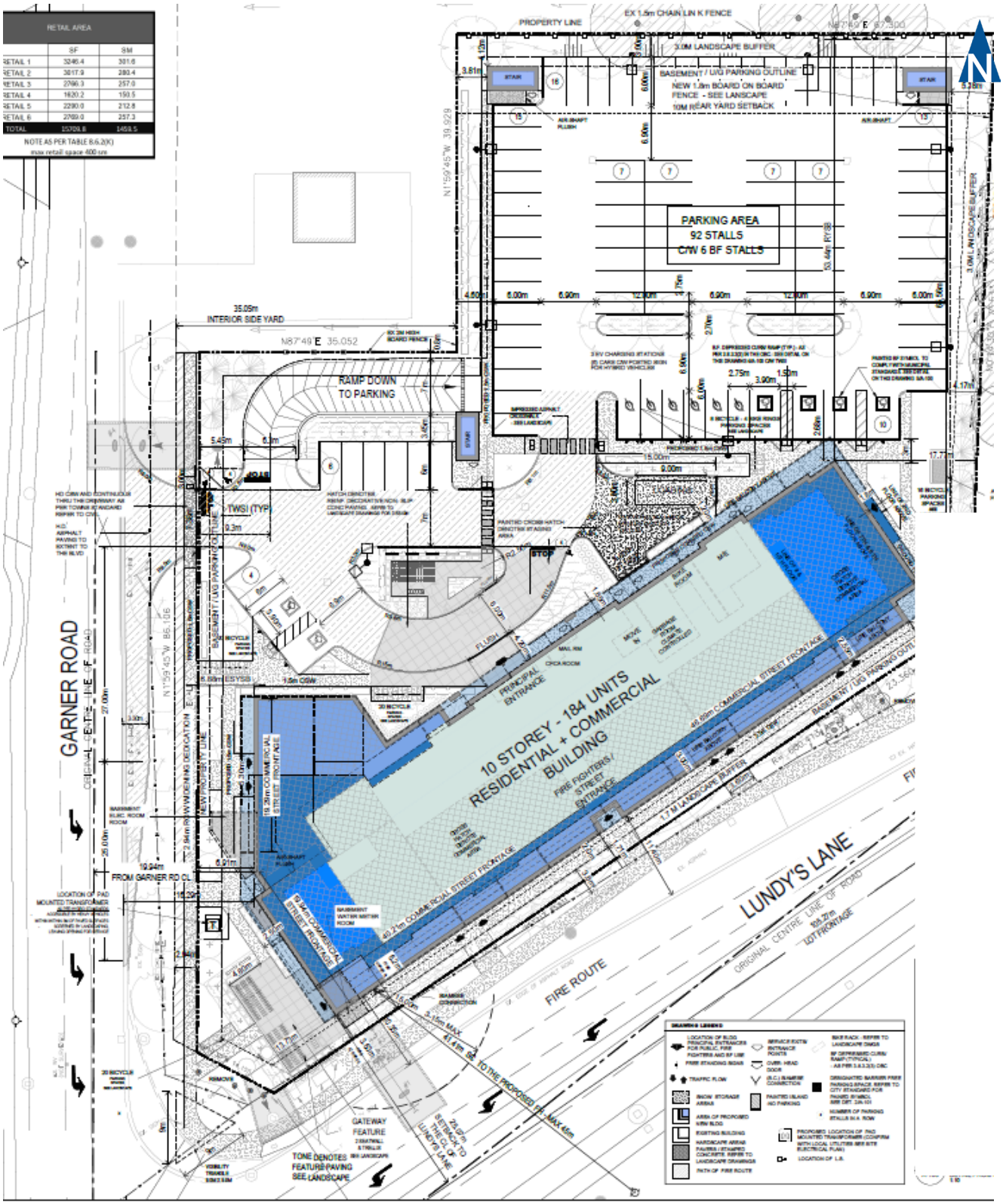
3.2 Access and Circulation Review

A swept path analysis was conducted for the proposed internal driveway network.

The vehicle movements were examined using a CAD base file of the development plan dated 27 June 2023. The swept path analysis examined the on-site maneuverability of typical design vehicles expected to utilize the site: Heavy Single Unit (HSU), Fire Truck, Medium Single Unit (MSU) and Garbage Truck.

Appendix C provides the vehicle manoeuvring analysis, as well as the profile and dimensions of the design vehicles.

The AutoTURN analyses indicate that the large design vehicles do not have any difficulty entering the development through the proposed driveway connection to Garner Road or circumnavigating the internal roadway. The AutoTURN swept path analysis confirms the design vehicles will function adequately.



paradigm TRANSPORTATION SOLUTIONS LIMITED

Concept Plan

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 3.1

3.3 Development Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual[1] was used to estimate the peak-hour traffic volumes this development will generate. Land Use Codes LUC 221 (Multi-Family Housing Mid-Rise) and LUC 822 (Strip Retail <40k) were utilized. The estimated total trip generation is displayed in **Table 3.1,** which indicates 106-176 trips are forecast to be generated during the weekday AM and PM peak hours, respectively.

TABLE 3.1: TRIP GENERATION

Land Use Code	GFA (sq. ft.)	Units	Trips	AM Peak Hour				PM Peak Hour			
				Rate	In	Out	Total	Rate	In	Out	Total
221 - Multi-Family Housing Mid Rise (Units)	-	184	Total	Eqn.[a]	16	53	**69**	Eqn.[b]	44	28	**72**
822 - Strip Retial (<40k) (GFA)	15,709	-	Total	2.36	22	15	**37**	6.59	52	52	**104**
Total Trip Generation			**Total**		**38**	**68**	**106**		**96**	**80**	**176**

[a] T = 0.44(X) - 11.61

[b] T = 0.39(X) + 0.34

3.4 Development Trip Distribution and Assignment

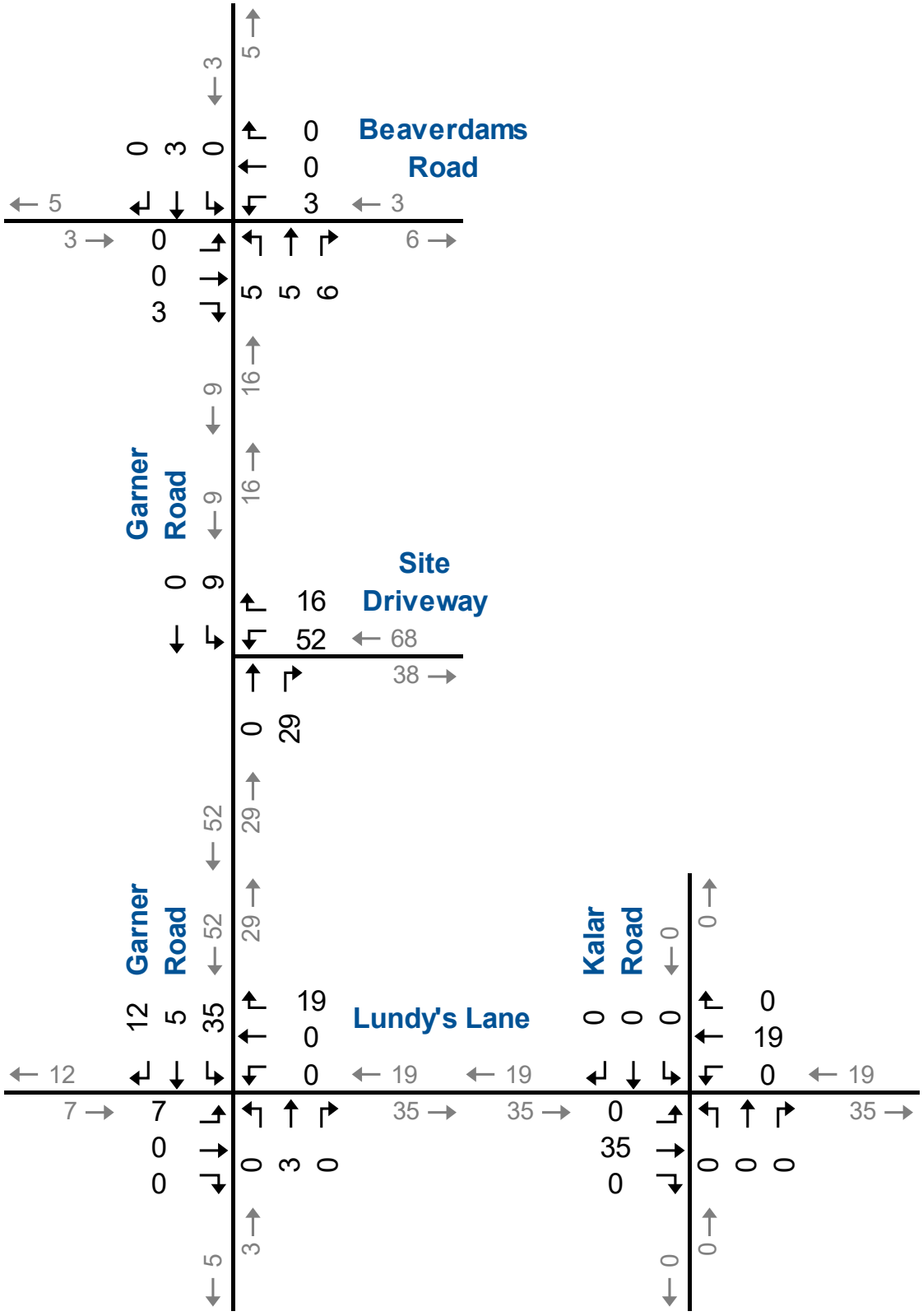
The trip distribution for the site was developed based on the existing link volumes at the external limits of the study area. **Table 3.2** summarizes the estimated trip distribution for the development.

TABLE 3.2: TRIP DISTRIBUTION

Direction (To/From)	Travel Route	%
North	Garner Road	9%
South	Garner Road	9%
East	Beaverdams Road	10%
	Lundy's Lane	39%
West	Lundy's Lane	23%
	Beaverdams Road	10%
	Total	**100%**

The site traffic was assigned to the adjacent road network using trip generation and distribution. **Figure 3.2** illustrates the weekday AM and PM peak hour vehicle trips estimated to be generated by the subject site.

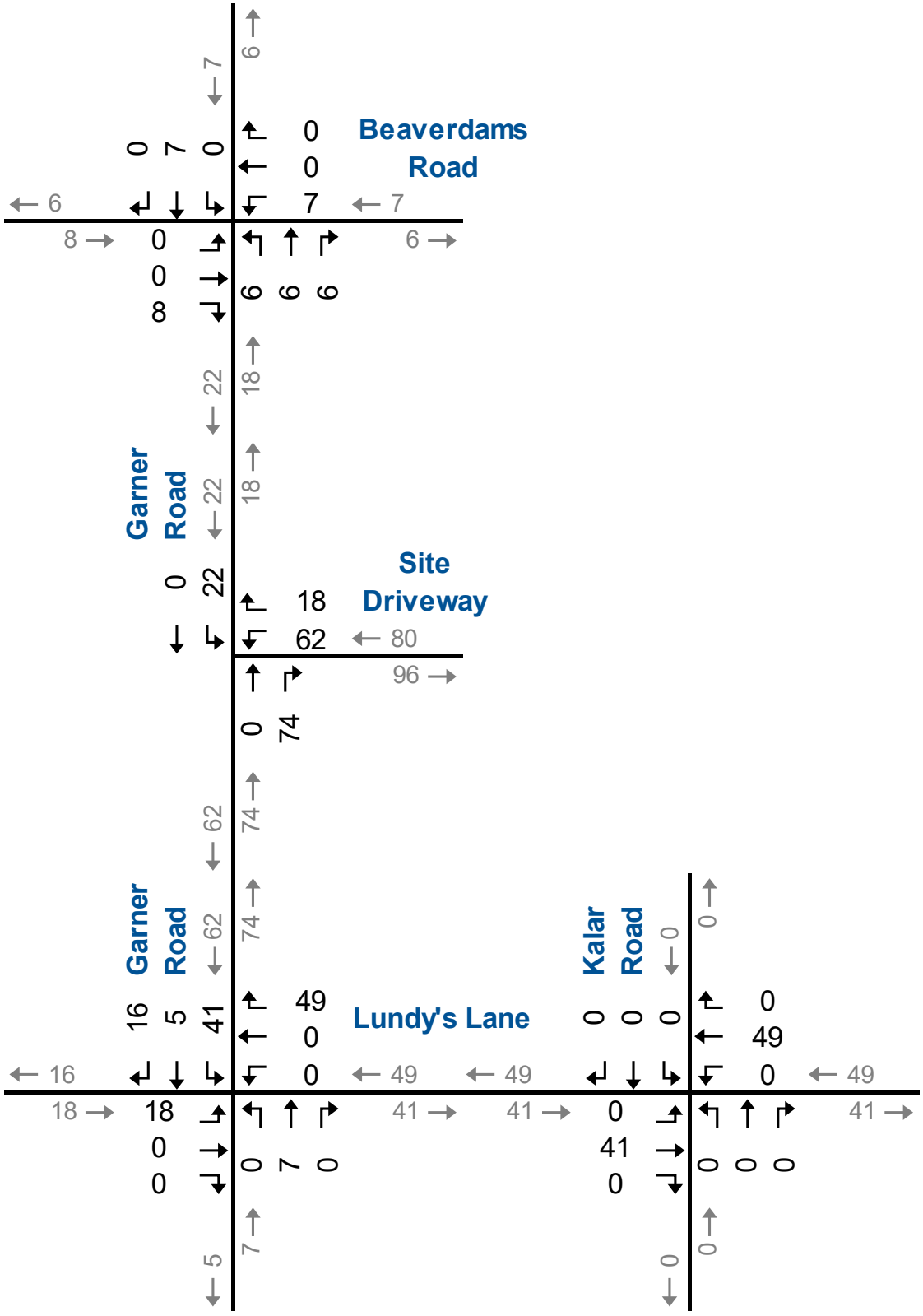
[1] Trip Generation Manual 11th Edition Institute of Transportation Engineers Washington DC



Site-Generated Traffic AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 3.2A



Site-Generated Traffic
PM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 3.2B

4 Evaluation of Future Traffic Conditions

The assessment of the future conditions in this section includes the following components necessary to assess the traffic implications on the adjacent road network:

- Future background traffic estimates;
- Level of service analysis for background traffic (pre-development);
- Future total traffic estimates; and
- Level of service analysis for total traffic (post-development).

4.1 Traffic Forecasts

To be consistent with the Region's Traffic Impact Study Guidelines and the pre-study consultation, the build-out year and five years after build-out have been used for forecasting and analysis.

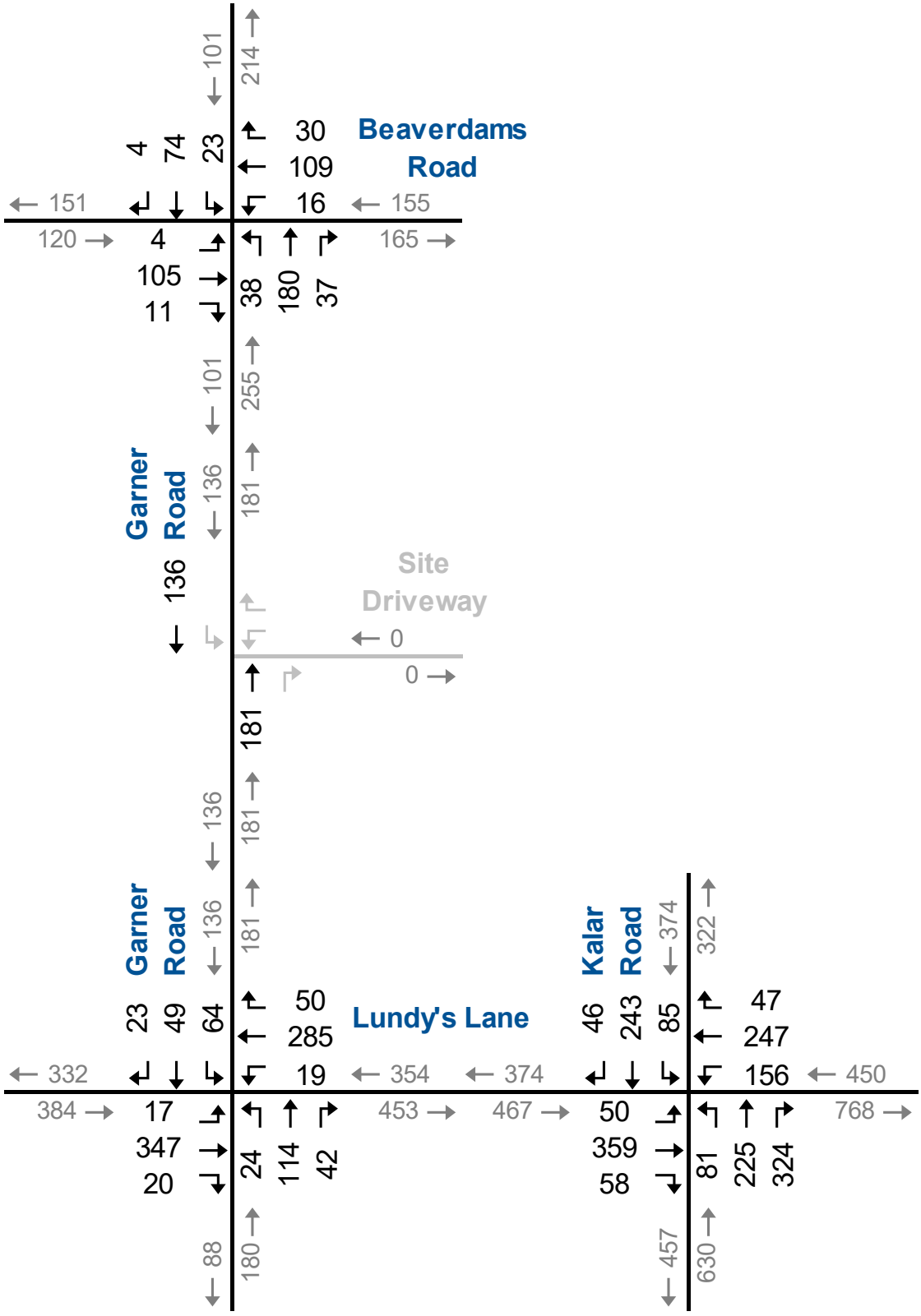
The future background traffic volumes have been estimated by applying a growth rate of 2.0% compounded per annum to the existing traffic volumes. The Town provided this growth rate during the pre-study consultation.

4.1.1 Background Projections

The weekday AM and PM peak hour background traffic volumes for the 2025 and 2030 horizon are illustrated in **Figures 4.1 and 4.2.**

4.1.2 Total Projections

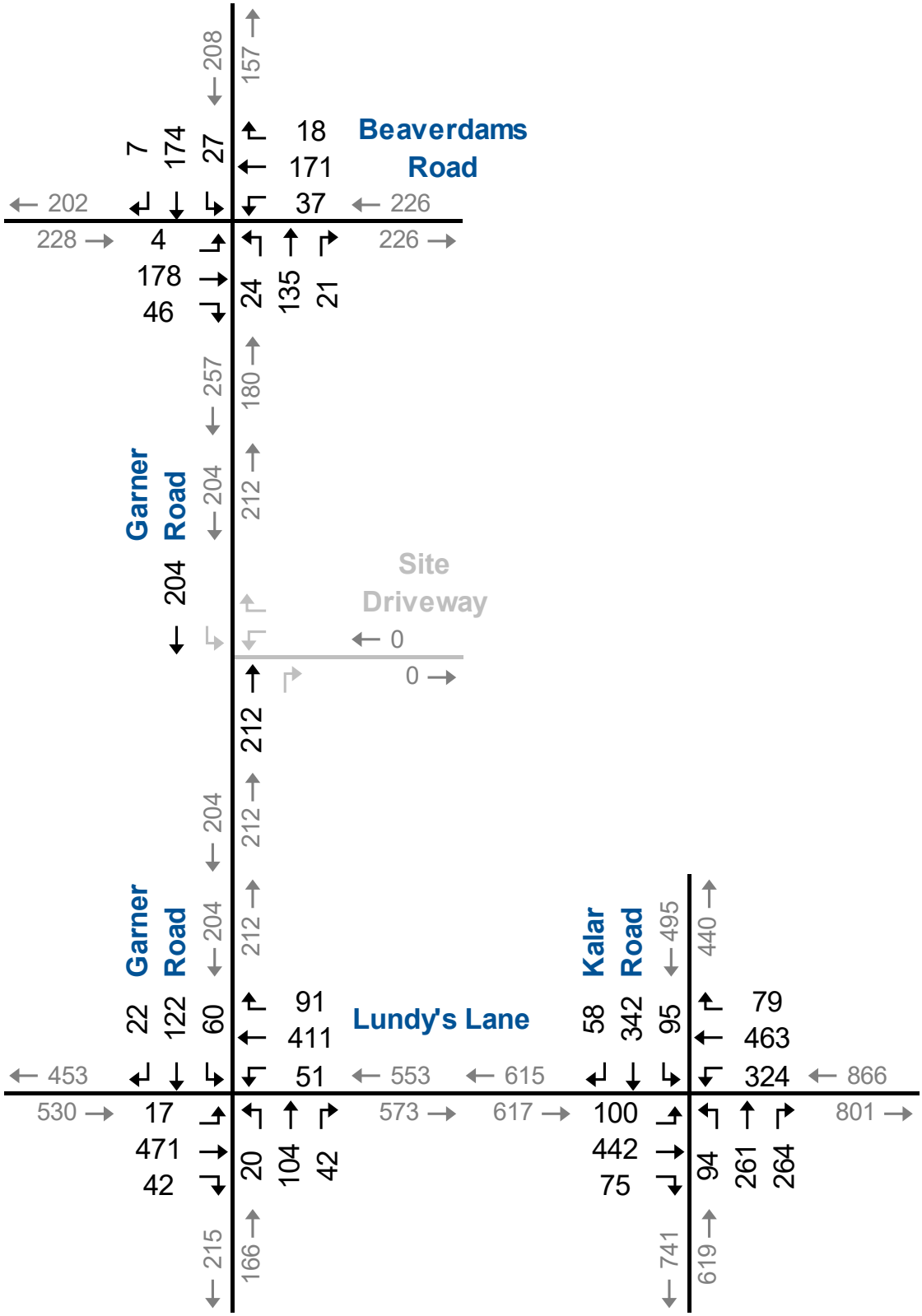
The projected site-generated traffic volumes were added to the Background projections to develop the Total traffic volumes. The weekday AM and PM peak hour Total traffic volumes for the 2025 and 2030 horizon are illustrated in **Figures 4.3 and 4.4**.



