Killaly Street East

Traffic Impact Study

SG Real Estate Developments LP III

31 July 2023

The Power of Commitment

Executive Summary

GHD Limited is pleased to provide the following Traffic Impact Study for a proposed residential development located generally in the southeast quadrant of the intersection of Killaly Street East and James Street in the City of Port Colborne.

This report determines the site related traffic and subsequent traffic related impacts on the adjacent road network and site driveways during the weekday a.m. and p.m. peak hours. These impacts are based on the projected future background traffic and road network conditions derived for a 2028 future planning horizon year.

Based on the approved Terms of Reference for the study, the following intersections were included in the study area:

- Killaly Street East and James Street
- James Street and Bell Street
- James Street and Johnston Street
- Killaly Street East and the proposed access

The proposed site plan prepared by Cynthia Zahoruk Architects consists of a total of 286 townhouse units, and consist of the following:

- 66 block townhouse units
- 17 street townhouse units
- 10 2-storey semi-detached units
- 138 stacked townhouse units
- 13 street townhouse units
- 42 1.5-storey townhouse units

Access to the subject site is proposed via a new access on Killaly Street East in addition to the proposed extensions of the existing municipal roadways of Bell Street and Johnston Street.

Based on ITE Trip Generation rates using Land Use Code 215 (Single-Family Attached Housing) and 220 (Multi-family Housing, Low-Rise), the subject site is expected to generate a total of 115 two-way vehicle trips during the a.m. peak hour consisting of 27 inbound and 88 outbound trips. During the p.m. peak hour, it is expected to generate 163 new two-way vehicle trips consisting of 103 inbound and 60 outbound trips.

Under existing traffic conditions, all intersections are operating at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours.

Under the 2028 future background conditions, all intersections are expected to continue to operate at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours.

With the addition of site generated traffic under the 2028 future total condition, all intersections continue to demonstrate acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours with no improvements required to accommodate the proposed development site traffic.

Application of the City of Port Colborne's Comprehensive Zoning By-law 6575/30/18 parking rates to the subject site results in a requirement of a minimum of 321 vehicular parking spaces. The subject site provides a total of 434 parking spaces consisting of both resident and visitor spaces, which is greater than the total number of parking spaces required. The shortfall of parking spaces for the stacked townhouse units will be aligned with the proposed Zoning By-law Amendment.

GHD assessed the site circulation for emergency vehicles, waste collection vehicles, and passenger vehicles and confirmed no issues with site circulation.

The traffic study confirms that the proposed residential development can be accommodated on the existing road network.

We trust that this satisfies your requirements, but do not hesitate to contact the undersigned if you have any questions.

Sincerely,

GHD

Rafael Andrenacci, B.Eng
Transportation Planner

William Maria, P. Eng.
Transportation Planning Lead

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1. Introduction

1.1 Retainer and Objective

GHD Limited was retained to prepare a Traffic Impact Study for a residential development located generally in the southeast quadrant of the intersection of Killaly Street East and James Street in the City of Port Colborne.

The site location is illustrated in **Figure 1**.

The purpose of this study is to:

- Establish baseline traffic conditions for the study area in 2023 and determine future background operating conditions for a future planning horizon in 2028.
- Estimate the site trips generated by the proposed development and distribute the traffic to the adjacent road network.
- Determine future operating traffic conditions during the weekday peek periods through intersection capacity analysis.
- Conduct a site access and swept path review of the proposed site plan.

1.2 Study Team

The GHD team involved in the preparation of the study are:

- William Maria, P. Eng., Transportation Planning Lead
- Muhammad Safder Haider, B.Eng., Transportation Engineer In Training
- Rafael Andrenacci, B.Eng., Transportation Planner

Figure 1 Site Location

2. Site Characteristics

2.1 Study Area

As per the agreed Terms of Reference for the study attached in **Appendix A**, the following intersections were included in the study area:

- Killaly Street East and James Street
- Killaly Street East and the proposed site access
- James Street and Johnston Street
- James Street and Bell Street

2.2 Proposed Development Content

A site plan was prepared by Cynthia Zahoruk Architects and is shown in **Figure 2** and provided in **Appendix B**. It consists of a total of 286 dwelling units within a total of six phases of development. The unit count per phase is as follows:

- Phase 1: 66 block townhouse units
- Phase 2: 17 street townhouse units
- Phase 3: 10 2-storey semi-detached units
- Phase 4: 138 stacked townhouse units
- Phase 5: 13 street townhouse units
- Phase 6: 42 1.5-storey townhouse units

Access to the subject site is proposed via a new access on Killaly Street East and through the extensions of Johnston and Bell Streets.

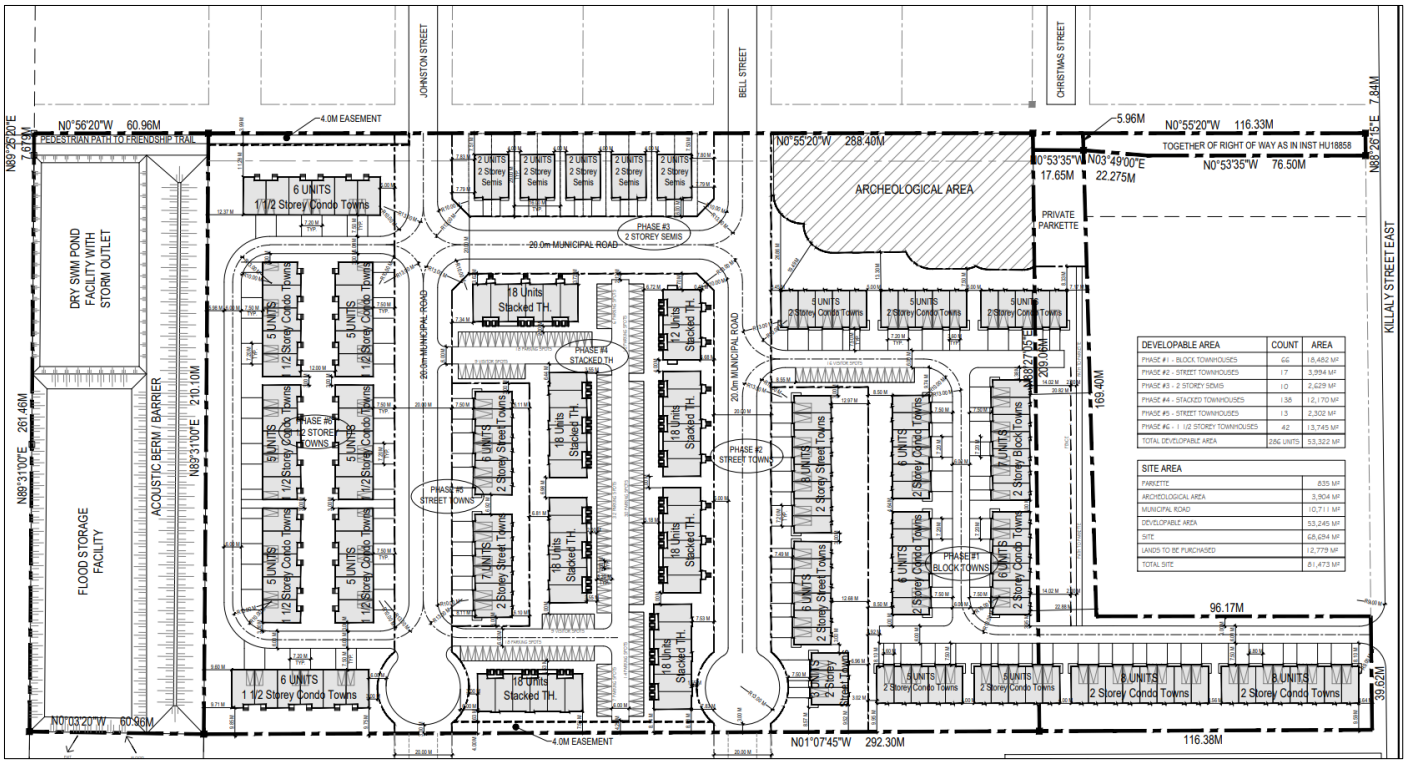


Figure 2 Proposed Site Plan

3. Existing Conditions

3.1 Existing Road Network

Killaly Street East is an east/west arterial road under the jurisdiction of the City of Port Colborne. Within the study area it has a two-lane cross-section. Its intersection with James Street is unsignalized with the stop-control provided only along the minor approach. The posted speed limit along Killaly Street East is 50 km/h west of James Street and 40 km/h east of James Street.

Bell Street is an east/west local road under the jurisdiction of the City of Port Colborne. Within the study area it has a two-lane cross-section. Its intersection with James Street is unsignalized with the stop-control provided along the minor approach. The assumed posted speed limit along Bell Street is 50 km/h.

Johnston Street is an east/west local road under the jurisdiction of the City of Port Colborne. Within the study area it has a two-lane cross-section. Its intersection with James Street is unsignalized with the stop-control provided along the minor approach. The assumed posted speed limit along Johnston Street is 50 km/h.

James Street is a north/south local road under the jurisdiction of the City of Port Colborne. Within the study area it has a two-lane cross-section. Its intersection with Killaly Street East is unsignalized with the stop-control provided along the minor approach. The assumed posted speed limit along James Street is 50 km/h.

The existing lane configurations and intersection control are shown in the figure below.