2025 Background AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

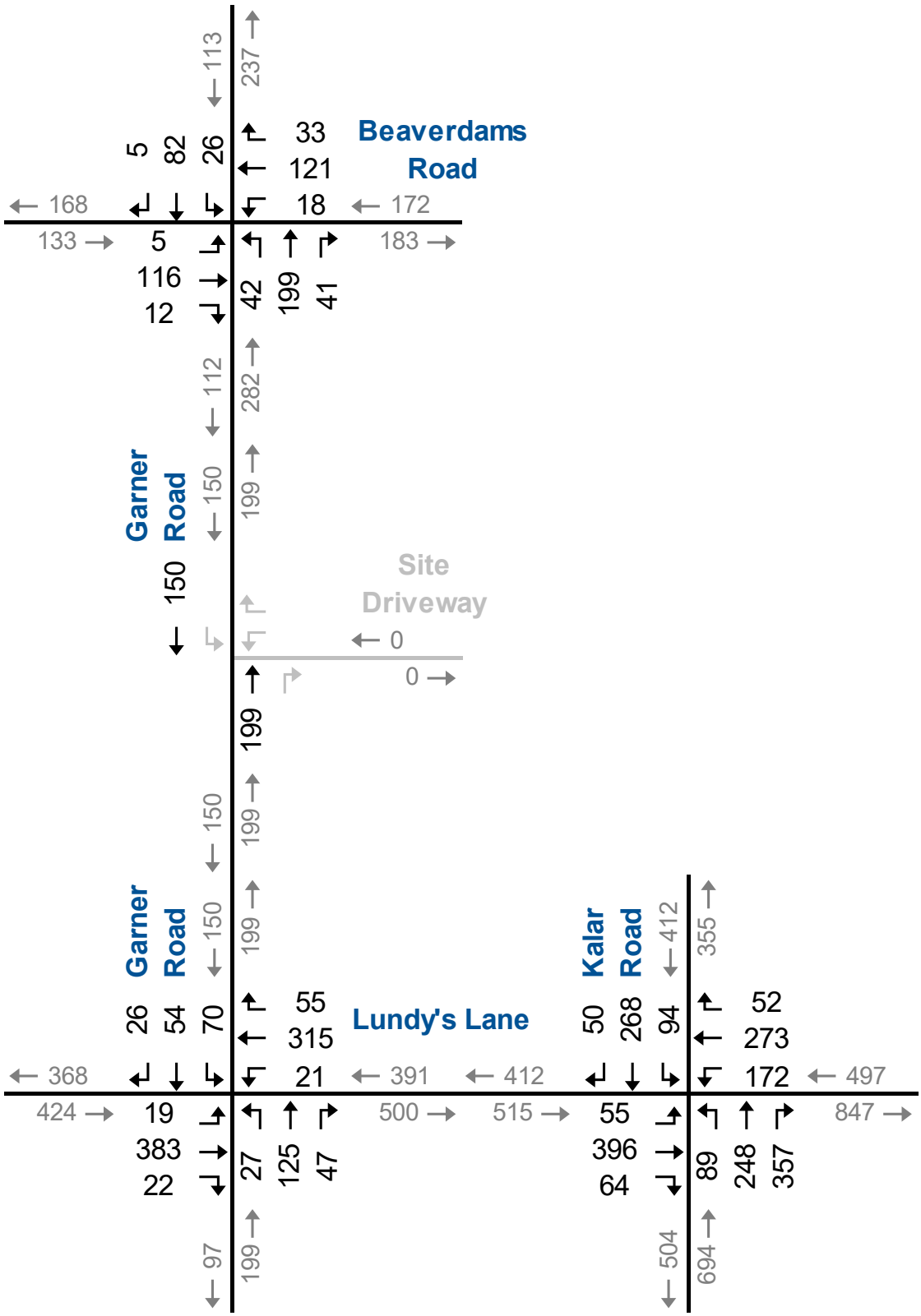
Figure 4.1A



2025 Background PM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

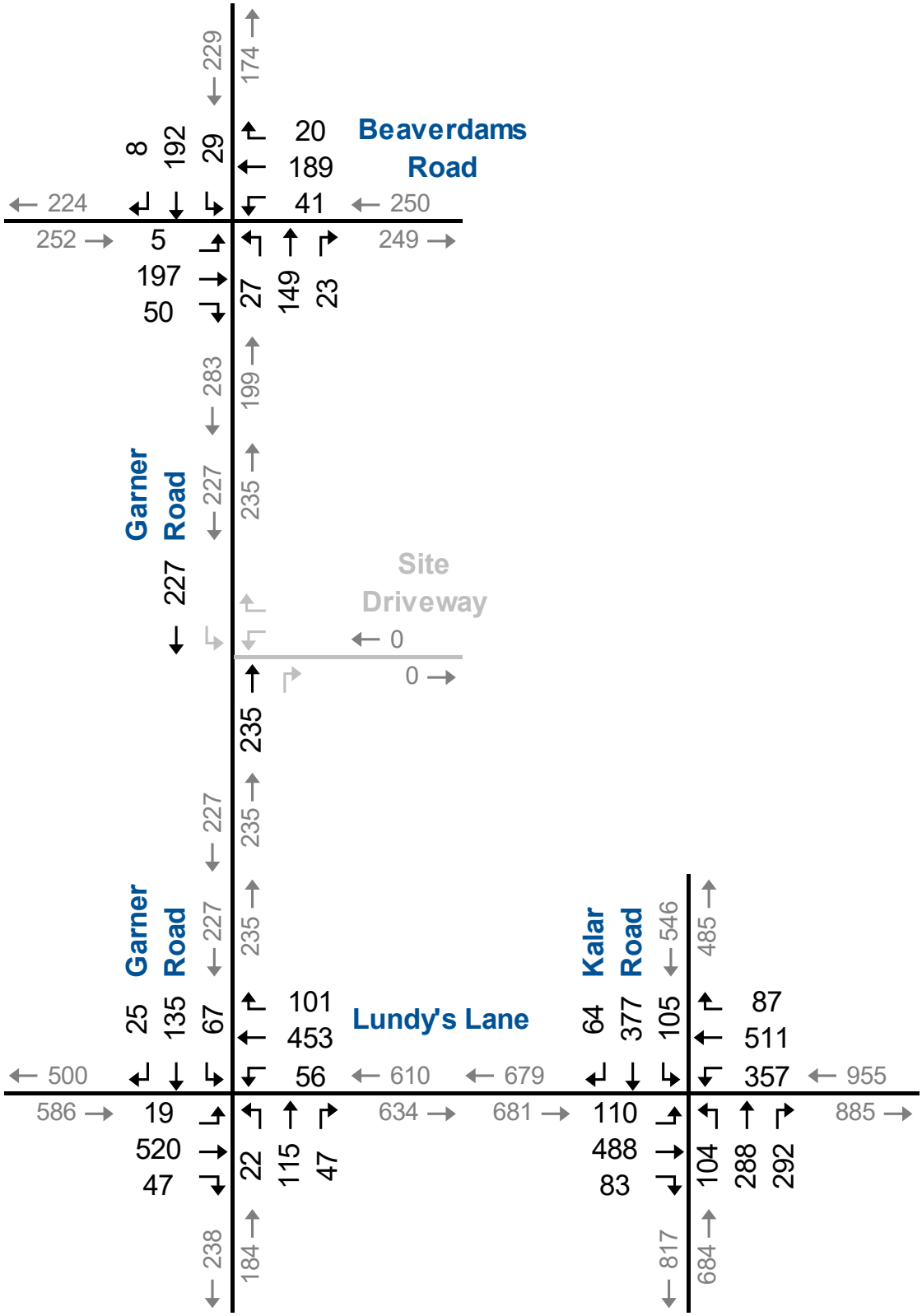
Figure 4.1B



2030 Background AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 4.2A

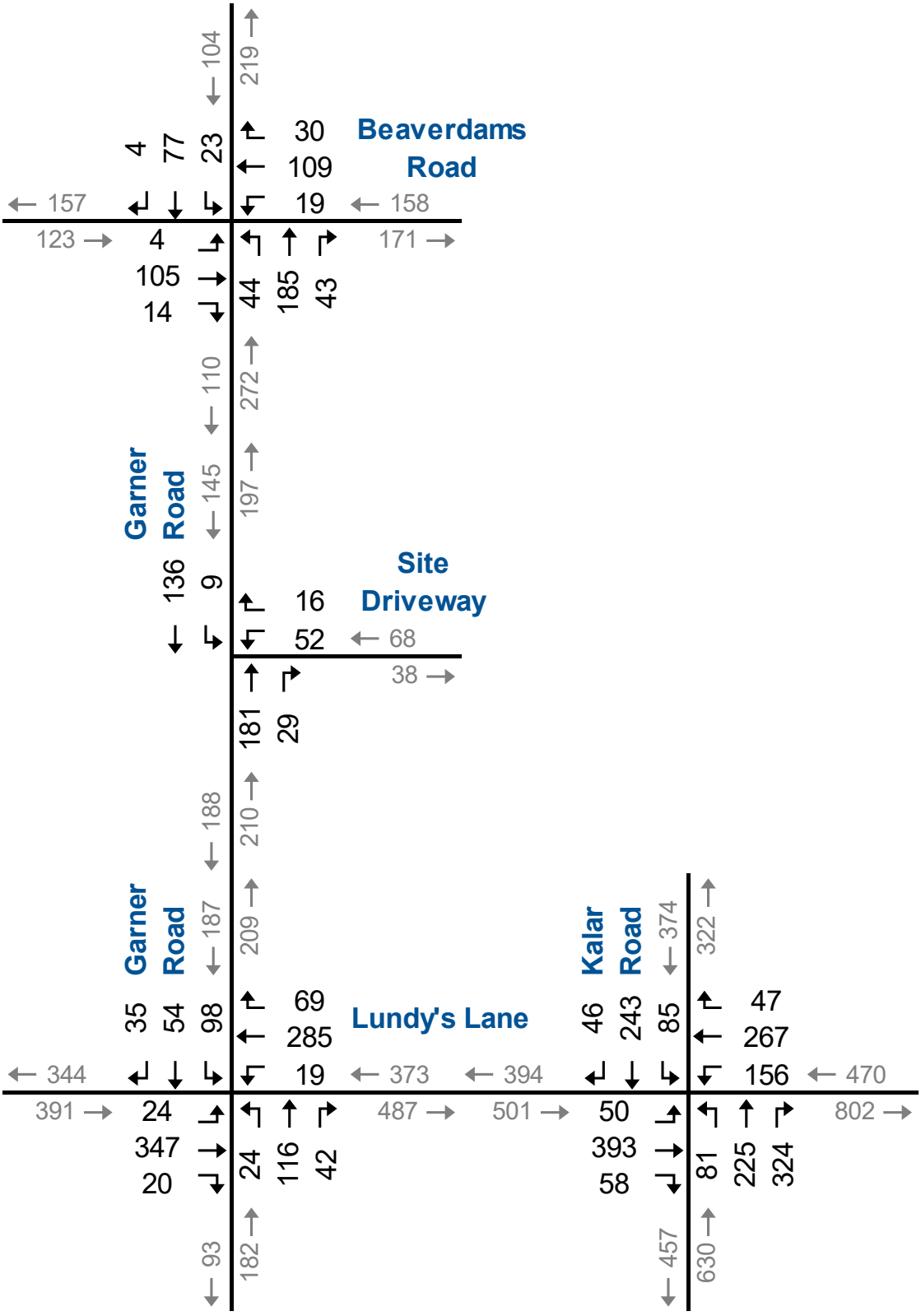


paradigm TRANSPORTATION SOLUTIONS LIMITED

2030 Background PM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

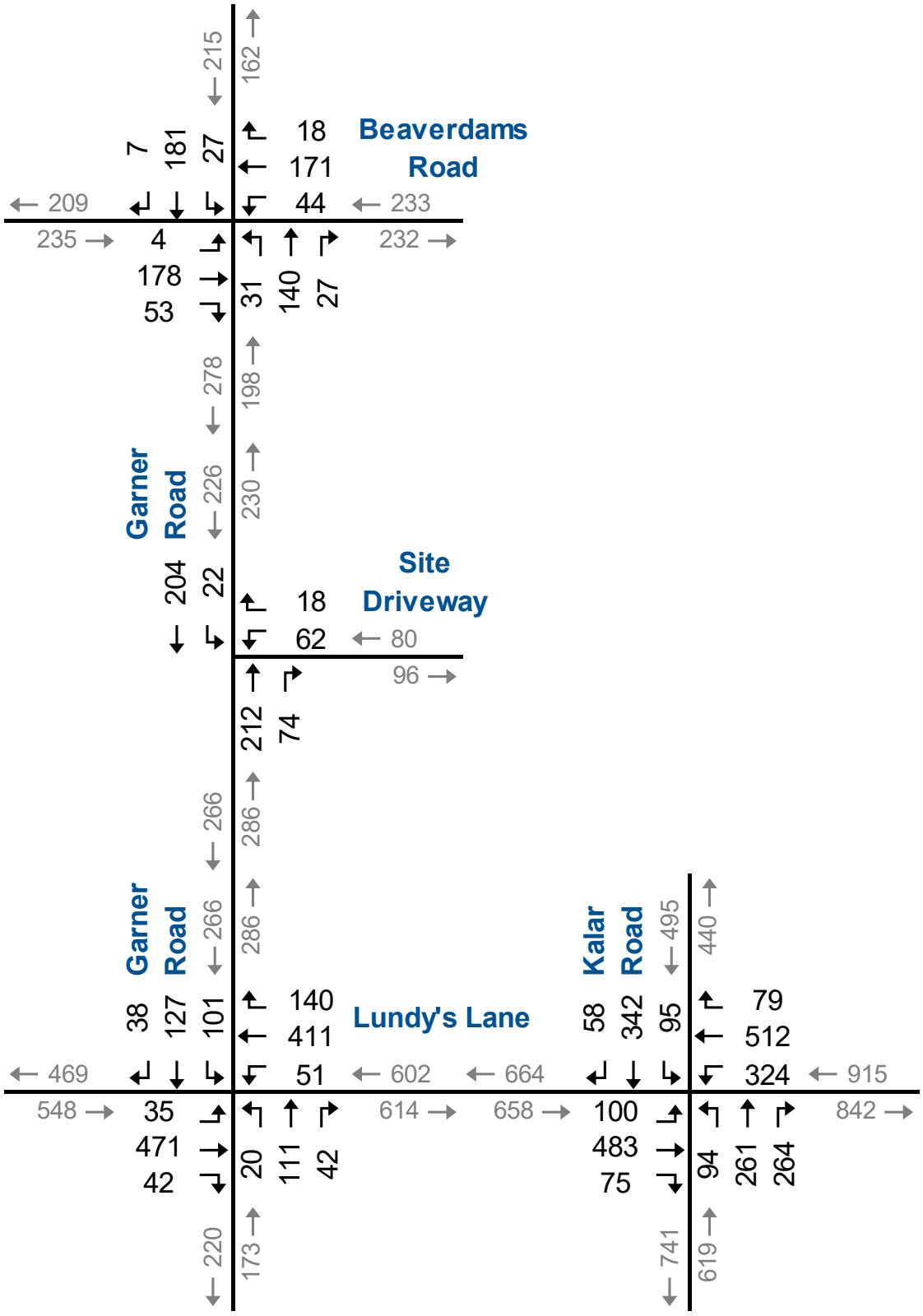
Figure 4.2B



2025 Total AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

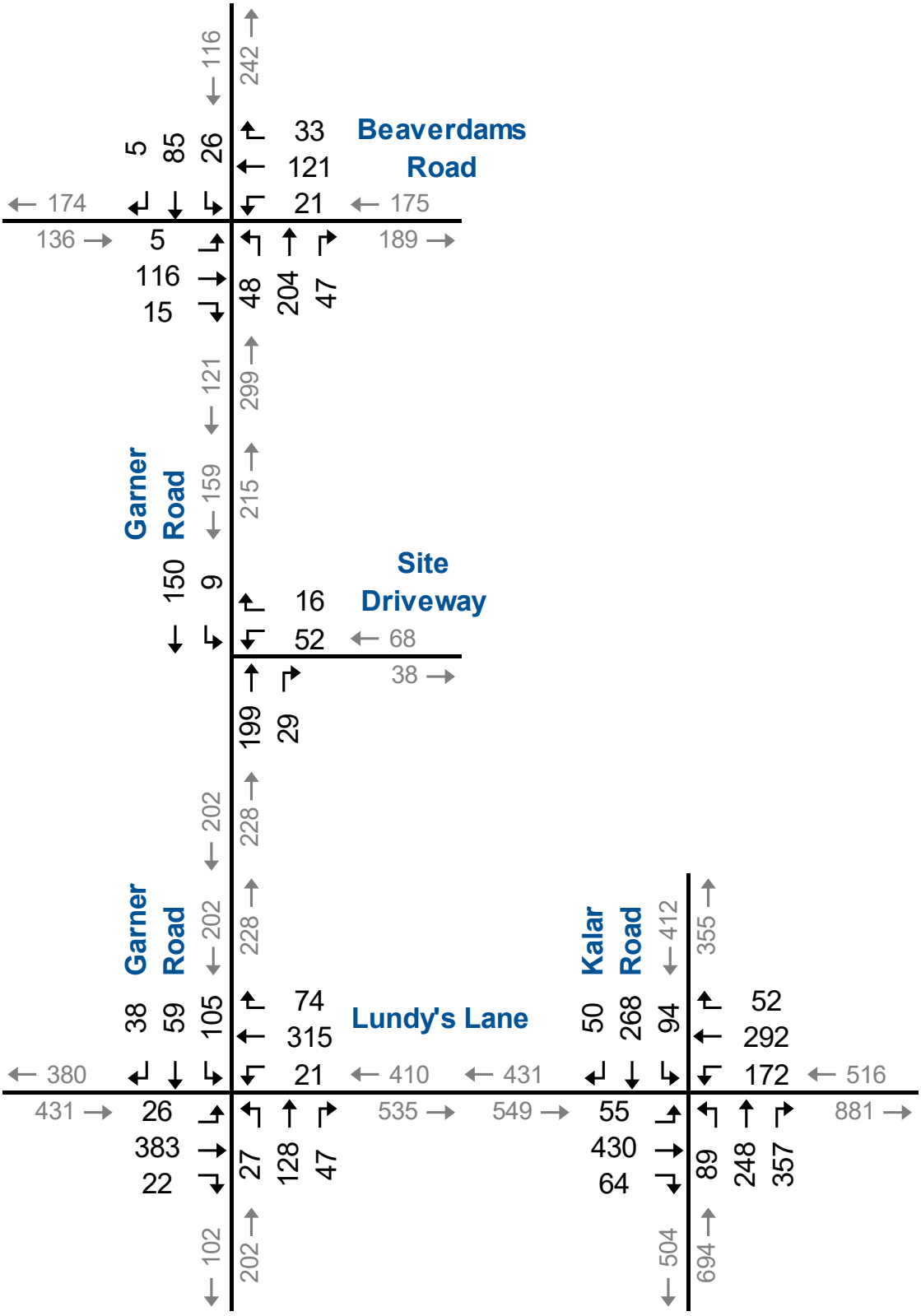
Figure 4.3A



2025 Total PM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

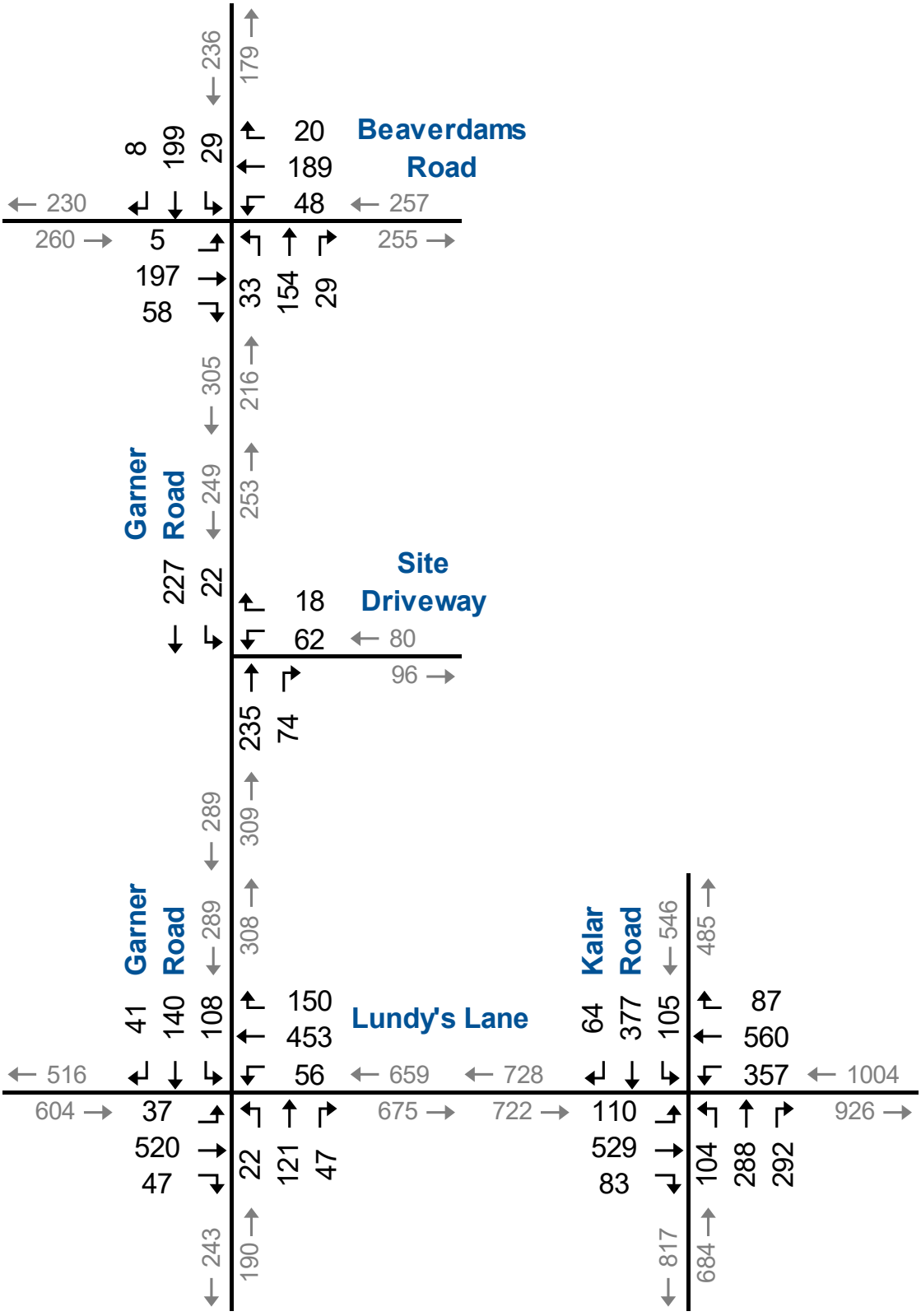
Figure 4.3B



2030 Total AM Peak Hour

8885 Lundy's Lane, TIA, Niagara Falls
220571

Figure 4.4A



2030 Total PM Peak Hour

5 Operational Analysis

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic within the study area. To assess the quality of flow, roadway capacity analysis was conducted with respect to base year conditions and projected background and total conditions. The capacity analysis indicates how well the roadway facilities serve the traffic demands. Calculated levels of service classify roadway operating conditions.

5.1 Level of Service Criteria

Level of service (LOS) denotes the different operating conditions on a given roadway segment under various traffic volume loads. It is a qualitative measure that indexes the operational qualities of a roadway segment or an intersection with designations ranging from LOS A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

For unsignalized intersections, the analysis assumes that traffic on the mainline is not affected by the traffic on the side streets. The level of service is only determined for left turns from the main road and all movements from the minor street. Unsignalized intersections use conservative analysis parameters, such as high critical gaps. A "critical gap" is defined as the minimum time, in seconds, between successive major stream vehicles in which a minor-street vehicle can make a maneuver.

Actual field observations indicate that drivers on minor streets generally accept smaller gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. Consequently, the analysis results overstate the actual delays experienced in the field. For this reason, the results of the unsignalized intersection analyses should be considered conservative.

5.2 Intersection Capacity Analysis

The evaluation criteria for analyzing signalized and unsignalized intersections are based on the 2000 Highway Capacity Manual (HCM).[2] utilizing Synchro 11.

Table 5.1 summarizes the capacity analyses for the study area intersections for the base year and the 2030 future horizon years for the weekday AM, PM and Saturday peak hours, respectively. **Appendix D** includes the capacity analysis results.

5.2.1 Garner Road at Beaverdam Road

The all-way stop intersection currently operates at LOS B or better for all approaches during the weekday peak hours. With build-out of the proposed development, the intersection is expected to continue to operate at acceptable operations (i.e. LOC C or better).

5.2.2 Lundy's Lane at Garner Road

Individual movements at the signalized intersection presently operate at LOS C or better. Similar levels of operation are expected under future Background and Total traffic conditions with only a negligible increase in delay resulting from site-generated traffic volumes.

5.2.3 Lundy's Lane at Kalar Road

Individual movements at the signalized intersection presently operate at LOS D or better. Under 2030 Background and Total traffic conditions, the westbound left-turn movement is projected to operate at LOS E with a v/c ratio approaching 1.00 during the weekday PM peak hour.

The westbound left turn movement is projected to experience higher delays during the weekday PM peak hour caused by increased opposing volumes. However, it is recognized that the left-turn volume will not build a significant queue that would require a storage extension.

5.2.4 Garner Road at Site Driveway

As described previously, a single new all-turn driveway is proposed to provide access to the Development through Garner Road. Under future conditions with the full build-out of the development, the Site Driveway is expected to operate at LOS B or better during the critical peak hours studied.

[2] Transportation Research Board, Highway Capacity Manual, Washington, D.C. 2003.

TABLE 5.1A: WEEKDAY AM PEAK HOUR OPERATIONS

Analysis Period	Intersection	Control Type	Scenario	MOE	Direction / Movement / Approach																OVERALL
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Beaversdam Road & Garner Road	AWSC	Existing	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	A	>	A	B
				Delay	<	10	>	10	<	10	>	10	<	11	>	11	<	9	>	9	10
				D/U	<	0.21	>		<	0.23	>		<	0.41	>		<	0.17	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2025 Background	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	A	>	A	B
				Delay	<	10	>	10	<	10	>	10	<	12	>	12	<	10	>	10	11
				D/U	<	0.23	>		<	0.25	>		<	0.44	>		<	0.19	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2025 Total	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	A	>	A	B
				Delay	<	10	>	10	<	10	>	10	<	13	>	13	<	10	>	10	11
				D/U	<	0.24	>		<	0.26	>		<	0.48	>		<	0.20	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2030 Background	LOS	<	B	>	B	<	B	>	B	<	C	>	C	<	B	>	B	B
				Delay	<	13	>	13	<	11	>	11	<	15	>	15	<	11	>	11	13
				D/U	<	0.45	>		<	0.31	>		<	0.54	>		<	0.24	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2030 Total	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
				Delay	<	11	>	11	<	11	>	11	<	14	>	14	<	10	>	10	12
				D/U	<	0.28	>		<	0.30	>		<	0.54	>		<	0.23	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
	Lundy's Lane & Garner Road	TCS	Existing	LOS	B	C	>	C	B	B	>	B	A	A	>	A	A	A	>	A	B
				Delay	18	20	>	20	19	20	>	20	7	7	>	7	7	7	>	7	16
				V/C	0.14	0.54	>		0.23	0.50	>		0.05	0.18	>		0.13	0.09	>		0.28
				95th	5	29	>		5	26	>		4	16	>		9	8	>		
			2025 Background	LOS	B	C	>	C	B	C	>	B	A	A	>	A	A	A	>	A	B
				Delay	18	21	>	20	19	20	>	20	7	8	>	7	7	7	>	7	16
				V/C	0.15	0.57	>		0.24	0.53	>		0.05	0.19	>		0.14	0.09	>		0.30
				95th	5	31	>		5	28	>		4	18	>		10	8	>		
			2025 Total	LOS	B	C	>	C	B	C	>	C	A	A	>	A	A	A	>	A	B
				Delay	19	21	>	20	19	20	>	20	7	8	>	7	8	7	>	8	16
				V/C	0.21	0.57	>		0.24	0.54	>		0.05	0.19	>		0.21	0.11	>		0.32
				95th	7	31	>		5	28	>		4	18	>		14	9	>		
			2030 Background	LOS	B	C	>	C	B	C	>	C	A	A	>	A	A	A	>	A	B
				Delay	18	21	>	21	19	20	>	20	7	8	>	8	8	7	>	8	17
				V/C	0.16	0.60	>		0.27	0.56	>		0.06	0.22	>		0.16	0.10	>		0.33
				95th	6	34	>		5	30	>		5	20	>		11	10	>		
			2030 Total	LOS	B	C	>	C	B	C	>	C	A	A	>	A	A	A	>	A	B
				Delay	19	21	>	21	19	21	>	20	7	8	>	8	9	8	>	8	16
				V/C	0.23	0.60	>		0.27	0.57	>		0.06	0.22	>		0.24	0.12	>		0.35
				95th	8	34	>		5	31	>		5	21	>		16	10	>		
	Lundy's Lane & Kalar Road	TCS	Existing	LOS	C	C	>	C	C	C	>	C	<	C	>	C	B	C	>	B	C
				Delay	24	35	>	34	21	26	>	24	16	23	>	22	16	21	>	20	25
				V/C	0.19	0.68	>		0.54	0.40	>		0.19	0.43	>		0.33	0.28	>		0.50
				95th	13	59	>		33	37	>		19	44	>		19	36	>		
			2025 Background	LOS	C	D	>	D	C	C	>	C	<	C	>	C	B	C	>	C	C
				Delay	25	37	>	36	23	27	>	26	17	26	>	24	16	22	>	20	27
				V/C	0.20	0.71	>		0.58	0.42	>		0.21	0.48	>		0.35	0.29	>		0.55
				95th	14	64	>		35	40	>		20	51	>		20	40	>		
			2025 Total	LOS	C	D	>	D	C	C	>	C	<	C	>	C	B	C	>	C	C
				Delay	25	38	>	37	23	27	>	26	17	26	>	25	16	22	>	21	27
				V/C	0.20	0.74	>		0.60	0.44	>		0.21	0.48	>		0.36	0.30	>		0.56
				95th	13	69	>		35	42	>		21	52	>		21	41	>		
			2030 Background	LOS	C	D	>	D	C	C	>	C	<	C	>	C	B	C	>	C	C
				Delay	26	39	>	37	24	27	>	26	18	29	>	27	18	24	>	22	28
				V/C	0.22	0.74	>		0.64	0.44	>		0.24	0.56	>		0.43	0.33	>		0.61
				95th	15	72	>		38	44	>		23	63	>		24	47	>		
			2030 Total	LOS	C	D	>	D	C	C	>	C	<	C	>	C	B	C	>	C	C
				Delay	25	39	>	38	25	27	>	26	19	30	>	28	19	24	>	23	29
				V/C	0.22	0.76	>		0.66	0.45	>		0.24	0.57	>		0.44	0.34	>		0.63
				95th	14	78	>		38	46	>		24	65	>		24	48	>		
	Site Driveway & Garner Road	TWSC	2025 Total	LOS					<	B	>	B	-	A	>	A	<	A	-	A	A
				Delay					<	11	>	11	-	0	>	0	<	1	-	1	2
				V/C					<	0.11	>		-	0.13	>		<	0.01	-		
				95th					<	3	>		-	0	>		<	0	-		
			2030 Total	LOS					<	B	>	B	-	A	>	A	<	A	-	A	A
				Delay					<	12	>	12	-	0	>	0	<	1	-	1	2
				V/C					<	0.12	>		-	0.15	>		<	0.01	-		
				95th					<	3	>		-	0	>		<	0	-		

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

LOS - Level of Service
D/U - Degree Utilization
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length

Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

TABLE 5.1B: WEEKDAY PM PEAK HOUR OPERATIONS

Analysis Period	Intersection	Control Type	Scenario	MOE	Direction / Movement / Approach																OVERALL
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Beaversdam Road & Garner Road	AWSC	Existing	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
				Delay	<	13	>	**13**	<	13	>	**13**	<	12	>	**12**	<	13	>	**13**	**13**
				D/U	<	0.40	>		<	0.43	>		<	0.36	>		<	0.44	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2025 Background	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
				Delay	<	14	>	**14**	<	14	>	**14**	<	13	>	**13**	<	15	>	**15**	**14**
				D/U	<	0.45	>		<	0.47	>		<	0.39	>		<	0.49	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2025 Total	LOS	<	B	>	**B**	<	C	>	**C**	<	B	>	**B**	<	C	>	**C**	**C**
				Delay	<	15	>	**15**	<	15	>	**15**	<	14	>	**14**	<	16	>	**16**	**15**
				D/U	<	0.47	>		<	0.50	>		<	0.44	>		<	0.52	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2030 Background	LOS	<	C	>	**C**	<	C	>	**C**	<	C	>	**C**	<	C	>	**C**	**C**
				Delay	<	17	>	**17**	<	18	>	**18**	<	15	>	**15**	<	18	>	**18**	**17**
				D/U	<	0.53	>		<	0.56	>		<	0.47	>		<	0.58	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
			2030 Total	LOS	<	C	>	**C**	<	C	>	**C**	<	C	>	**C**	<	C	>	**C**	**C**
				Delay	<	18	>	**18**	<	20	>	**20**	<	17	>	**17**	<	20	>	**20**	**19**
				D/U	<	0.57	>		<	0.60	>		<	0.53	>		<	0.62	>		
				95th	<	-	>		<	-	>		<	-	>		<	-	>		
	Lundy's Lane & Garner Road	TCS	Existing	LOS	B	C	>	**C**	B	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**B**
				Delay	18	21	>	**21**	19	22	>	**21**	7	8	>	**8**	8	8	>	**8**	**18**
				V/C	0.15	0.64	>		0.32	0.65	>		0.04	0.19	>		0.11	0.20	>		**0.34**
				95th	5	38	>		13	39	>		5	18	>		11	19	>		
			2025 Background	LOS	B	C	>	**C**	B	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**B**
				Delay	18	21	>	**21**	19	22	>	**22**	8	9	>	**9**	8	9	>	**9**	**18**
				V/C	0.16	0.65	>		0.35	0.67	>		0.04	0.20	>		0.12	0.21	>		**0.37**
				95th	5	41	>		13	42	>		5	20	>		11	21	>		
			2025 Total	LOS	B	C	>	**C**	B	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**B**
				Delay	19	21	>	**21**	19	22	>	**22**	8	9	>	**9**	9	9	>	**9**	**18**
				V/C	0.38	0.63	>		0.34	0.69	>		0.05	0.21	>		0.21	0.25	>		**0.40**
				95th	10	41	>		13	44	>		5	22	>		18	24	>		
			2030 Background	LOS	B	C	>	**C**	B	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**B**
				Delay	17	22	>	**21**	19	22	>	**22**	8	10	>	**9**	9	10	>	**10**	**18**
				V/C	0.19	0.68	>		0.41	0.70	>		0.05	0.23	>		0.14	0.24	>		**0.41**
				95th	6	45	>		15	47	>		6	23	>		13	24	>		
			2030 Total	LOS	B	C	>	**C**	B	C	>	**C**	A	B	>	**A**	B	B	>	**B**	**B**
				Delay	20	21	>	**21**	19	23	>	**22**	9	10	>	**10**	10	11	>	**10**	**18**
				V/C	0.42	0.65	>		0.39	0.72	>		0.05	0.24	>		0.23	0.28	>		**0.44**
				95th	10	45	>		14	49	>		6	26	>		21	29	>		
	Lundy's Lane & Kalar Road	TCS	Existing	LOS	C	D	>	**D**	D	C	>	**C**	<	C	>	**C**	C	C	>	**C**	**C**
				Delay	27	43	>	**40**	38	31	>	**33**	20	30	>	**28**	21	31	>	**29**	**33**
				V/C	0.42	0.78	>		0.86	0.60	>		0.36	0.43	>		0.32	0.45	>		**0.68**
				95th	20	81	>		70	72	>		24	54	>		26	63	>		
			2025 Background	LOS	C	D	>	**D**	D	C	>	**D**	<	C	>	**C**	C	C	>	**C**	**C**
				Delay	27	45	>	**41**	44	31	>	**36**	22	32	>	**30**	23	33	>	**31**	**35**
				V/C	0.44	0.80	>		0.90	0.61	>		0.40	0.47	>		0.35	0.49	>		**0.73**
				95th	22	86	>		81	78	>		26	61	>		28	69	>		
			2025 Total	LOS	C	D	>	**D**	D	C	>	**D**	<	C	>	**C**	C	C	>	**C**	**C**
				Delay	27	45	>	**42**	48	31	>	**37**	23	31	>	**31**	24	34	>	**32**	**36**
				V/C	0.45	0.82	>		0.92	0.64	>		0.41	0.48	>		0.37	0.50	>		**0.74**
				95th	21	94	>		88	86	>		27	63	>		29	70	>		
			2030 Background	LOS	C	D	>	**D**	E	C	>	**D**	<	D	>	**C**	C	D	>	**D**	**D**
				Delay	28	48	>	**44**	63	31	>	**43**	25	37	>	**35**	26	38	>	**36**	**40**
				V/C	0.49	0.83	>		0.98	0.63	>		0.50	0.57	>		0.45	0.58	>		**0.82**
				95th	23	96	>		117	88	>		30	73	>		32	78	>		
			2030 Total	LOS	C	D	>	**D**	E	C	>	**D**	<	D	>	**D**	C	D	>	**D**	**D**
				Delay	28	49	>	**45**	68	31	>	**44**	27	39	>	**36**	27	40	>	**37**	**41**
				V/C	0.50	0.85	>		0.99	0.65	>		0.51	0.58	>		0.46	0.59	>		**0.83**
				95th	23	104	>		123	99	>		30	73	>		32	78	>		
	Site Driveway & Garner Road	TWSC	2025 Total	LOS					<	B	>	**B**	-	A	>	**A**	<	A	-	**A**	**A**
				Delay					<	13	>	**13**	-	0	>	**0**	<	1	-	**1**	**2**
				V/C					<	0.16	>		-	0.18	>		<	0.02	-		
				95th					<	5	>		-	0	>		<	0	-		
			2030 Total	LOS					<	B	>	**B**	-	A	>	**A**	<	A	-	**A**	**A**
				Delay					<	14	>	**14**	-	0	>	**0**	<	1	-	**1**	**2**
				V/C					<	0.17	>		-	0.20	>		<	0.02	-		
				95th					<	4	>		-	0	>		<	0	-		

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

LOS - Level of Service
D/U - Degree Utilization
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length

Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

6 Mitigation Measures

As summarized in the analysis tables in the previous chapter, the study area intersections are not projected to experience any operational deficiencies. The analysis also concludes that the development would have minimal impact on study area traffic conditions.

This chapter summarizes the results of the investigation to identify if improvement measures are required to accommodate the impacts of the proposed development.

6.1 Left Turn Lanes

The proposed driveway connection was assessed to determine whether future traffic volumes warrant a left-turn lane along the major roadway.

The left-turn lane warrants follow the Ministry of Transportation's (MTO) Geometric Design Standards[3] requirements. A design speed of 20 kilometres per hour over the posted and assumed speed limit had been utilized. **Table 6.1** summarizes the results of the left-turn lane warrant analyses. The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5 percent, as nomographs are only provided for 5 percent increments. **Appendix E** contains the nomographs. The following is noted:

- A southbound left turn lane at Garner Road and the Site Driveway is not warranted under the 2030 Total conditions.

TABLE 6.1: LEFT-TURN LANE ANALYSIS (2030)

Garner Road at Site Driveway		
Approach Direction Design Speed	Southbound 80 km/h	
Peak Hour	AM	PM
Advancing Volume	159	249
Opposing Volumes	228	309
Left Turning Traffic	9	22
% of Left Turning Traffic	5.7%	8.8%
Figure Used*	9A-14 (10%)	9A-14 (10%)
Warranted	**No**	**No**
Storage Length Required	N/A	N/A

Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Road - June 2017

[3] MTO Design Supplement for TAC Geometric Design Guide for Canadian Road, 2017

6.2 Right Turn Lane

The proposed driveway connection to Garner Road was assessed to determine if the projected traffic volumes warrant the installation of a right-turn lane along the major roadway.

Although right turns are generally made more efficiently than left turn movements, exclusive right turn lanes are often provided for many of the same reasons left turn lanes are provided.

MTO guidelines (Geometric Design Standards for Ontario Highways) note that right-turn lanes or tapers may be considered where right-turn volumes exceed 60 vehicles per hour (vph) and where right-turning vehicles create a hazard or reduce capacity at the intersection. The forecast right turn movement at Garner Road and the Site Driveway indicates a right turn movement of 27 vehicles during the weekday AM peak hour and 68 vehicles during the weekday PM peak hour.

However, if right-turn lanes were implemented at these intersections, the change in the level of service for the affected traffic would be negligible as it currently operates at LOS A. As no significant operational benefits are expected with implementing separate right turn lanes, a northbound right turn lane along Garner Road at the Site Driveway is not recommended.

6.3 Sight Distance Evaluation

Paradigm conducted a sight distance evaluation for the proposed roadway connections to Garner Road following the Transportation Association of Canada (TAC) guidelines.

Paradigm generally utilizes a design speed of 20 km/h over the posted speed to provide a conservative analysis in rural environments. The sight distance analysis was based on this assumption along Garner Road.

Table 6.2 shows the available stopping sight distance from the north and south of the Site Driveway. The measurements indicate that the proposed Site Driveway is adequately spaced from a sight-distance perspective.

TABLE 6.2: SIGHT DISTANCE

Location	SSD (metres)	
	Required[a]	Measured[b]
Garner Road at Site Driveawy		
To/From the North	130	130+
To/From the South	130	130+

a Based on guidelines established in the Geometric Design Guide for Canadian Roads, Transportation Association of Canada (TAC), 2017 for the operating speed of 80

b Field measurements taken by Paradigm

\+ Field measurement exceeds w hat listed

7 Transportation Demand Management

Based on best practices and policy objectives, there is merit for a further reduction through a Transportation Demand Management (TDM) program.

A Transportation Demand Management (TDM) plan aims to reduce the development's overall traffic and parking impacts by implementing strategies to affect the demand side of the transportation equation. TDM strategies include incentives and disincentives that increase people's likelihood of changing travel behaviour. Strategies include financial incentives, time incentives, new or enhanced commuter services, information dissemination, and alternative marketing services.

The TDM plan has been formulated to extend reasonable and practical strategies that encourage residents and visitors to take alternative modes of transportation. The strategies identified are expected to improve transportation access and connectivity within the development and reset of the study area.

7.1 Proposed Strategies

The development will implement the proposed strategies identified herein to reduce the number of auto-trips made to/from the Development:

7.1.1 Transportation Information

The Applicant will develop marketing/informational materials as part of their initial scope of work. Information on transportation options and links to the appropriate website should be conveyed to all prospective residents as a component of a resident welcome packet.

Available information should include schedules for local and regional transit services, bicycle and trail networks and the location of retail and recreational establishments.

7.1.2 Unbundled Parking

Implementing a paid-parking operation is one of the most effective TDM strategies for encouraging alternative travel habits. Occupants are not forced to pay for parking they do not need and allow consumers to adjust their parking supply to reflect their needs. To further encourage residents of the apartment building to utilize sustainable travel modes, the development will enable residents to opt out of purchasing their parking space, providing a discount on the purchase price.

The development will consider the use of unbundled parking. This is an essential factor as residents are notified at the project's onset that parking is proposed to be provided as an additional cost instead of the price to rent a unit. If residents are significantly considering changing their travel behaviour, the cost of renting a parking space could contribute to this change.

7.1.3 Bicycle Parking

The Applicant will promote travel to the site by biking by providing convenient bicycle amenities. It is unclear at this time how many bicycle spaces are proposed; however, based on best practices should include a minimum of 0.50 long-term and 0.05 short-term spaces per unit.

8 Conclusions

8.1 Conclusions

This study evaluated the impacts of background traffic growth and the proposed development of 184 residential units and 15,709 square feet of commercial space. Full build-out is expected at or before 2025 for this report.

A new driveway connection proposes access to the Development through Garner Road. The connection is located at the northern terminus of the property. The proposed new Site Driveway will be designed with adequate width to provide for reasonable entry and exit from the development and accommodate emergency response vehicles; the proposed locations afford safe sight lines for all turning movements and approaches.

The development is projected to generate approximately 106-176 new vehicle trips during the weekday AM and PM peak hours.

Detailed traffic analysis was conducted for each study area intersection under existing traffic conditions and 2025 and 2030 background and total traffic conditions. Based on traffic data and analyses completed, the study area's intersections presently operate at a level of service (LOS) C or better during the weekday peak hours. LOS D or better is generally considered a well-functioning intersection in urban environments. With additional trips generated by the development, the impact on the study area's intersections is expected to be minimal as the intersections are forecast to continue to operate at LOS D or better.

The exception is the westbound left turn movement at the intersection of Lundy's Lane and Kalar Road. Increased delay is projected during the weekday PM peak hour under the 2030 Background and Total horizon caused by increased opposing volumes. However, it is recognized that the left-turn volume will not build a significant queue that would require a storage extension.

The analysis has further determined that an auxiliary left turn lane is not warranted under 2030 Total Horizon along Garner Road at the Site Driveway. Additionally, an auxiliary right turn lane is not recommended as it would offer no tangible benefits in traffic operations.

Overall, the study finds that development-generated traffic should not significantly impact traffic operations within the study area and that the existing transportation infrastructure in the area can adequately accommodate the traffic volumes projected to be generated by the proposed development.

8.2 Recommendations

Based on the findings of this study, it is recommended that:

- That the Region and City monitor the future traffic volumes at the intersection of Lundy's Lane with Garner Road and Kalar Road and adjust signal timings as needed to correspond to changing traffic volumes; and
- The development implements a Transportation Demand Management program that will include the following at a minimum:
  - Transportation Information Package
  - Unbundled Parking
  - Bicycle Parking supply

Appendix A

Pre-Study Consultation

Adam Makarewicz

To: Linda Ford
Subject: RE: (Q220571) RE: 8885-8911 Lundy's Lane - RFP + Timelines (Paradigm)

We have been asked to prepare a quote to complete a traffic impact study for the proposed development located at 8885-8911 Lundy's Lane (site plan attached, for reference only). I would like to confirm the scope items below.

1) Intersections Analysed:
Garner Road / Site Access; and
Garner Road / Lundy's Lane; and
c. Garner/Beaverdams

2) Analysis Horizon Years
a. Existing year (2022);
b. Horizon: opening year
c. 5-year horizon, post opening

3) Analysis Period
a. Weekday morning (7:00am to 9:00am); and
b. Weekday afternoon (4:00pm to 7:00pm);

4) Traffic Generation
a. Based on ITE trip generation data rates

5) Background Traffic Volumes
a. Based on the Region's Traffic Impact Study Guidelines (2%); plus
b. Additional traffic generated by adjacent developments. There are no background developments to add

6) Sight Distance
a. Review proposed site access driveways.

7) Driveway(s)
Please perform a RT/LT lane warrant, per MTO guidelines

8) TDM/Transit
Provide commentary on existing transit service, and TDM measures the developer is willing to put in place

John Grubich, C.E.T. | Traffic Planning Supervisor | Municipal Works - Transportation Services | City of Niagara Falls
8208 Heartland Forest Road | Niagara Falls, ON L2H 0L7 | (905) 356-7521 ext 5214 | Fax 905-356-5576 | jgrubich@niagarafalls.ca

Adam Makarewicz

To: Dunsmore, Susan
Subject: RE: 8885-8911 Lundy's Lane - TIS Scope

From: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Sent: Monday, September 12, 2022 1:59 PM
To: Maitham Dinani <maitham.dinani@jdengineering.ca>
Cc: John Grubich <jgrubich@niagarafalls.ca>
Subject: RE: 8885-8911 Lundy's Lane - TIS Scope

Hi Maitham,

Transportation planning has reviewed your TIS scope and has provided the comments below in green. If you require regional traffic data – requests are to be submitted through our website using the following link: https://www.niagararegion.ca/living/roads/permits/traffic-data-requests.aspx.

If there are any improvements required on Regional roads or at the intersection a functional design is to be included in the TIS.

If you require anything further please contact the undersigned at your convenience.

Thank you

Susan M. Dunsmore, P. Eng.
Manager, Development Engineering
Planning and Development Services

Phone: (905) 980-6000 or 1-800-263-7215 ext 3661
Address: 1815 Sir Isaac Brock Way, Thorold ON, L2V4T7
Niagara Region

From: Maitham Dinani <maitham.dinani@jdengineering.ca>
Sent: Tuesday, September 06, 2022 10:28 AM
To: John Grubich <jgrubich@niagarafalls.ca>; Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Subject: 8885-8911 Lundy's Lane - TIS Scope

Good morning,

We have been asked to prepare a quote to complete a traffic impact study for the proposed development located at 8885-8911 Lundy's Lane (site plan attached, for reference only). I would like to confirm the scope items below.

1) Intersections Analysed:
    a. Garner Road / Site Access; and
    b. Garner Road / Lundy's Lane; and
    c. Lundy's Lane/Kalar Rd
2) Analysis Horizon Years
    a. Existing year (2022);
    b. ~~5-year horizon (2027);~~ Build-out year. If the development is being phased, the TIS to include an estimated timeframe for the build-out of the various phases and analyze the study area at each phase.
    c. 5-year horizon after full development occupancy.
3) Analysis Period
    a. Weekday morning (7:00am to 9:00am); and
    b. Weekday afternoon (4:00pm to 7:00pm);
4) Traffic Generation
    a. Based on ITE trip generation data rates
5) Background Traffic Volumes
    a. Based on the Region's Traffic Impact Study Guidelines (2%); plus
    b. Additional traffic generated by adjacent developments.
6) Sight Distance
    a. Review proposed site access driveways.

- The Consultant to follow Niagara Region Guidelines for TIS (2012) for traffic analysis software settings, intersections capacity thresholds and other requirements.
- For the ideal saturation flows, there are currently new saturation flow rates (shown below) that will be a part of the new TIS Guidelines. The Consultant can either use the new sat values or 1750 across the board for all movements.

Variable	Saturation Flow Rate (pc/h/ln) -Niagara Falls
T	1,579
L	1,454
LT	1,178
LL	2,144
R	1,301
RT	1,338
LTR	1,433

Appendix B

Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022

Turning Movement Data

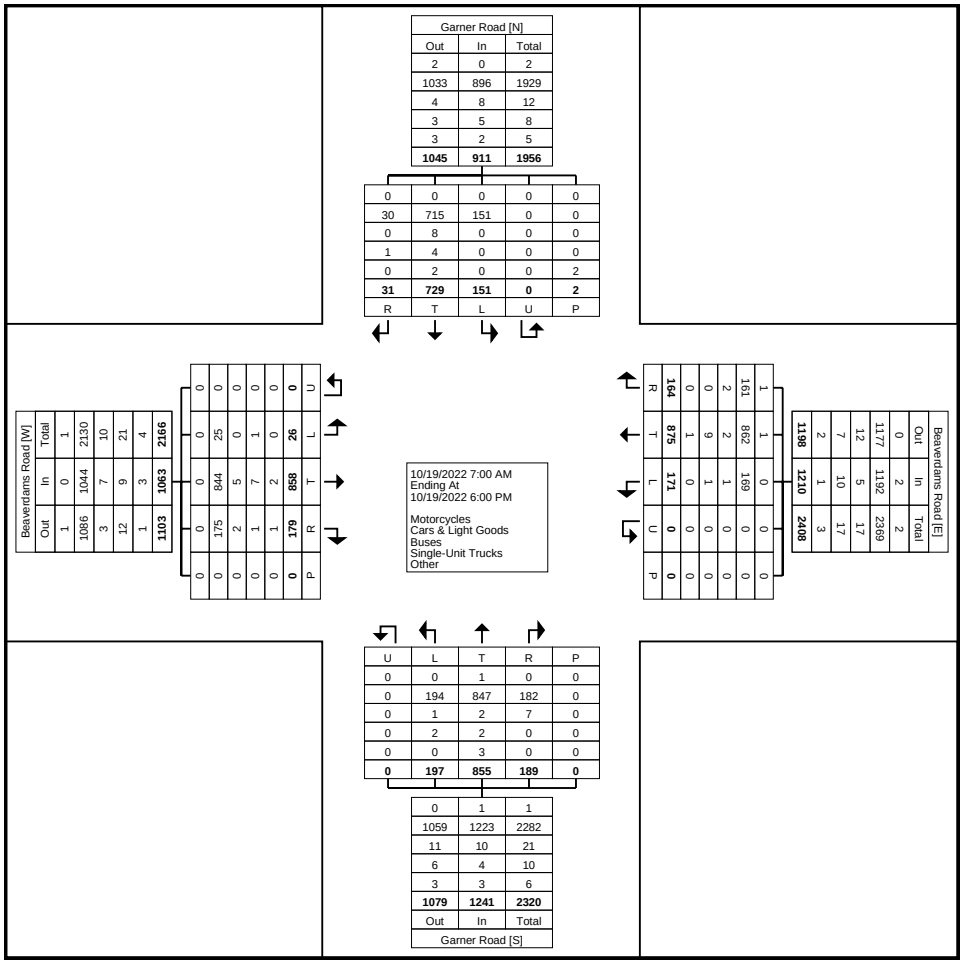
Start Time	Beaverdams Road Eastbound						Beaverdams Road Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	14	1	0	0	16	0	18	4	0	0	22	5	10	0	0	0	15	2	4	2	0	0	8	61
7:15 AM	0	13	1	0	0	14	2	22	5	0	0	29	10	16	4	0	0	30	2	8	1	0	0	11	84
7:30 AM	1	22	6	0	0	29	4	32	11	0	0	47	9	35	5	0	0	49	1	17	0	0	0	18	143
7:45 AM	3	28	5	0	0	36	4	27	7	0	0	38	4	44	8	0	0	56	5	21	1	0	0	27	157
Hourly Total	5	77	13	0	0	95	10	99	27	0	0	136	28	105	17	0	0	150	10	50	4	0	0	64	445
8:00 AM	0	27	2	0	0	29	3	28	4	0	0	35	9	49	13	0	0	71	7	13	1	0	0	21	156
8:15 AM	0	20	1	0	0	21	4	20	8	0	0	32	13	34	3	0	0	50	4	20	0	0	0	24	127
8:30 AM	1	24	2	0	0	27	4	28	9	0	0	41	10	43	11	0	0	64	6	16	2	0	0	24	156
8:45 AM	1	22	1	0	0	24	9	21	5	0	0	35	11	33	14	0	0	58	1	18	1	0	0	20	137
Hourly Total	2	93	6	0	0	101	20	97	26	0	0	143	43	159	41	0	0	243	18	67	4	0	0	89	576
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	17	6	0	0	23	4	19	0	0	0	23	5	23	4	0	0	32	4	10	1	0	0	15	93
11:15 AM	0	25	1	0	0	26	1	19	7	0	0	27	2	25	1	0	0	28	5	20	0	0	0	25	106
11:30 AM	0	18	4	0	0	22	3	21	3	0	0	27	5	18	4	0	0	27	6	18	0	0	0	24	100
11:45 AM	0	25	4	0	0	29	2	29	5	0	0	36	5	12	4	0	0	21	2	9	0	0	2	11	97
Hourly Total	0	85	15	0	0	100	10	88	15	0	0	113	17	78	13	0	0	108	17	57	1	0	2	75	396
12:00 PM	1	22	5	0	0	28	6	23	8	0	0	37	3	26	4	0	0	33	0	13	0	0	0	13	111
12:15 PM	0	14	5	0	0	19	3	20	4	0	0	27	8	14	1	0	0	23	7	25	3	0	0	35	104
12:30 PM	3	22	4	0	0	29	7	27	4	0	0	38	3	24	2	0	0	29	6	19	3	0	0	28	124
12:45 PM	0	26	6	0	0	32	1	18	4	0	0	23	3	25	2	0	0	30	6	25	1	0	0	32	117
Hourly Total	4	84	20	0	0	108	17	88	20	0	0	125	17	89	9	0	0	115	19	82	7	0	0	108	456
1:00 PM	0	24	6	0	0	30	6	19	6	0	0	31	3	22	6	0	0	31	0	18	2	0	0	20	112
1:15 PM	0	22	5	0	0	27	1	29	2	0	0	32	8	13	6	0	0	27	6	22	0	0	0	28	114
1:30 PM	2	14	2	0	0	18	6	23	6	0	0	35	1	28	3	0	0	32	7	18	0	0	0	25	110
1:45 PM	0	21	3	0	0	24	3	18	5	0	0	26	2	18	8	0	0	28	4	14	0	0	0	18	96
Hourly Total	2	81	16	0	0	99	16	89	19	0	0	124	14	81	23	0	0	118	17	72	2	0	0	91	432
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	19	4	0	0	24	10	33	5	0	0	48	11	40	13	0	0	64	4	24	0	0	0	28	164
3:15 PM	2	30	11	0	0	43	4	37	8	0	0	49	7	23	6	0	0	36	7	30	2	0	0	39	167
3:30 PM	2	42	13	0	0	57	7	32	2	0	0	41	6	33	4	0	0	43	5	28	2	0	0	35	176
3:45 PM	1	43	14	0	0	58	7	28	4	0	0	39	5	26	11	0	0	42	7	30	0	0	0	37	176
Hourly Total	6	134	42	0	0	182	28	130	19	0	0	177	29	122	34	0	0	185	23	112	4	0	0	139	683
4:00 PM	2	30	6	0	0	38	7	27	5	0	0	39	6	25	12	0	0	43	7	32	0	0	0	39	159
4:15 PM	1	41	6	0	0	48	18	38	6	0	0	62	5	15	7	0	0	27	6	33	1	0	0	40	177
4:30 PM	1	39	11	0	0	51	7	33	7	0	0	47	5	41	6	0	0	52	8	29	1	0	0	38	188

4:45 PM	1	40	9	0	0	50	10	37	3	0	0	50	6	28	7	0	0	41	4	43	2	0	0	49	190
Hourly Total	5	150	32	0	0	187	42	135	21	0	0	198	22	109	32	0	0	163	25	137	4	0	0	166	714
5:00 PM	1	50	11	0	0	62	11	48	4	0	0	63	6	36	3	0	0	45	8	35	1	0	0	44	214
5:15 PM	1	39	12	0	0	52	7	43	3	0	0	53	6	22	4	0	0	32	5	57	3	0	0	65	202
5:30 PM	0	32	7	0	0	39	7	31	4	0	0	42	7	32	7	0	0	46	5	31	1	0	0	37	164
5:45 PM	0	33	5	0	0	38	3	27	6	0	0	36	8	22	6	0	0	36	4	29	0	0	0	33	143
Hourly Total	2	154	35	0	0	191	28	149	17	0	0	194	27	112	20	0	0	159	22	152	5	0	0	179	723
Grand Total	26	858	179	0	0	1063	171	875	164	0	0	1210	197	855	189	0	0	1241	151	729	31	0	2	911	4425
Approach %	2.4	80.7	16.8	0.0	-	-	14.1	72.3	13.6	0.0	-	-	15.9	68.9	15.2	0.0	-	-	16.6	80.0	3.4	0.0	-	-	-
Total %	0.6	19.4	4.0	0.0	-	24.0	3.9	19.8	3.7	0.0	-	27.3	4.5	19.3	4.3	0.0	-	28.0	3.4	16.5	0.7	0.0	-	20.6	-
Motorcycles	0	0	0	0	-	0	0	1	1	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.6	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	25	844	175	0	-	1044	169	862	161	0	-	1192	194	847	182	0	-	1223	151	715	30	0	-	896	4355
% Cars & Light Goods	96.2	98.4	97.8	-	-	98.2	98.8	98.5	98.2	-	-	98.5	98.5	99.1	96.3	-	-	98.5	100.0	98.1	96.8	-	-	98.4	98.4
Buses	0	5	2	0	-	7	1	2	2	0	-	5	1	2	7	0	-	10	0	8	0	0	-	8	30
% Buses	0.0	0.6	1.1	-	-	0.7	0.6	0.2	1.2	-	-	0.4	0.5	0.2	3.7	-	-	0.8	0.0	1.1	0.0	-	-	0.9	0.7
Single-Unit Trucks	1	7	1	0	-	9	1	9	0	0	-	10	2	2	0	0	-	4	0	4	1	0	-	5	28
% Single-Unit Trucks	3.8	0.8	0.6	-	-	0.8	0.6	1.0	0.0	-	-	0.8	1.0	0.2	0.0	-	-	0.3	0.0	0.5	3.2	-	-	0.5	0.6
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	0	3	0	0	-	3	0	2	0	0	-	2	8
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.0	0.4	0.0	-	-	0.2	0.0	0.3	0.0	-	-	0.2	0.2
Bicycles on Road	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.6	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022

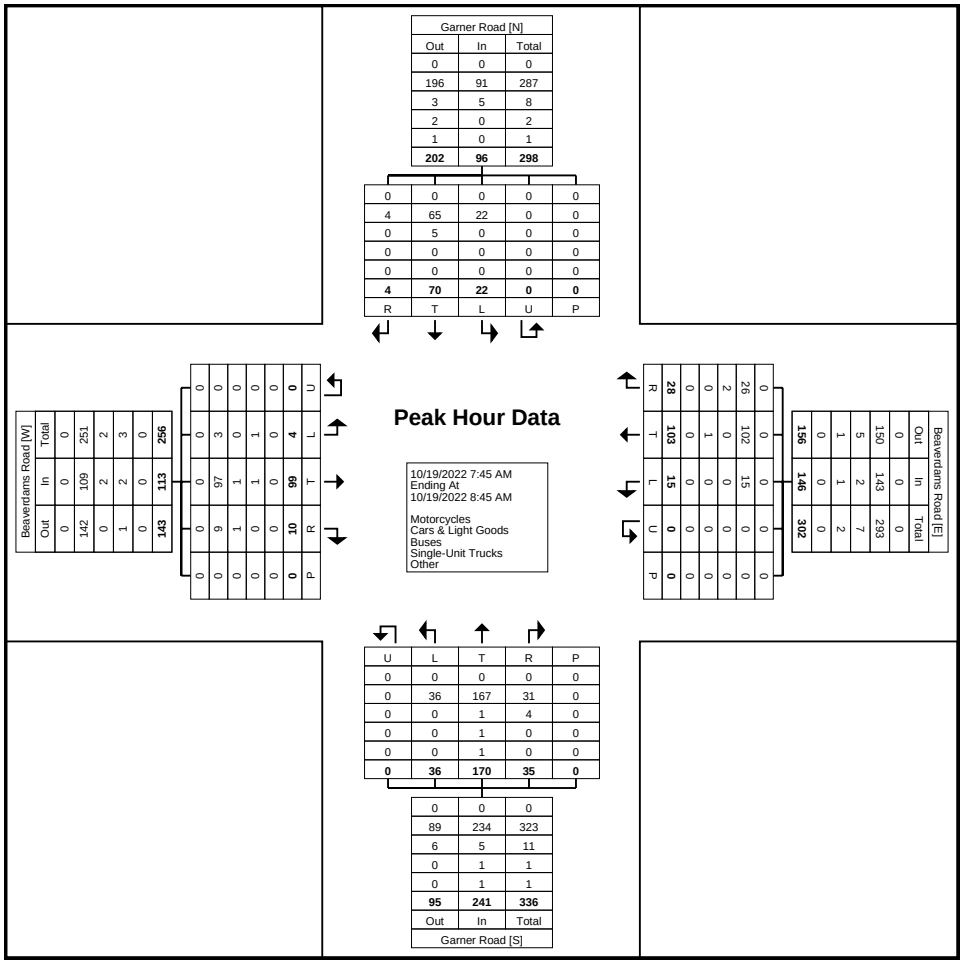
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Beaverdams Road Eastbound						Beaverdams Road Westbound						Garner Road Northbound						Garner Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	3	28	5	0	0	36	4	27	7	0	0	38	4	44	8	0	0	56	5	21	1	0	0	27	157
8:00 AM	0	27	2	0	0	29	3	28	4	0	0	35	9	49	13	0	0	71	7	13	1	0	0	21	156
8:15 AM	0	20	1	0	0	21	4	20	8	0	0	32	13	34	3	0	0	50	4	20	0	0	0	24	127
8:30 AM	1	24	2	0	0	27	4	28	9	0	0	41	10	43	11	0	0	64	6	16	2	0	0	24	156
Total	4	99	10	0	0	113	15	103	28	0	0	146	36	170	35	0	0	241	22	70	4	0	0	96	596
Approach %	3.5	87.6	8.8	0.0	-	-	10.3	70.5	19.2	0.0	-	-	14.9	70.5	14.5	0.0	-	-	22.9	72.9	4.2	0.0	-	-	-
Total %	0.7	16.6	1.7	0.0	-	19.0	2.5	17.3	4.7	0.0	-	24.5	6.0	28.5	5.9	0.0	-	40.4	3.7	11.7	0.7	0.0	-	16.1	-
PHF	0.333	0.884	0.500	0.000	-	0.785	0.938	0.920	0.778	0.000	-	0.890	0.692	0.867	0.673	0.000	-	0.849	0.786	0.833	0.500	0.000	-	0.889	0.949
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	3	97	9	0	-	109	15	102	26	0	-	143	36	167	31	0	-	234	22	65	4	0	-	91	577
% Cars & Light Goods	75.0	98.0	90.0	-	-	96.5	100.0	99.0	92.9	-	-	97.9	100.0	98.2	88.6	-	-	97.1	100.0	92.9	100.0	-	-	94.8	96.8
Buses	0	1	1	0	-	2	0	0	2	0	-	2	0	1	4	0	-	5	0	5	0	0	-	5	14
% Buses	0.0	1.0	10.0	-	-	1.8	0.0	0.0	7.1	-	-	1.4	0.0	0.6	11.4	-	-	2.1	0.0	7.1	0.0	-	-	5.2	2.3
Single-Unit Trucks	1	1	0	0	-	2	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	4
% Single-Unit Trucks	25.0	1.0	0.0	-	-	1.8	0.0	1.0	0.0	-	-	0.7	0.0	0.6	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	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	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022

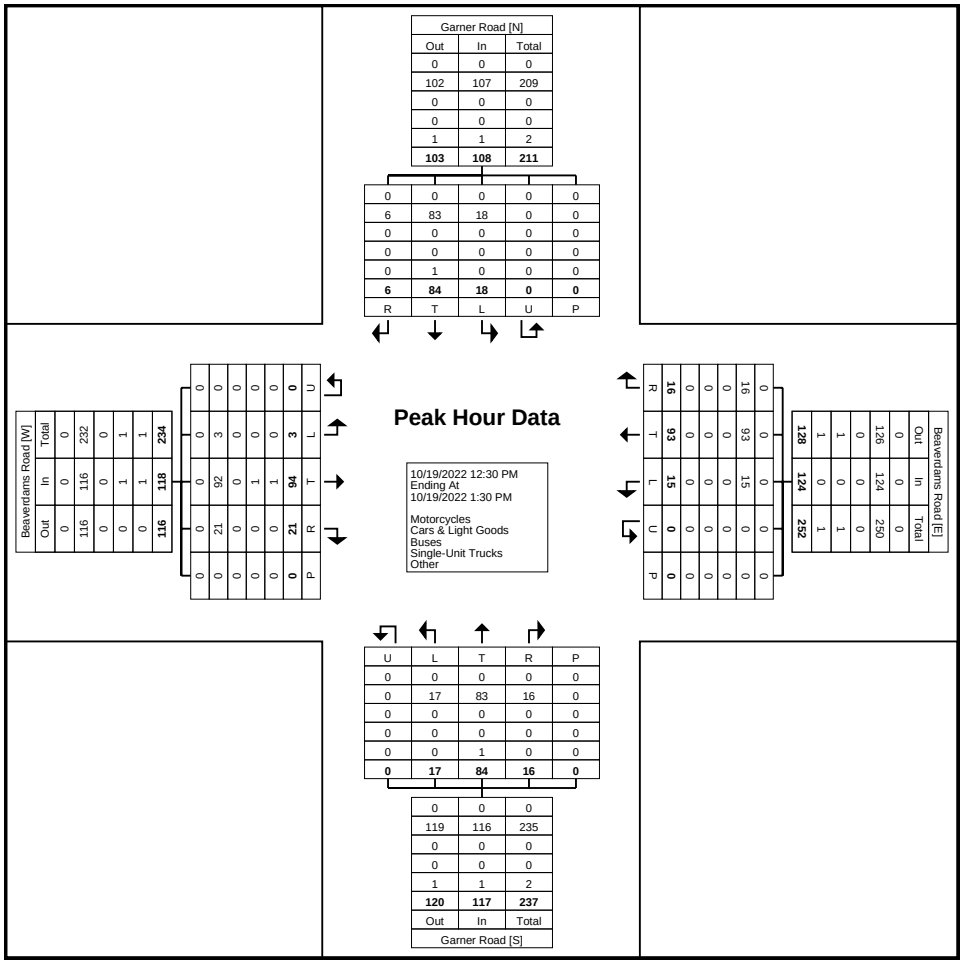
Turning Movement Peak Hour Data (12:30 PM)

Start Time	Beaverdams Road Eastbound						Beaverdams Road Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:30 PM	3	22	4	0	0	29	7	27	4	0	0	38	3	24	2	0	0	29	6	19	3	0	0	28	124
12:45 PM	0	26	6	0	0	32	1	18	4	0	0	23	3	25	2	0	0	30	6	25	1	0	0	32	117
1:00 PM	0	24	6	0	0	30	6	19	6	0	0	31	3	22	6	0	0	31	0	18	2	0	0	20	112
1:15 PM	0	22	5	0	0	27	1	29	2	0	0	32	8	13	6	0	0	27	6	22	0	0	0	28	114
Total	3	94	21	0	0	118	15	93	16	0	0	124	17	84	16	0	0	117	18	84	6	0	0	108	467
Approach %	2.5	79.7	17.8	0.0	-	-	12.1	75.0	12.9	0.0	-	-	14.5	71.8	13.7	0.0	-	-	16.7	77.8	5.6	0.0	-	-	-
Total %	0.6	20.1	4.5	0.0	-	25.3	3.2	19.9	3.4	0.0	-	26.6	3.6	18.0	3.4	0.0	-	25.1	3.9	18.0	1.3	0.0	-	23.1	-
PHF	0.250	0.904	0.875	0.000	-	0.922	0.536	0.802	0.667	0.000	-	0.816	0.531	0.840	0.667	0.000	-	0.944	0.750	0.840	0.500	0.000	-	0.844	0.942
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	3	92	21	0	-	116	15	93	16	0	-	124	17	83	16	0	-	116	18	83	6	0	-	107	463
% Cars & Light Goods	100.0	97.9	100.0	-	-	98.3	100.0	100.0	100.0	-	-	100.0	100.0	98.8	100.0	-	-	99.1	100.0	98.8	100.0	-	-	99.1	99.1
Buses	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	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Single-Unit Trucks	0.0	1.1	0.0	-	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	3
% Articulated Trucks	0.0	1.1	0.0	-	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	1.2	0.0	-	-	0.9	0.0	1.2	0.0	-	-	0.9	0.6
Bicycles on Road	0	0	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	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022

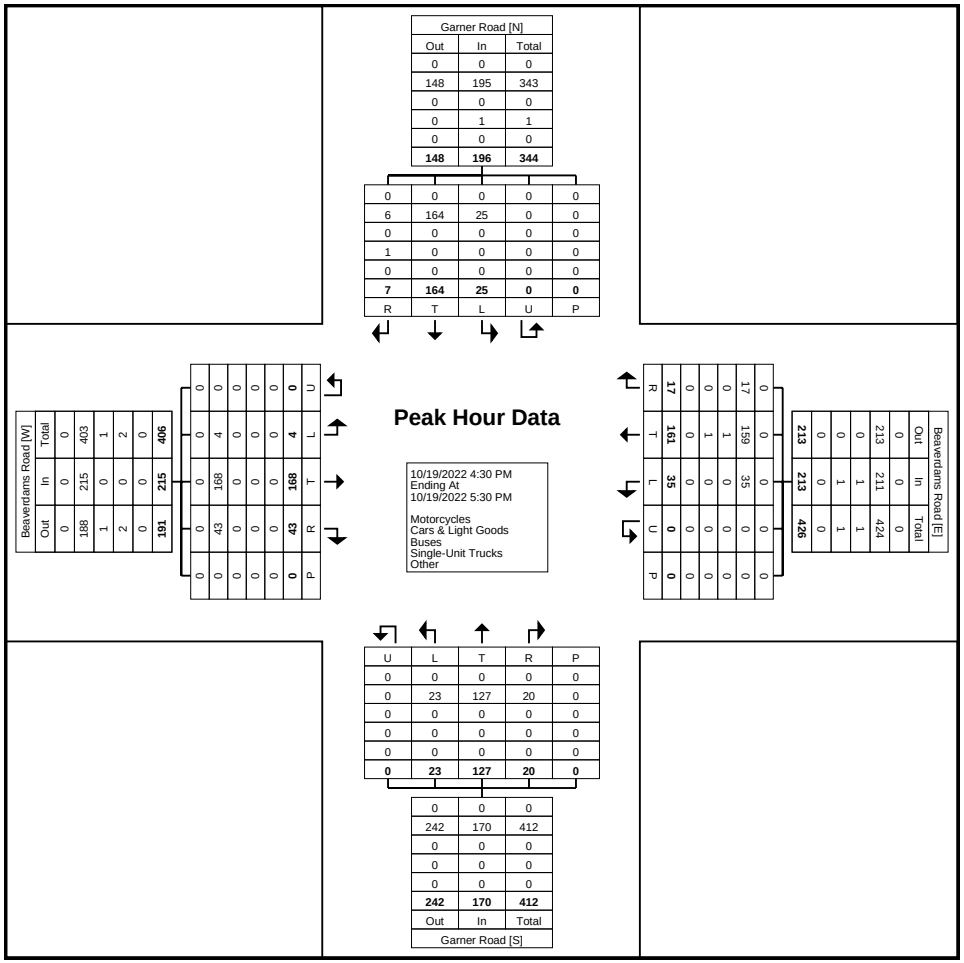
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Beaverdams Road Eastbound						Beaverdams Road Westbound						Garner Road Northbound						Garner Road Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	1	39	11	0	0	51	7	33	7	0	0	47	5	41	6	0	0	52	8	29	1	0	0	38	188
4:45 PM	1	40	9	0	0	50	10	37	3	0	0	50	6	28	7	0	0	41	4	43	2	0	0	49	190
5:00 PM	1	50	11	0	0	62	11	48	4	0	0	63	6	36	3	0	0	45	8	35	1	0	0	44	214
5:15 PM	1	39	12	0	0	52	7	43	3	0	0	53	6	22	4	0	0	32	5	57	3	0	0	65	202
Total	4	168	43	0	0	215	35	161	17	0	0	213	23	127	20	0	0	170	25	164	7	0	0	196	794
Approach %	1.9	78.1	20.0	0.0	-	-	16.4	75.6	8.0	0.0	-	-	13.5	74.7	11.8	0.0	-	-	12.8	83.7	3.6	0.0	-	-	-
Total %	0.5	21.2	5.4	0.0	-	27.1	4.4	20.3	2.1	0.0	-	26.8	2.9	16.0	2.5	0.0	-	21.4	3.1	20.7	0.9	0.0	-	24.7	-
PHF	1.000	0.840	0.896	0.000	-	0.867	0.795	0.839	0.607	0.000	-	0.845	0.958	0.774	0.714	0.000	-	0.817	0.781	0.719	0.583	0.000	-	0.754	0.928
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	4	168	43	0	-	215	35	159	17	0	-	211	23	127	20	0	-	170	25	164	6	0	-	195	791
% Cars & Light Goods	100.0	100.0	100.0	-	-	100.0	100.0	98.8	100.0	-	-	99.1	100.0	100.0	100.0	-	-	100.0	100.0	100.0	85.7	-	-	99.5	99.6
Buses	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	2
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	14.3	-	-	0.5	0.3
Articulated Trucks	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	0.0	0.0	0.0	-	-	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	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Beaverdams Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (4:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022

Turning Movement Data

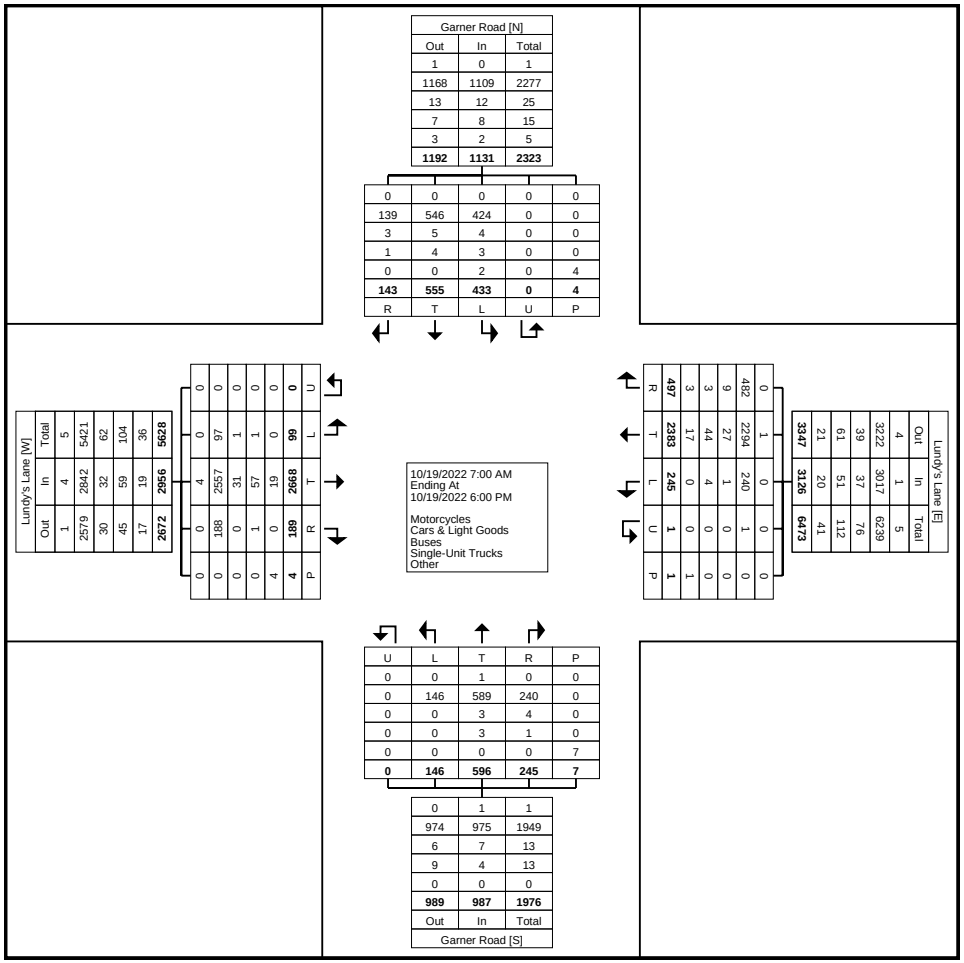
Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	52	0	0	0	54	3	40	5	0	0	48	3	7	1	0	0	11	5	1	1	0	0	7	120
7:15 AM	2	59	2	0	0	63	1	54	12	0	0	67	2	11	3	0	0	16	8	6	2	0	0	16	162
7:30 AM	5	84	2	0	1	91	3	60	13	0	0	76	4	23	3	0	2	30	8	19	2	0	0	29	226
7:45 AM	2	50	2	0	0	54	3	57	13	0	0	73	8	19	9	0	0	36	10	16	4	0	2	30	193
Hourly Total	11	245	6	0	1	262	10	211	43	0	0	264	17	60	16	0	2	93	31	42	9	0	2	82	701
8:00 AM	2	78	4	0	0	84	2	70	12	0	0	84	4	27	14	0	1	45	17	14	8	0	0	39	252
8:15 AM	3	86	5	0	0	94	4	54	11	0	0	69	4	25	6	0	0	35	14	8	6	0	0	28	226
8:30 AM	6	87	6	0	0	99	1	74	15	0	0	90	8	28	8	0	0	44	11	14	3	0	0	28	261
8:45 AM	5	76	4	0	0	85	11	71	9	0	0	91	7	27	12	0	0	46	18	10	5	0	0	33	255
Hourly Total	16	327	19	0	0	362	18	269	47	0	0	334	23	107	40	0	1	170	60	46	22	0	0	128	994
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	2	71	2	0	0	75	4	47	16	0	0	67	3	17	7	0	0	27	11	9	3	0	0	23	192
11:15 AM	1	63	3	0	0	67	5	63	12	0	0	80	4	16	6	0	0	26	11	11	8	0	0	30	203
11:30 AM	2	79	5	0	1	86	11	53	12	1	0	77	6	16	7	0	0	29	16	9	5	0	0	30	222
11:45 AM	4	46	3	0	0	53	10	89	13	0	0	112	5	9	11	0	0	25	9	11	4	0	0	24	214
Hourly Total	9	259	13	0	1	281	30	252	53	1	0	336	18	58	31	0	0	107	47	40	20	0	0	107	831
12:00 PM	3	102	6	0	1	111	9	83	11	0	0	103	8	17	9	0	1	34	6	9	4	0	0	19	267
12:15 PM	2	84	5	0	0	91	8	67	13	0	0	88	2	11	6	0	0	19	15	16	3	0	0	34	232
12:30 PM	1	88	8	0	0	97	8	66	18	0	0	92	3	18	5	0	0	26	23	19	4	0	0	46	261
12:45 PM	1	43	4	0	0	48	7	61	18	0	0	86	3	17	6	0	0	26	11	17	1	0	0	29	189
Hourly Total	7	317	23	0	1	347	32	277	60	0	0	369	16	63	26	0	1	105	55	61	12	0	0	128	949
1:00 PM	4	105	7	0	0	116	5	71	7	0	0	83	8	17	6	0	0	31	15	14	4	0	0	33	263
1:15 PM	2	78	6	0	0	86	3	62	16	0	0	81	3	14	4	0	0	21	15	20	5	0	0	40	228
1:30 PM	0	86	3	0	0	89	10	70	21	0	0	101	3	20	9	0	0	32	5	9	5	0	0	19	241
1:45 PM	1	36	2	0	0	39	10	56	19	0	0	85	10	18	10	0	0	38	9	13	0	0	0	22	184
Hourly Total	7	305	18	0	0	330	28	259	63	0	0	350	24	69	29	0	0	122	44	56	14	0	0	114	916
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	6	92	13	0	0	111	9	99	16	0	1	124	2	18	7	0	0	27	22	23	14	0	0	59	321
3:15 PM	5	93	13	0	0	111	15	88	24	0	0	127	1	15	6	0	0	22	11	22	3	0	0	36	296
3:30 PM	3	113	7	0	0	123	11	96	17	0	0	124	5	23	13	0	1	41	16	25	2	0	0	43	331
3:45 PM	4	98	8	0	0	110	12	91	17	0	0	120	5	18	11	0	0	34	13	19	8	0	0	40	304
Hourly Total	18	396	41	0	0	455	47	374	74	0	1	495	13	74	37	0	1	124	62	89	27	0	0	178	1252
4:00 PM	6	83	6	0	1	95	10	102	12	0	0	124	1	14	6	0	1	21	17	23	5	0	1	45	285
4:15 PM	3	113	13	0	0	129	14	95	11	0	0	120	4	16	7	0	0	27	19	24	2	0	0	45	321
4:30 PM	6	108	6	0	0	120	6	93	32	0	0	131	5	28	14	0	1	47	14	22	5	0	0	41	339