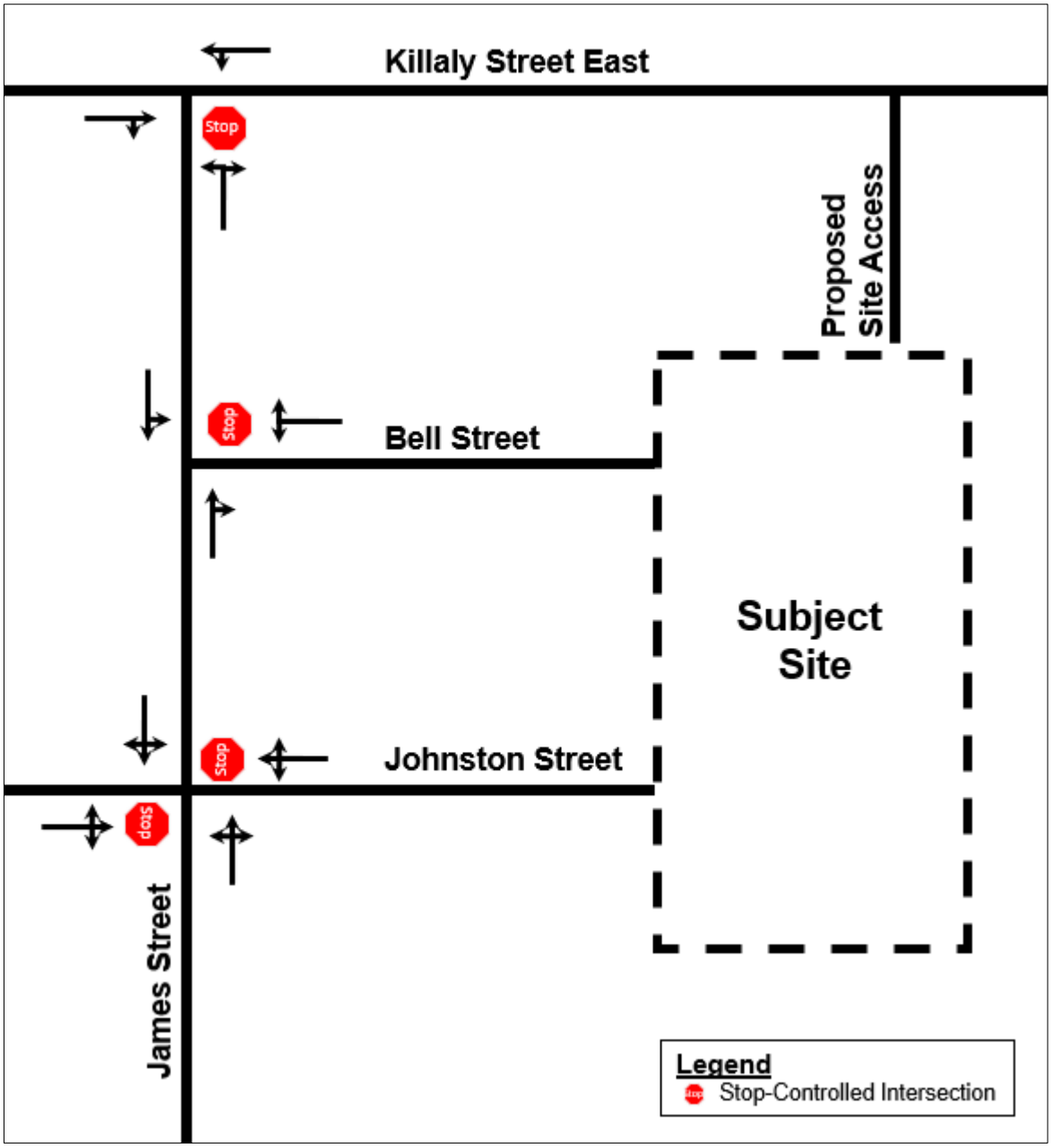


Figure 3 Existing Lane Configuration and Traffic Controls

3.2 Pedestrian and Bicycle Facilities

Within the study area, a sidewalk is provided along the south side of Killaly Street that terminates east of the subject site.

Bicycle facilities are not currently provided on any of the study area roadways; however a multi-use trail (the Friendship Trail) is provided along the south limit of the subject site. The trail runs in an east/west direction from the Welland Canal in the west to the City's border with the Town of Fort Erie to the east.

The existing pedestrian and bicycle routes are illustrated in the figure below.

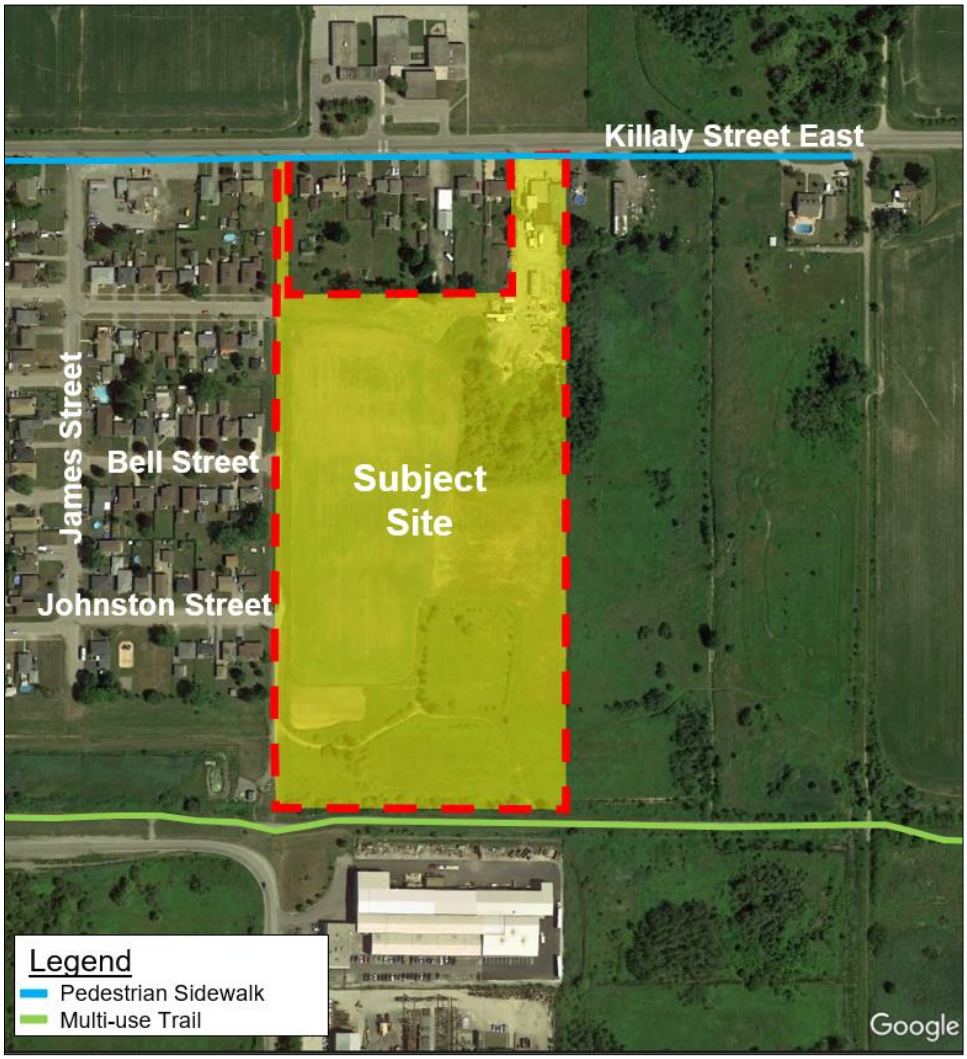


Figure 4 Existing Active Transportation Facilities

3.3 Transit Services

Within the study area and the City of Port Colborne, Niagara Region operates the NRT OnDemand service. The NRT OnDemand is an on-demand rideshare service provided to all residents in Port Colborne.

The NRT OnDemand service operates Monday to Saturday from 7 a.m. to 10 p.m. with a $3 fare per local trip and $6 for inter-municipal trips to anywhere in Grimsby, Lincoln, Niagara-on-the-Lake, Pelham, Wainfleet, West Lincoln, and only to the transfer point at Dominion Road and Ridge Road in Fort Erie. Port Colborne residents can use the NRT OnDemand service to connect to the Niagara Region's Port Colborne Link with a $4 fare. The Port Colborne Link

(Niagara Region Transit Route 25) connects Port Colborne (from City Hall) to the Welland Downtown Terminal which operates with one hour headways from 6:30 a.m. to 9:30 p.m.

3.4 Existing Traffic Data

GHD contracted Spectrum Traffic Inc. to conduct updated turning movement counts at all the study intersections in June 2023. The baseline 2023 traffic volumes for the a.m. and p.m. peak hours are summarized in **Figure 5** below with the full turning movement counts provided in **Appendix C.**