4:45 PM	6	111	12	0	0	129	15	91	20	0	0	126	6	25	9	0	0	40	17	36	6	0	0	59	354
Hourly Total	21	415	37	0	1	473	45	381	75	0	0	501	16	83	36	0	2	135	67	105	18	0	1	190	1299
5:00 PM	1	112	9	0	0	122	13	108	23	0	0	144	4	29	10	0	0	43	17	33	8	0	1	58	367
5:15 PM	3	63	5	0	0	71	6	91	23	0	0	120	1	15	7	0	0	23	23	45	6	0	0	74	288
5:30 PM	4	118	7	0	0	129	10	89	17	0	0	116	5	23	5	0	0	33	12	19	3	0	0	34	312
5:45 PM	2	111	11	0	0	124	6	72	19	0	0	97	9	15	8	0	0	32	15	19	4	0	0	38	291
Hourly Total	10	404	32	0	0	446	35	360	82	0	0	477	19	82	30	0	0	131	67	116	21	0	1	204	1258
Grand Total	99	2668	189	0	4	2956	245	2383	497	1	1	3126	146	596	245	0	7	987	433	555	143	0	4	1131	8200
Approach %	3.3	90.3	6.4	0.0	-	-	7.8	76.2	15.9	0.0	-	-	14.8	60.4	24.8	0.0	-	-	38.3	49.1	12.6	0.0	-	-	-
Total %	1.2	32.5	2.3	0.0	-	36.0	3.0	29.1	6.1	0.0	-	38.1	1.8	7.3	3.0	0.0	-	12.0	5.3	6.8	1.7	0.0	-	13.8	-
Motorcycles	0	4	0	0	-	4	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	6
% Motorcycles	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	97	2557	188	0	-	2842	240	2294	482	1	-	3017	146	589	240	0	-	975	424	546	139	0	-	1109	7943
% Cars & Light Goods	98.0	95.8	99.5	-	-	96.1	98.0	96.3	97.0	100.0	-	96.5	100.0	98.8	98.0	-	-	98.8	97.9	98.4	97.2	-	-	98.1	96.9
Buses	1	31	0	0	-	32	1	27	9	0	-	37	0	3	4	0	-	7	4	5	3	0	-	12	88
% Buses	1.0	1.2	0.0	-	-	1.1	0.4	1.1	1.8	0.0	-	1.2	0.0	0.5	1.6	-	-	0.7	0.9	0.9	2.1	-	-	1.1	1.1
Single-Unit Trucks	1	57	1	0	-	59	4	44	3	0	-	51	0	3	1	0	-	4	3	4	1	0	-	8	122
% Single-Unit Trucks	1.0	2.1	0.5	-	-	2.0	1.6	1.8	0.6	0.0	-	1.6	0.0	0.5	0.4	-	-	0.4	0.7	0.7	0.7	-	-	0.7	1.5
Articulated Trucks	0	16	0	0	-	16	0	15	2	0	-	17	0	0	0	0	-	0	2	0	0	0	-	2	35
% Articulated Trucks	0.0	0.6	0.0	-	-	0.5	0.0	0.6	0.4	0.0	-	0.5	0.0	0.0	0.0	-	-	0.0	0.5	0.0	0.0	-	-	0.2	0.4
Bicycles on Road	0	3	0	0	-	3	0	2	1	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	6
% Bicycles on Road	0.0	0.1	0.0	-	-	0.1	0.0	0.1	0.2	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022

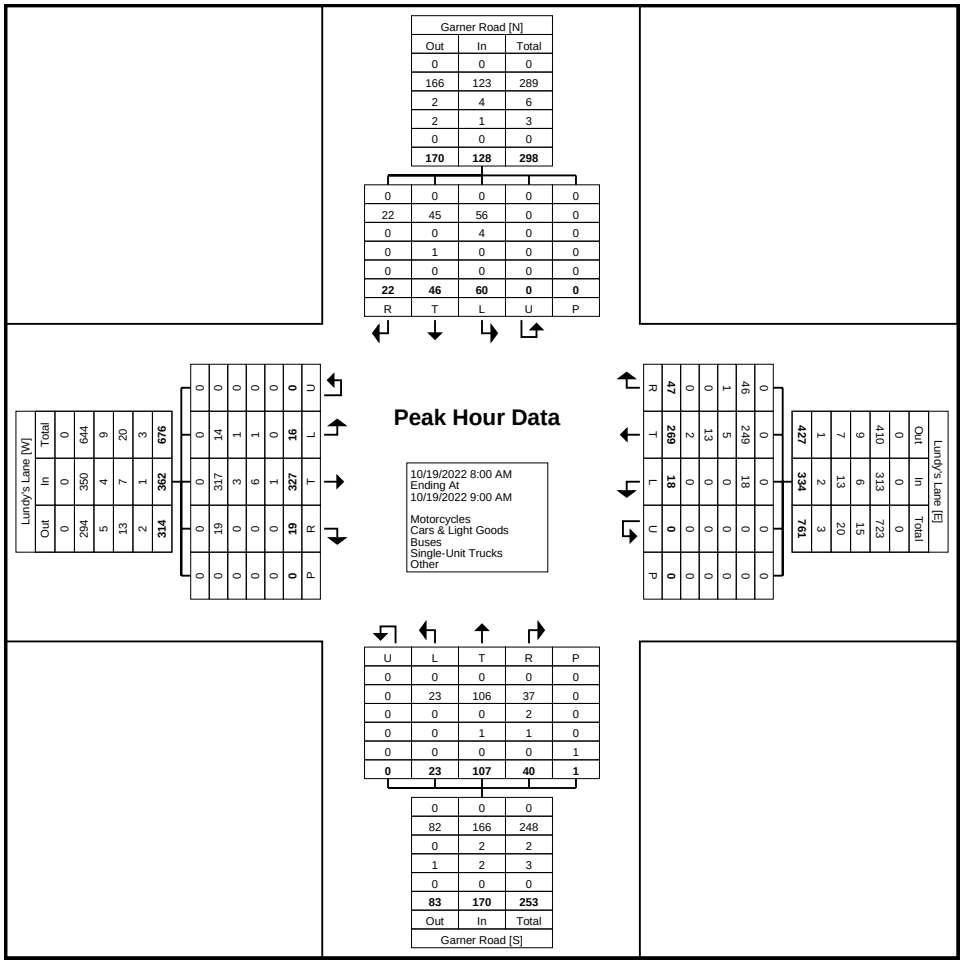
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	2	78	4	0	0	84	2	70	12	0	0	84	4	27	14	0	1	45	17	14	8	0	0	39	252
8:15 AM	3	86	5	0	0	94	4	54	11	0	0	69	4	25	6	0	0	35	14	8	6	0	0	28	226
8:30 AM	6	87	6	0	0	99	1	74	15	0	0	90	8	28	8	0	0	44	11	14	3	0	0	28	261
8:45 AM	5	76	4	0	0	85	11	71	9	0	0	91	7	27	12	0	0	46	18	10	5	0	0	33	255
Total	16	327	19	0	0	362	18	269	47	0	0	334	23	107	40	0	1	170	60	46	22	0	0	128	994
Approach %	4.4	90.3	5.2	0.0	-	-	5.4	80.5	14.1	0.0	-	-	13.5	62.9	23.5	0.0	-	-	46.9	35.9	17.2	0.0	-	-	-
Total %	1.6	32.9	1.9	0.0	-	36.4	1.8	27.1	4.7	0.0	-	33.6	2.3	10.8	4.0	0.0	-	17.1	6.0	4.6	2.2	0.0	-	12.9	-
PHF	0.667	0.940	0.792	0.000	-	0.914	0.409	0.909	0.783	0.000	-	0.918	0.719	0.955	0.714	0.000	-	0.924	0.833	0.821	0.688	0.000	-	0.821	0.952
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	14	317	19	0	-	350	18	249	46	0	-	313	23	106	37	0	-	166	56	45	22	0	-	123	952
% Cars & Light Goods	87.5	96.9	100.0	-	-	96.7	100.0	92.6	97.9	-	-	93.7	100.0	99.1	92.5	-	-	97.6	93.3	97.8	100.0	-	-	96.1	95.8
Buses	1	3	0	0	-	4	0	5	1	0	-	6	0	0	2	0	-	2	4	0	0	0	-	4	16
% Buses	6.3	0.9	0.0	-	-	1.1	0.0	1.9	2.1	-	-	1.8	0.0	0.0	5.0	-	-	1.2	6.7	0.0	0.0	-	-	3.1	1.6
Single-Unit Trucks	1	6	0	0	-	7	0	13	0	0	-	13	0	1	1	0	-	2	0	1	0	0	-	1	23
% Single-Unit Trucks	6.3	1.8	0.0	-	-	1.9	0.0	4.8	0.0	-	-	3.9	0.0	0.9	2.5	-	-	1.2	0.0	2.2	0.0	-	-	0.8	2.3
Articulated Trucks	0	1	0	0	-	1	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	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	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022

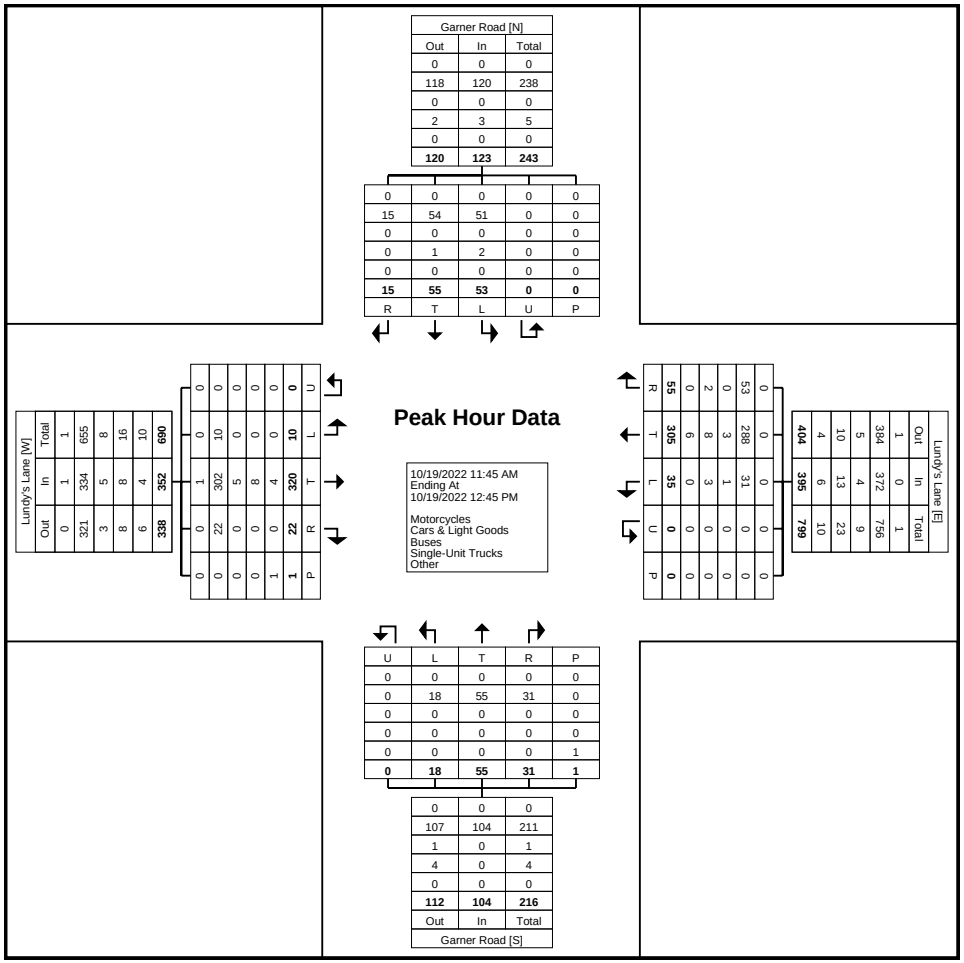
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	4	46	3	0	0	53	10	89	13	0	0	112	5	9	11	0	0	25	9	11	4	0	0	24	214
12:00 PM	3	102	6	0	1	111	9	83	11	0	0	103	8	17	9	0	1	34	6	9	4	0	0	19	267
12:15 PM	2	84	5	0	0	91	8	67	13	0	0	88	2	11	6	0	0	19	15	16	3	0	0	34	232
12:30 PM	1	88	8	0	0	97	8	66	18	0	0	92	3	18	5	0	0	26	23	19	4	0	0	46	261
Total	10	320	22	0	1	352	35	305	55	0	0	395	18	55	31	0	1	104	53	55	15	0	0	123	974
Approach %	2.8	90.9	6.3	0.0	-	-	8.9	77.2	13.9	0.0	-	-	17.3	52.9	29.8	0.0	-	-	43.1	44.7	12.2	0.0	-	-	-
Total %	1.0	32.9	2.3	0.0	-	36.1	3.6	31.3	5.6	0.0	-	40.6	1.8	5.6	3.2	0.0	-	10.7	5.4	5.6	1.5	0.0	-	12.6	-
PHF	0.625	0.784	0.688	0.000	-	0.793	0.875	0.857	0.764	0.000	-	0.882	0.563	0.764	0.705	0.000	-	0.765	0.576	0.724	0.938	0.000	-	0.668	0.912
Motorcycles	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	10	302	22	0	-	334	31	288	53	0	-	372	18	55	31	0	-	104	51	54	15	0	-	120	930
% Cars & Light Goods	100.0	94.4	100.0	-	-	94.9	88.6	94.4	96.4	-	-	94.2	100.0	100.0	100.0	-	-	100.0	96.2	98.2	100.0	-	-	97.6	95.5
Buses	0	5	0	0	-	5	1	3	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	9
% Buses	0.0	1.6	0.0	-	-	1.4	2.9	1.0	0.0	-	-	1.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.9
Single-Unit Trucks	0	8	0	0	-	8	3	8	2	0	-	13	0	0	0	0	-	0	2	1	0	0	-	3	24
% Single-Unit Trucks	0.0	2.5	0.0	-	-	2.3	8.6	2.6	3.6	-	-	3.3	0.0	0.0	0.0	-	-	0.0	3.8	1.8	0.0	-	-	2.4	2.5
Articulated Trucks	0	4	0	0	-	4	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	8
% Articulated Trucks	0.0	1.3	0.0	-	-	1.1	0.0	1.3	0.0	-	-	1.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.8
Bicycles on Road	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022

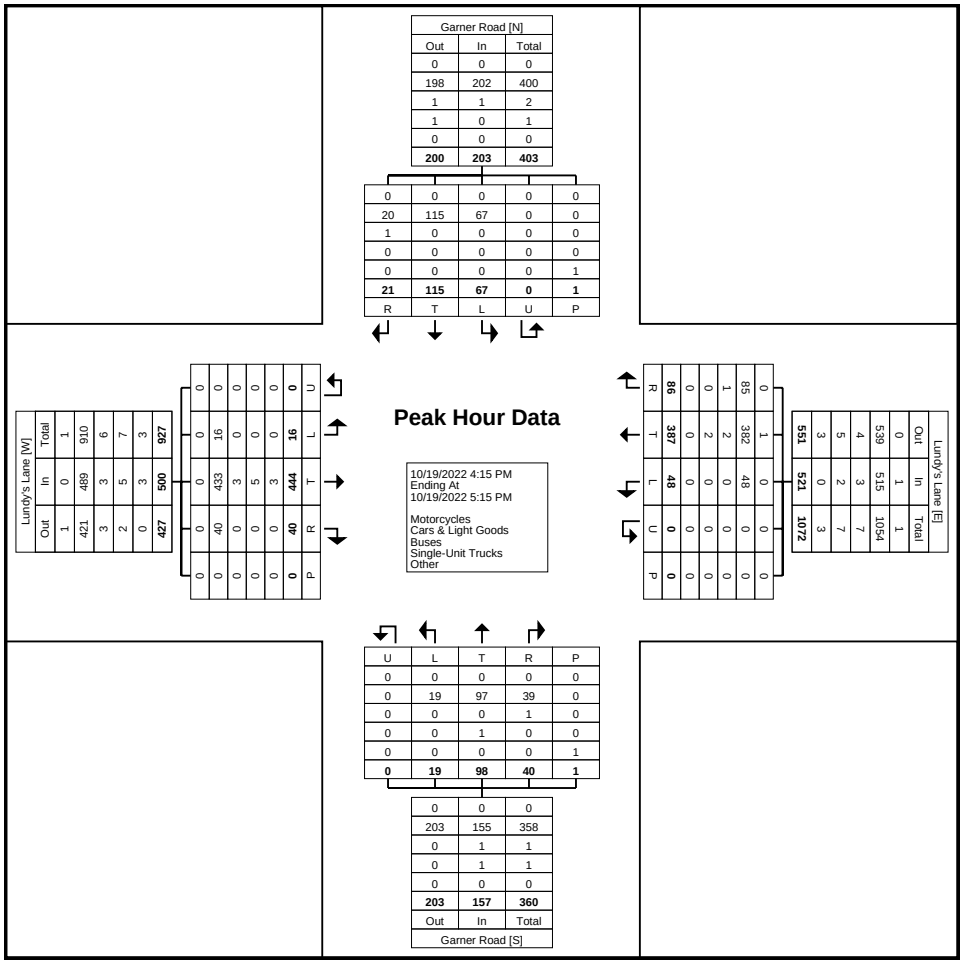
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Garner Road Northbound						Garner Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:15 PM	3	113	13	0	0	129	14	95	11	0	0	120	4	16	7	0	0	27	19	24	2	0	0	45	321
4:30 PM	6	108	6	0	0	120	6	93	32	0	0	131	5	28	14	0	1	47	14	22	5	0	0	41	339
4:45 PM	6	111	12	0	0	129	15	91	20	0	0	126	6	25	9	0	0	40	17	36	6	0	0	59	354
5:00 PM	1	112	9	0	0	122	13	108	23	0	0	144	4	29	10	0	0	43	17	33	8	0	1	58	367
Total	16	444	40	0	0	500	48	387	86	0	0	521	19	98	40	0	1	157	67	115	21	0	1	203	1381
Approach %	3.2	88.8	8.0	0.0	-	-	9.2	74.3	16.5	0.0	-	-	12.1	62.4	25.5	0.0	-	-	33.0	56.7	10.3	0.0	-	-	-
Total %	1.2	32.2	2.9	0.0	-	36.2	3.5	28.0	6.2	0.0	-	37.7	1.4	7.1	2.9	0.0	-	11.4	4.9	8.3	1.5	0.0	-	14.7	-
PHF	0.667	0.982	0.769	0.000	-	0.969	0.800	0.896	0.672	0.000	-	0.905	0.792	0.845	0.714	0.000	-	0.835	0.882	0.799	0.656	0.000	-	0.860	0.941
Motorcycles	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	16	433	40	0	-	489	48	382	85	0	-	515	19	97	39	0	-	155	67	115	20	0	-	202	1361
% Cars & Light Goods	100.0	97.5	100.0	-	-	97.8	100.0	98.7	98.8	-	-	98.8	100.0	99.0	97.5	-	-	98.7	100.0	100.0	95.2	-	-	99.5	98.6
Buses	0	3	0	0	-	3	0	2	1	0	-	3	0	0	1	0	-	1	0	0	1	0	-	1	8
% Buses	0.0	0.7	0.0	-	-	0.6	0.0	0.5	1.2	-	-	0.6	0.0	0.0	2.5	-	-	0.6	0.0	0.0	4.8	-	-	0.5	0.6
Single-Unit Trucks	0	5	0	0	-	5	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	8
% Single-Unit Trucks	0.0	1.1	0.0	-	-	1.0	0.0	0.5	0.0	-	-	0.4	0.0	1.0	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.6
Articulated Trucks	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	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	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Garner Road & Lundy's Lane
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (4:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022

Turning Movement Data

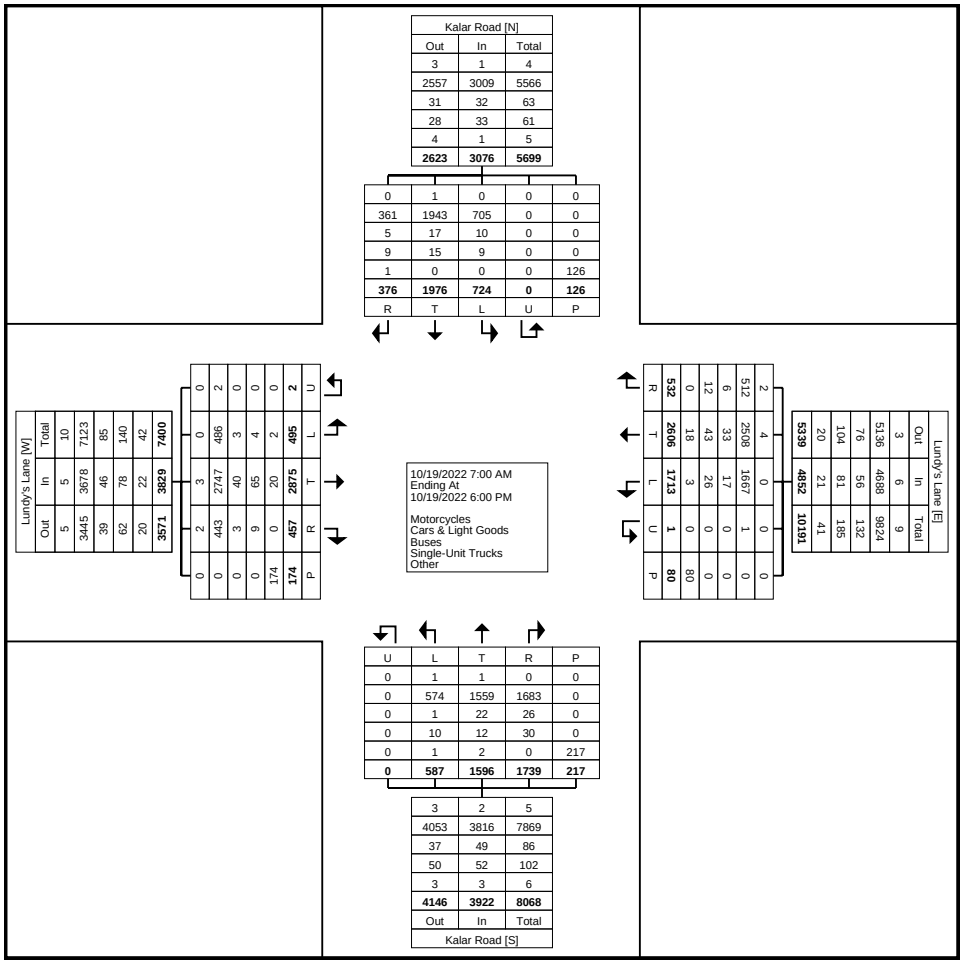
Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Kalar Road Northbound						Kalar Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	3	59	6	0	0	68	15	43	9	0	1	67	7	25	35	0	1	67	12	19	10	0	0	41	243
7:15 AM	6	51	4	0	5	61	16	52	10	0	0	78	15	31	53	0	0	99	13	17	8	0	0	38	276
7:30 AM	6	97	7	0	2	110	33	57	5	0	0	95	16	25	61	0	0	102	14	53	13	0	1	80	387
7:45 AM	10	69	12	0	2	91	29	51	12	0	1	92	18	51	58	0	2	127	16	67	10	0	2	93	403
Hourly Total	25	276	29	0	9	330	93	203	36	0	2	332	56	132	207	0	3	395	55	156	41	0	3	252	1309
8:00 AM	12	84	9	0	1	105	22	54	10	0	0	86	21	47	73	0	5	141	16	42	11	0	1	69	401
8:15 AM	12	84	14	0	6	110	35	49	18	0	0	102	17	62	68	0	3	147	25	67	9	0	3	101	460
8:30 AM	13	76	16	0	2	105	44	60	10	0	0	114	20	51	96	0	2	167	26	57	14	0	2	97	483
8:45 AM	10	94	16	0	4	120	46	70	6	0	0	122	18	52	68	0	2	138	13	63	9	0	6	85	465
Hourly Total	47	338	55	0	13	440	147	233	44	0	0	424	76	212	305	0	12	593	80	229	43	0	12	352	1809
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	8	96	10	0	2	114	49	53	13	0	0	115	20	40	48	0	5	108	22	52	8	0	1	82	419
11:15 AM	13	86	9	0	6	108	47	84	22	0	2	153	6	36	39	0	2	81	23	38	7	0	1	68	410
11:30 AM	13	102	3	0	2	118	44	72	18	0	1	134	18	44	41	0	2	103	26	43	11	0	0	80	435
11:45 AM	10	68	7	0	1	85	52	88	19	0	3	159	22	52	35	0	2	109	20	49	11	0	8	80	433
Hourly Total	44	352	29	0	11	425	192	297	72	0	6	561	66	172	163	0	11	401	91	182	37	0	10	310	1697
12:00 PM	15	96	11	0	24	122	46	83	17	0	7	146	17	44	47	0	27	108	40	56	11	0	33	107	483
12:15 PM	17	90	14	0	15	121	57	64	26	0	5	147	13	49	44	0	24	106	22	61	11	0	22	94	468
12:30 PM	14	89	16	1	4	120	47	76	22	0	1	145	18	47	56	0	11	121	24	52	12	0	2	88	474
12:45 PM	6	76	10	0	2	92	57	77	14	1	7	149	15	42	58	0	20	115	36	46	18	0	0	100	456
Hourly Total	52	351	51	1	45	455	207	300	79	1	20	587	63	182	205	0	82	450	122	215	52	0	57	389	1881
1:00 PM	21	92	24	0	1	137	45	64	16	0	2	125	18	47	38	0	14	103	14	63	14	0	0	91	456
1:15 PM	14	82	17	0	4	113	41	88	26	0	8	155	16	49	38	0	7	103	22	59	9	0	0	90	461
1:30 PM	12	108	9	0	11	129	58	96	10	0	0	164	13	45	45	0	4	103	26	51	12	0	0	89	485
1:45 PM	15	62	13	0	10	90	45	85	28	0	3	158	23	35	48	0	1	106	19	59	10	0	0	88	442
Hourly Total	62	344	63	0	26	469	189	333	80	0	13	602	70	176	169	0	26	415	81	232	45	0	0	358	1844
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	24	113	14	0	9	151	75	119	24	0	3	218	25	68	64	0	11	157	26	75	9	0	2	110	636
3:15 PM	20	89	15	0	10	124	67	90	15	0	2	172	19	57	53	0	7	129	29	86	20	0	3	135	560
3:30 PM	23	124	26	0	9	173	63	96	15	0	1	174	22	54	47	0	4	123	22	69	14	0	3	105	575
3:45 PM	20	103	9	0	2	132	59	103	19	0	3	181	19	68	62	0	5	149	29	63	15	0	7	107	569
Hourly Total	87	429	64	0	30	580	264	408	73	0	9	745	85	247	226	0	27	558	106	293	58	0	15	457	2340
4:00 PM	17	89	15	1	4	122	92	128	20	0	5	240	25	64	70	0	5	159	22	77	9	0	3	108	629
4:15 PM	21	113	21	0	4	155	54	91	25	0	7	170	12	61	60	0	11	133	26	89	20	0	3	135	593
4:30 PM	23	99	18	0	6	140	84	115	16	0	5	215	35	58	62	0	9	155	22	87	11	0	7	120	630

4:45 PM	33	116	17	0	9	166	75	102	13	0	0	190	17	63	57	0	7	137	20	69	15	0	2	104	597
Hourly Total	94	417	71	1	23	583	305	436	74	0	17	815	89	246	249	0	32	584	90	322	55	0	15	467	2449
5:00 PM	23	103	30	0	0	156	86	118	19	0	4	223	19	55	49	0	5	123	28	82	12	0	3	122	624
5:15 PM	17	78	23	0	7	118	88	105	27	0	3	220	16	52	50	0	10	118	26	88	8	0	3	122	578
5:30 PM	23	97	19	0	2	139	67	92	11	0	0	170	24	65	53	0	2	142	16	83	14	0	0	113	564
5:45 PM	21	90	23	0	8	134	75	81	17	0	6	173	23	57	63	0	7	143	29	94	11	0	8	134	584
Hourly Total	84	368	95	0	17	547	316	396	74	0	13	786	82	229	215	0	24	526	99	347	45	0	14	491	2350
Grand Total	495	2875	457	2	174	3829	1713	2606	532	1	80	4852	587	1596	1739	0	217	3922	724	1976	376	0	126	3076	15679
Approach %	12.9	75.1	11.9	0.1	-	-	35.3	53.7	11.0	0.0	-	-	15.0	40.7	44.3	0.0	-	-	23.5	64.2	12.2	0.0	-	-	-
Total %	3.2	18.3	2.9	0.0	-	24.4	10.9	16.6	3.4	0.0	-	30.9	3.7	10.2	11.1	0.0	-	25.0	4.6	12.6	2.4	0.0	-	19.6	-
Motorcycles	0	3	2	0	-	5	0	4	2	0	-	6	1	1	0	0	-	2	0	1	0	0	-	1	14
% Motorcycles	0.0	0.1	0.4	0.0	-	0.1	0.0	0.2	0.4	0.0	-	0.1	0.2	0.1	0.0	-	-	0.1	0.0	0.1	0.0	-	-	0.0	0.1
Cars & Light Goods	486	2747	443	2	-	3678	1667	2508	512	1	-	4688	574	1559	1683	0	-	3816	705	1943	361	0	-	3009	15191
% Cars & Light Goods	98.2	95.5	96.9	100.0	-	96.1	97.3	96.2	96.2	100.0	-	96.6	97.8	97.7	96.8	-	-	97.3	97.4	98.3	96.0	-	-	97.8	96.9
Buses	3	40	3	0	-	46	17	33	6	0	-	56	1	22	26	0	-	49	10	17	5	0	-	32	183
% Buses	0.6	1.4	0.7	0.0	-	1.2	1.0	1.3	1.1	0.0	-	1.2	0.2	1.4	1.5	-	-	1.2	1.4	0.9	1.3	-	-	1.0	1.2
Single-Unit Trucks	4	65	9	0	-	78	26	43	12	0	-	81	10	12	30	0	-	52	9	15	9	0	-	33	244
% Single-Unit Trucks	0.8	2.3	2.0	0.0	-	2.0	1.5	1.7	2.3	0.0	-	1.7	1.7	0.8	1.7	-	-	1.3	1.2	0.8	2.4	-	-	1.1	1.6
Articulated Trucks	2	18	0	0	-	20	3	16	0	0	-	19	1	2	0	0	-	3	0	0	1	0	-	1	43
% Articulated Trucks	0.4	0.6	0.0	0.0	-	0.5	0.2	0.6	0.0	0.0	-	0.4	0.2	0.1	0.0	-	-	0.1	0.0	0.0	0.3	-	-	0.0	0.3
Bicycles on Road	0	2	0	0	-	2	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	4
% Bicycles on Road	0.0	0.1	0.0	0.0	-	0.1	0.0	0.1	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	9	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	1.3	-	-	-	-	-	4.1	-	-	-	-	-	1.6	-	-
Pedestrians	-	-	-	-	174	-	-	-	-	-	79	-	-	-	-	-	208	-	-	-	-	-	124	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	98.8	-	-	-	-	-	95.9	-	-	-	-	-	98.4	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022

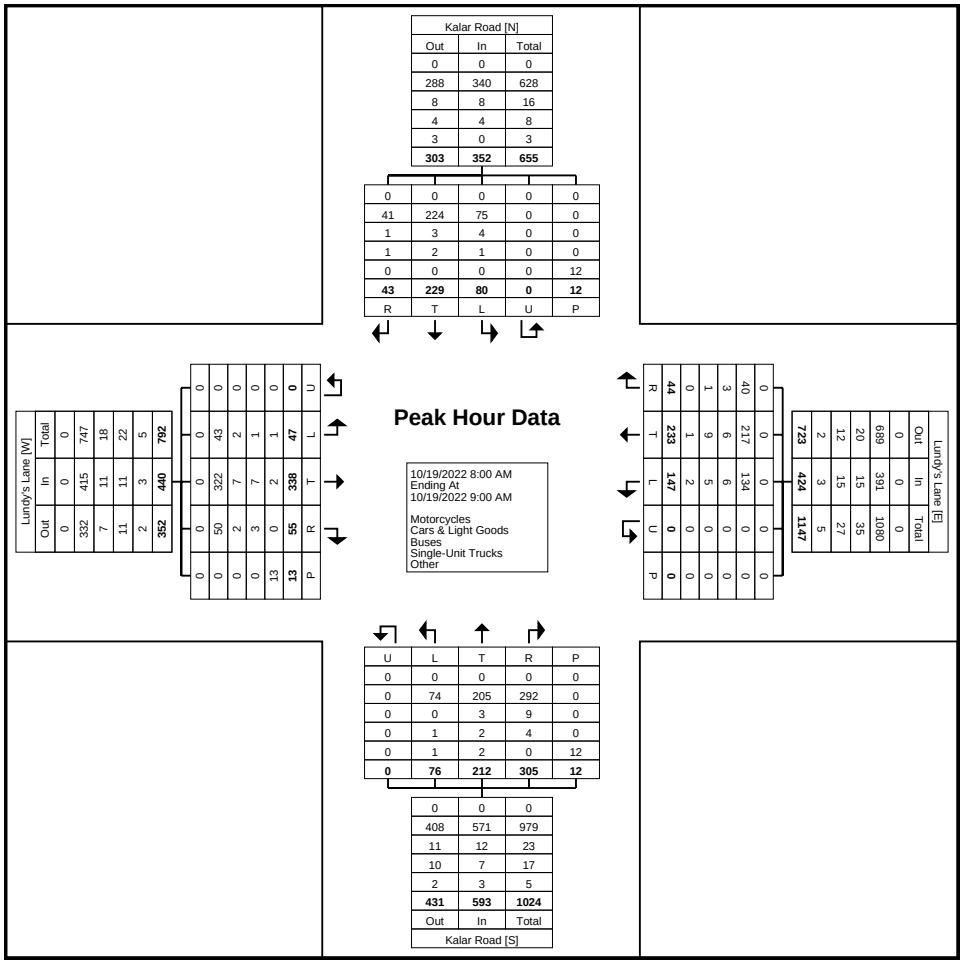
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Kalar Road Northbound						Kalar Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	12	84	9	0	1	105	22	54	10	0	0	86	21	47	73	0	5	141	16	42	11	0	1	69	401
8:15 AM	12	84	14	0	6	110	35	49	18	0	0	102	17	62	68	0	3	147	25	67	9	0	3	101	460
8:30 AM	13	76	16	0	2	105	44	60	10	0	0	114	20	51	96	0	2	167	26	57	14	0	2	97	483
8:45 AM	10	94	16	0	4	120	46	70	6	0	0	122	18	52	68	0	2	138	13	63	9	0	6	85	465
Total	47	338	55	0	13	440	147	233	44	0	0	424	76	212	305	0	12	593	80	229	43	0	12	352	1809
Approach %	10.7	76.8	12.5	0.0	-	-	34.7	55.0	10.4	0.0	-	-	12.8	35.8	51.4	0.0	-	-	22.7	65.1	12.2	0.0	-	-	-
Total %	2.6	18.7	3.0	0.0	-	24.3	8.1	12.9	2.4	0.0	-	23.4	4.2	11.7	16.9	0.0	-	32.8	4.4	12.7	2.4	0.0	-	19.5	-
PHF	0.904	0.899	0.859	0.000	-	0.917	0.799	0.832	0.611	0.000	-	0.869	0.905	0.855	0.794	0.000	-	0.888	0.769	0.854	0.768	0.000	-	0.871	0.936
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	43	322	50	0	-	415	134	217	40	0	-	391	74	205	292	0	-	571	75	224	41	0	-	340	1717
% Cars & Light Goods	91.5	95.3	90.9	-	-	94.3	91.2	93.1	90.9	-	-	92.2	97.4	96.7	95.7	-	-	96.3	93.8	97.8	95.3	-	-	96.6	94.9
Buses	2	7	2	0	-	11	6	6	3	0	-	15	0	3	9	0	-	12	4	3	1	0	-	8	46
% Buses	4.3	2.1	3.6	-	-	2.5	4.1	2.6	6.8	-	-	3.5	0.0	1.4	3.0	-	-	2.0	5.0	1.3	2.3	-	-	2.3	2.5
Single-Unit Trucks	1	7	3	0	-	11	5	9	1	0	-	15	1	2	4	0	-	7	1	2	1	0	-	4	37
% Single-Unit Trucks	2.1	2.1	5.5	-	-	2.5	3.4	3.9	2.3	-	-	3.5	1.3	0.9	1.3	-	-	1.2	1.3	0.9	2.3	-	-	1.1	2.0
Articulated Trucks	1	2	0	0	-	3	2	1	0	0	-	3	1	2	0	0	-	3	0	0	0	0	-	0	9
% Articulated Trucks	2.1	0.6	0.0	-	-	0.7	1.4	0.4	0.0	-	-	0.7	1.3	0.9	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Road	0	0	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	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	13	-	-	-	-	-	0	-	-	-	-	-	12	-	-	-	-	-	12	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022