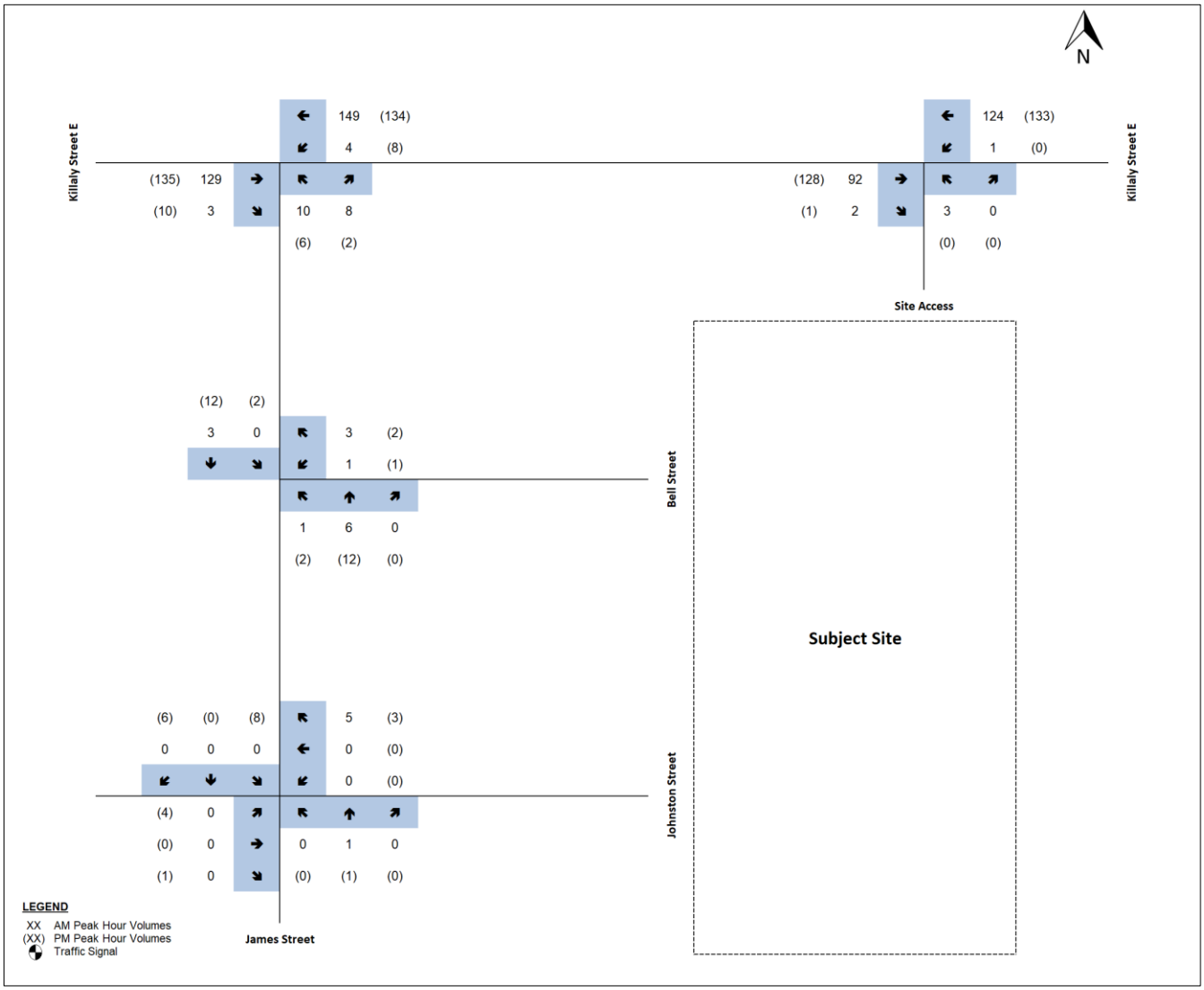


Figure 5 Baseline 2023 Traffic Volumes

4. Future Conditions

4.1 Study Horizon Year

A future horizon year of 2028 representing five years from the date of the study was selected for the analysis of future traffic conditions as agreed to with City staff.

4.2 Corridor Growth

A 2% growth rate was applied to all movements along each road within the study area to estimate corridor growth up to the future horizon years. The corridor growth rate was agreed to in the Terms of Reference with City staff.

4.3 Background Development Traffic

City identified a large development area to the north of the subject site, generally bounded by Main Street East, Lorraine Road, Killaly Street East, and Elizabeth Street that is proposed to be developed in the future. The secondary plan is in the very early stages and while it is expected to include a very large number of residential units, the project is in the early stages and information about this development is not available at this time. Therefore, it agreed with City staff that this development would not be included in the analysis of the 2028 future horizon year, instead, the secondary plan traffic study will include the subject site as background traffic when that traffic study is undertaken.

The location of the secondary plan in relation to the subject site is shown in **Figure 6** below.

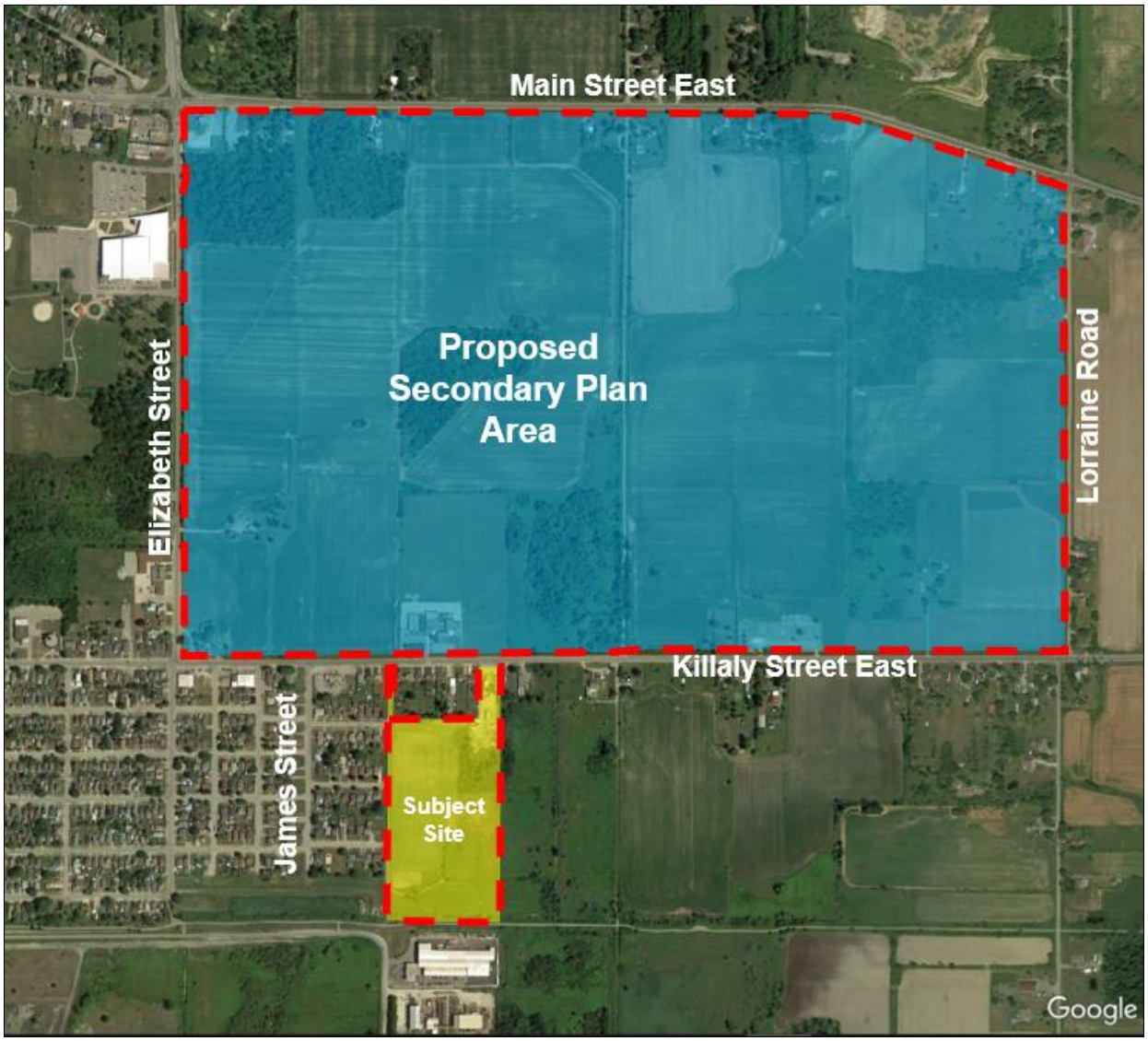


Figure 6 Background Developments

4.4 Future Background Traffic Volumes

The background traffic volumes for the 2028 horizon year were derived by applying the respective growth rates to the study area. The resulting 2028 future background traffic volumes is summarized in **Figure 7**

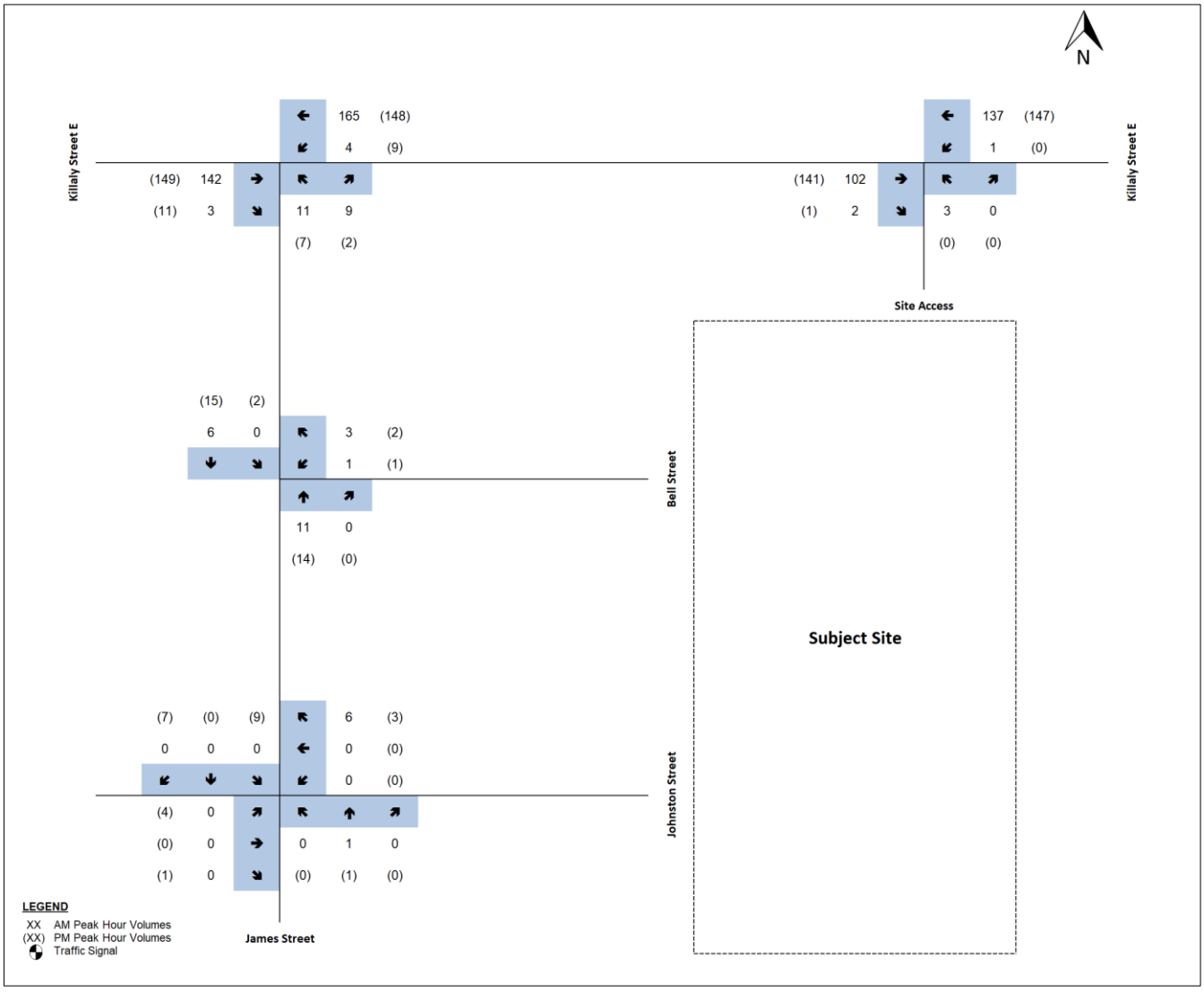


Figure 7 2028 Future Background Traffic Volumes

5. Site Generated Traffic

5.1 Modal Split

To provide a conservative analysis, no transit modal split reduction was applied to the estimated site generated trips.

5.2 Site Trip Generation

The proposed development consists of a total of 286 townhouse dwelling units.

Site traffic generated by the proposed development for the weekday a.m. and p.m. peak hours was estimated by applying the trip rates for Land Use Code 215 Single-Family Attached Housing for the 10 semi-detached units and LUC 220 Multifamily Housing Low-Rise for the remaining 276 townhouse units in the 11th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE).

Table 1 summarizes the estimated trip generation for the subject site. Individual trips for Cars and Trucks were calculated for the site.

Table 1 Total Site Trip Generation

Land Use Code	Dwelling Units	Parameters	Peak Hour Trip Generation					
			Weekday AM			Weekday PM		
			In	Out	Total	In	Out	Total
Single-Family Attached Housing (LUC 215)	10 units	Trip Rate	0.100	0.400	0.500	0.400	0.200	0.600
		Trip Ratio	25%	75%	100%	59%	41%	100%
		New Trips	1	4	5	4	2	6
Multifamily Housing (Low-Rise) (LUC 220)	276 units	Trip Rate	0.094	0.305	0.399	0.359	0.210	0.569
		Trip Ratio	24%	76%	100%	63%	37%	100%
		New Trips	26	84	110	99	58	157
Total Trips			**27**	**88**	**115**	**103**	**60**	**163**

The proposed development is expected to generate a total of 115 two-way vehicle trips during the a.m. peak hour consisting of 27 inbound and 88 outbound trips. During the p.m. peak hour, it is expected to generate 163 new two-way vehicle trips consisting of 103 inbound and 60 outbound trips.

5.3 Site Traffic Distribution and Assignment

The site generated traffic for the subject site was distributed based on the existing travel patterns and a review of the 2016 Transportation Tomorrow Survey (TTS) data and is provided in **Table 2** with the site generated traffic assignment to the study area road network for the weekday a.m. and p.m. peak hours provided in **Figure 8**.

Based on the 2016 TTS data derived for trips departing from home during the a.m. peak hour, the majority of trips were destined to either Port Colborne, Welland, St. Catharines or Niagara Falls. As a result, site trips were assigned to

either the eastbound or westbound direction along Killaly Street East with 20% of the trips assigned to/from the east and 80% of the trips assigned to/from the west.

The site trips were distributed between the three accesses based on the shortest route estimated for each dwelling unit. The units located nearest to the north of the site and Killaly Street East were all assigned to the Killaly Street East access and the units located towards the southern portion of the site were all assigned to exit the site through Johnston Street. The units located in the centre of the site were assigned to the Killaly Street East access if they were arriving/going towards the east and assigned to Bell Street if they were arriving/going towards the west.

Table 2 Site Traffic Distribution – Passenger Vehicles

Peak Period	Direction	East (Killaly Street East)	West (Killaly Street East)
AM	Inbound	20%	80%
	Outbound	20%	80%
PM	Inbound	20%	80%
	Outbound	20%	80%

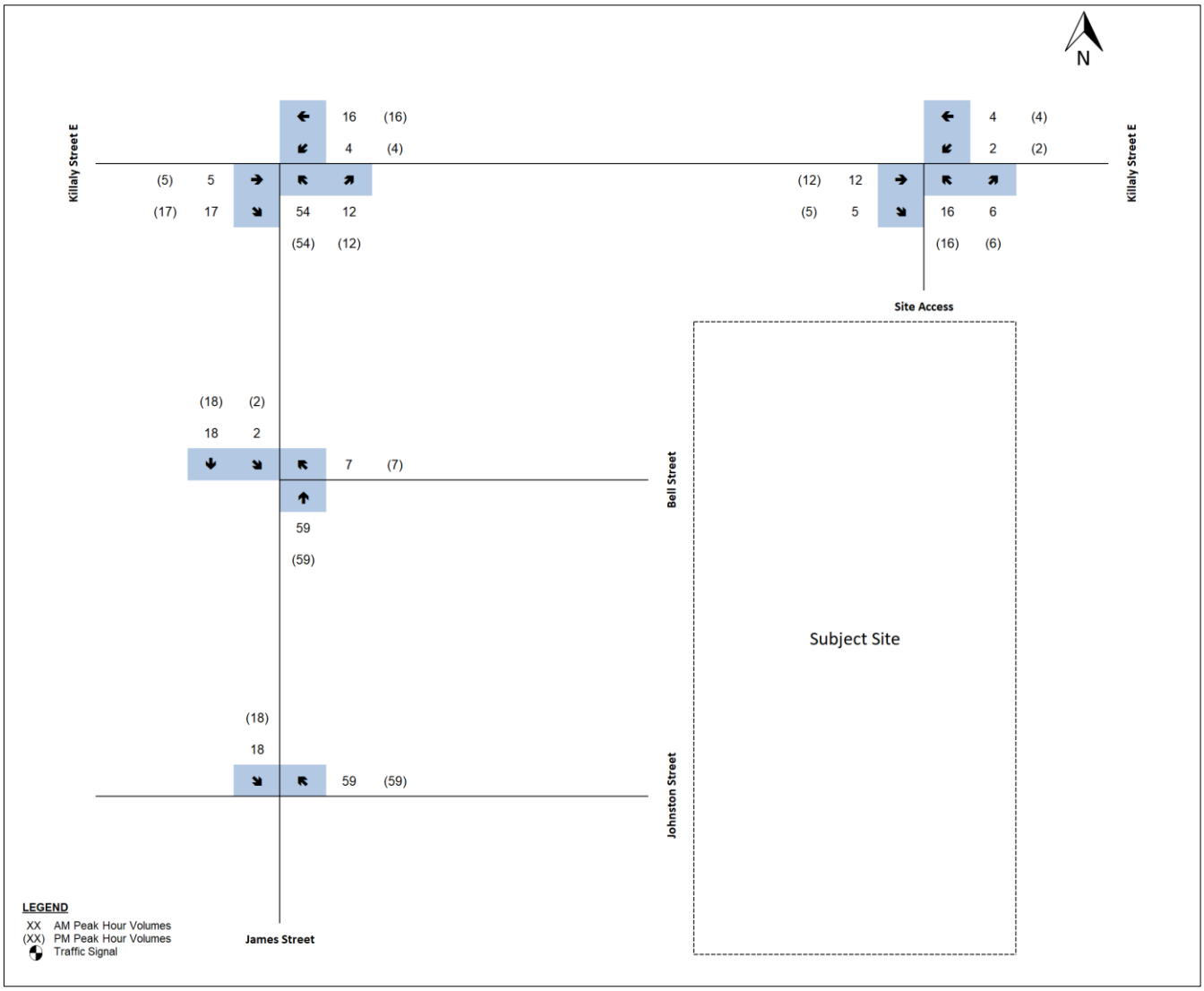


Figure 8 Total Site Trips – Passenger Vehicles

6. Future Total Traffic

The future total traffic conditions in the weekday a.m. and p.m. peak hours for the 2028 planning horizon was derived by combining the projected future background traffic with the corresponding estimated site generated traffic. The resulting traffic volumes are presented in **Figure 9**.