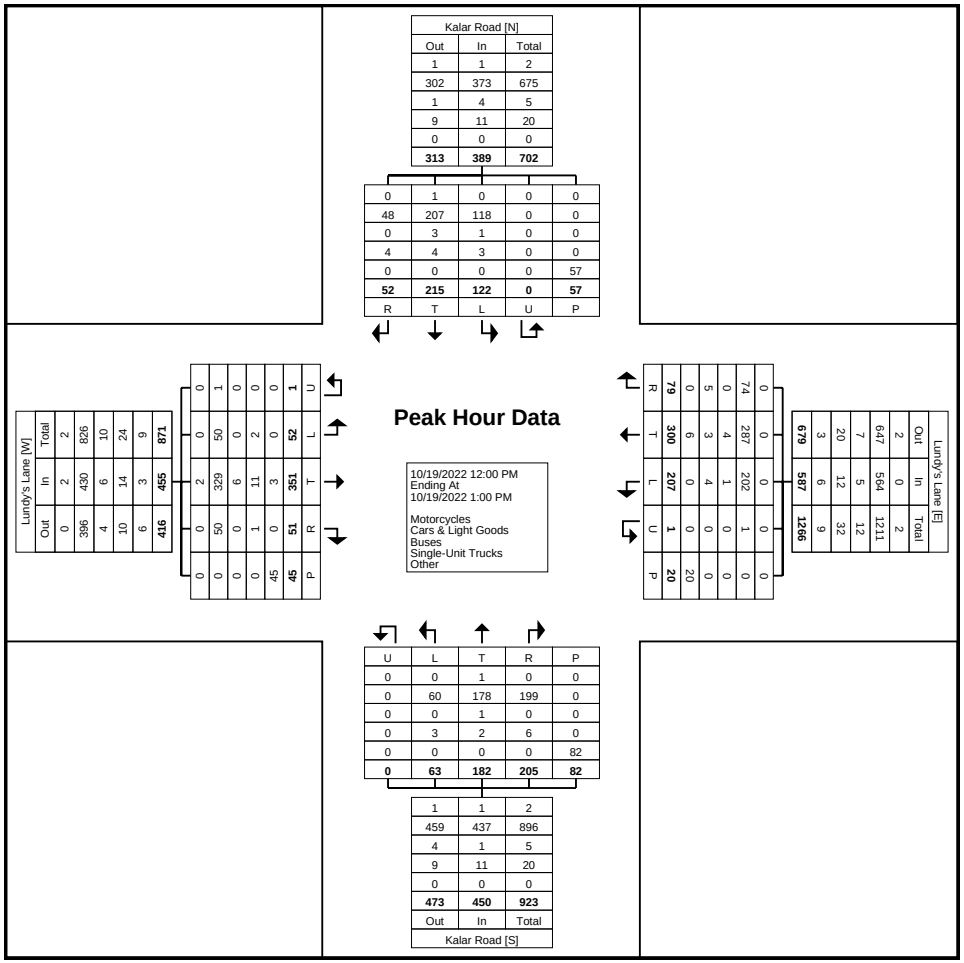
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Kalar Road Northbound						Kalar Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	15	96	11	0	24	122	46	83	17	0	7	146	17	44	47	0	27	108	40	56	11	0	33	107	483
12:15 PM	17	90	14	0	15	121	57	64	26	0	5	147	13	49	44	0	24	106	22	61	11	0	22	94	468
12:30 PM	14	89	16	1	4	120	47	76	22	0	1	145	18	47	56	0	11	121	24	52	12	0	2	88	474
12:45 PM	6	76	10	0	2	92	57	77	14	1	7	149	15	42	58	0	20	115	36	46	18	0	0	100	456
Total	52	351	51	1	45	455	207	300	79	1	20	587	63	182	205	0	82	450	122	215	52	0	57	389	1881
Approach %	11.4	77.1	11.2	0.2	-	-	35.3	51.1	13.5	0.2	-	-	14.0	40.4	45.6	0.0	-	-	31.4	55.3	13.4	0.0	-	-	-
Total %	2.8	18.7	2.7	0.1	-	24.2	11.0	15.9	4.2	0.1	-	31.2	3.3	9.7	10.9	0.0	-	23.9	6.5	11.4	2.8	0.0	-	20.7	-
PHF	0.765	0.914	0.797	0.250	-	0.932	0.908	0.904	0.760	0.250	-	0.985	0.875	0.929	0.884	0.000	-	0.930	0.763	0.881	0.722	0.000	-	0.909	0.974
Motorcycles	0	2	0	0	-	2	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	4
% Motorcycles	0.0	0.6	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	-	0.2	0.0	0.5	0.0	-	-	0.3	0.2
Cars & Light Goods	50	329	50	1	-	430	202	287	74	1	-	564	60	178	199	0	-	437	118	207	48	0	-	373	1804
% Cars & Light Goods	96.2	93.7	98.0	100.0	-	94.5	97.6	95.7	93.7	100.0	-	96.1	95.2	97.8	97.1	-	-	97.1	96.7	96.3	92.3	-	-	95.9	95.9
Buses	0	6	0	0	-	6	1	4	0	0	-	5	0	1	0	0	-	1	1	3	0	0	-	4	16
% Buses	0.0	1.7	0.0	0.0	-	1.3	0.5	1.3	0.0	0.0	-	0.9	0.0	0.5	0.0	-	-	0.2	0.8	1.4	0.0	-	-	1.0	0.9
Single-Unit Trucks	2	11	1	0	-	14	4	3	5	0	-	12	3	2	6	0	-	11	3	4	4	0	-	11	48
% Single-Unit Trucks	3.8	3.1	2.0	0.0	-	3.1	1.9	1.0	6.3	0.0	-	2.0	4.8	1.1	2.9	-	-	2.4	2.5	1.9	7.7	-	-	2.8	2.6
Articulated Trucks	0	3	0	0	-	3	0	6	0	0	-	6	0	0	0	0	-	0	0	0	0	0	-	0	9
% Articulated Trucks	0.0	0.9	0.0	0.0	-	0.7	0.0	2.0	0.0	0.0	-	1.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Road	0	0	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	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	1.2	-	-	-	-	-	1.8	-	-
Pedestrians	-	-	-	-	45	-	-	-	-	-	20	-	-	-	-	-	81	-	-	-	-	-	56	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	98.8	-	-	-	-	-	98.2	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022

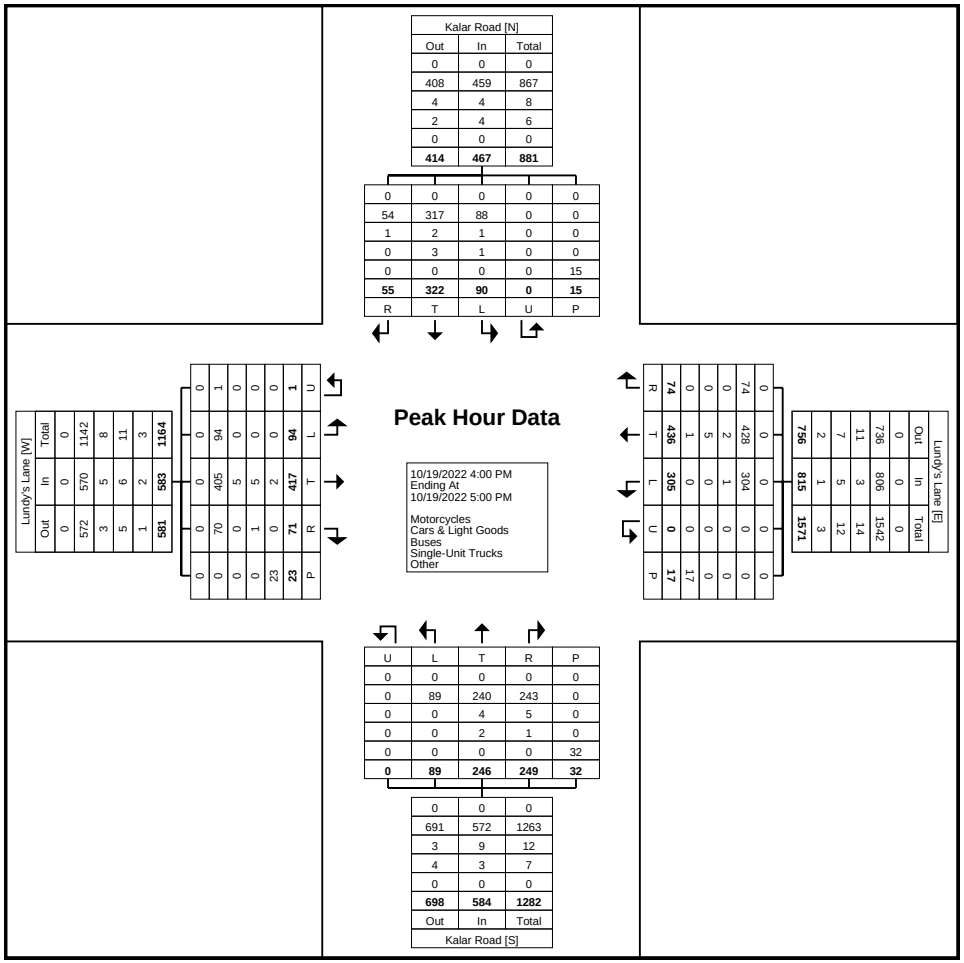
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Lundy's Lane Eastbound						Lundy's Lane Westbound						Kalar Road Northbound						Kalar Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	17	89	15	1	4	122	92	128	20	0	5	240	25	64	70	0	5	159	22	77	9	0	3	108	629
4:15 PM	21	113	21	0	4	155	54	91	25	0	7	170	12	61	60	0	11	133	26	89	20	0	3	135	593
4:30 PM	23	99	18	0	6	140	84	115	16	0	5	215	35	58	62	0	9	155	22	87	11	0	7	120	630
4:45 PM	33	116	17	0	9	166	75	102	13	0	0	190	17	63	57	0	7	137	20	69	15	0	2	104	597
Total	94	417	71	1	23	583	305	436	74	0	17	815	89	246	249	0	32	584	90	322	55	0	15	467	2449
Approach %	16.1	71.5	12.2	0.2	-	-	37.4	53.5	9.1	0.0	-	-	15.2	42.1	42.6	0.0	-	-	19.3	69.0	11.8	0.0	-	-	-
Total %	3.8	17.0	2.9	0.0	-	23.8	12.5	17.8	3.0	0.0	-	33.3	3.6	10.0	10.2	0.0	-	23.8	3.7	13.1	2.2	0.0	-	19.1	-
PHF	0.712	0.899	0.845	0.250	-	0.878	0.829	0.852	0.740	0.000	-	0.849	0.636	0.961	0.889	0.000	-	0.918	0.865	0.904	0.688	0.000	-	0.865	0.972
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	94	405	70	1	-	570	304	428	74	0	-	806	89	240	243	0	-	572	88	317	54	0	-	459	2407
% Cars & Light Goods	100.0	97.1	98.6	100.0	-	97.8	99.7	98.2	100.0	-	-	98.9	100.0	97.6	97.6	-	-	97.9	97.8	98.4	98.2	-	-	98.3	98.3
Buses	0	5	0	0	-	5	1	2	0	0	-	3	0	4	5	0	-	9	1	2	1	0	-	4	21
% Buses	0.0	1.2	0.0	0.0	-	0.9	0.3	0.5	0.0	-	-	0.4	0.0	1.6	2.0	-	-	1.5	1.1	0.6	1.8	-	-	0.9	0.9
Single-Unit Trucks	0	5	1	0	-	6	0	5	0	0	-	5	0	2	1	0	-	3	1	3	0	0	-	4	18
% Single-Unit Trucks	0.0	1.2	1.4	0.0	-	1.0	0.0	1.1	0.0	-	-	0.6	0.0	0.8	0.4	-	-	0.5	1.1	0.9	0.0	-	-	0.9	0.7
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.5	0.0	0.0	-	0.3	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	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	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	3.1	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	23	-	-	-	-	-	17	-	-	-	-	-	31	-	-	-	-	-	15	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	96.9	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

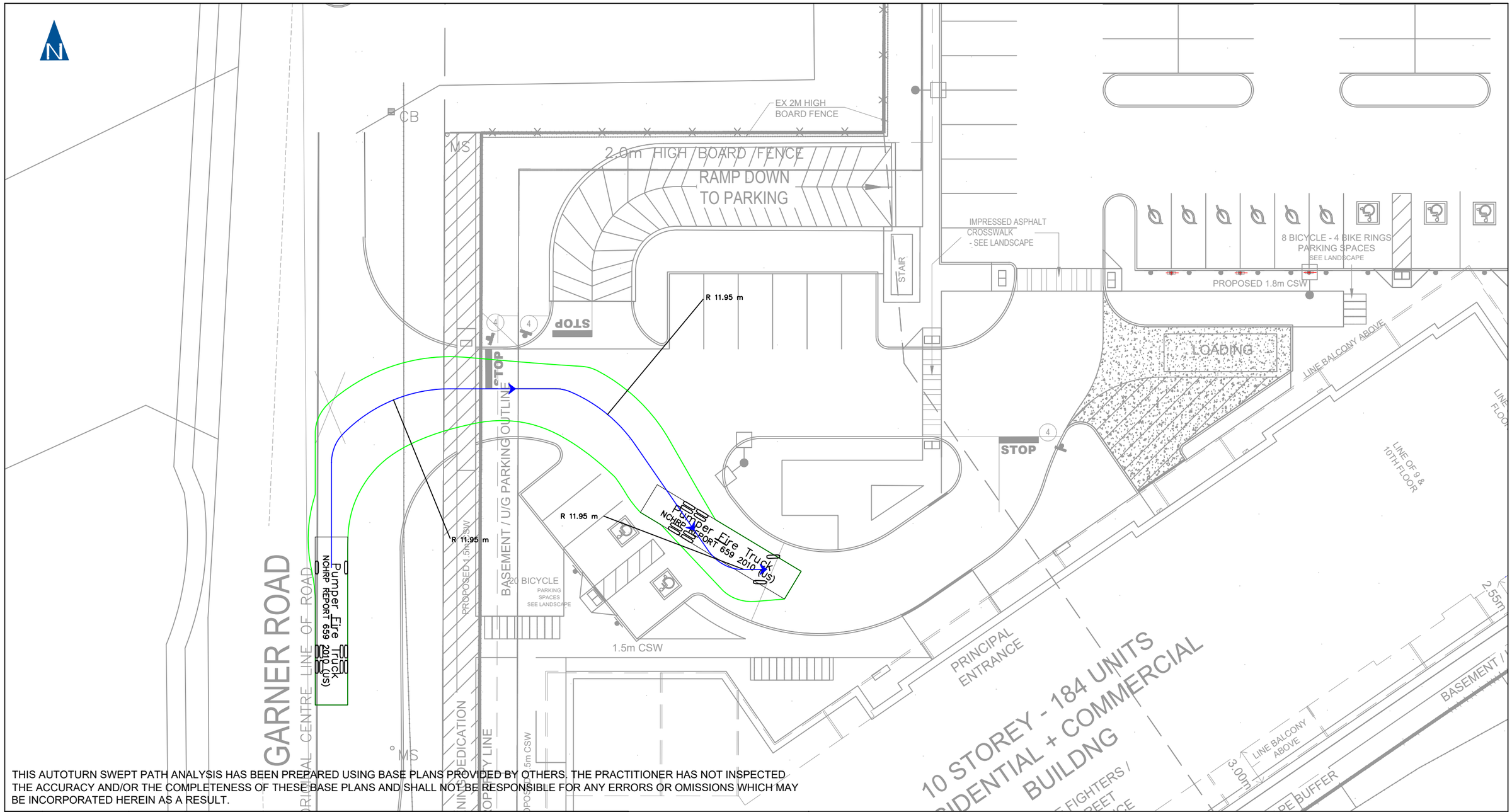
Count Name: Lundy's Lane & Kalar Road
Site Code: 220571
Start Date: 10/19/2022



Turning Movement Peak Hour Data Plot (4:00 PM)

Appendix C

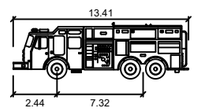
AutoTURN Analysis



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:



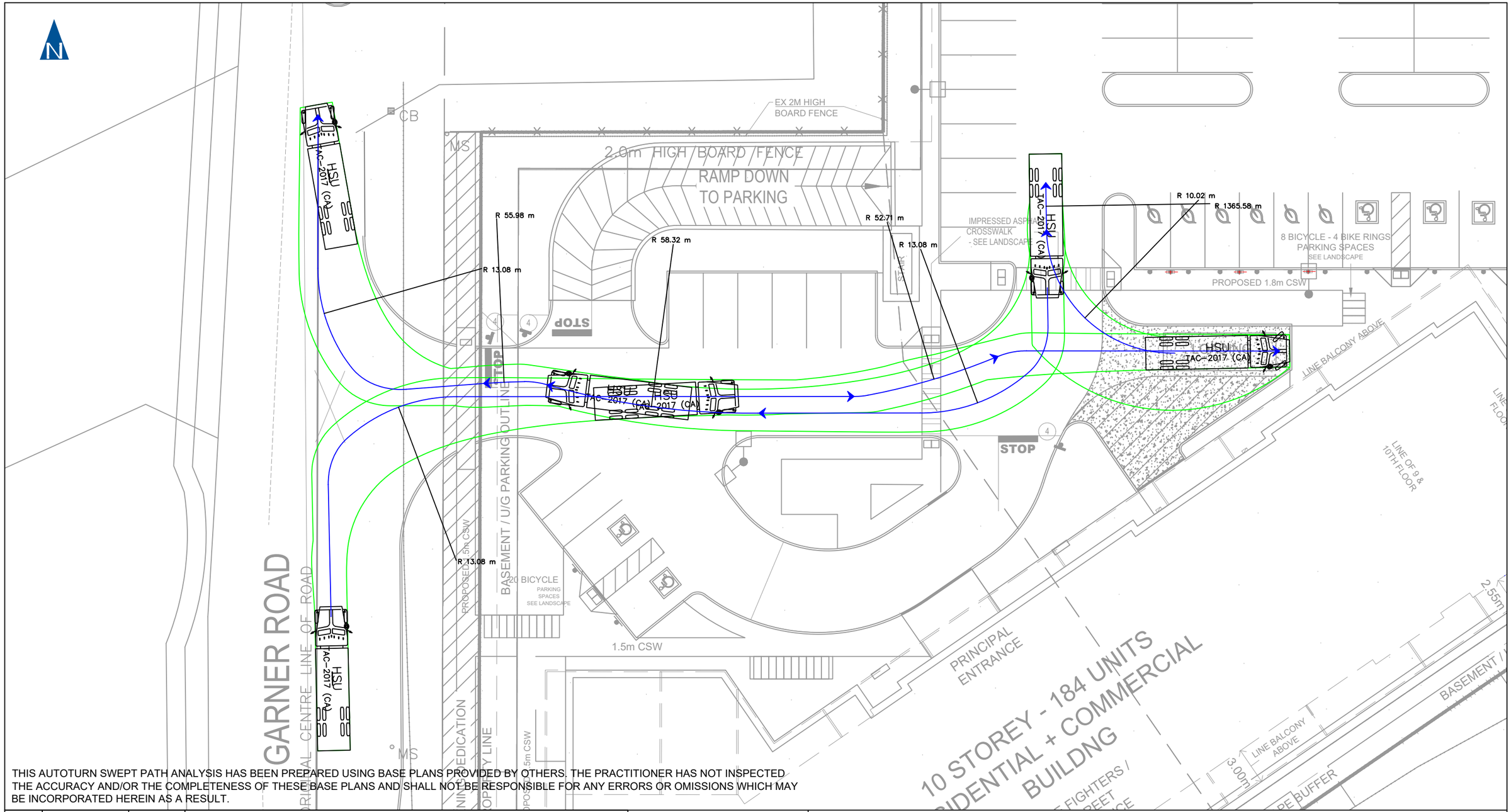
Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000
	DRAWN: SC	DESIGN: SC	CHECK: AMa

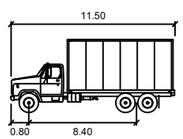
DRAWING NO.: 01



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:

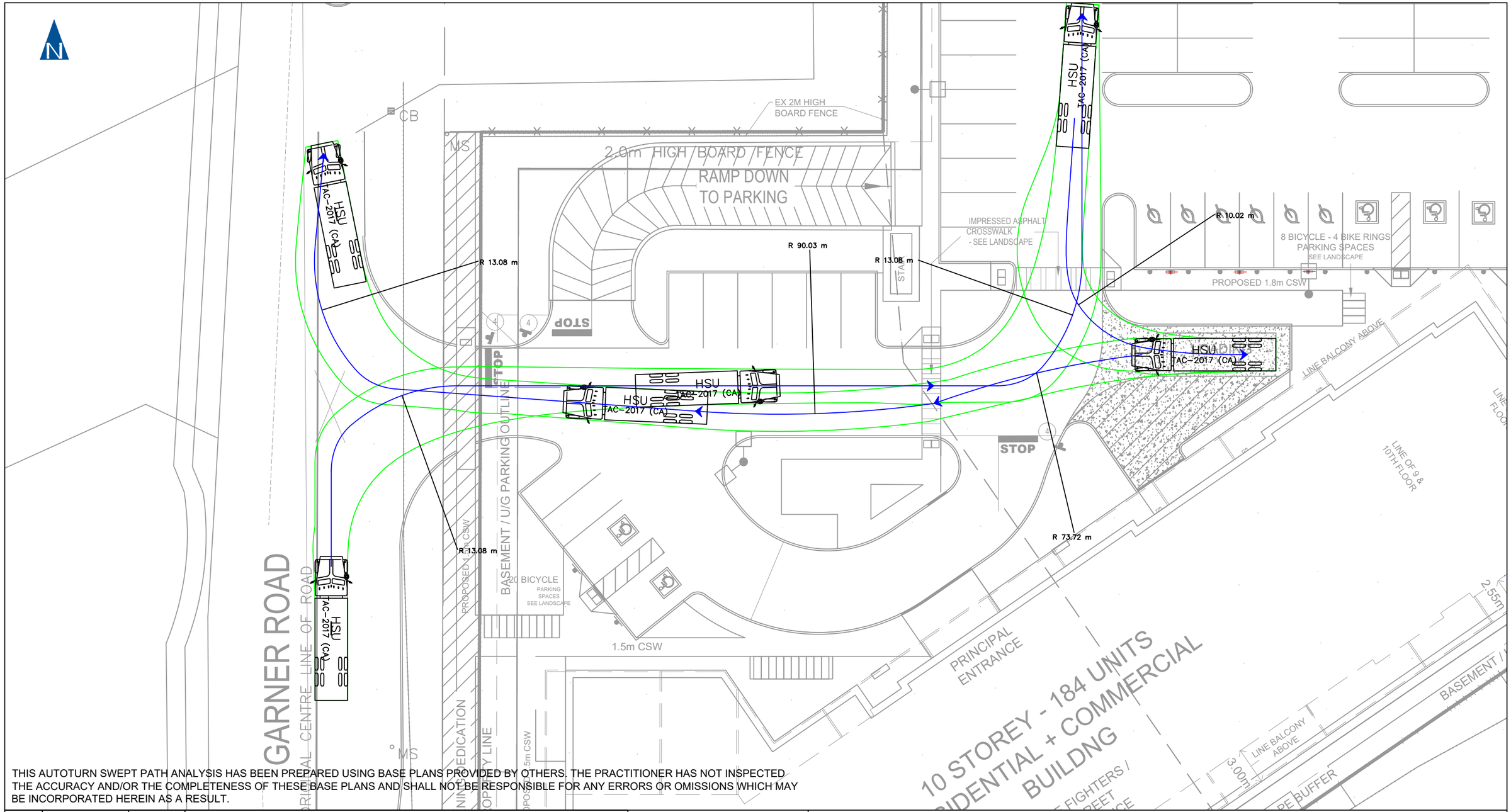


HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

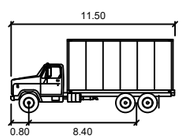
	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.: 02
	DRAWN: SC	DESIGN: SC	CHECK: AMa	



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:

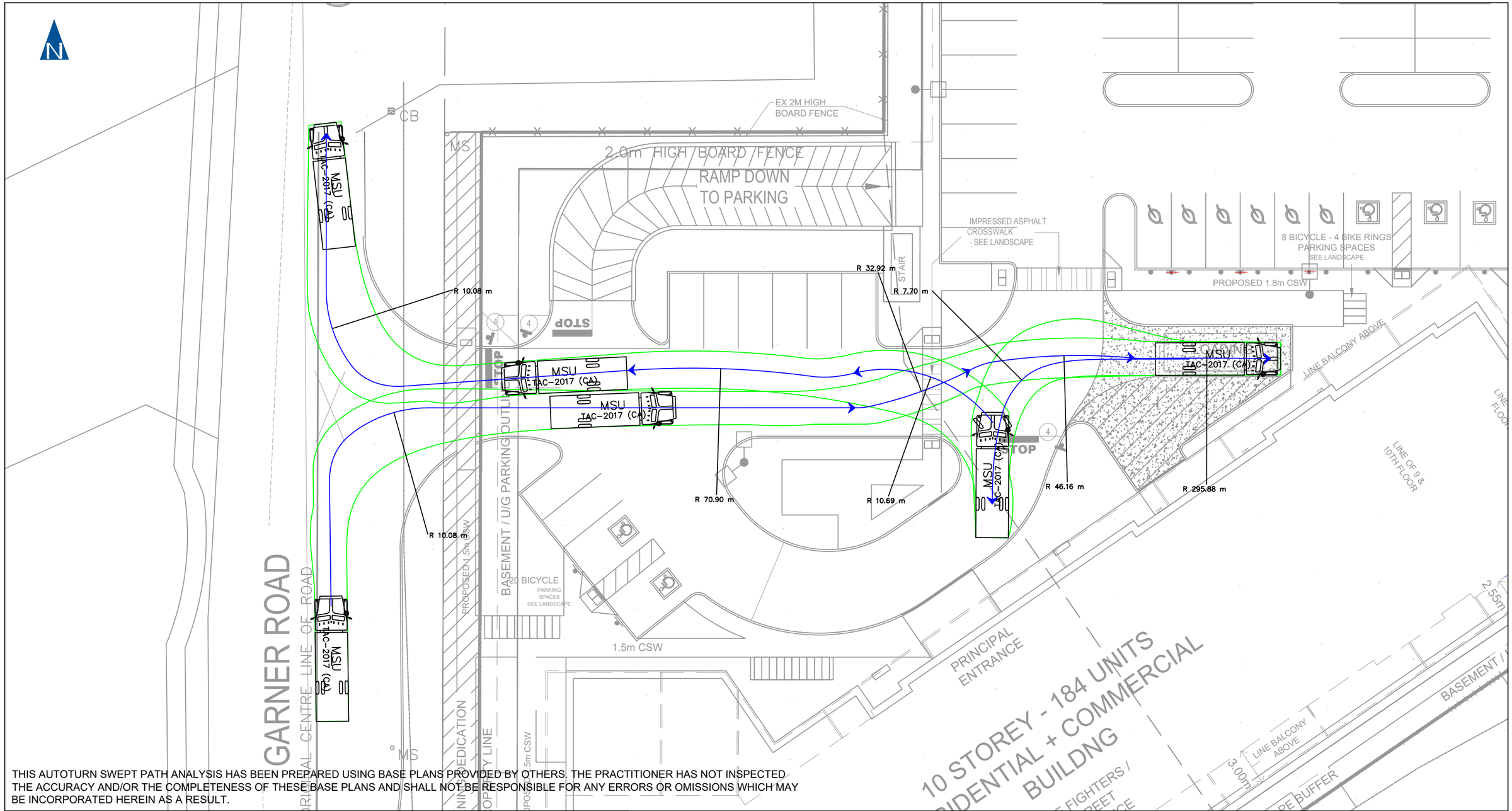


HSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

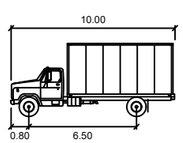
	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.: 03
	DRAWN: SC	DESIGN: SC	CHECK: AMa	



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:

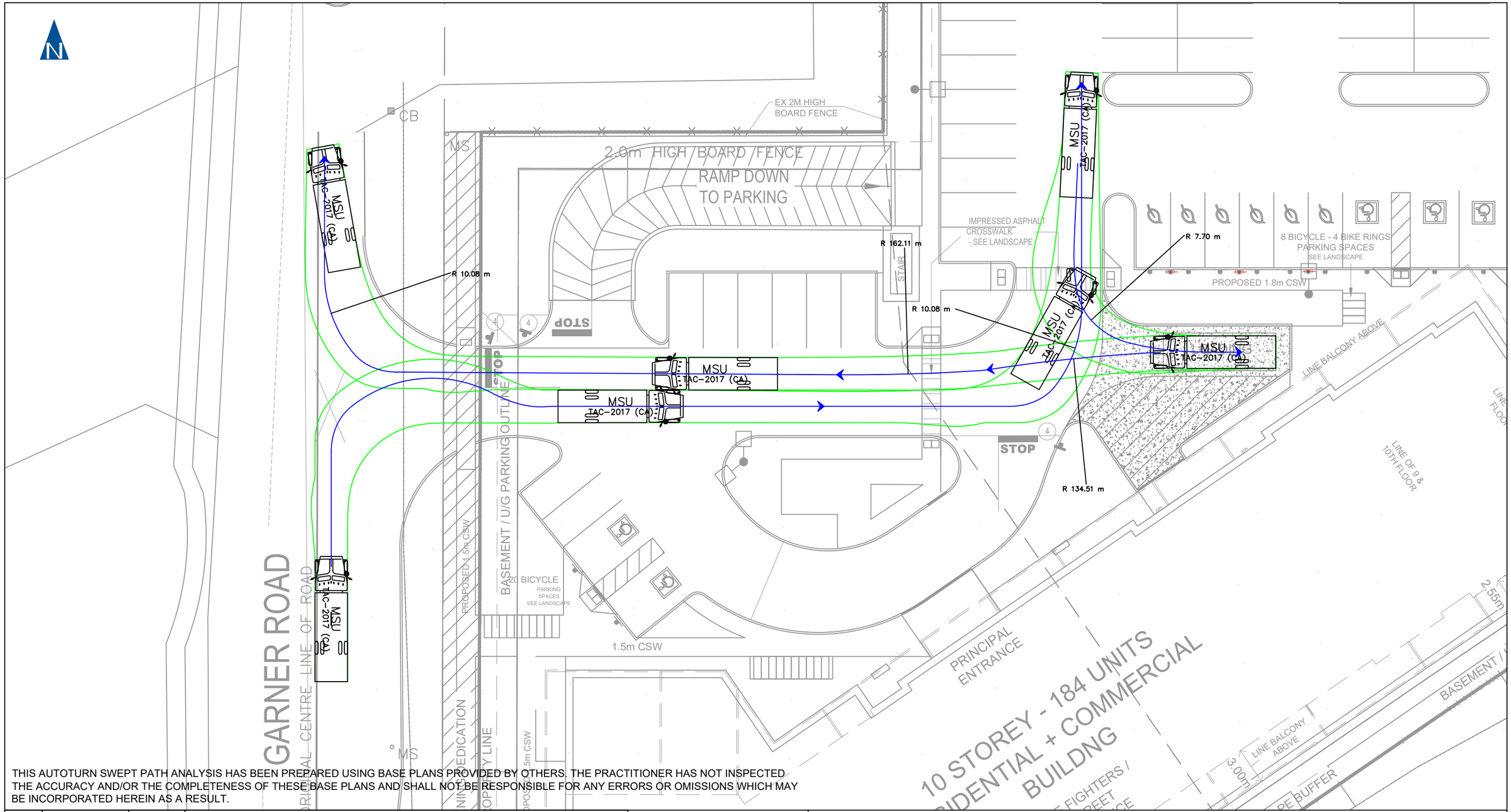


MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

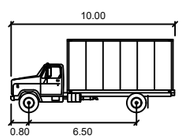
	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.: 04
	DRAWN: SC	DESIGN: SC	CHECK: AMa	



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:

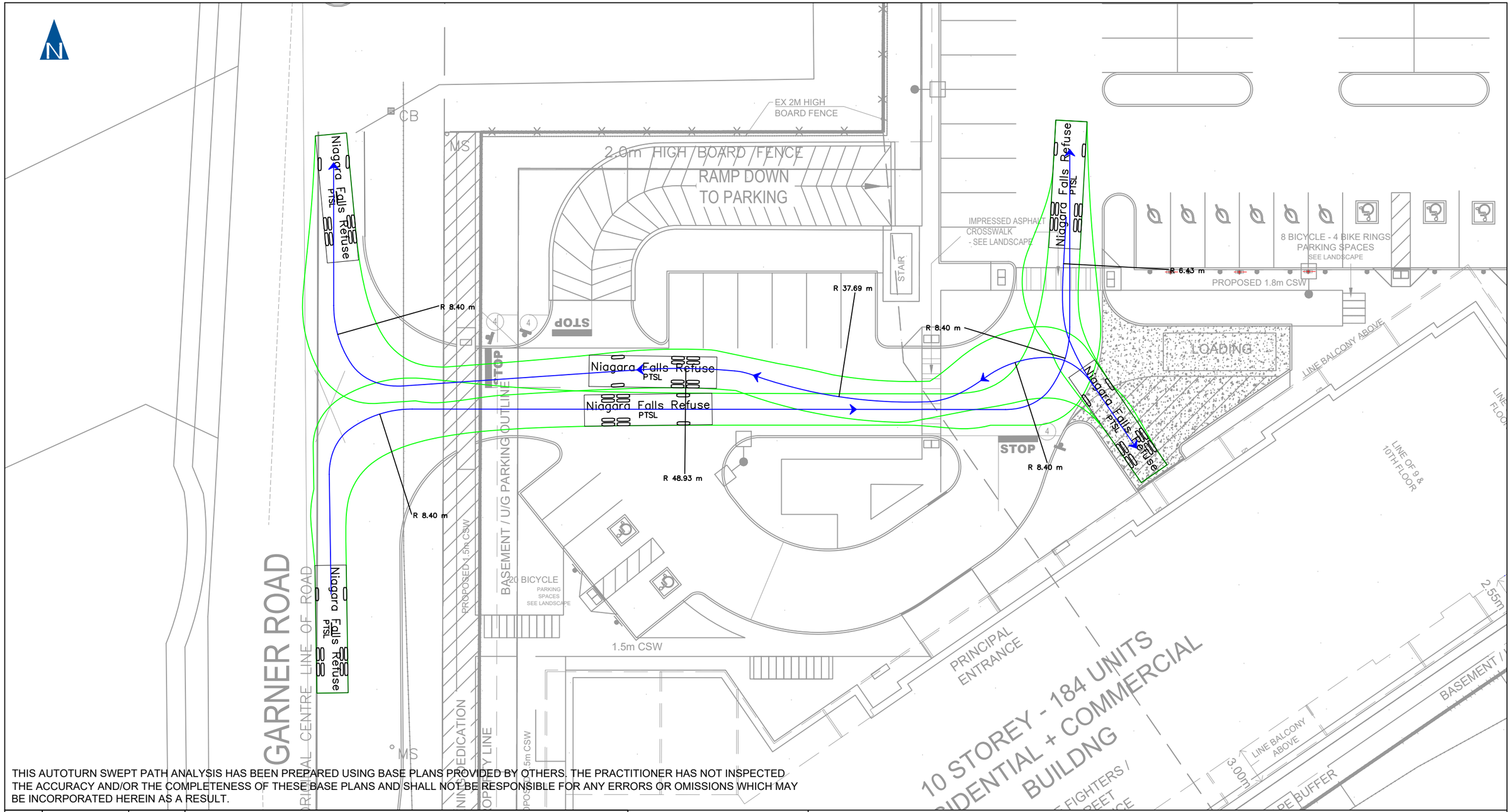


MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

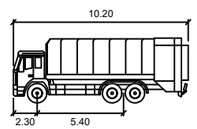
	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.: 05
	DRAWN: SC	DESIGN: SC	CHECK: AMa	