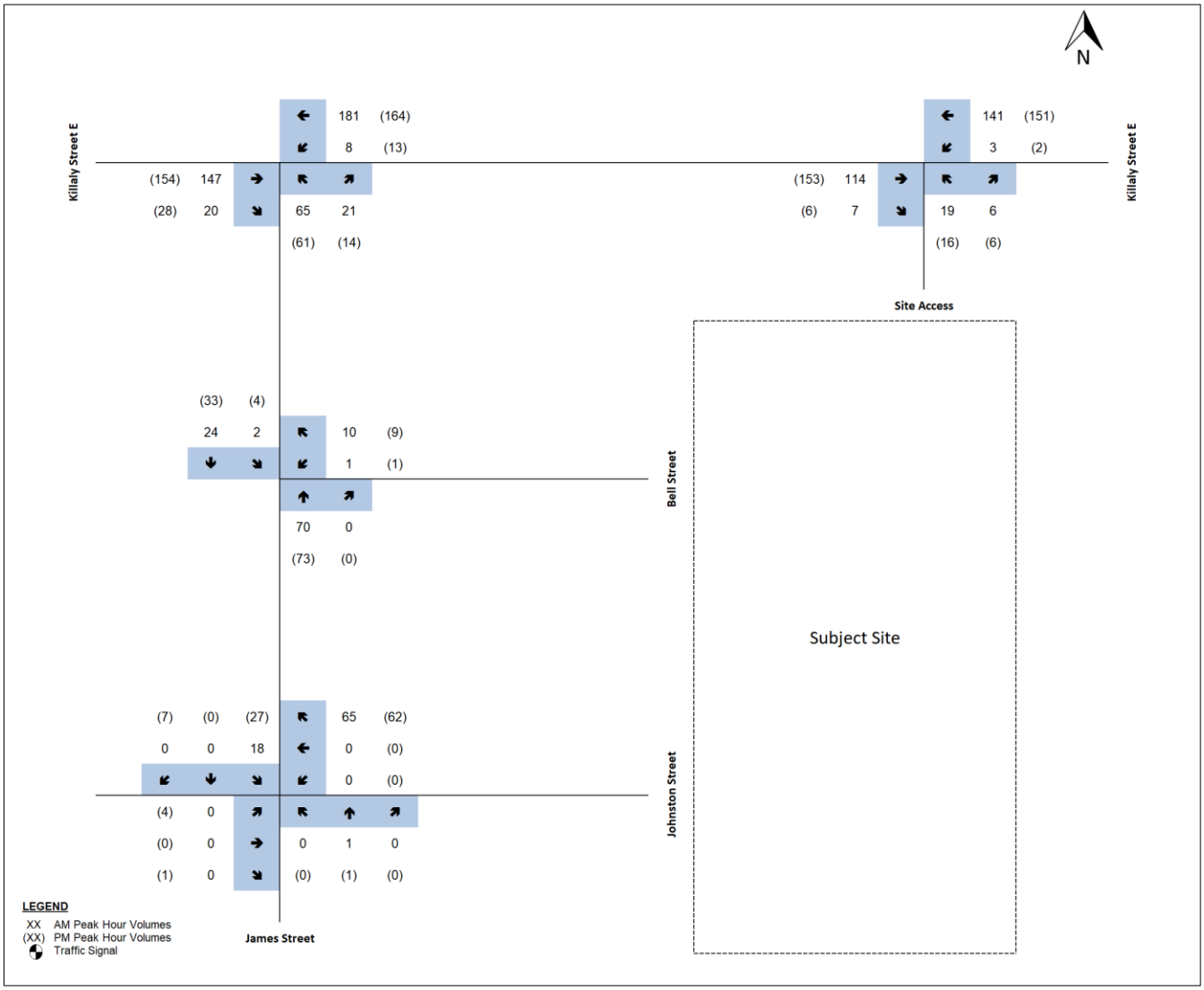


Figure 9 2028 Future Total Traffic Volumes

7. Capacity Analysis

The capacity analysis identifies how well the intersections and driveways are operating. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000 procedure within the Synchro Version 11 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement. Both

pedestrian crossing volumes and heavy vehicle proportions are included in the analyses. The peak hour factors from the counts were used to analyze existing traffic conditions. Existing peak hour factors were also used for future traffic conditions.

The analysis includes identification and required modifications and improvements (if any) at intersections where the addition of background growth or background growth plus site-generated traffic volumes causes the following:

'Critical' intersections and movements for a signalized intersection include:

- V/C ratios for overall intersections operations, through movements, or shared through/turning movements increase to 0.85 or above;
- V/C ratios for exclusive movements increase to 0.95 or above; or
- 95th percentile queue length for individual movements that are projected to, or exceed, the storage length.

'Critical' intersections and movements for an unsignalized intersection include:

- Level of Services (LOS), based on average delay per vehicle, on individual movements exceeds LOS "E"; or
- Queue length for individual movements that exceeds the available queue storage.

The following tables summarize the HCM capacity results for the study intersections during the weekday a.m. and p.m. peak hours under existing (2023), future background (2028) and future total (2028) traffic conditions. The detailed calculation sheets are provided in **Appendix D**.

7.1 Killaly Street East and James Street

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours for the existing, future background, and future total traffic conditions are summarized in the following table.

Table 3 Capacity analysis of Killaly Street East and James Street

Scenario	AM Peak Hour		PM Peak Hour	
	V/C (LOS) seconds	95th % Que.	V/C (LOS) seconds	95th % Que
Existing 2023	EBTR = 0.1 (A) 0 WBTL = 0 (A) 0 NBLR = 0.03 (B) 10	EBTR = 0 m WBTL = 5 m NBLR = 5 m	EBTR = 0.09 (A) 0 WBTL = 0.01 (A) 0 NBLR = 0.01 (B) 10	EBTR = 0 m WBTL = 5 m NBLR = 5 m
Future Background 2028	EBTR = 0.11 (A) 0 WBTL = 0 (A) 0 NBLR = 0.03 (B) 10	EBTR = 0 m WBTL = 5 m NBLR = 5 m	EBTR = 0.1 (A) 0 WBTL = 0.01 (A) 0 NBLR = 0.01 (B) 10	EBTR = 0 m WBTL = 5 m NBLR = 5 m
Future Total 2028	EBTR = 0.13 (A) 0 WBTL = 0.01 (A) 0 NBLR = 0.18 (B) 12	EBTR = 0 m WBTL = 5 m NBLR = 5 m	EBTR = 0.14 (A) 0 WBTL = 0.01 (A) 1 NBLR = 0.16 (B) 12	EBTR = 0 m WBTL = 5 m NBLR = 5 m

Under existing traffic conditions, the intersection is operating satisfactorily with low levels of delay and queuing and a maximum delay of 10 seconds which occurs in the northbound approach during both peak hours.

With the addition of corridor growth in the 2028 future background traffic scenario, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay remaining unchanged at 10 seconds in the northbound approach during both peak hours.

Under the 2028 future total traffic scenario, with the addition of site generated traffic, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay increasing by two seconds to 12 seconds in the northbound approach during both peak hours.

The existing configuration and geometry of this intersection is expected to adequately accommodate the expected traffic from the subject site with no improvements.

7.2 James Street and Bell Street

Capacity analysis for this intersection during the weekday a.m. and p.m. peak hours for the existing, future background, and future total traffic conditions are summarized in the following table.

Table 4 Capacity analysis of James Street and Bell Street

Scenario	Am Peak Hour		PM Peak Hour	
	V/C (LOS) seconds	95th % Que.	V/C (LOS) seconds	95th % Que
Existing 2023	WBLR = 0.01 (A) 8 NBTR = 0.01 (A) 0 SBTL = 0 (A) 0	WBLR = 5 m NBTR = 0 m SBTL = 0 m	WBLR = 0 (A) 8 NBTR = 0.01 (A) 0 SBTL = 0 (A) 1	WBLR = 5 m NBTR = 0 m SBTL = 5 m
Future Background 2028	WBLR = 0.01 (A) 8 NBTR = 0.01 (A) 0 SBTL = 0 (A) 0	WBLR = 5 m NBTR = 0 m SBTL = 0 m	WBLR = 0 (A) 8 NBTR = 0.02 (A) 0 SBTL = 0 (A) 1	WBLR = 5 m NBTR = 0 m SBTL = 5 m
Future Total 2028	WBLR = 0.03 (A) 9 NBTR = 0.09 (A) 0 SBTL = 0 (A) 1	WBLR = 5 m NBTR = 0 m SBTL = 5 m	WBLR = 0.02 (A) 9 NBTR = 0.1 (A) 0 SBTL = 0.01 (A) 1	WBLR = 5 m NBTR = 0 m SBTL = 5 m

Under existing traffic conditions, the intersection is operating satisfactorily with low levels of delay and queuing with a maximum delay of 8 seconds in the westbound approach during both peak hours.

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay remaining at 8 seconds in the westbound approach during both peak hours.

Under the 2028 future total traffic scenario, with the addition of site generated traffic, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay increasing by one second to 9 seconds in the westbound approach during both peak hours.

The existing configuration and geometry of this intersection is expected to adequately accommodate the expected traffic from the subject site with no improvements.

7.3 James Street and Johnston Street

Capacity analysis for this intersection during the weekday a.m. and p.m. peak hours for the existing, future background, and future total traffic conditions are summarized in the following table.

Table 5 Capacity analysis of James Street and Johnston Street

Scenario	Am Peak Hour		PM Peak Hour	
	V/C (LOS) seconds	95th % Que.	V/C (LOS) seconds	95th % Que
Existing 2023	EBTLR = 0.02 (A) 0 WBTLR = 0.02 (A) 8 NBTLR = 0 (A) 0 SBTLR = 0 (A) 0	EBTLR = 0 m WBTLR = 5 m NBTLR = 0 m SBTLR = 0 m	EBTLR = 0.01 (A) 9 WBTLR = 0.01 (A) 8 NBTLR = 0 (A) 0 SBTLR = 0.01 (A) 4	EBTLR = 5 m WBTLR = 5 m NBTLR = 0 m SBTLR = 5 m

	EBTLR = 0.01 (A) 0 WBTLR = 0.02 (A) 8 NBTLR = 0 (A) 0 SBTLR = 0 (A) 0	EBTLR = 0 m WBTLR = 5 m NBTLR = 0 m SBTLR = 0 m	EBTLR = 0.01 (A) 9 WBTLR = 0.01 (A) 8 NBTLR = 0 (A) 0 SBTLR = 0.01 (A) 4	EBTLR = 5 m WBTLR = 5 m NBTLR = 0 m SBTLR = 5 m
Future Total 2028	EBTLR = 0.01 (A) 0 WBTLR = 0.24 (A) 9 NBTLR = 0 (A) 0 SBTLR = 0.04 (A) 7	EBTLR = 0 m WBTLR = 10 m NBTLR = 0 m SBTLR = 5 m	EBTLR = 0.02 (B) 13 WBTLR = 0.23 (A) 9 NBTLR = 0 (A) 0 SBTLR = 0.06 (A) 6	EBTLR = 5 m WBTLR = 10 m NBTLR = 0 m SBTLR = 5 m

Under existing traffic conditions, the intersection is operating satisfactorily with low levels of delay and queuing with a maximum delay of 8 seconds in the westbound approach during the a.m. peak hour and a maximum delay of 9 seconds in the eastbound approach during the p.m. peak hour.