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:

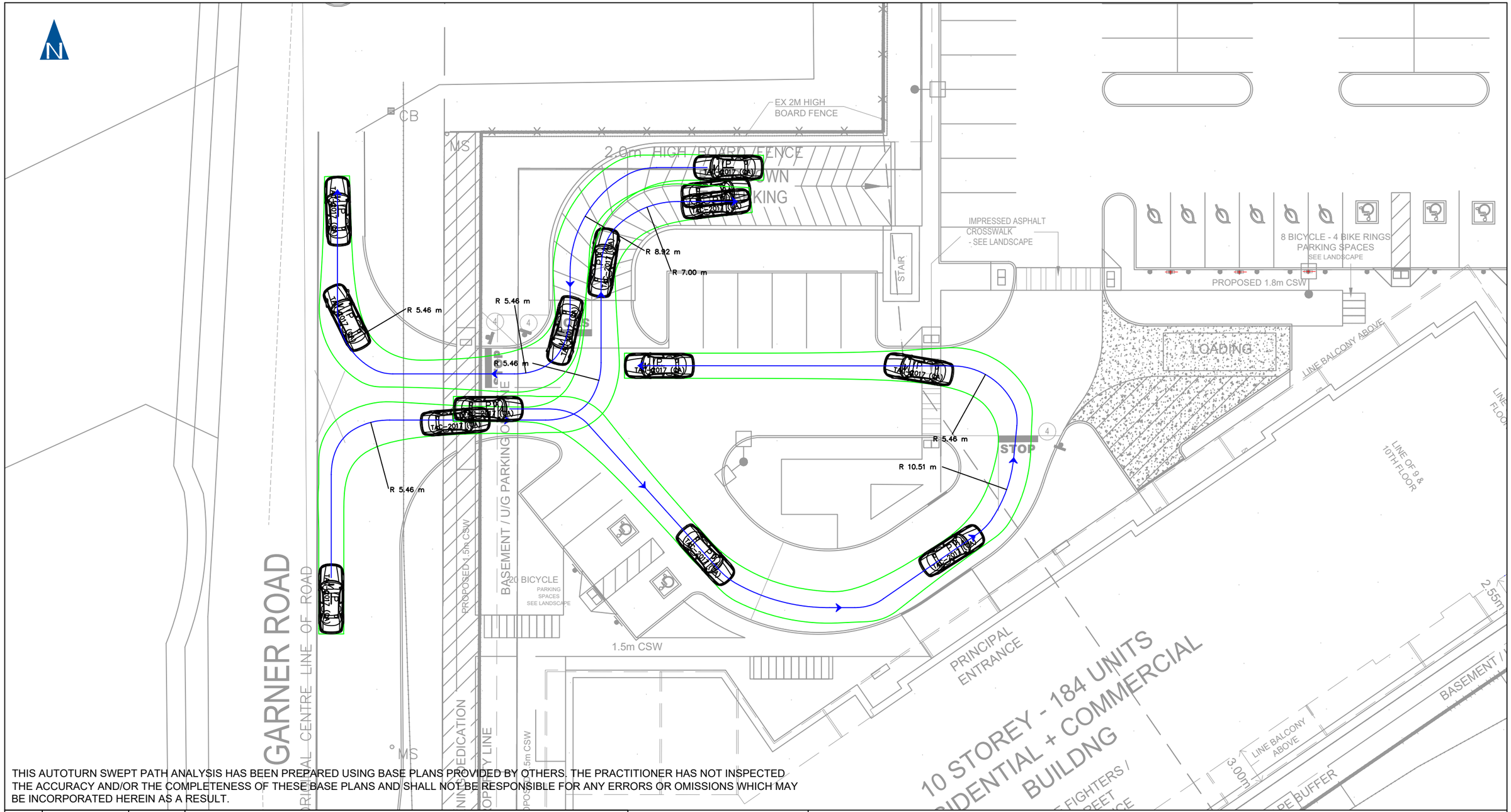


Niagara Falls Refuse

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.4

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

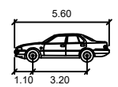
	PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.: 06
	DRAWN: SC	DESIGN: SC	CHECK: AMa	



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
2	2023-06-27	LC	UPDATED SITE PLAN
1	2023-06-22	LC	UPDATED SITE PLAN

DESIGN VEHICLE:



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

AUTOTURN ASSESSMENT
8885-8911 LUNDY'S LANE

PROJECT NO.: 220571	DATE: APRIL 2023	SCALE: 1:1000	DRAWING NO.:
DRAWN: SC	DESIGN: SC	CHECK: AMa	07

Appendix D

Operations Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	99	10	15	103	28	36	170	35	22	70	4
Future Volume (vph)	4	99	10	15	103	28	36	170	35	22	70	4
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Hourly flow rate (vph)	12	112	20	16	112	36	52	195	52	28	84	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	144	164	299	120
Volume Left (vph)	12	16	52	28
Volume Right (vph)	20	36	52	8
Hadj (s)	0.02	-0.07	-0.01	0.09
Departure Headway (s)	5.2	5.1	4.9	5.2
Degree Utilization, x	0.21	0.23	0.41	0.17
Capacity (veh/h)	623	640	700	628
Control Delay (s)	9.6	9.7	11.2	9.3
Approach Delay (s)	9.6	9.7	11.2	9.3
Approach LOS	A	A	B	A

Intersection Summary				
Delay			10.2	
Level of Service			B	
Intersection Capacity Utilization			38.5%	ICU Level of Service A
Analysis Period (min)			15	

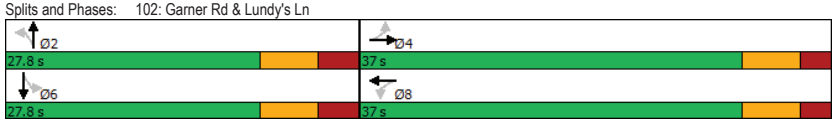
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	99	10	15	103	28	36	170	35	22	70	4
Future Volume (vph)	4	99	10	15	103	28	36	170	35	22	70	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.970			0.977			0.991	
Flt Protected		0.996			0.995			0.991			0.988	
Satd. Flow (prot)	0	1628	0	0	1652	0	0	1642	0	0	1633	0
Flt Permitted		0.996			0.995			0.991			0.988	
Satd. Flow (perm)	0	1628	0	0	1652	0	0	1642	0	0	1633	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Heavy Vehicles (%)	25%	2%	10%	0%	1%	7%	0%	2%	11%	0%	7%	0%
Adj. Flow (vph)	12	113	20	16	112	36	52	195	52	28	84	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	145	0	0	164	0	0	299	0	0	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	38.5%		ICU Level of Service A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	11.5	11.5		11.5	11.5		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
v/c Ratio	0.14	0.55		0.23	0.53		0.05	0.20		0.13	0.10	
Control Delay	19.7	22.2		21.3	19.8		7.3	6.4		8.0	5.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.7	22.2		21.3	19.8		7.3	6.4		8.0	5.4	
LOS	B	C		C	B		A	A		A	A	
Approach Delay		22.0			19.9			6.5			6.6	
Approach LOS		C			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 55.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	327	19	18	269	47	23	107	40	60	46	22
Future Volume (vph)	16	327	19	18	269	47	23	107	40	60	46	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.990			0.975			0.950			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1471	3197	0	1662	3054	0	1662	1609	0	1554	1633	0
Flt Permitted	0.539			0.531			0.700			0.650		
Satd. Flow (perm)	835	3197	0	928	3054	0	1225	1609	0	1063	1633	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			49			40			32	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Adj. Flow (vph)	24	348	24	44	296	60	32	113	56	72	56	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	372	0	44	356	0	32	169	0	72	88	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	327	19	18	269	47	23	107	40	60	46	22
Future Volume (vph)	16	327	19	18	269	47	23	107	40	60	46	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1471	3199		1661	3053		1662	1610		1554	1634	
Flt Permitted	0.54	1.00		0.53	1.00		0.70	1.00		0.65	1.00	
Satd. Flow (perm)	834	3199		928	3053		1225	1610		1064	1634	
Peak-hour factor, PHF	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Adj. Flow (vph)	24	348	24	44	296	60	32	113	56	72	56	32
RTOR Reduction (vph)	0	11	0	0	39	0	0	19	0	0	15	0
Lane Group Flow (vph)	24	361	0	44	317	0	32	150	0	72	73	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.5	11.5		11.5	11.5		29.0	29.0		29.0	29.0	
Effective Green, g (s)	11.5	11.5		11.5	11.5		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	173	665		192	634		642	844		557	856	
v/s Ratio Prot		c0.11			0.10			c0.09			0.04	
v/s Ratio Perm	0.03			0.05			0.03			0.07		
v/c Ratio	0.14	0.54		0.23	0.50		0.05	0.18		0.13	0.09	
Uniform Delay, d1	17.9	19.6		18.2	19.4		6.4	6.9		6.7	6.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.7		0.4	0.5		0.1	0.5		0.5	0.2	
Delay (s)	18.1	20.3		18.7	19.8		6.6	7.4		7.2	6.7	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.1			19.7			7.2			6.9	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

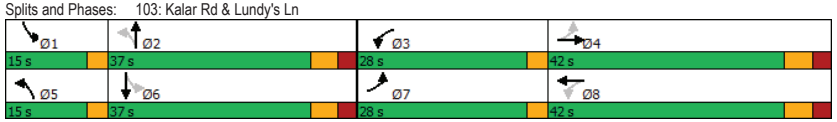
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	372	44	356	32	169	72	88
v/c Ratio	0.14	0.55	0.23	0.53	0.05	0.20	0.13	0.10
Control Delay	19.7	22.2	21.3	19.8	7.3	6.4	8.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	22.2	21.3	19.8	7.3	6.4	8.0	5.4
Queue Length 50th (m)	2.1	17.8	3.9	15.1	1.4	6.1	3.4	2.5
Queue Length 95th (m)	5.3	29.1	4.7	25.9	4.2	16.3	9.1	7.9
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	453	1742	503	1680	643	863	557	872
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.21	0.09	0.21	0.05	0.20	0.13	0.10

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			19.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	28.6	17.3		36.5	24.4		41.1	30.7		42.3	31.3	
Actuated g/C Ratio	0.33	0.20		0.42	0.28		0.47	0.35		0.49	0.36	
v/c Ratio	0.15	0.71		0.50	0.41		0.17	0.52		0.29	0.28	
Control Delay	17.1	38.7		21.9	26.2		13.8	14.2		15.1	21.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.1	38.7		21.9	26.2		13.8	14.2		15.1	21.8	
LOS	B	D		C	C		B	B		B	C	
Approach Delay		36.4			24.7			14.2			20.1	
Approach LOS		D			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 86.6			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 23.0		Intersection LOS: C	
Intersection Capacity Utilization 73.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	338	55	147	233	44	76	212	305	80	229	43
Future Volume (vph)	47	338	55	147	233	44	76	212	305	80	229	43
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99				1.00	
Frt		0.978			0.969			0.909			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	3068	0	1525	2984	0	1614	2917	0	1568	3144	0
Flt Permitted	0.540			0.348			0.555			0.324		
Satd. Flow (perm)	868	3068	0	555	2984	0	934	2917	0	535	3144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			26			308			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	12		12	12		12	13					13
Peak Hour Factor	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Adj. Flow (vph)	52	376	64	184	281	72	84	249	386	104	269	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	440	0	184	353	0	84	635	0	104	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	338	55	147	233	44	76	212	305	80	229	43
Future Volume (vph)	47	338	55	147	233	44	76	212	305	80	229	43
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1534	3071		1523	2987		1608	2917		1568	3147	
Flt Permitted	0.54	1.00		0.35	1.00		0.56	1.00		0.32	1.00	
Satd. Flow (perm)	873	3071		558	2987		940	2917		535	3147	
Peak-hour factor, PHF	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Adj. Flow (vph)	52	376	64	184	281	72	84	249	386	104	269	56
RTOR Reduction (vph)	0	13	0	0	19	0	0	200	0	0	12	0
Lane Group Flow (vph)	52	427	0	184	334	0	84	435	0	104	313	0
Confl. Peds. (#/hr)	12		12	12		12	13					13
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.7	18.0		33.1	24.4		37.0	30.7		38.2	31.3	
Effective Green, g (s)	23.7	18.0		33.1	24.4		37.0	30.7		38.2	31.3	
Actuated g/C Ratio	0.27	0.21		0.38	0.28		0.42	0.35		0.44	0.36	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	278	630		343	831		444	1021		314	1123	
v/s Ratio Prot	0.01	c0.14		c0.07	0.11		0.01	c0.15		c0.03	0.10	
v/s Ratio Perm	0.04			0.13			0.07			0.12		
v/c Ratio	0.19	0.68		0.54	0.40		0.19	0.43		0.33	0.28	
Uniform Delay, d1	24.2	32.2		19.6	25.7		15.5	21.8		15.3	20.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.7		1.3	0.3		0.2	1.3		0.5	0.6	
Delay (s)	24.4	34.9		21.0	26.0		15.6	23.1		15.7	20.8	
Level of Service	C	C		C	C		B	C		B	C	
Approach Delay (s)		33.8			24.3			22.2			19.5	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	87.7	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	440	184	353	84	635	104	325
v/c Ratio	0.15	0.71	0.50	0.41	0.17	0.52	0.29	0.28
Control Delay	17.1	38.7	21.9	26.2	13.8	14.2	15.1	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	38.7	21.9	26.2	13.8	14.2	15.1	21.8
Queue Length 50th (m)	5.4	37.1	21.0	25.4	7.2	22.4	9.0	20.1
Queue Length 95th (m)	12.9	59.4	33.0	37.3	18.5	43.5	18.5	36.0
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	563	1277	520	1248	563	1232	416	1147
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.34	0.35	0.28	0.15	0.52	0.25	0.28

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	170	0	0	95
Future Volume (Veh/h)	0	0	170	0	0	95
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	185	0	0	103
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	288	185			185	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288	185			185	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	702	857			1390	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	185	103
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1390
Volume to Capacity	0.00	0.11	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		13.0%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	170	0	0	95
Future Volume (vph)	0	0	170	0	0	95
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	185	0	0	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	185	0	0	103
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	168	43	35	161	17	23	127	20	25	164	7
Future Volume (vph)	4	168	43	35	161	17	23	127	20	25	164	7
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Hourly flow rate (vph)	4	200	48	44	192	28	24	165	28	32	228	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	252	264	217	272
Volume Left (vph)	4	44	24	32
Volume Right (vph)	48	28	28	12
Hadj (s)	-0.11	-0.02	-0.06	0.01
Departure Headway (s)	5.8	5.8	5.9	5.9
Degree Utilization, x	0.40	0.43	0.36	0.44
Capacity (veh/h)	564	562	541	560
Control Delay (s)	12.6	13.1	12.2	13.4
Approach Delay (s)	12.6	13.1	12.2	13.4
Approach LOS	B	B	B	B

Intersection Summary				
Delay			12.9	
Level of Service			B	
Intersection Capacity Utilization			50.0%	ICU Level of Service A
Analysis Period (min)			15	

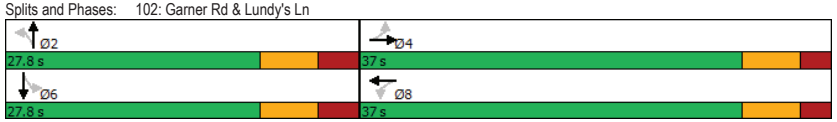
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	168	43	35	161	17	23	127	20	25	164	7
Future Volume (vph)	4	168	43	35	161	17	23	127	20	25	164	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.986			0.983			0.994	
Flt Protected		0.999			0.992			0.995			0.994	
Satd. Flow (prot)	0	1703	0	0	1699	0	0	1712	0	0	1718	0
Flt Permitted		0.999			0.992			0.995			0.994	
Satd. Flow (perm)	0	1703	0	0	1699	0	0	1712	0	0	1718	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	4	200	48	44	192	28	24	165	28	32	228	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	264	0	0	217	0	0	272	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	50.0%		ICU Level of Service A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	13.9	13.9		13.9	13.9		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.50	0.50		0.50	0.50	
v/c Ratio	0.15	0.65		0.32	0.68		0.04	0.21		0.11	0.21	
Control Delay	18.9	22.7		22.8	21.4		8.9	7.7		9.4	8.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.9	22.7		22.8	21.4		8.9	7.7		9.4	8.7	
LOS	B	C		C	C		A	A		A	A	
Approach Delay		22.5			21.5			7.9			8.9	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 57.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 18.3		Intersection LOS: B	
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln

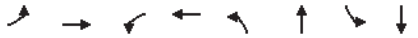


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	444	40	48	387	86	19	98	40	57	115	21
Future Volume (vph)	16	444	40	48	387	86	19	98	40	57	115	21
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.985			0.966			0.951			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3182	0	1662	3164	0	1662	1637	0	1662	1687	0
Flt Permitted	0.393			0.446			0.646			0.648		
Satd. Flow (perm)	687	3182	0	780	3164	0	1130	1637	0	1134	1687	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			80			38			18	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Adj. Flow (vph)	24	453	52	60	430	128	24	117	56	65	144	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	505	0	60	558	0	24	173	0	65	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	444	40	48	387	86	19	98	40	57	115	21
Future Volume (vph)	16	444	40	48	387	86	19	98	40	57	115	21
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1661	3181		1661	3163		1662	1638		1662	1687	
Flt Permitted	0.39	1.00		0.45	1.00		0.65	1.00		0.65	1.00	
Satd. Flow (perm)	688	3181		780	3163		1131	1638		1134	1687	
Peak-hour factor, PHF	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Adj. Flow (vph)	24	453	52	60	430	128	24	117	56	65	144	32
RTOR Reduction (vph)	0	19	0	0	61	0	0	19	0	0	9	0
Lane Group Flow (vph)	24	486	0	60	497	0	24	154	0	65	167	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.9	13.9		13.9	13.9		29.1	29.1		29.1	29.1	
Effective Green, g (s)	13.9	13.9		13.9	13.9		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.50	0.50		0.50	0.50	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	165	764		187	760		569	824		570	849	
v/s Ratio Prot		0.15			c0.16			0.09			c0.10	
v/s Ratio Perm	0.03			0.08			0.02			0.06		
v/c Ratio	0.15	0.64		0.32	0.65		0.04	0.19		0.11	0.20	
Uniform Delay, d1	17.3	19.7		18.1	19.8		7.3	7.9		7.6	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.5		0.7	1.8		0.1	0.5		0.4	0.5	
Delay (s)	17.6	21.2		18.8	21.6		7.4	8.4		8.0	8.4	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		21.0			21.3			8.3			8.3	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group



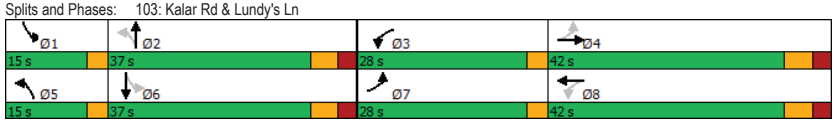
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	505	60	558	24	173	65	176
v/c Ratio	0.15	0.65	0.32	0.68	0.04	0.21	0.11	0.21
Control Delay	18.9	22.7	22.8	21.4	8.9	7.7	9.4	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	22.7	22.8	21.4	8.9	7.7	9.4	8.7
Queue Length 50th (m)	2.1	25.0	5.5	25.0	1.2	7.3	3.4	8.6
Queue Length 95th (m)	5.2	38.4	12.5	39.3	4.5	18.1	10.5	18.9
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	358	1668	406	1685	568	842	570	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.30	0.15	0.33	0.04	0.21	0.11	0.21

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	36.1	22.3		48.9	32.1		45.3	31.4		43.4	30.4	
Actuated g/C Ratio	0.35	0.22		0.48	0.31		0.44	0.31		0.42	0.30	
v/c Ratio	0.38	0.79		0.83	0.61		0.34	0.51		0.29	0.46	
Control Delay	19.3	46.0		35.9	31.6		20.8	20.5		20.7	31.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.3	46.0		35.9	31.6		20.8	20.5		20.7	31.8	
LOS	B	D		D	C		C	C		C	C	
Approach Delay		40.8			33.2			20.5			29.7	
Approach LOS		D			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 102.4			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 31.4		Intersection LOS: C	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	417	71	305	436	74	89	246	249	90	322	55
Future Volume (vph)	94	417	71	305	436	74	89	246	249	90	322	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		0.99	0.98		0.99	0.99	
Frt		0.977			0.976			0.922			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3139	0	1662	3173	0	1662	2955	0	1630	3149	0
Flt Permitted	0.420			0.248			0.427			0.374		
Satd. Flow (perm)	729	3139	0	428	3173	0	737	2955	0	636	3149	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			215			21	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Peak Hour Factor	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Adj. Flow (vph)	132	463	85	367	513	100	139	256	280	105	358	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	132	548	0	367	613	0	139	536	0	105	438	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	417	71	305	436	74	89	246	249	90	322	55
Future Volume (vph)	94	417	71	305	436	74	89	246	249	90	322	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1657	3141		1658	3173		1655	2959		1626	3150	
Flt Permitted	0.42	1.00		0.25	1.00		0.43	1.00		0.37	1.00	
Satd. Flow (perm)	732	3141		434	3173		745	2959		641	3150	
Peak-hour factor, PHF	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Adj. Flow (vph)	132	463	85	367	513	100	139	256	280	105	358	80
RTOR Reduction (vph)	0	13	0	0	13	0	0	149	0	0	15	0
Lane Group Flow (vph)	132	535	0	367	600	0	139	387	0	105	423	0
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	22.3		44.9	32.1		41.2	31.4		39.4	30.5	
Effective Green, g (s)	32.1	22.3		44.9	32.1		41.2	31.4		39.4	30.5	
Actuated g/C Ratio	0.31	0.22		0.44	0.31		0.40	0.31		0.39	0.30	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	318	685		425	996		387	909		332	940	
v/s Ratio Prot	0.04	0.17		c0.17	0.19		c0.03	0.13		0.03	c0.13	
v/s Ratio Perm	0.09			c0.21			0.11			0.09		
v/c Ratio	0.42	0.78		0.86	0.60		0.36	0.43		0.32	0.45	
Uniform Delay, d1	26.1	37.6		21.8	29.7		20.0	28.2		20.8	29.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	5.6		16.3	0.9		0.4	1.5		0.4	1.6	
Delay (s)	26.8	43.2		38.1	30.6		20.4	29.7		21.2	30.6	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		40.1			33.4			27.8			28.8	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	88.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	132	548	367	613	139	536	105	438
v/c Ratio	0.38	0.79	0.83	0.61	0.34	0.51	0.29	0.46
Control Delay	19.3	46.0	35.9	31.6	20.8	20.5	20.7	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	46.0	35.9	31.6	20.8	20.5	20.7	31.8
Queue Length 50th (m)	15.2	56.0	49.7	55.3	16.7	28.3	12.4	37.8
Queue Length 95th (m)	20.3	80.7	69.5	72.0	24.1	54.4	26.4	63.1
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	573	1099	510	1173	444	1054	403	950
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.50	0.72	0.52	0.31	0.51	0.26	0.46

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	200	0	0	242
Future Volume (Veh/h)	0	0	200	0	0	242
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	217	0	0	263
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	480	217			217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480	217			217	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	545	823			1353	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	217	263
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1353
Volume to Capacity	0.26	0.13	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		17.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	200	0	0	242
Future Volume (vph)	0	0	200	0	0	242
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	217	0	0	263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	217	0	0	263
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	105	11	16	109	30	38	180	37	23	74	4
Future Volume (vph)	4	105	11	16	109	30	38	180	37	23	74	4
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Hourly flow rate (vph)	12	119	22	17	118	38	55	207	55	29	89	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	173	317	126
Volume Left (vph)	12	17	55	29
Volume Right (vph)	22	38	55	8
Hadj (s)	0.01	-0.07	-0.01	0.09
Departure Headway (s)	5.4	5.2	5.0	5.4
Degree Utilization, x	0.23	0.25	0.44	0.19
Capacity (veh/h)	610	626	689	613
Control Delay (s)	9.9	10.0	11.8	9.6
Approach Delay (s)	9.9	10.0	11.8	9.6
Approach LOS	A	B	B	A

Intersection Summary				
Delay			10.7	
Level of Service			B	
Intersection Capacity Utilization			40.4%	ICU Level of Service A
Analysis Period (min)			15	

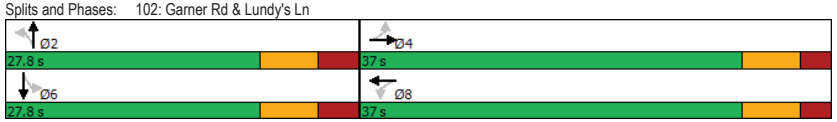
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	105	11	16	109	30	38	180	37	23	74	4
Future Volume (vph)	4	105	11	16	109	30	38	180	37	23	74	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.970			0.977			0.991	
Flt Protected		0.996			0.995			0.991			0.989	
Satd. Flow (prot)	0	1629	0	0	1652	0	0	1642	0	0	1634	0
Flt Permitted		0.996			0.995			0.991			0.989	
Satd. Flow (perm)	0	1629	0	0	1652	0	0	1642	0	0	1634	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Heavy Vehicles (%)	25%	2%	10%	0%	1%	7%	0%	2%	11%	0%	7%	0%
Adj. Flow (vph)	12	119	22	17	118	38	55	207	55	29	89	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	153	0	0	173	0	0	317	0	0	126	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	40.4%		ICU Level of Service A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
v/c Ratio	0.15	0.58		0.24	0.55		0.05	0.21		0.14	0.11	
Control Delay	19.7	22.5		21.5	20.2		7.5	6.6		8.3	5.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.7	22.5		21.5	20.2		7.5	6.6		8.3	5.6	
LOS	B	C		C	C		A	A		A	A	
Approach Delay		22.3			20.3			6.8			6.8	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 55.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 51.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	347	20	19	285	50	24	114	42	64	49	23
Future Volume (vph)	17	347	20	19	285	50	24	114	42	64	49	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.990			0.975			0.951			0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1471	3197	0	1662	3054	0	1662	1611	0	1554	1636	0
Flt Permitted	0.528			0.519			0.697			0.644		
Satd. Flow (perm)	818	3197	0	907	3054	0	1220	1611	0	1053	1636	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			49			40			33	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Adj. Flow (vph)	25	369	25	46	313	64	33	120	59	77	60	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	394	0	46	377	0	33	179	0	77	93	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	347	20	19	285	50	24	114	42	64	49	23
Future Volume (vph)	17	347	20	19	285	50	24	114	42	64	49	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1471	3199		1661	3053		1662	1610		1554	1636	
Flt Permitted	0.53	1.00		0.52	1.00		0.70	1.00		0.64	1.00	
Satd. Flow (perm)	818	3199		908	3053		1219	1610		1054	1636	
Peak-hour factor, PHF	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Adj. Flow (vph)	25	369	25	46	313	64	33	120	59	77	60	33
RTOR Reduction (vph)	0	11	0	0	39	0	0	19	0	0	16	0
Lane Group Flow (vph)	25	383	0	46	338	0	33	160	0	77	77	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Effective Green, g (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	172	674		191	643		636	841		550	854	
v/s Ratio Prot		c0.12			0.11			c0.10			0.05	
v/s Ratio Perm	0.03			0.05			0.03			0.07		
v/c Ratio	0.15	0.57		0.24	0.53		0.05	0.19		0.14	0.09	
Uniform Delay, d1	17.8	19.6		18.2	19.4		6.5	7.0		6.8	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9		0.5	0.6		0.2	0.5		0.5	0.2	
Delay (s)	18.1	20.5		18.7	20.0		6.7	7.5		7.4	6.8	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		20.4			19.9			7.4			7.1	
Approach LOS		C			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	51.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

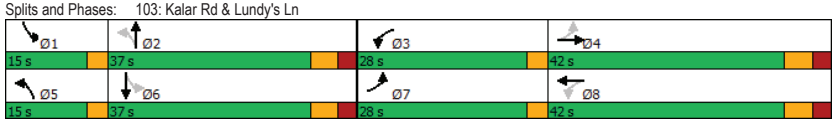
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	394	46	377	33	179	77	93
v/c Ratio	0.15	0.58	0.24	0.55	0.05	0.21	0.14	0.11
Control Delay	19.7	22.5	21.5	20.2	7.5	6.6	8.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	22.5	21.5	20.2	7.5	6.6	8.3	5.6
Queue Length 50th (m)	2.2	19.1	4.1	16.2	1.5	6.8	3.7	2.8
Queue Length 95th (m)	5.4	30.7	4.9	27.5	4.4	17.7	9.9	8.4
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	442	1733	489	1672	637	860	550	870
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.23	0.09	0.23	0.05	0.21	0.14	0.11

Intersection Summary

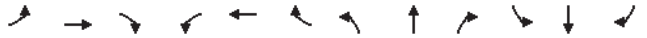
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	29.6	18.3		38.0	25.7		42.5	30.4		44.3	33.0	
Actuated g/C Ratio	0.33	0.20		0.42	0.28		0.47	0.34		0.49	0.37	
v/c Ratio	0.17	0.74		0.55	0.43		0.18	0.57		0.33	0.30	
Control Delay	17.1	40.6		23.2	26.7		14.5	16.4		16.4	22.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.1	40.6		23.2	26.7		14.5	16.4		16.4	22.8	
LOS	B	D		C	C		B	B		B	C	
Approach Delay		38.0			25.5			16.2			21.2	
Approach LOS		D			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 90.2			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 24.4		Intersection LOS: C	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln



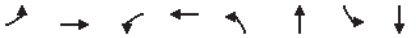
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	359	58	156	247	47	81	225	324	85	243	46
Future Volume (vph)	50	359	58	156	247	47	81	225	324	85	243	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99				1.00	
Frt		0.978			0.969			0.909			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	3068	0	1525	2980	0	1614	2917	0	1568	3144	0
Flt Permitted	0.529			0.320			0.544			0.277		
Satd. Flow (perm)	848	3068	0	510	2980	0	916	2917	0	457	3144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			27			303			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	12		12	12		12	13					13
Peak Hour Factor	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Adj. Flow (vph)	56	399	67	195	298	77	89	265	410	110	286	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	466	0	195	375	0	89	675	0	110	346	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	359	58	156	247	47	81	225	324	85	243	46
Future Volume (vph)	50	359	58	156	247	47	81	225	324	85	243	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1532	3071		1523	2984		1608	2917		1568	3146	
Flt Permitted	0.53	1.00		0.32	1.00		0.54	1.00		0.28	1.00	
Satd. Flow (perm)	853	3071		513	2984		921	2917		458	3146	
Peak-hour factor, PHF	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Adj. Flow (vph)	56	399	67	195	298	77	89	265	410	110	286	60
RTOR Reduction (vph)	0	13	0	0	19	0	0	200	0	0	12	0
Lane Group Flow (vph)	56	453	0	195	356	0	89	475	0	110	334	0
Confl. Peds. (#/hr)	12		12	12		12	13					13
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.8	18.9		34.6	25.7		37.7	31.0		41.7	33.0	
Effective Green, g (s)	24.8	18.9		34.6	25.7		37.7	31.0		41.7	33.0	
Actuated g/C Ratio	0.27	0.21		0.38	0.28		0.41	0.34		0.46	0.36	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	275	635		334	839		430	990		314	1137	
v/s Ratio Prot	0.01	c0.15		c0.08	0.12		0.02	c0.16		c0.03	0.11	
v/s Ratio Perm	0.04			0.14			0.07			0.13		
v/c Ratio	0.20	0.71		0.58	0.42		0.21	0.48		0.35	0.29	
Uniform Delay, d1	25.1	33.7		20.6	26.8		16.7	23.8		15.1	20.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	3.6		2.2	0.3		0.2	1.7		0.5	0.7	
Delay (s)	25.4	37.3		22.8	27.0		16.8	25.5		15.7	21.5	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		36.0			25.6			24.4			20.1	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	74.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	466	195	375	89	675	110	346
v/c Ratio	0.17	0.74	0.55	0.43	0.18	0.57	0.33	0.30
Control Delay	17.1	40.6	23.2	26.7	14.5	16.4	16.4	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	40.6	23.2	26.7	14.5	16.4	16.4	22.8
Queue Length 50th (m)	5.9	40.3	22.7	27.6	7.9	27.4	10.0	22.5
Queue Length 95th (m)	13.5	63.7	34.6	39.5	20.2	50.7	20.2	39.7
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	551	1213	499	1186	554	1182	381	1163
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.38	0.39	0.32	0.16	0.57	0.29	0.30

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	181	0	0	136
Future Volume (Veh/h)	0	0	181	0	0	136
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	197	0	0	148
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	345	197			197	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345	197			197	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	652	844			1376	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	197	148
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1376
Volume to Capacity	0.00	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		13.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	181	0	0	136
Future Volume (vph)	0	0	181	0	0	136
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	197	0	0	148
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	197	0	0	148
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	178	46	37	171	18	24	135	21	27	174	7
Future Volume (vph)	4	178	46	37	171	18	24	135	21	27	174	7
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Hourly flow rate (vph)	4	212	51	46	204	30	25	175	30	35	242	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	267	280	230	289
Volume Left (vph)	4	46	25	35
Volume Right (vph)	51	30	30	12
Hadj (s)	-0.11	-0.02	-0.06	0.01
Departure Headway (s)	6.0	6.1	6.2	6.1
Degree Utilization, x	0.45	0.47	0.39	0.49
Capacity (veh/h)	543	534	521	532
Control Delay (s)	13.8	14.4	13.1	14.8
Approach Delay (s)	13.8	14.4	13.1	14.8
Approach LOS	B	B	B	B