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay remaining at 8 and 9 seconds in the westbound and eastbound approaches respectively during both peak hours.

Under the 2028 future total traffic scenario, with the addition of site generated traffic, the intersection is reported to continue to operate satisfactorily with low levels of delay and queuing with the maximum delay increasing to 9 seconds in the westbound approach and 7 seconds in the southbound approach during the a.m. peak hour while the eastbound approach reports a 13 second delay, 9 seconds in the westbound approach, and 6 seconds in the southbound approach during the p.m. peak hour.

The existing configuration and geometry of this intersection is expected to adequately accommodate the expected traffic from the subject site with no improvements.

7.4 Killaly Street East and the Site Access

Capacity analysis for this intersection during the weekday a.m. and p.m. peak hours for the future total traffic conditions are summarized in the following table.

Table 6 Capacity analysis of Killaly Street East and the Site Access

Scenario	Am Peak Hour		PM Peak Hour	
	V/C (LOS) seconds	95th % Que.	V/C (LOS) seconds	95th % Que
Future Total 2028	EBTR = 0.1 (A) 0 WBTL = 0 (A) 0 NBLR = 0.05 (B) 11	EBTR = 0 m WBTL = 5 m NBLR = 5 m	EBTR = 0.13 (A) 0 WBTL = 0 (A) 0 NBLR = 0.05 (B) 12	EBTR = 0 m WBTL = 5 m NBLR = 5 m

Under all future traffic conditions, the proposed site access along Killaly Street East is expected to operate satisfactorily with a maximum delay of 11 seconds for the northbound approach during the a.m. peak hour and 12 seconds for the northbound approach during the p.m. peak hour.

The proposed configuration and geometry of this intersection is expected to adequately accommodate the expected traffic from the subject site with no improvements.

8. Parking Review

GHD reviewed the City's current Zoning By-Law parking and loading requirements for the subject site.

8.1 City of Port Colborne Comprehensive Zoning By-law 6575/30/18

8.1.1 Vehicular Parking

The current City of Port Colborne Comprehensive Zoning By-Law 6575/30/18 minimum parking requirements are found in Section 5.10.2. The minimum By-Law requirement for the subject site is as follows:

- Block Townhouse
    - 1.0 parking space per unit
- Street Townhouse
    - 1.0 parking space per unit
- Semi-detached
    - 1.0 parking space per unit
- Stacked Townhouse
    - 1.25 parking space per unit

The minimum parking required for the subject site is as follows:

- Block Townhouse
    - 1.0 parking space per unit x 66 units = 17 spaces
- Street Townhouse
    - 1.0 parking space per unit x 17 units = 66 spaces
- 2-storey semi-detached
    - 1.0 parking space per unit x 10 units = 10 spaces
- Stacked Townhouse
    - 1.25 parking space per unit x 138 units = 173 spaces
- Street townhouse
    - 1.0 parking space per unit x 13 units = 13 spaces
- 1.5-storey townhouse
    - 1.0 parking space per unit x 42 units = 42 spaces

In total, 321 vehicle parking spaces are required under the City's Comprehensive Zoning By-Law.

8.2 Proposed Site Parking

The subject site proposes to provide parking at the following rates:

- Stacked townhouse: 1 space/unit
- 2-storey condo townhouse: 2 spaces per unit (1 in the driveway and 1 in the garage)
- 2-storey street townhouse: 2 spaces per unit (1 in the driveway and 1 in the garage)
- 2-storey semi-detached: 2 spaces per unit (1 in the driveway and 1 in the garage)

- 1.5-storey condo townhouse: 2 spaces per unit (1 in the driveway and 1 in the garage)

The parking supply for the subject site is as follows:

- 138 stacked townhouses x 1 space/unit = 138 parking spaces
- 148 condo/street/semi-detached units x 2 spaces/unit = 296 parking spaces

In total, 434 parking spaces are proposed for the subject site which exceeds the minimum By-Law requirement. However, the supply of 1 space per unit for the stacked townhouse units presents a shortfall from the requirement of 1.25 spaces per unit. The stacked townhouse units will be located adjacent to additional on-street visitor parking that will be provided along one side of all municipal roads with 20 metre right-of-ways.

9. Vehicle Swept Path Analysis

GHD undertook a vehicle swept path analysis to assess the site plan circulation for an emergency vehicles, waste collection vehicle and passenger vehicles within the site. The results of the analysis are provided in **Appendix F** and illustrate that the site can sufficiently accommodate the aforementioned design vehicles with no issues.

A fire truck was analyzed entering the site from Killally Street, Bell Street, and Johnston Street and circulating the site in drawing AT-101. Drawing AT-102 illustrates the path of the fire truck exiting the site. No conflicts were found with the manoeuvres.

The waste collection vehicle was analyzed entering the site from Killally Street, Bell Street, and Johnston Street and circulating the site in drawing AT-103. Drawing AT-104 illustrates the path of the waste truck exiting the site. No conflicts were found with the manoeuvres.

A passenger vehicle was analyzed entering the site from Killally Street, Bell Street, and Johnston Street and accessing resident parking spaces (in the driveway) and visitor spaces in drawings AT-105. Drawing AT-106 illustrates the path of the passenger vehicles exiting the parking spaces and the site. No conflicts were found with the manoeuvres.

10. Conclusion

The proposed site consists of a total of 286 townhouse units of the following unit types:

- 66 block townhouse units
- 17 street townhouse units
- 10 2-storey semi-detached units
- 138 stacked townhouse units
- 13 street townhouse units
- 42 1.5-storey townhouse units

Access to the subject site is proposed via an access along Killaly Street East in addition to extensions of the existing municipal roadways along Bell Street and Johnston Street.

Based on ITE Trip Generation rates using Land Use Code 215 (Single-Family Attached Housing) and 220 (Multi-family Housing, Low-Rise), the subject site is expected to generate a total of 115 two-way vehicle trips during the a.m. peak

hour consisting of 27 inbound and 88 outbound trips. During the p.m. peak hour, it is expected to generate 163 new two-way vehicle trips consisting of 103 inbound and 60 outbound trips.

Under existing traffic conditions, all intersections are operating at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours.

Under the 2028 future background conditions, all intersections are expected to continue to operate at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours.

With the addition of site generated traffic under the 2028 future total condition, all intersections are expected to continue to operate at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours.

Application of the City of Port Colborne's Comprehensive Zoning By-law 6575/30/18 parking rates to the subject site results in a requirement of a minimum of 321 vehicular parking spaces. The subject site provides a total of 434 parking spaces consisting of both resident and visitor spaces, which is greater than the total number of parking spaces required. The shortfall of parking spaces for the stacked townhouse units will be aligned with the proposed Zoning By-law Amendment.

GHD assessed the site circulation for emergency vehicles, waste collection vehicles, and passenger vehicles and confirmed no issues with the site circulation.

Appendices

Appendix A

Terms of Reference

Raf Andrenacci

From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Monday, May 29, 2023 9:41 AM
To: Will Maria
Cc: Raf Andrenacci
Subject: RE: Killaly Street East - Terms of Reference

Hi Will,

I think that sounds reasonable.

Thanks,

David

From: Will Maria <William.Maria@ghd.com>
Sent: Monday, May 29, 2023 9:25 AM
To: David Schulz <David.Schulz@portcolborne.ca>
Cc: Raf Andrenacci <Raf.Andrenacci@ghd.com>
Subject: RE: Killaly Street East - Terms of Reference

Good morning David and thank you for your comments on the ToR.
With respect to the secondary plan area located to the north of the subject site, I appreciate that given its size it will generate a significant volume of traffic to the surrounding road network, however, considering that it is still in the early stages I assume based on your comment that there is no trip generation and assignment of site trips has been done that we can rely on to include as background in our study.
That being the case, can we proceed with out study using a 2% per annum growth rate to the base 2023 traffic counts we are undertaking and assume no other background developments?
I would expect that the transportation study being completed for the secondary plan area will include the subject site trips as background traffic along Killaly Street.

Will

William C. Maria, P.Eng.
Transportation Planning Lead

GHD Ltd.
T: 905 814 4397 | C: 647 229 8541 | F: 905 890 8499 | E: will.maria@ghd.com
100 Milverton Drive Suite 404, Mississauga, ON L5R 4H1 | **www.ghd.com**

WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Monday, May 29, 2023 9:10 AM
To: Raf Andrenacci <Raf.Andrenacci@ghd.com>
Subject: RE: Killaly Street East - Terms of Reference

Hi Raf,

Apologies for the delay on our end as well.

Please see our comments below in red:

Study intersections

- Killaly Street East and James Street
- Killaly Street East and the proposed site access
- James Street and Johnston Street
- James Street and Bell Street

Traffic Data

Updated traffic counts at the existing study intersection of Killaly Street East and James Street will be undertaken during the a.m. and p.m. peak hours.