Intersection Summary					
Delay			14.1		
Level of Service			B		
Intersection Capacity Utilization			52.6%	ICU Level of Service	A
Analysis Period (min)			15		

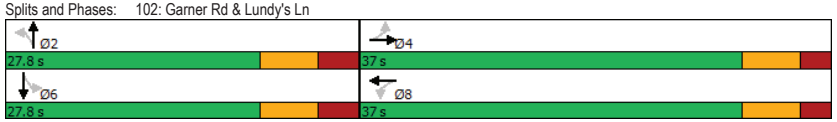
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	178	46	37	171	18	24	135	21	27	174	7
Future Volume (vph)	4	178	46	37	171	18	24	135	21	27	174	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.986			0.982			0.994	
Flt Protected		0.999			0.992			0.995			0.994	
Satd. Flow (prot)	0	1703	0	0	1699	0	0	1710	0	0	1719	0
Flt Permitted		0.999			0.992			0.995			0.994	
Satd. Flow (perm)	0	1703	0	0	1699	0	0	1710	0	0	1719	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	4	212	51	46	204	30	25	175	30	35	242	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	0	0	280	0	0	230	0	0	289	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	52.6%	ICU Level of Service A		
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	14.7	14.7		14.7	14.7		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.50	0.50		0.50	0.50	
v/c Ratio	0.16	0.66		0.35	0.70		0.05	0.22		0.12	0.22	
Control Delay	19.0	22.7		23.5	21.6		9.4	8.3		10.0	9.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.0	22.7		23.5	21.6		9.4	8.3		10.0	9.4	
LOS	B	C		C	C		A	A		A	A	
Approach Delay		22.5			21.8			8.4			9.5	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 58.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	471	42	51	411	91	20	104	42	60	122	22
Future Volume (vph)	17	471	42	51	411	91	20	104	42	60	122	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.985			0.966			0.952			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3182	0	1662	3164	0	1662	1639	0	1662	1688	0
Flt Permitted	0.364			0.417			0.640			0.642		
Satd. Flow (perm)	637	3182	0	729	3164	0	1120	1639	0	1124	1688	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			80			38			17	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Adj. Flow (vph)	25	481	55	64	457	136	25	124	59	68	153	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	536	0	64	593	0	25	183	0	68	186	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	471	42	51	411	91	20	104	42	60	122	22
Future Volume (vph)	17	471	42	51	411	91	20	104	42	60	122	22
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1661	3181		1661	3163		1662	1638		1662	1688	
Flt Permitted	0.36	1.00		0.42	1.00		0.64	1.00		0.64	1.00	
Satd. Flow (perm)	636	3181		729	3163		1121	1638		1124	1688	
Peak-hour factor, PHF	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Adj. Flow (vph)	25	481	55	64	457	136	25	124	59	68	152	33
RTOR Reduction (vph)	0	19	0	0	60	0	0	19	0	0	9	0
Lane Group Flow (vph)	25	517	0	64	533	0	25	164	0	68	177	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.7	14.7		14.7	14.7		29.1	29.1		29.1	29.1	
Effective Green, g (s)	14.7	14.7		14.7	14.7		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.50	0.50		0.50	0.50	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	159	797		182	793		556	813		558	838	
v/s Ratio Prot		0.16			c0.17			0.10			c0.11	
v/s Ratio Perm	0.04			0.09			0.02			0.06		
v/c Ratio	0.16	0.65		0.35	0.67		0.04	0.20		0.12	0.21	
Uniform Delay, d1	17.1	19.6		18.0	19.8		7.6	8.3		7.9	8.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6		0.9	2.0		0.2	0.6		0.4	0.6	
Delay (s)	17.5	21.3		18.9	21.8		7.7	8.8		8.4	8.9	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		21.1			21.5			8.7			8.7	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	63.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

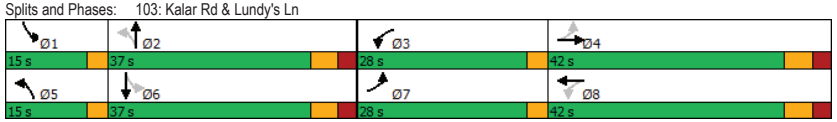
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	536	64	593	25	183	68	186
v/c Ratio	0.16	0.66	0.35	0.70	0.05	0.22	0.12	0.22
Control Delay	19.0	22.7	23.5	21.6	9.4	8.3	10.0	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	22.7	23.5	21.6	9.4	8.3	10.0	9.4
Queue Length 50th (m)	2.2	26.9	5.9	27.2	1.3	8.1	3.7	9.6
Queue Length 95th (m)	5.4	40.9	13.3	42.1	4.7	19.8	11.3	20.7
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	327	1645	374	1663	555	832	557	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.33	0.17	0.36	0.05	0.22	0.12	0.22

Intersection Summary

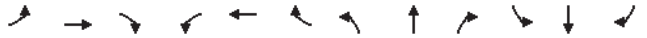
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	37.9	23.8		51.7	34.6		45.5	31.3		43.6	30.4	
Actuated g/C Ratio	0.36	0.23		0.49	0.33		0.43	0.30		0.41	0.29	
v/c Ratio	0.41	0.80		0.88	0.62		0.38	0.55		0.33	0.50	
Control Delay	19.6	47.1		42.0	31.8		22.6	22.8		22.4	34.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.6	47.1		42.0	31.8		22.6	22.8		22.4	34.0	
LOS	B	D		D	C		C	C		C	C	
Approach Delay		41.7			35.6			22.7			31.8	
Approach LOS		D			D			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 105.4			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 33.3		Intersection LOS: C	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln



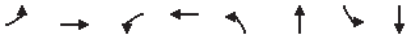
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	442	75	324	463	79	94	261	264	95	342	58
Future Volume (vph)	100	442	75	324	463	79	94	261	264	95	342	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		0.99	0.98		0.99	0.99	
Frt		0.977			0.975			0.922			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3140	0	1662	3169	0	1662	2955	0	1630	3149	0
Flt Permitted	0.404			0.229			0.398			0.339		
Satd. Flow (perm)	702	3140	0	395	3169	0	688	2955	0	577	3149	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			215			21	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Peak Hour Factor	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Adj. Flow (vph)	141	491	89	390	545	107	147	272	297	110	380	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	141	580	0	390	652	0	147	569	0	110	464	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	442	75	324	463	79	94	261	264	95	342	58
Future Volume (vph)	100	442	75	324	463	79	94	261	264	95	342	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1657	3142		1659	3173		1655	2958		1626	3151	
Flt Permitted	0.40	1.00		0.23	1.00		0.40	1.00		0.34	1.00	
Satd. Flow (perm)	705	3142		400	3173		693	2958		581	3151	
Peak-hour factor, PHF	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Adj. Flow (vph)	141	491	89	390	545	107	147	272	297	110	380	84
RTOR Reduction (vph)	0	13	0	0	13	0	0	151	0	0	15	0
Lane Group Flow (vph)	141	567	0	390	639	0	147	418	0	110	449	0
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.9	23.8		47.7	34.6		41.4	31.3		39.6	30.4	
Effective Green, g (s)	33.9	23.8		47.7	34.6		41.4	31.3		39.6	30.4	
Actuated g/C Ratio	0.32	0.23		0.45	0.33		0.39	0.30		0.38	0.29	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	318	710		431	1043		365	880		310	910	
v/s Ratio Prot	0.04	0.18		c0.18	0.20		c0.04	0.14		0.03	c0.14	
v/s Ratio Perm	0.10			c0.23			0.12			0.10		
v/c Ratio	0.44	0.80		0.90	0.61		0.40	0.47		0.35	0.49	
Uniform Delay, d1	26.4	38.4		22.1	29.7		21.4	30.2		22.2	31.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	6.1		22.0	1.0		0.6	1.8		0.5	1.9	
Delay (s)	27.2	44.5		44.1	30.6		22.0	32.1		22.7	32.9	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		41.1			35.7			30.0			31.0	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	580	390	652	147	569	110	464
v/c Ratio	0.41	0.80	0.88	0.62	0.38	0.55	0.33	0.50
Control Delay	19.6	47.1	42.0	31.8	22.6	22.8	22.4	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	47.1	42.0	31.8	22.6	22.8	22.4	34.0
Queue Length 50th (m)	16.5	62.2	54.5	60.7	19.1	33.9	14.0	43.2
Queue Length 95th (m)	21.5	86.0	80.9	77.9	26.1	60.9	28.3	68.5
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	567	1067	498	1166	416	1029	373	922
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.54	0.78	0.56	0.35	0.55	0.29	0.50

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	212	0	0	204
Future Volume (Veh/h)	0	0	212	0	0	204
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	230	0	0	222
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	452	230			230	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	452	230			230	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	565	809			1338	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	230	222
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1338
Volume to Capacity	0.26	0.14	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		15.4%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	212	0	0	204
Future Volume (vph)	0	0	212	0	0	204
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	230	0	0	222
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	230	0	0	222
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 15.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	168	43	18	121	33	42	199	41	26	82	5
Future Volume (vph)	4	168	43	18	121	33	42	199	41	26	82	5
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Hourly flow rate (vph)	12	191	86	19	132	42	61	229	61	33	99	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	289	193	351	142
Volume Left (vph)	12	19	61	33
Volume Right (vph)	86	42	61	10
Hadj (s)	-0.08	-0.07	-0.01	0.09
Departure Headway (s)	5.6	5.8	5.6	6.1
Degree Utilization, x	0.45	0.31	0.54	0.24
Capacity (veh/h)	590	554	605	522
Control Delay (s)	13.2	11.4	15.0	11.0
Approach Delay (s)	13.2	11.4	15.0	11.0
Approach LOS	B	B	B	B

Intersection Summary				
Delay			13.2	
Level of Service			B	
Intersection Capacity Utilization			46.7%	ICU Level of Service
Analysis Period (min)			15	

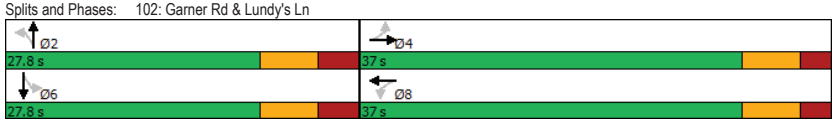
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	168	43	18	121	33	42	199	41	26	82	5
Future Volume (vph)	4	168	43	18	121	33	42	199	41	26	82	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.971			0.977			0.990	
Flt Protected		0.998			0.995			0.991			0.989	
Satd. Flow (prot)	0	1592	0	0	1654	0	0	1642	0	0	1634	0
Flt Permitted		0.998			0.995			0.991			0.989	
Satd. Flow (perm)	0	1592	0	0	1654	0	0	1642	0	0	1634	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Heavy Vehicles (%)	25%	2%	10%	0%	1%	7%	0%	2%	11%	0%	7%	0%
Adj. Flow (vph)	12	191	86	19	132	42	61	229	61	33	99	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	289	0	0	193	0	0	351	0	0	142	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	46.7%		ICU Level of Service A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.4	12.4		12.4	12.4		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.52	0.52		0.52	0.52	
v/c Ratio	0.16	0.61		0.27	0.59		0.06	0.23		0.16	0.12	
Control Delay	19.8	23.0		21.8	20.7		8.0	7.3		8.9	5.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.8	23.0		21.8	20.7		8.0	7.3		8.9	5.9	
LOS	B	C		C	C		A	A		A	A	
Approach Delay		22.8			20.8			7.4			7.2	
Approach LOS		C			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 56.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 54.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln

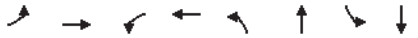


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	383	22	21	315	55	27	125	47	70	54	26
Future Volume (vph)	19	383	22	21	315	55	27	125	47	70	54	26
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.990			0.974			0.950			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1471	3197	0	1662	3051	0	1662	1609	0	1554	1633	0
Flt Permitted	0.508			0.499			0.690			0.633		
Satd. Flow (perm)	787	3197	0	872	3051	0	1208	1609	0	1035	1633	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			50			40			38	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Adj. Flow (vph)	28	407	28	51	346	71	38	132	66	84	66	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	435	0	51	417	0	38	198	0	84	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	383	22	21	315	55	27	125	47	70	54	26
Future Volume (vph)	19	383	22	21	315	55	27	125	47	70	54	26
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1471	3199		1661	3052		1662	1609		1554	1633	
Flt Permitted	0.51	1.00		0.50	1.00		0.69	1.00		0.63	1.00	
Satd. Flow (perm)	787	3199		873	3052		1207	1609		1036	1633	
Peak-hour factor, PHF	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Adj. Flow (vph)	28	407	28	51	346	71	38	132	66	84	66	38
RTOR Reduction (vph)	0	11	0	0	39	0	0	19	0	0	18	0
Lane Group Flow (vph)	28	424	0	51	378	0	38	179	0	84	86	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.4	12.4		12.4	12.4		29.0	29.0		29.0	29.0	
Effective Green, g (s)	12.4	12.4		12.4	12.4		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.52	0.52		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	173	705		192	673		622	830		534	842	
v/s Ratio Prot		c0.13			0.12			c0.11			0.05	
v/s Ratio Perm	0.04			0.06			0.03			0.08		
v/c Ratio	0.16	0.60		0.27	0.56		0.06	0.22		0.16	0.10	
Uniform Delay, d1	17.7	19.7		18.1	19.5		6.8	7.4		7.2	6.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.2		0.5	0.9		0.2	0.6		0.6	0.2	
Delay (s)	18.0	20.9		18.7	20.4		7.0	8.0		7.8	7.2	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		20.7			20.2			7.8			7.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



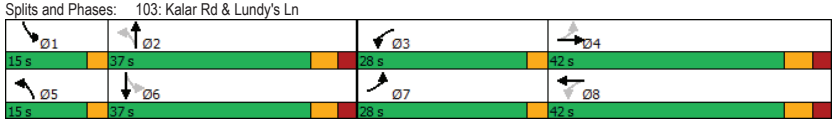
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	435	51	417	38	198	84	104
v/c Ratio	0.16	0.61	0.27	0.59	0.06	0.23	0.16	0.12
Control Delay	19.8	23.0	21.8	20.7	8.0	7.3	8.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	23.0	21.8	20.7	8.0	7.3	8.9	5.9
Queue Length 50th (m)	2.4	21.4	4.6	18.4	1.8	8.1	4.2	3.2
Queue Length 95th (m)	5.9	33.8	5.2	30.4	5.0	20.4	11.1	9.5
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	420	1713	465	1652	623	849	534	861
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.25	0.11	0.25	0.06	0.23	0.16	0.12

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	31.8	20.2		41.0	28.5		43.0	30.4		44.8	33.1	
Actuated g/C Ratio	0.34	0.22		0.44	0.30		0.46	0.32		0.48	0.35	
v/c Ratio	0.18	0.76		0.60	0.45		0.21	0.65		0.41	0.34	
Control Delay	17.0	41.9		24.6	26.8		16.0	19.8		19.4	25.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.0	41.9		24.6	26.8		16.0	19.8		19.4	25.1	
LOS	B	D		C	C		B	B		B	C	
Approach Delay		39.3			26.0			19.4			23.7	
Approach LOS		D			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 93.7			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 76.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln

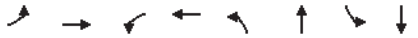


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	396	64	172	273	52	89	248	357	94	268	50
Future Volume (vph)	55	396	64	172	273	52	89	248	357	94	268	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99				1.00	
Frt		0.978			0.969			0.909			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	3068	0	1525	2980	0	1614	2917	0	1568	3144	0
Flt Permitted	0.509			0.287			0.526			0.227		
Satd. Flow (perm)	817	3068	0	458	2980	0	886	2917	0	375	3144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			26			305			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	12		12	12		12	13					13
Peak Hour Factor	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Adj. Flow (vph)	61	440	74	215	329	85	98	292	452	122	315	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	514	0	215	414	0	98	744	0	122	380	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	396	64	172	273	52	89	248	357	94	268	50
Future Volume (vph)	55	396	64	172	273	52	89	248	357	94	268	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1533	3071		1523	2984		1608	2917		1568	3147	
Flt Permitted	0.51	1.00		0.29	1.00		0.53	1.00		0.23	1.00	
Satd. Flow (perm)	822	3071		460	2984		891	2917		375	3147	
Peak-hour factor, PHF	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Adj. Flow (vph)	61	440	74	215	329	85	98	292	452	122	315	65
RTOR Reduction (vph)	0	12	0	0	18	0	0	205	0	0	12	0
Lane Group Flow (vph)	61	502	0	215	396	0	98	539	0	122	368	0
Confl. Peds. (#/hr)	12		12	12		12	13					13
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.0	20.9		37.6	28.5		38.2	31.1		42.2	33.1	
Effective Green, g (s)	27.0	20.9		37.6	28.5		38.2	31.1		42.2	33.1	
Actuated g/C Ratio	0.28	0.22		0.40	0.30		0.40	0.33		0.45	0.35	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	279	677		336	897		412	956		281	1098	
v/s Ratio Prot	0.01	c0.16		c0.09	0.13		0.02	c0.18		c0.04	0.12	
v/s Ratio Perm	0.05			0.16			0.08			0.15		
v/c Ratio	0.22	0.74		0.64	0.44		0.24	0.56		0.43	0.33	
Uniform Delay, d1	25.2	34.4		20.7	26.7		18.0	26.3		16.9	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	4.2		3.6	0.3		0.2	2.4		0.8	0.8	
Delay (s)	25.6	38.6		24.3	27.0		18.2	28.7		17.7	23.6	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		37.2			26.1			27.4			22.1	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	76.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	514	215	414	98	744	122	380
v/c Ratio	0.18	0.76	0.60	0.45	0.21	0.65	0.41	0.34
Control Delay	17.0	41.9	24.6	26.8	16.0	19.8	19.4	25.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	41.9	24.6	26.8	16.0	19.8	19.4	25.1
Queue Length 50th (m)	6.5	46.5	25.7	31.6	9.5	36.4	12.0	26.8
Queue Length 95th (m)	14.5	71.5	37.7	43.7	23.3	63.2	23.7	46.5
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	552	1171	488	1159	526	1152	338	1122
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.44	0.44	0.36	0.19	0.65	0.36	0.34

Intersection Summary

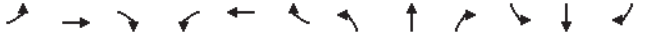
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	199	0	0	150
Future Volume (Veh/h)	0	0	199	0	0	150
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	216	0	0	163
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	379	216			216	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	379	216			216	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	623	824			1354	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	216	163
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1354
Volume to Capacity	0.00	0.13	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		14.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	199	0	0	150
Future Volume (vph)	0	0	199	0	0	150
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	216	0	0	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	216	0	0	163
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

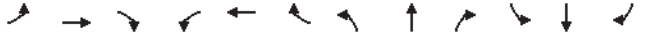
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 14.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	197	50	41	189	20	27	149	23	29	192	8
Future Volume (vph)	5	197	50	41	189	20	27	149	23	29	192	8
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Hourly flow rate (vph)	5	235	56	51	225	33	28	194	32	37	267	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	296	309	254	318
Volume Left (vph)	5	51	28	37
Volume Right (vph)	56	33	32	14
Hadj (s)	-0.11	-0.02	-0.05	0.01
Departure Headway (s)	6.5	6.5	6.7	6.5
Degree Utilization, x	0.53	0.56	0.47	0.58
Capacity (veh/h)	500	499	469	499
Control Delay (s)	16.6	17.5	15.4	18.2
Approach Delay (s)	16.6	17.5	15.4	18.2
Approach LOS	C	C	C	C

Intersection Summary				
Delay			17.0	
Level of Service			C	
Intersection Capacity Utilization			56.8%	ICU Level of Service B
Analysis Period (min)			15	



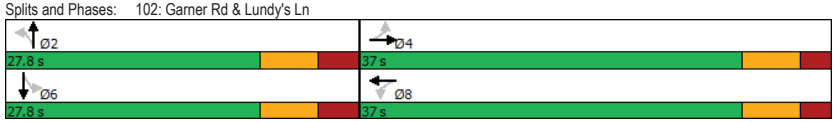
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	197	50	41	189	20	27	149	23	29	192	8
Future Volume (vph)	5	197	50	41	189	20	27	149	23	29	192	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.986			0.983			0.994	
Flt Protected		0.999			0.992			0.995			0.994	
Satd. Flow (prot)	0	1703	0	0	1699	0	0	1712	0	0	1718	0
Flt Permitted		0.999			0.992			0.995			0.994	
Satd. Flow (perm)	0	1703	0	0	1699	0	0	1712	0	0	1718	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	5	235	56	51	225	33	28	194	32	37	267	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	296	0	0	309	0	0	254	0	0	318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	56.8%		ICU Level of Service B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	16.0	16.0		16.0	16.0		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.48	0.48		0.48	0.48	
v/c Ratio	0.19	0.68		0.41	0.73		0.05	0.25		0.14	0.25	
Control Delay	19.6	23.0		25.4	22.3		10.2	9.2		10.9	10.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.6	23.0		25.4	22.3		10.2	9.2		10.9	10.3	
LOS	B	C		C	C		B	A		B	B	
Approach Delay		22.9			22.6			9.3			10.4	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 60			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	520	47	56	453	101	22	115	47	67	135	25
Future Volume (vph)	19	520	47	56	453	101	22	115	47	67	135	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.985			0.965			0.951			0.972	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3182	0	1662	3161	0	1662	1637	0	1662	1686	0
Flt Permitted	0.318			0.370			0.628			0.630		
Satd. Flow (perm)	556	3182	0	647	3161	0	1099	1637	0	1102	1686	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			81			39			18	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Adj. Flow (vph)	28	531	61	70	503	151	28	137	66	76	169	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	592	0	70	654	0	28	203	0	76	207	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	520	47	56	453	101	22	115	47	67	135	25
Future Volume (vph)	19	520	47	56	453	101	22	115	47	67	135	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3181		1661	3162		1662	1638		1662	1686	
Flt Permitted	0.32	1.00		0.37	1.00		0.63	1.00		0.63	1.00	
Satd. Flow (perm)	556	3181		647	3162		1099	1638		1103	1686	
Peak-hour factor, PHF	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Adj. Flow (vph)	28	531	61	70	503	151	28	137	66	76	169	38
RTOR Reduction (vph)	0	18	0	0	59	0	0	20	0	0	9	0
Lane Group Flow (vph)	28	574	0	70	595	0	28	183	0	76	198	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		29.1	29.1		29.1	29.1	
Effective Green, g (s)	16.0	16.0		16.0	16.0		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.49	0.49		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	148	849		172	844		533	795		535	819	
v/s Ratio Prot		0.18			c0.19			0.11			c0.12	
v/s Ratio Perm	0.05			0.11			0.03			0.07		
v/c Ratio	0.19	0.68		0.41	0.70		0.05	0.23		0.14	0.24	
Uniform Delay, d1	16.9	19.6		18.0	19.8		8.1	8.9		8.5	9.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.9		1.1	2.5		0.2	0.7		0.6	0.7	
Delay (s)	17.4	21.6		19.2	22.3		8.3	9.6		9.1	9.7	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		21.4			22.0			9.4			9.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	66.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

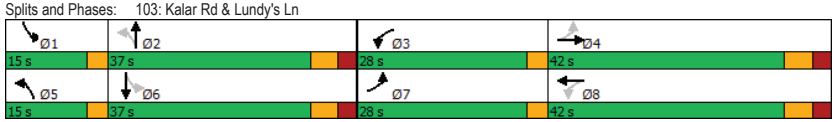
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	592	70	654	28	203	76	207
v/c Ratio	0.19	0.68	0.41	0.73	0.05	0.25	0.14	0.25
Control Delay	19.6	23.0	25.4	22.3	10.2	9.2	10.9	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	23.0	25.4	22.3	10.2	9.2	10.9	10.3
Queue Length 50th (m)	2.5	30.6	6.6	31.3	1.6	9.9	4.4	11.5
Queue Length 95th (m)	5.9	45.2	14.6	47.2	5.5	23.3	13.1	24.2
Internal Link Dist (m)		208.7		212.3		228.8		135.5
Turn Bay Length (m)	119.0		126.0		80.0		120.0	
Base Capacity (vph)	279	1611	325	1628	533	815	535	828
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.37	0.22	0.40	0.05	0.25	0.14	0.25

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	41.4	26.8		57.2	39.5		45.9	31.2		44.0	30.2	
Actuated g/C Ratio	0.37	0.24		0.51	0.36		0.41	0.28		0.40	0.27	
v/c Ratio	0.45	0.83		0.95	0.63		0.47	0.64		0.42	0.59	
Control Delay	20.2	49.6		57.2	32.0		26.5	27.4		26.1	38.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.2	49.6		57.2	32.0		26.5	27.4		26.1	38.4	
LOS	C	D		E	C		C	C		C	D	
Approach Delay		43.9			41.4			27.2			36.0	
Approach LOS		D			D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 111.2			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 37.7		Intersection LOS: D	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 103: Kalar Rd & Lundy's Ln

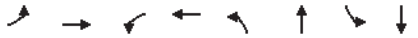


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	488	83	357	511	87	104	288	292	105	377	64
Future Volume (vph)	110	488	83	357	511	87	104	288	292	105	377	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		0.99	0.98		0.99	0.99	
Frt		0.977			0.975			0.922			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3139	0	1662	3169	0	1662	2955	0	1630	3149	0
Flt Permitted	0.378			0.196			0.342			0.276		
Satd. Flow (perm)	658	3139	0	339	3169	0	592	2955	0	470	3149	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			214			21	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Peak Hour Factor	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Adj. Flow (vph)	155	542	99	430	601	118	163	300	328	122	419	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	641	0	430	719	0	163	628	0	122	512	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	488	83	357	511	87	104	288	292	105	377	64
Future Volume (vph)	110	488	83	357	511	87	104	288	292	105	377	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1658	3140		1660	3172		1657	2957		1627	3150	
Flt Permitted	0.38	1.00		0.20	1.00		0.34	1.00		0.28	1.00	
Satd. Flow (perm)	660	3140		343	3172		597	2957		473	3150	
Peak-hour factor, PHF	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Adj. Flow (vph)	155	542	99	430	601	118	162	300	328	122	419	93
RTOR Reduction (vph)	0	13	0	0	12	0	0	154	0	0	15	0
Lane Group Flow (vph)	155	628	0	430	707	0	163	474	0	122	497	0
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.5	26.8		53.2	39.5		41.9	31.2		40.1	30.3	
Effective Green, g (s)	37.5	26.8		53.2	39.5		41.9	31.2		40.1	30.3	
Actuated g/C Ratio	0.34	0.24		0.48	0.36		0.38	0.28		0.36	0.27	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	318	756		441	1126		326	829		272	858	
v/s Ratio Prot	0.05	0.20		c0.21	0.22		c0.05	c0.16		0.04	0.16	
v/s Ratio Perm	0.12			c0.26			0.14			0.12		
v/c Ratio	0.49	0.83		0.98	0.63		0.50	0.57		0.45	0.58	
Uniform Delay, d1	26.9	40.0		27.2	29.7		24.3	34.3		25.1	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	7.6		36.1	1.0		0.9	2.9		0.9	2.8	
Delay (s)	27.9	47.7		63.2	30.7		25.3	37.1		26.0	37.8	
Level of Service	C	D		E	C		C	D		C	D	
Approach Delay (s)		43.8			42.9			34.7			35.5	
Approach LOS		D			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	39.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	111.2	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	93.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	155	641	430	719	163	628	122	512
v/c Ratio	0.45	0.83	0.95	0.63	0.47	0.64	0.42	0.59
Control Delay	20.2	49.6	57.2	32.0	26.5	27.4	26.1	38.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	49.6	57.2	32.0	26.5	27.4	26.1	38.4
Queue Length 50th (m)	18.6	74.1	72.6	70.4	23.9	45.3	17.4	53.5
Queue Length 95th (m)	23.2	96.0	#116.5	88.1	29.5	73.1	32.0	78.4
Internal Link Dist (m)		264.9		267.8		258.2		204.1
Turn Bay Length (m)	90.0		127.0		90.0		134.0	
Base Capacity (vph)	553	1007	474	1172	364	981	320	871
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.64	0.91	0.61	0.45	0.64	0.38	0.59

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	235	0	0	227
Future Volume (Veh/h)	0	0	235	0	0	227
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	255	0	0	247
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	502	255			255	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	502	255			255	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	529	784			1310	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	255	247
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1310
Volume to Capacity	0.26	0.15	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary				
Average Delay		0.0		
Intersection Capacity Utilization		16.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	235	0	0	227
Future Volume (vph)	0	0	235	0	0	227
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	255	0	0	247
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	255	0	0	247
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	105	14	19	109	30	44	185	43	23	77	4
Future Volume (vph)	4	105	14	19	109	30	44	185	43	23	77	4
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Hourly flow rate (vph)	12	119	28	20	118	38	64	213	64	29	93	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	159	176	341	130
Volume Left (vph)	12	20	64	29
Volume Right (vph)	28	38	64	8
Hadj (s)	0.00	-0.07	-0.02	0.09
Departure Headway (s)	5.4	5.4	5.0	5.4
Degree Utilization, x	0.24	0.26	0.48	0.20
Capacity (veh/h)	598	611	674	602
Control Delay (s)	10.2	10.2	12.5	9.8
Approach Delay (s)	10.2	10.2	12.5	9.8
Approach LOS	B	B	B	A

Intersection Summary					
Delay			11.1		
Level of Service			B		
Intersection Capacity Utilization			42.3%	ICU Level of Service	A
Analysis Period (min)			15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	105	14	19	109	30	44	185	43	23	77	4
Future Volume (vph)	4	105	14	19	109	30	44	185	43	23	77	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. 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
Frt		0.976			0.971			0.975			0.992	
Flt Protected		0.996			0.994			0.991			0.989	
Satd. Flow (prot)	0	1618	0	0	1653	0	0	1637	0	0	1635	0
Flt Permitted		0.996			0.994			0.991			0.989	
Satd. Flow (perm)	0	1618	0	0	1653	0	0	1637	0	0	1635	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Heavy Vehicles (%)	25%	2%	10%	0%	1%	7%	0%	2%	11%	0%	7%	0%
Adj. Flow (vph)	12	119	28	20	118	38	64	213	64	29	93	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	159	0	0	176	0	0	341	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	42.3%	ICU Level of Service A		
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
v/c Ratio	0.21	0.58		0.24	0.57		0.05	0.21		0.21	0.13	
Control Delay	21.3	22.5		21.5	19.4		7.5	6.7		9.0	5.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.3	22.5		21.5	19.4		7.5	6.7		9.0	5.2	
LOS	C	C		C	B		A	A		A	A	
Approach Delay		22.4			19.6			6.8			7.1	
Approach LOS		C			B			A			A	
Queue Length 50th (m)	3.2	19.1		4.1	16.2		1.5	6.9		5.9	3.1	
Queue Length 95th (m)	7.1	30.7		4.9	27.9		4.4	18.0		14.3	9.4	
Internal Link Dist (m)		208.7			212.3			228.8			135.5	
Turn Bay Length (m)	119.0			126.0			80.0			120.0		
Base Capacity (vph)	431	1733		489	1674		623	860		549	869	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.23		0.09	0.24		0.05	0.21		0.21	0.13	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 55.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	347	20	19	285	69	24	116	42	98	54	35
Future Volume (vph)	24	347	20	19	285	69	24	116	42	98	54	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.990			0.967			0.951			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1471	3197	0	1662	3036	0	1662	1611	0	1554	1618	0
Flt Permitted	0.516			0.519			0.682			0.643		
Satd. Flow (perm)	799	3197	0	907	3036	0	1194	1611	0	1052	1618	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			74			39			51	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Adj. Flow (vph)	36	369	25	46	313	88	33	122	59	118	66	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	394	0	46	401	0	33	181	0	118	117	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

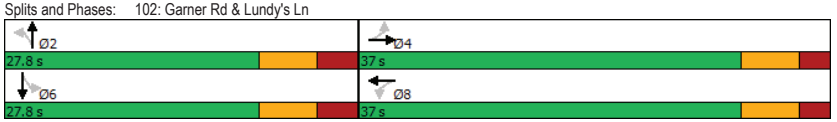
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	347	20	19	285	69	24	116	42	98	54	35
Future Volume (vph)	24	347	20	19	285	69	24	116	42	98	54	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1471	3199		1661	3036		1662	1612		1554	1617	
Flt Permitted	0.52	1.00		0.52	1.00		0.68	1.00		0.64	1.00	
Satd. Flow (perm)	799	3199		908	3036		1193	1612		1052	1617	
Peak-hour factor, PHF	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Adj. Flow (vph)	36	369	25	46	313	88	33	122	59	118	66	51
RTOR Reduction (vph)	0	11	0	0	58	0	0	19	0	0	24	0
Lane Group Flow (vph)	36	383	0	46	343	0	33	162	0	118	93	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Effective Green, g (s)	11.7	11.7		11.7	11.7		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.52	0.52		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	168	674		191	640		623	842		549	844	
v/s Ratio Prot		c0.12			0.11			0.10			0.06	
v/s Ratio Perm	0.05			0.05			0.03			c0.11		
v/c Ratio	0.21	0.57		0.24	0.54		0.05	0.19		0.21	0.11	
Uniform Delay, d1	18.1	19.6		18.2	19.5		6.5	7.0		7.1	6.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.9		0.5	0.7		0.2	0.5		0.9	0.3	
Delay (s)	18.6	20.5		18.7	20.2		6.7	7.5		8.0	7.0	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		20.4			20.0			7.4			7.5	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	55.5	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	30.9	19.6		39.3	27.0		42.6	30.4		44.4	33.0	
Actuated g/C Ratio	0.34	0.21		0.43	0.29		0.47	0.33		0.48	0.36	
v/c Ratio	0.17	0.76		0.56	0.44		0.18	0.58		0.34	0.30	
Control Delay	16.9	41.1		23.4	26.9		15.1	16.9		17.1	23.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.9	41.1		23.4	26.9		15.1	16.9		17.1	23.5	
LOS	B	D		C	C		B	B		B	C	
Approach Delay		38.7			25.8			16.7			22.0	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	5.9	44.6		22.7	30.1		8.2	28.2		10.3	23.1	
Queue Length 95th (m)	13.4	69.2		34.5	42.3		20.7	52.0		21.0	40.7	
Internal Link Dist (m)		264.9			267.8			258.2			204.1	
Turn Bay Length (m)	90.0			127.0			90.0			134.0		
Base Capacity (vph)	552	1198		493	1175		547	1169		374	1145	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.42		0.40	0.34		0.16	0.58		0.29	0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 91.6			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 25.2		Intersection LOS: C	
Intersection Capacity Utilization 75.3%		ICU Level of Service D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	393	58	156	267	47	81	225	324	85	243	46
Future Volume (vph)	50	393	58	156	267	47	81	225	324	85	243	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99				1.00	
Frt		0.980			0.971			0.909			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	3077	0	1525	2988	0	1614	2917	0	1568	3144	0
Flt Permitted	0.517			0.295			0.544			0.275		
Satd. Flow (perm)	829	3077	0	471	2988	0	916	2917	0	454	3144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			24			303			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	12		12	12		12	13					13
Peak Hour Factor	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Adj. Flow (vph)	56	437	67	195	322	77	89	265	410	110	286	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	504	0	195	399	0	89	675	0	110	346	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

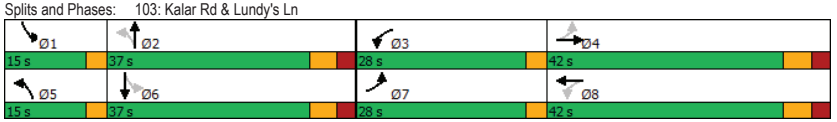
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	393	58	156	267	47	81	225	324	85	243	46
Future Volume (vph)	50	393	58	156	267	47	81	225	324	85	243	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1533	3078		1523	2991		1608	2917		1568	3146	
Flt Permitted	0.52	1.00		0.30	1.00		0.54	1.00		0.27	1.00	
Satd. Flow (perm)	834	3078		473	2991		921	2917		454	3146	
Peak-hour factor, PHF	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Adj. Flow (vph)	56	437	67	195	322	77	89	265	410	110	286	60
RTOR Reduction (vph)	0	11	0	0	17	0	0	201	0	0	12	0
Lane Group Flow (vph)	56	493	0	195	382	0	89	474	0	110	334	0
Confl. Peds. (#/hr)	12		12	12		12	13					13
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.1	20.2		35.9	27.0		37.9	31.1		41.7	33.0	
Effective Green, g (s)	26.1	20.2		35.9	27.0		37.9	31.1		41.7	33.0	
Actuated g/C Ratio	0.28	0.22		0.39	0.29		0.41	0.34		0.45	0.36	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	279	670		327	871		426	978		308	1119	
v/s Ratio Prot	0.01	c0.16		c0.08	0.13		0.02	c0.16		c0.03	0.11	
v/s Ratio Perm	0.04			0.15			0.07			0.13		
v/c Ratio	0.20	0.74		0.60	0.44		0.21	0.48		0.36	0.30	
Uniform Delay, d1	24.8	33.8		20.5	26.7		17.1	24.4		15.7	21.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	4.0		2.5	0.3		0.2	1.7		0.6	0.7	
Delay (s)	25.1	37.8		23.0	27.0		17.3	26.2		16.3	22.2	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		36.5			25.7			25.1			20.8	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	16	181	29	9	136
Future Volume (Veh/h)	52	16	181	29	9	136
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	17	197	32	10	148
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	381	213			229	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	381	213			229	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	98			99	
cM capacity (veh/h)	617	827			1339	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	74	229	158
Volume Left	57	0	10
Volume Right	17	32	0
cSH	655	1700	1339
Volume to Capacity	0.11	0.13	0.01
Queue Length 95th (m)	3.0	0.0	0.2
Control Delay (s)	11.2	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.5
Approach LOS	B		

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		26.6%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	16	181	29	9	136
Future Volume (vph)	52	16	181	29	9	136
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969		0.981			
Flt Protected	0.963					0.997
Satd. Flow (prot)	1601	0	1683	0	0	1711
Flt Permitted	0.963					0.997
Satd. Flow (perm)	1601	0	1683	0	0	1711
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	17	197	32	10	148
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	0	229	0	0	158
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	178	53	44	171	18	31	140	27	27	181	7
Future Volume (vph)	4	178	53	44	171	18	31	140	27	27	181	7
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Hourly flow rate (vph)	4	212	59	55	204	30	32	182	38	35	251	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	275	289	252	298
Volume Left (vph)	4	55	32	35
Volume Right (vph)	59	30	38	12
Hadj (s)	-0.13	-0.01	-0.07	0.01
Departure Headway (s)	6.2	6.3	6.3	6.3
Degree Utilization, x	0.47	0.50	0.44	0.52
Capacity (veh/h)	517	515	507	516
Control Delay (s)	14.7	15.5	14.3	15.9
Approach Delay (s)	14.7	15.5	14.3	15.9
Approach LOS	B	C	B	C

Intersection Summary			
Delay		15.1	
Level of Service		C	
Intersection Capacity Utilization		54.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	178	53	44	171	18	31	140	27	27	181	7
Future Volume (vph)	4	178	53	44	171	18	31	140	27	27	181	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. 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
Frt		0.971			0.986			0.980			0.995	
Flt Protected		0.999			0.991			0.994			0.994	
Satd. Flow (prot)	0	1698	0	0	1698	0	0	1705	0	0	1721	0
Flt Permitted		0.999			0.991			0.994			0.994	
Satd. Flow (perm)	0	1698	0	0	1698	0	0	1705	0	0	1721	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	4	212	59	55	204	30	32	182	38	35	251	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	275	0	0	289	0	0	252	0	0	298	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	54.2%	ICU Level of Service A	
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	15.2	15.2		15.2	15.2		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.49	0.49		0.49	0.49	
v/c Ratio	0.38	0.64		0.34	0.73		0.05	0.23		0.21	0.26	
Control Delay	26.4	22.2		22.9	20.2		9.8	8.8		11.2	9.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.4	22.2		22.9	20.2		9.8	8.8		11.2	9.6	
LOS	C	C		C	C		A	A		B	A	
Approach Delay		22.5			20.5			9.0			10.1	
Approach LOS		C			C			A			B	
Queue Length 50th (m)	4.8	26.9		5.9	27.5		1.3	8.9		6.7	11.1	
Queue Length 95th (m)	9.6	40.6		13.2	43.6		5.0	21.7		18.3	23.8	
Internal Link Dist (m)		208.7			212.3			228.8			135.5	
Turn Bay Length (m)	119.0			126.0			80.0			120.0		
Base Capacity (vph)	270	1632		372	1661		535	826		548	830	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.33		0.17	0.40		0.05	0.23		0.21	0.26	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 59.2			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	471	42	51	411	140	20	111	42	101	127	38
Future Volume (vph)	35	471	42	51	411	140	20	111	42	101	127	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	0.99							
Frt		0.985			0.953			0.954			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3182	0	1662	3116	0	1662	1643	0	1662	1658	0
Flt Permitted	0.304			0.418			0.622			0.637		
Satd. Flow (perm)	532	3182	0	731	3116	0	1088	1643	0	1115	1658	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			152			36			29	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Adj. Flow (vph)	52	481	55	64	457	209	25	132	59	115	159	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	536	0	64	666	0	25	191	0	115	217	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

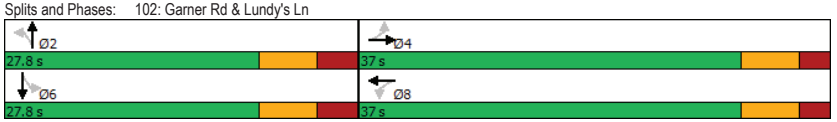
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	471	42	51	411	140	20	111	42	101	127	38
Future Volume (vph)	35	471	42	51	411	140	20	111	42	101	127	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3181		1661	3116		1662	1642		1662	1658	
Flt Permitted	0.30	1.00		0.42	1.00		0.62	1.00		0.64	1.00	
Satd. Flow (perm)	531	3181		731	3116		1089	1642		1115	1658	
Peak-hour factor, PHF	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Adj. Flow (vph)	52	481	55	64	457	209	25	132	59	115	159	58
RTOR Reduction (vph)	0	19	0	0	113	0	0	18	0	0	15	0
Lane Group Flow (vph)	52	517	0	64	553	0	25	173	0	115	202	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.2	15.2		15.2	15.2		29.1	29.1		29.1	29.1	
Effective Green, g (s)	15.2	15.2		15.2	15.2		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.49	0.49		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	136	818		188	801		536	808		549	816	
v/s Ratio Prot		0.16			c0.18			0.11			c0.12	
v/s Ratio Perm	0.10			0.09			0.02			0.10		
v/c Ratio	0.38	0.63		0.34	0.69		0.05	0.21		0.21	0.25	
Uniform Delay, d1	18.1	19.5		17.9	19.8		7.8	8.5		8.5	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	1.4		0.8	2.4		0.2	0.6		0.9	0.7	
Delay (s)	19.4	20.9		18.7	22.2		8.0	9.1		9.4	9.4	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		20.7			21.9			9.0			9.4	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	66.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	39.9	25.8		54.0	36.8		45.6	31.3		43.7	30.4	
Actuated g/C Ratio	0.37	0.24		0.50	0.34		0.42	0.29		0.41	0.28	
v/c Ratio	0.42	0.82		0.90	0.65		0.39	0.56		0.34	0.51	
Control Delay	19.6	47.8		46.0	32.2		23.9	23.7		23.6	35.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.6	47.8		46.0	32.2		23.9	23.7		23.6	35.4	
LOS	B	D		D	C		C	C		C	D	
Approach Delay		42.6			37.1			23.7			33.1	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	16.6	69.5		57.8	68.2		20.0	35.3		14.7	45.0	
Queue Length 95th (m)	21.3	93.7		#88.0	85.8		26.9	62.5		29.2	70.2	
Internal Link Dist (m)		264.9			267.8			258.2			204.1	
Turn Bay Length (m)	90.0			127.0			90.0			134.0		
Base Capacity (vph)	556	1044		485	1181		403	1011		362	902	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.25	0.60		0.80	0.60		0.36	0.56		0.30	0.51	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 107.8			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 34.7		Intersection LOS: C	
Intersection Capacity Utilization 90.9%		ICU Level of Service E	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	483	75	324	512	79	94	261	264	95	342	58
Future Volume (vph)	100	483	75	324	512	79	94	261	264	95	342	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99		0.99	0.99		0.99	0.98		0.99	0.99	
Frt		0.979			0.977			0.922			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3147	0	1662	3177	0	1662	2955	0	1630	3149	0
Flt Permitted	0.376			0.208			0.392			0.333		
Satd. Flow (perm)	654	3147	0	359	3177	0	677	2955	0	567	3149	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			17			215			21	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Peak Hour Factor	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Adj. Flow (vph)	141	537	89	390	602	107	147	272	297	110	380	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	141	626	0	390	709	0	147	569	0	110	464	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	483	75	324	512	79	94	261	264	95	342	58
Future Volume (vph)	100	483	75	324	512	79	94	261	264	95	342	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1658	3148		1660	3179		1656	2958		1626	3150	
Flt Permitted	0.38	1.00		0.21	1.00		0.39	1.00		0.33	1.00	
Satd. Flow (perm)	657	3148		364	3179		683	2958		569	3150	
Peak-hour factor, PHF	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Adj. Flow (vph)	141	537	89	390	602	107	147	272	297	110	380	84
RTOR Reduction (vph)	0	11	0	0	11	0	0	152	0	0	15	0
Lane Group Flow (vph)	141	615	0	390	698	0	147	417	0	110	449	0
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.9	25.8		50.0	36.9		41.5	31.3		39.7	30.4	
Effective Green, g (s)	35.9	25.8		50.0	36.9		41.5	31.3		39.7	30.4	
Actuated g/C Ratio	0.33	0.24		0.46	0.34		0.39	0.29		0.37	0.28	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	313	754		424	1090		355	860		301	889	
v/s Ratio Prot	0.04	0.20		c0.18	0.22		c0.04	0.14		0.03	c0.14	
v/s Ratio Perm	0.11			c0.25			0.12			0.10		
v/c Ratio	0.45	0.82		0.92	0.64		0.41	0.48		0.37	0.50	
Uniform Delay, d1	26.1	38.6		23.6	29.8		22.5	31.5		23.3	32.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	6.6		24.7	1.2		0.6	1.9		0.6	2.0	
Delay (s)	26.9	45.3		48.3	30.9		23.1	33.4		23.9	34.3	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		41.9			37.1			31.3			32.3	
Approach LOS		D			D			C			C	

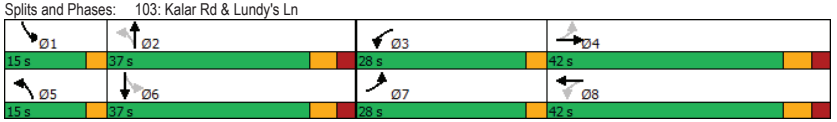
Intersection Summary				
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

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

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	18	212	74	22	204
Future Volume (Veh/h)	62	18	212	74	22	204
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	20	230	80	24	222
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	540	270			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	540	270			310	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	97			98	
cM capacity (veh/h)	493	769			1250	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	310	246
Volume Left	67	0	24
Volume Right	20	80	0
cSH	537	1700	1250
Volume to Capacity	0.16	0.18	0.02
Queue Length 95th (m)	4.6	0.0	0.5
Control Delay (s)	13.0	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	13.0	0.0	0.9
Approach LOS	B		

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		43.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	18	212	74	22	204
Future Volume (vph)	62	18	212	74	22	204
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969		0.965			
Flt Protected	0.963					0.995
Satd. Flow (prot)	1601	0	1656	0	0	1707
Flt Permitted	0.963					0.995
Satd. Flow (perm)	1601	0	1656	0	0	1707
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	20	230	80	24	222
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	0	310	0	0	246
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	116	15	21	121	33	48	204	47	26	85	5
Future Volume (vph)	5	116	15	21	121	33	48	204	47	26	85	5
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Hourly flow rate (vph)	15	132	30	22	132	42	70	234	70	33	102	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	177	196	374	145
Volume Left (vph)	15	22	70	33
Volume Right (vph)	30	42	70	10
Hadj (s)	0.01	-0.07	-0.02	0.09
Departure Headway (s)	5.7	5.6	5.2	5.7
Degree Utilization, x	0.28	0.30	0.54	0.23
Capacity (veh/h)	568	581	651	570
Control Delay (s)	10.9	11.0	14.2	10.4
Approach Delay (s)	10.9	11.0	14.2	10.4
Approach LOS	B	B	B	B

Intersection Summary				
Delay			12.2	
Level of Service			B	
Intersection Capacity Utilization			47.2%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	116	15	21	121	33	48	204	47	26	85	5
Future Volume (vph)	5	116	15	21	121	33	48	204	47	26	85	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. 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
Frt		0.977			0.971			0.975			0.991	
Flt Protected		0.996			0.994			0.991			0.989	
Satd. Flow (prot)	0	1617	0	0	1653	0	0	1637	0	0	1635	0
Flt Permitted		0.996			0.994			0.991			0.989	
Satd. Flow (perm)	0	1617	0	0	1653	0	0	1637	0	0	1635	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	0.33	0.88	0.50	0.94	0.92	0.78	0.69	0.87	0.67	0.79	0.83	0.50
Heavy Vehicles (%)	25%	2%	10%	0%	1%	7%	0%	2%	11%	0%	7%	0%
Adj. Flow (vph)	15	132	30	22	132	42	70	234	70	33	102	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	177	0	0	196	0	0	374	0	0	145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	47.2%		ICU Level of Service A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	12.4	12.4		12.4	12.4		29.1	29.1		29.1	29.1	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.52	0.52		0.52	0.52	
v/c Ratio	0.23	0.61		0.27	0.61		0.06	0.24		0.24	0.15	
Control Delay	21.5	23.0		21.8	20.2		8.0	7.4		9.7	5.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.5	23.0		21.8	20.2		8.0	7.4		9.7	5.5	
LOS	C	C		C	C		A	A		A	A	
Approach Delay		22.8			20.3			7.5			7.6	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	3.5	21.4		4.6	18.5		1.8	8.3		6.7	3.5	
Queue Length 95th (m)	7.5	33.8		5.2	31.0		5.0	20.9		16.0	10.4	
Internal Link Dist (m)		208.7			212.3			228.8			135.5	
Turn Bay Length (m)	119.0			126.0			80.0			120.0		
Base Capacity (vph)	410	1713		465	1656		610	850		533	861	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.25		0.11	0.27		0.06	0.24		0.24	0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 56.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	383	22	21	315	74	27	128	47	105	59	38
Future Volume (vph)	26	383	22	21	315	74	27	128	47	105	59	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.990			0.968			0.951			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1471	3197	0	1662	3039	0	1662	1611	0	1554	1618	0
Flt Permitted	0.496			0.499			0.676			0.632		
Satd. Flow (perm)	768	3197	0	872	3039	0	1183	1611	0	1034	1618	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			72			39			55	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Adj. Flow (vph)	39	407	28	51	346	95	38	135	66	127	72	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	435	0	51	441	0	38	201	0	127	127	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

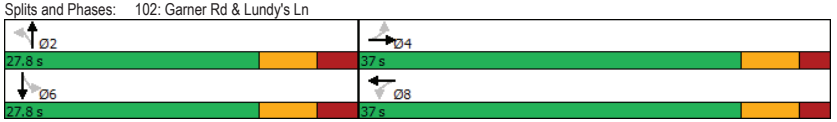
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	383	22	21	315	74	27	128	47	105	59	38
Future Volume (vph)	26	383	22	21	315	74	27	128	47	105	59	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.95		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1471	3199		1661	3038		1662	1611		1554	1618	
Flt Permitted	0.50	1.00		0.50	1.00		0.68	1.00		0.63	1.00	
Satd. Flow (perm)	769	3199		873	3038		1182	1611		1033	1618	
Peak-hour factor, PHF	0.67	0.94	0.79	0.41	0.91	0.78	0.72	0.95	0.71	0.83	0.82	0.69
Adj. Flow (vph)	39	407	28	51	346	95	38	135	66	127	72	55
RTOR Reduction (vph)	0	11	0	0	56	0	0	19	0	0	27	0
Lane Group Flow (vph)	39	424	0	51	385	0	38	182	0	127	100	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	13%	3%	0%	0%	7%	2%	0%	1%	8%	7%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.4	12.4		12.4	12.4		29.0	29.0		29.0	29.0	
Effective Green, g (s)	12.4	12.4		12.4	12.4		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.52	0.52		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	169	705		192	670		609	831		533	834	
v/s Ratio Prot		c0.13			0.13			0.11			0.06	
v/s Ratio Perm	0.05			0.06			0.03			c0.12		
v/c Ratio	0.23	0.60		0.27	0.57		0.06	0.22		0.24	0.12	
Uniform Delay, d1	18.0	19.7		18.1	19.5		6.8	7.4		7.5	7.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.2		0.5	1.0		0.2	0.6		1.1	0.3	
Delay (s)	18.5	20.9		18.7	20.5		7.0	8.0		8.6	7.3	
Level of Service	B	C		B	C		A	A		A	A	
Approach Delay (s)		20.7			20.3			7.9			7.9	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	33.2	21.6		42.4	30.0		43.1	30.4		44.9	33.2	
Actuated g/C Ratio	0.35	0.23		0.45	0.32		0.45	0.32		0.47	0.35	
v/c Ratio	0.18	0.78		0.62	0.46		0.21	0.65		0.42	0.34	
Control Delay	16.8	42.4		25.0	26.9		16.7	20.5		20.3	25.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.8	42.4		25.0	26.9		16.7	20.5		20.3	25.9	
LOS	B	D		C	C		B	C		C	C	
Approach Delay		39.9			26.2			20.0			24.5	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	6.6	51.3		25.8	34.2		9.8	37.6		12.4	27.6	
Queue Length 95th (m)	14.3	77.6		37.7	46.4		24.2	64.8		24.4	47.6	
Internal Link Dist (m)		264.9			267.8			258.2			204.1	
Turn Bay Length (m)	90.0			127.0			90.0			134.0		
Base Capacity (vph)	553	1155		482	1154		518	1139		331	1107	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.11	0.48		0.45	0.38		0.19	0.65		0.37	0.34	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 95.2			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 27.1		Intersection LOS: C	
Intersection Capacity Utilization 77.5%		ICU Level of Service D	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	430	64	172	292	52	89	248	357	94	268	50
Future Volume (vph)	55	430	64	172	292	52	89	248	357	94	268	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.99	1.00		0.99	0.99		0.99				1.00	
Frt		0.980			0.971			0.909			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	3077	0	1525	2988	0	1614	2917	0	1568	3144	0
Flt Permitted	0.498			0.266			0.526			0.223		
Satd. Flow (perm)	799	3077	0	425	2988	0	886	2917	0	368	3144	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			24			305			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	12		12	12		12	13					13
Peak Hour Factor	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Adj. Flow (vph)	61	478	74	215	352	85	98	292	452	122	315	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	552	0	215	437	0	98	744	0	122	380	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

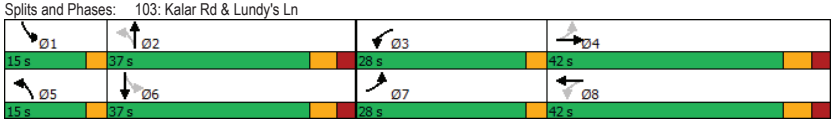
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	430	64	172	292	52	89	248	357	94	268	50
Future Volume (vph)	55	430	64	172	292	52	89	248	357	94	268	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1533	3078		1524	2990		1608	2917		1568	3147	
Flt Permitted	0.50	1.00		0.27	1.00		0.53	1.00		0.22	1.00	
Satd. Flow (perm)	804	3078		426	2990		891	2917		368	3147	
Peak-hour factor, PHF	0.90	0.90	0.86	0.80	0.83	0.61	0.91	0.85	0.79	0.77	0.85	0.77
Adj. Flow (vph)	61	478	74	215	352	85	98	292	452	122	315	65
RTOR Reduction (vph)	0	11	0	0	17	0	0	206	0	0	12	0
Lane Group Flow (vph)	61	541	0	215	420	0	98	538	0	122	368	0
Confl. Peds. (#/hr)	12		12	12		12	13					13
Heavy Vehicles (%)	8%	5%	9%	9%	7%	9%	3%	3%	4%	6%	2%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.5	22.4		39.1	30.0		38.4	31.2		42.4	33.2	
Effective Green, g (s)	28.5	22.4		39.1	30.0		38.4	31.2		42.4	33.2	
Actuated g/C Ratio	0.30	0.23		0.41	0.31		0.40	0.32		0.44	0.34	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	283	714		328	929		408	943		276	1082	
v/s Ratio Prot	0.01	c0.18		c0.09	0.14		0.02	c0.18		c0.04	0.12	
v/s Ratio Perm	0.05			0.17			0.08			0.15		
v/c Ratio	0.22	0.76		0.66	0.45		0.24	0.57		0.44	0.34	
Uniform Delay, d1	25.0	34.5		20.7	26.7		18.6	27.1		17.6	23.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	4.4		4.3	0.3		0.2	2.5		0.9	0.9	
Delay (s)	25.3	39.0		24.9	26.9		18.9	29.6		18.5	24.4	
Level of Service	C	D		C	C		B	C		B	C	
Approach Delay (s)		37.6			26.3			28.3			22.9	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	77.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	16	199	29	9	150
Future Volume (Veh/h)	52	16	199	29	9	150
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	17	216	32	10	163
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	415	232			248	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	415	232			248	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	98			99	
cM capacity (veh/h)	589	807			1318	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	74	248	173
Volume Left	57	0	10
Volume Right	17	32	0
cSH	628	1700	1318
Volume to Capacity	0.12	0.15	0.01
Queue Length 95th (m)	3.2	0.0	0.2
Control Delay (s)	11.5	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.5
Approach LOS	B		

Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization		27.4%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	16	199	29	9	150
Future Volume (vph)	52	16	199	29	9	150
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969		0.983			
Flt Protected	0.963					0.997
Satd. Flow (prot)	1601	0	1687	0	0	1711
Flt Permitted	0.963					0.997
Satd. Flow (perm)	1601	0	1687	0	0	1711
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	17	216	32	10	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	0	248	0	0	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	197	58	48	189	20	33	154	29	29	199	8
Future Volume (vph)	5	197	58	48	189	20	33	154	29	29	199	8
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Hourly flow rate (vph)	5	235	64	60	225	33	34	200	41	37	276	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	304	318	275	327
Volume Left (vph)	5	60	34	37
Volume Right (vph)	64	33	41	14
Hadj (s)	-0.12	-0.01	-0.06	0.01
Departure Headway (s)	6.8	6.8	6.9	6.8
Degree Utilization, x	0.57	0.60	0.53	0.62
Capacity (veh/h)	481	483	460	484
Control Delay (s)	18.3	19.6	17.3	20.3
Approach Delay (s)	18.3	19.6	17.3	20.3
Approach LOS	C	C	C	C

Intersection Summary			
Delay		19.0	
Level of Service		C	
Intersection Capacity Utilization		58.5%	ICU Level of Service B
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	5	197	58	48	189	20	33	154	29	29	199	8
Future Volume (vph)	5	197	58	48	189	20	33	154	29	29	199	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. 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
Frt		0.972			0.986			0.980			0.994	
Flt Protected		0.999			0.991			0.994			0.994	
Satd. Flow (prot)	0	1699	0	0	1698	0	0	1705	0	0	1719	0
Flt Permitted		0.999			0.991			0.994			0.994	
Satd. Flow (perm)	0	1699	0	0	1698	0	0	1705	0	0	1719	0
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		133.8			190.3			256.3			275.8	
Travel Time (s)		6.0			8.6			15.4			16.5	
Peak Hour Factor	1.00	0.84	0.90	0.80	0.84	0.61	0.96	0.77	0.71	0.78	0.72	0.58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	5	235	64	60	225	33	34	200	41	37	276	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	304	0	0	318	0	0	275	0	0	327	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.5%	ICU Level of Service B	
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	5.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		36.8	36.8		36.8	36.8	
Total Split (s)	37.0	37.0		37.0	37.0		27.8	27.8		27.8	27.8	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	2.5	2.5		2.5	2.5		3.3	3.3		3.3	3.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	8.0	8.0		8.0	8.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		18.0	18.0		18.0	18.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	17.0	17.0		17.0	17.0		29.2	29.2		29.2	29.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.48	0.48		0.48	0.48	
v/c Ratio	0.42	0.65		0.39	0.75		0.05	0.26		0.24	0.29	
Control Delay	28.2	21.9		23.9	20.8		11.0	10.1		12.6	10.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.2	21.9		23.9	20.8		11.0	10.1		12.6	10.9	
LOS	C	C		C	C		B	B		B	B	
Approach Delay		22.5			21.0			10.2			11.5	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	5.2	30.6		6.6	32.2		1.7	11.2		8.0	13.8	
Queue Length 95th (m)	10.2	44.9		14.3	49.0		5.8	26.0		21.2	28.6	
Internal Link Dist (m)		208.7			212.3			228.8			135.5	
Turn Bay Length (m)	119.0			126.0			80.0			120.0		
Base Capacity (vph)	231	1584		322	1615		510	803		523	807	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.24	0.37		0.22	0.45		0.05	0.26		0.24	0.29	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64.8			
Actuated Cycle Length: 61.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	520	47	56	453	150	22	121	47	108	140	41
Future Volume (vph)	37	520	47	56	453	150	22	121	47	108	140	41
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	119.0		0.0	126.0		0.0	80.0		0.0	120.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	0.99							
Frt		0.985			0.954			0.953			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3182	0	1662	3120	0	1662	1641	0	1662	1660	0
Flt Permitted	0.268			0.373			0.611			0.626		
Satd. Flow (perm)	469	3182	0	652	3120	0	1069	1641	0	1096	1660	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			146			37			28	
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		232.7			236.3			252.8			159.5	
Travel Time (s)		16.8			17.0			15.2			9.6	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Adj. Flow (vph)	55	531	61	70	503	224	28	144	66	123	175	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	592	0	70	727	0	28	210	0	123	237	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

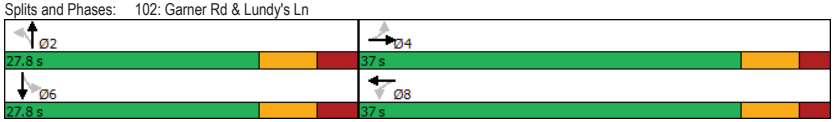
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	520	47	56	453	150	22	121	47	108	140	41
Future Volume (vph)	37	520	47	56	453	150	22	121	47	108	140	41
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3181		1661	3119		1662	1641		1662	1660	
Flt Permitted	0.27	1.00		0.37	1.00		0.61	1.00		0.63	1.00	
Satd. Flow (perm)	468	3181		652	3119		1070	1641		1096	1660	
Peak-hour factor, PHF	0.67	0.98	0.77	0.80	0.90	0.67	0.79	0.84	0.71	0.88	0.80	0.66
Adj. Flow (vph)	55	531	61	70	503	224	28	144	66	123	175	62
RTOR Reduction (vph)	0	18	0	0	105	0	0	19	0	0	15	0
Lane Group Flow (vph)	55	574	0	70	622	0	28	191	0	123	222	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	3%	0%	0%	1%	1%	0%	1%	3%	0%	0%	5%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.0	17.0		17.0	17.0		29.2	29.2		29.2	29.2	
Effective Green, g (s)	17.0	17.0		17.0	17.0		29.2	29.2		29.2	29.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.48	0.48		0.48	0.48	
Clearance Time (s)	7.0	7.0		7.0	7.0		7.8	7.8		7.8	7.8	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	130	886		181	869		512	785		524	794	
v/s Ratio Prot		0.18			c0.20			0.12			c0.13	
v/s Ratio Perm	0.12			0.11			0.03			0.11		
v/c Ratio	0.42	0.65		0.39	0.72		0.05	0.24		0.23	0.28	
Uniform Delay, d1	18.0	19.4		17.8	19.8		8.5	9.4		9.3	9.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.5		1.0	2.6		0.2	0.7		1.1	0.9	
Delay (s)	19.6	20.8		18.8	22.5		8.7	10.1		10.4	10.5	
Level of Service	B	C		B	C		A	B		B	B	
Approach Delay (s)		20.7			22.1			9.9			10.4	
Approach LOS		C			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	14.8	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

Splits and Phases: 102: Garner Rd & Lundy's Ln



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	37.0		9.0	37.0		9.0	37.0		9.0	37.0	
Total Split (s)	28.0	42.0		28.0	42.0		15.0	37.0		15.0	37.0	
Total Split (%)	23.0%	34.4%		23.0%	34.4%		12.3%	30.3%		12.3%	30.3%	
Maximum Green (s)	25.0	35.0		25.0	35.0		12.0	30.0		12.0	30.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.9		0.0	2.9		0.0	2.9		0.0	2.9	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		11.0			11.0			11.0			11.0	
Flash Dont Walk (s)		19.0			11.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	43.6	28.7		59.7	41.8		45.9	31.1		44.1	30.2	
Actuated g/C Ratio	0.38	0.25		0.52	0.37		0.40	0.27		0.39	0.27	
v/c Ratio	0.47	0.85		0.96	0.66		0.49	0.65		0.44	0.60	
Control Delay	20.3	51.0		61.6	32.8		27.9	28.4		27.4	39.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.3	51.0		61.6	32.8		27.9	28.4		27.4	39.8	
LOS	C	D		E	C		C	C		C	D	
Approach Delay		45.4			43.1			28.3			37.4	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	18.6	81.1		76.7	78.4		24.7	46.6		18.0	55.0	
Queue Length 95th (m)	23.2	104.4		#122.6	98.8		29.5	73.1		32.0	78.4	
Internal Link Dist (m)		264.9			267.8			258.2			204.1	
Turn Bay Length (m)	90.0			127.0			90.0			134.0		
Base Capacity (vph)	537	984		460	1190		352	963		308	851	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.70		0.93	0.65		0.46	0.65		0.40	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 122			
Actuated Cycle Length: 113.8			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 39.2		Intersection LOS: D	
Intersection Capacity Utilization 94.0%		ICU Level of Service F	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	529	83	357	560	87	104	288	292	105	377	64
Future Volume (vph)	110	529	83	357	560	87	104	288	292	105	377	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	90.0		0.0	127.0		0.0	90.0		0.0	134.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		0.99	0.99		0.99	0.98		0.99	0.99	
Frt		0.978			0.977			0.922			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3144	0	1662	3177	0	1662	2955	0	1630	3149	0
Flt Permitted	0.344			0.177			0.335			0.267		
Satd. Flow (perm)	599	3144	0	306	3177	0	579	2955	0	455	3149	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			17			214			21	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		288.9			291.8			282.2			228.1	
Travel Time (s)		20.8			21.0			20.3			16.4	
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Peak Hour Factor	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Adj. Flow (vph)	155	588	99	430	659	118	163	300	328	122	419	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	155	687	0	430	777	0	163	628	0	122	512	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	529	83	357	560	87	104	288	292	105	377	64
Future Volume (vph)	110	529	83	357	560	87	104	288	292	105	377	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1659	3146		1660	3178		1657	2956		1627	3149	
Flt Permitted	0.34	1.00		0.18	1.00		0.34	1.00		0.27	1.00	
Satd. Flow (perm)	601	3146		309	3178		584	2956		458	3149	
Peak-hour factor, PHF	0.71	0.90	0.84	0.83	0.85	0.74	0.64	0.96	0.89	0.86	0.90	0.69
Adj. Flow (vph)	155	588	99	430	659	118	162	300	328	122	419	93
RTOR Reduction (vph)	0	12	0	0	11	0	0	155	0	0	15	0
Lane Group Flow (vph)	155	675	0	430	766	0	163	473	0	122	497	0
Confl. Peds. (#/hr)	15		31	31		15	23		17	17		23
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	0%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.6	28.7		55.7	41.8		41.9	31.1		40.1	30.2	
Effective Green, g (s)	39.6	28.7		55.7	41.8		41.9	31.1		40.1	30.2	
Actuated g/C Ratio	0.35	0.25		0.49	0.37		0.37	0.27		0.35	0.27	
Clearance Time (s)	3.0	7.0		3.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	2.6	2.6		2.6	2.6		2.6	2.6		2.6	2.6	
Lane Grp Cap (vph)	310	794		436	1168		317	808		263	836	
v/s Ratio Prot	0.05	0.21		c0.21	0.24		c0.05	c0.16		0.04	0.16	
v/s Ratio Perm	0.13			c0.28			0.14			0.12		
v/c Ratio	0.50	0.85		0.99	0.66		0.51	0.58		0.46	0.59	
Uniform Delay, d1	26.6	40.5		29.2	30.0		25.6	35.7		26.4	36.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	8.6		39.1	1.2		1.1	3.1		1.0	3.1	
Delay (s)	27.6	49.0		68.4	31.2		26.7	38.8		27.4	39.5	
Level of Service	C	D		E	C		C	D		C	D	
Approach Delay (s)		45.1			44.4			36.3			37.2	
Approach LOS		D			D			D			D	

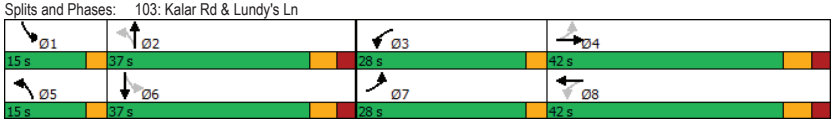
Intersection Summary				
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	113.7	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	94.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Analysis Period (min) 15

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

Splits and Phases: 103: Kalar Rd & Lundy's Ln



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	18	235	74	22	227
Future Volume (Veh/h)	62	18	235	74	22	227
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	20	255	80	24	247
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			159			
pX, platoon unblocked						
vC, conflicting volume	590	295			335	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590	295			335	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	97			98	
cM capacity (veh/h)	461	744			1224	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	87	335	271
Volume Left	67	0	24
Volume Right	20	80	0
cSH	505	1700	1224
Volume to Capacity	0.17	0.20	0.02
Queue Length 95th (m)	4.9	0.0	0.5
Control Delay (s)	13.6	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	13.6	0.0	0.9
Approach LOS	B		

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		44.4%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	62	18	235	74	22	227
Future Volume (vph)	62	18	235	74	22	227
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.969		0.968			
Flt Protected	0.963					0.996
Satd. Flow (prot)	1601	0	1661	0	0	1709
Flt Permitted	0.963					0.996
Satd. Flow (perm)	1601	0	1661	0	0	1709
Link Speed (k/h)	50		60			60
Link Distance (m)	155.3		159.5			245.6
Travel Time (s)	11.2		9.6			14.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	20	255	80	24	247
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	0	335	0	0	271
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Left-Turn Lane Nomographs

Exhibit 9A-14