Study Peak Hours

Weekday a.m. and p.m. peak hours

Study Horizon Year

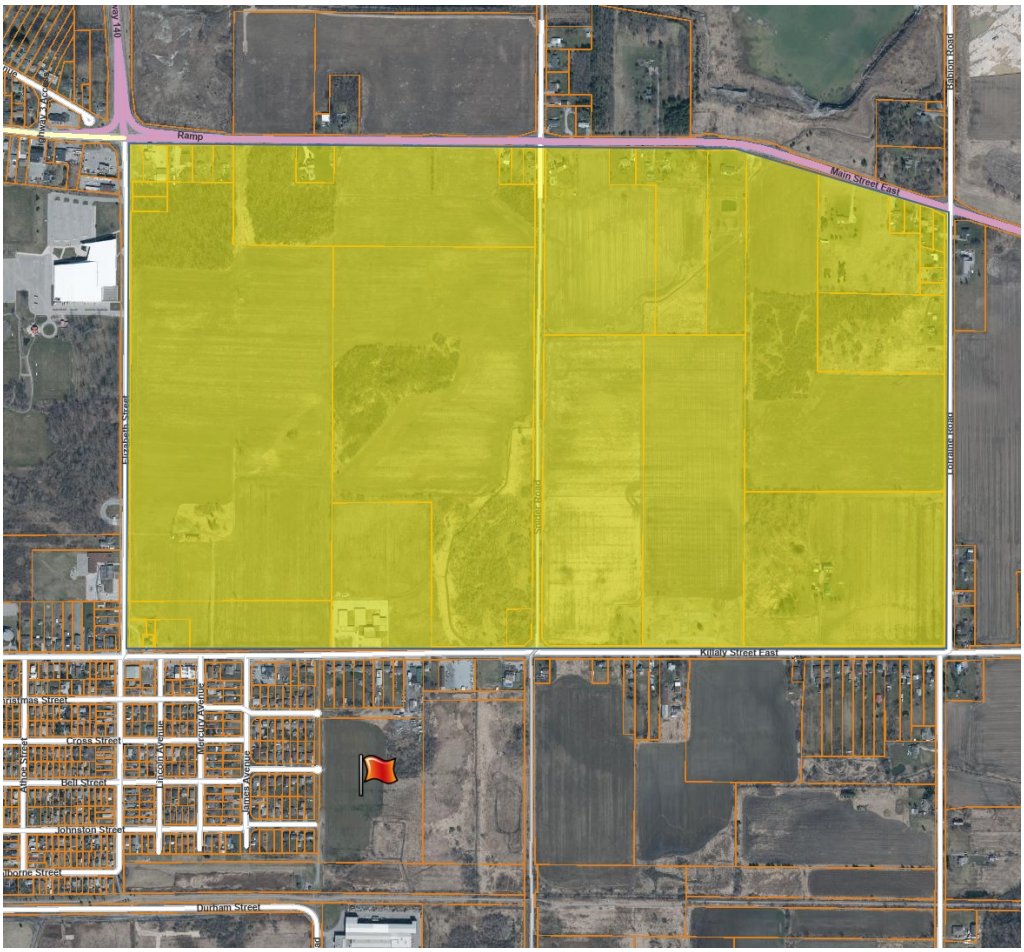
2023 (existing), and 2028 (5 years from the date of the study)

Background Growth Rate

GHD will consult with City staff to determine the growth rates to be used. Please advise if appropriate growth rates are available or if historic AADT data is available to calculate a growth rate. Please use a 2% per annum growth rate for background traffic growth. Unfortunately, no historical AADT traffic data is available from the City.

Background Development Traffic

City staff to advise if there are any proposed developments located in close proximity to the site that would contribute to additional trips along the study area road network and provide necessary site trips and assignment from any reports completed for these developments. There is a large proposed secondary plan area in the area to the north of this site (pictured below). It is in the very early stages but we anticipate a very large number of residential units.



Trip Generation
Will be completed using rates published by the ITE Trip Generation 11th Edition, LUC 220, Multifamily Housing (Low-Rise).

The directional distribution of traffic approaching and departing the site will be determined based on TTS 2016 data, existing local patterns and first principles.

The analysis will Identify the transportation system requirements and other measures required to ensure the acceptable operation of the study intersections, including auxiliary turning lanes and other transportation infrastructure improvements.

TAC and City guidelines will be reviewed in order to complete an access management.
Review for the site access that reviews corner clearance, driveway spacing, auxiliary lanes, corner radii, and clear throat distance.

GHD will review and assess the appropriateness of the proposed accesses and potential queuing concerns onto adjacent roads

The parking supply will be reviewed in accordance with the City's Zoning By-law.

Regards,

PORT COLBORNE

David Schulz BURPl, MCIP, RPP
Senior Planner
City of Port Colborne

66 Charlotte Street
Port Colborne, ON L3K 3C8
Phone 905-835-2900 x202
Email David.Schulz@portcolborne.ca

www.portcolborne.ca

"To provide an exceptional small-town experience in a big way"

From: Raf Andrenacci <Raf.Andrenacci@ghd.com>
Sent: Tuesday, May 16, 2023 8:17 AM
To: David Schulz <David.Schulz@portcolborne.ca>
Subject: Re: Killaly Street East - Terms of Reference

Hi David,

Apologies for that, please find attached the site plan as a PDF. Please let me know if you require anything else.

Regards,
Raf

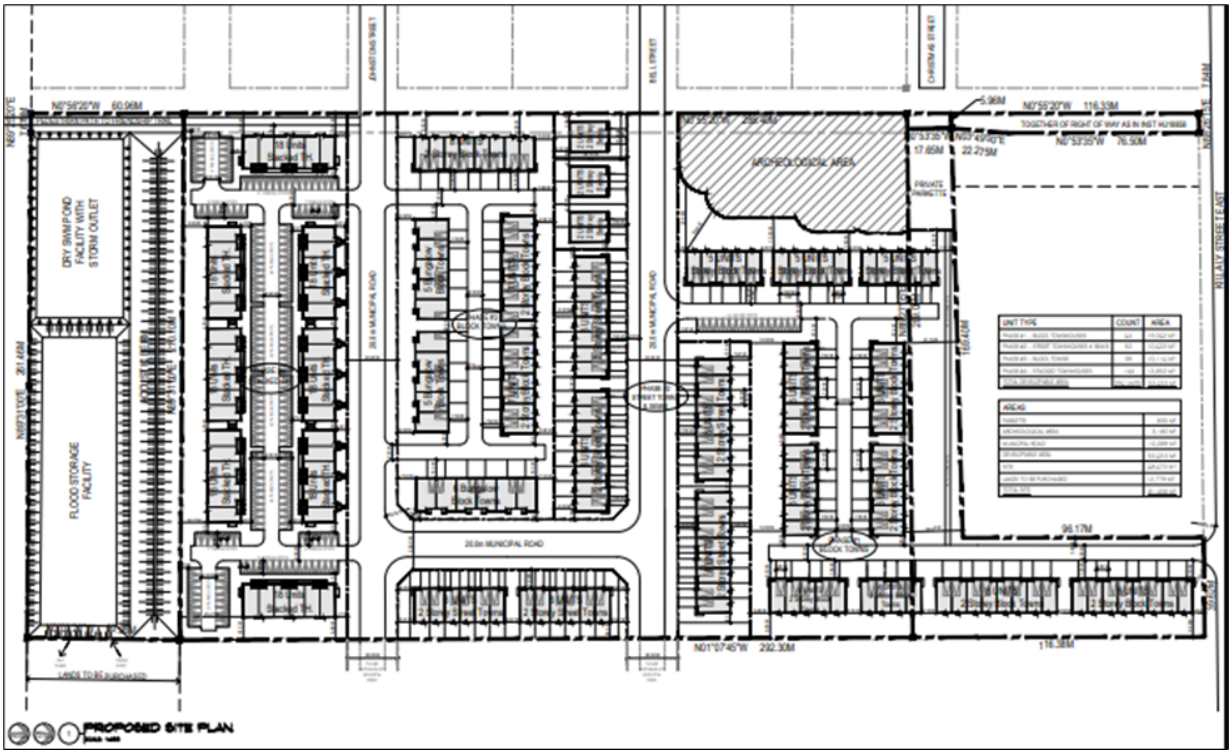
From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Tuesday, May 9, 2023 8:55 AM
To: Raf Andrenacci <Raf.Andrenacci@ghd.com>
Subject: Killaly Street East - Terms of Reference

> You don't often get email from david.schulz@portcolborne.ca. Learn why this is important

Hi Raf,

Apologies for the delay.

Can you send us a copy of the most recent plan for the site? We can see this one in your last email, but it is very difficult to decipher.



Thank you,

David

David Schulz, BURPI, MCIP, RPP
Senior Planner
City of Port Colborne

66 Charlotte Street
Port Colborne, ON L3K 3C8
Phone 905-835-2900 x202
Email David.Schulz@portcolborne.ca

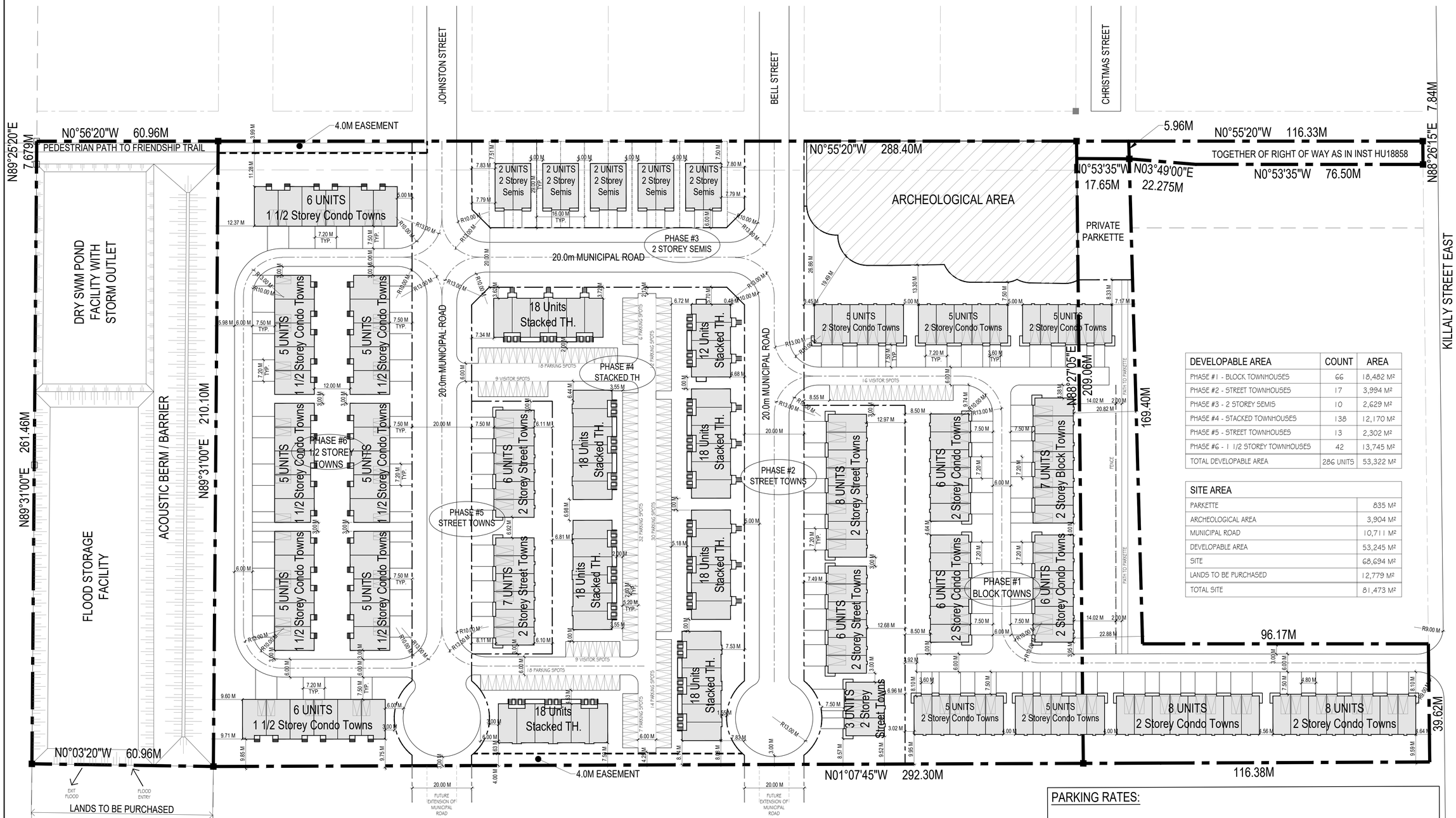
www.portcolborne.ca

"To provide an exceptional small-town experience in a big way"

purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

Appendix B

Site Plan



DEVELOPABLE AREA	COUNT	AREA
PHASE #1 - BLOCK TOWNHOUSES	66	18,482 M²
PHASE #2 - STREET TOWNHOUSES	17	3,994 M²
PHASE #3 - 2 STOREY SEMIS	10	2,629 M²
PHASE #4 - STACKED TOWNHOUSES	138	12,170 M²
PHASE #5 - STREET TOWNHOUSES	13	2,302 M²
PHASE #6 - 1 1/2 STOREY TOWNHOUSES	42	13,745 M²
TOTAL DEVELOPABLE AREA	286 UNITS	53,322 M²

SITE AREA	
PARKETTE	835 M²
ARCHEOLOGICAL AREA	3,904 M²
MUNICIPAL ROAD	10,711 M²
DEVELOPABLE AREA	53,245 M²
SITE	68,694 M²
LANDS TO BE PURCHASED	12,779 M²
TOTAL SITE	81,473 M²

PARKING RATES:

STACKED TOWNS - 1 SPACE / UNIT
2-STOREY CONDO TOWNS - 2 SPACES / UNIT (1 DRIVEWAY & 1 GARAGE)
2-STOREY STREET TOWNS - 2 SPACES / UNIT (1 DRIVEWAY & 1 GARAGE)
2- STOREY SEMI-DETACHED - 2 SPACES / UNIT (1 DRIVEWAY & 1 GARAGE)
1½ STOREY CONDO TOWNS - 2 SPACES / UNIT (1 DRIVEWAY & 1 GARAGE)

PLAN NORTH TRUE NORTH 1 SITE PLAN
SCALE: 1:600

CYNTHIA ZAHORUK ARCHITECTS
3077 NEW STREET,
BURLINGTON, ON L7N1M6
905.331.4480

ONTARIO ASSOCIATION OF ARCHITECTS
CYNTHIA ZAHORUK
LICENCE 4488
ONTARIO ASSOCIATION OF ARCHITECTS

NOTES:
1.THE CONTRACTOR OR PROJECT MANAGER WILL CHECK AND VERIFY ALL DIMENSIONS AND JOB CONDITIONS ON THE JOB AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. COORDINATION OF WORK IS THE RESPONSIBILITY OF THE CONTRACTOR OR OWNER/CONTRACTOR
2.THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SIGNED BY THE ARCHITECT.
3.ALL DRAWINGS ARE THE PROPERTY OF THE ARCHITECT AND MAY NOT BE COPIED, REPRODUCED OR ALTERED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
4.DO NOT SCALE THE DRAWINGS.

DD/MM/YY	#	REVISION
06/07/2022		ISSUED FOR PRE-CON.

SCALE: AS NOTED
DRAWN BY: KR/EM
PRINT DATE: 13/06/2023

CHEUNG
PROPOSED TOWNHOUSES
KILLALY STREET EAST
PORT COLBORNE, ONTARIO

PROPOSED SITE PLAN

A1.0

Appendix C

Traffic Data

Spectrum

Turning Movement Count
Location Name: JAMES ST & BELL ST
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Turning Movement Count (3 . JAMES ST & BELL ST)

Start Time	N Approach JAMES ST						E Approach BELL ST						S Approach JAMES ST						W Approach BELL ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	1	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	1	4	
07:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3	
07:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	2	0	0	2	4	
07:45:00	0	1	0	0	0	1	1	0	0	0	0	1	0	2	0	0	0	2	0	0	1	0	0	1	5	16
08:00:00	0	0	0	0	0	0	1	1	0	0	0	2	0	2	1	0	0	3	0	0	0	0	0	0	5	17
08:15:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	1	1	3	17
08:30:00	0	2	0	0	0	2	1	0	0	0	0	1	0	2	0	0	1	2	0	0	1	0	0	1	6	19
08:45:00	2	1	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	1	0	2	0	0	3	7	21
BREAK																										
16:00:00	0	1	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0	0	2	5	
16:15:00	0	2	1	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	4	
16:30:00	0	2	1	0	0	3	1	1	0	0	1	2	0	0	0	0	0	0	1	1	1	0	0	3	8	
16:45:00	1	6	0	0	0	7	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	9	26
17:00:00	0	5	1	0	0	6	1	0	0	0	0	1	0	2	0	0	0	2	0	0	0	0	0	0	9	30
17:15:00	1	1	0	0	0	2	0	0	0	0	0	0	0	3	1	0	0	4	0	0	1	0	0	1	7	33
17:30:00	0	2	1	0	0	3	1	1	0	0	0	2	0	4	0	0	1	4	1	0	0	0	0	1	10	35
17:45:00	1	4	0	0	0	5	0	0	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	0	9	35
Grand Total	6	27	5	0	0	38	8	3	0	0	1	11	0	30	3	0	2	33	3	1	12	0	1	16	**98**	-
Approach%	15.8%	71.1%	13.2%	0%		-	72.7%	27.3%	0%	0%		-	0%	90.9%	9.1%	0%		-	18.8%	6.3%	75%	0%		-	**-**	-
Totals %	6.1%	27.6%	5.1%	0%		38.8%	8.2%	3.1%	0%	0%		11.2%	0%	30.6%	3.1%	0%		33.7%	3.1%	1%	12.2%	0%		16.3%	**-**	-
Heavy	0	0	0	0		-	0	0	0	0		-	0	0	0	0		-	0	0	1	0		-	**-**	-
Heavy %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	8.3%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: JAMES ST & BELL ST
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 08:00 AM - 09:00 AM **Weather: Overcast Clouds (12.35 °C)**

Start Time	N Approach JAMES ST						E Approach BELL ST						S Approach JAMES ST						W Approach BELL ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	0	0	0	0	0	0	1	1	0	0	0	2	0	2	1	0	0	3	0	0	0	0	0	0	5
08:15:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	1	1	3
08:30:00	0	2	0	0	0	2	1	0	0	0	0	1	0	2	0	0	1	2	0	0	1	0	0	1	6
08:45:00	2	1	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	1	1	0	2	0	0	3	7
Grand Total	2	3	0	0	0	5	3	1	0	0	0	4	0	6	1	0	1	7	1	0	4	0	1	5	**21**
Approach%	40%	60%	0%	0%		-	75%	25%	0%	0%		-	0%	85.7%	14.3%	0%		-	20%	0%	80%	0%		-	**-**
Totals %	9.5%	14.3%	0%	0%		23.8%	14.3%	4.8%	0%	0%		19%	0%	28.6%	4.8%	0%		33.3%	4.8%	0%	19%	0%		23.8%	**-**
PHF	0.25	0.38	0	0		0.42	0.75	0.25	0	0		0.5	0	0.75	0.25	0		0.58	0.25	0	0.5	0		0.42	**-**
Heavy	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	1	0		1	**-**
Heavy %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	25%	0%		20%	**-**
Lights	2	3	0	0		5	3	1	0	0		4	0	6	1	0		7	1	0	3	0		4	**-**
Lights %	100%	100%	0%	0%		100%	100%	100%	0%	0%		100%	0%	100%	100%	0%		100%	100%	0%	75%	0%		80%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	1	0		1	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	25%	0%		20%	**-**
Bicycles on Road	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%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	50%		-	-	-	-	50%		**-**

Spectrum

Turning Movement Count
Location Name: JAMES ST & BELL ST
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 05:00 PM - 06:00 PM **Weather: Few Clouds (16.49 °C)**

Start Time	N Approach JAMES ST						E Approach BELL ST						S Approach JAMES ST						W Approach BELL ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
17:00:00	0	5	1	0	0	6	1	0	0	0	0	1	0	2	0	0	0	2	0	0	0	0	0	0	9
17:15:00	1	1	0	0	0	2	0	0	0	0	0	0	0	3	1	0	0	4	0	0	1	0	0	1	7
17:30:00	0	2	1	0	0	3	1	1	0	0	0	2	0	4	0	0	1	4	1	0	0	0	0	1	10
17:45:00	1	4	0	0	0	5	0	0	0	0	0	0	0	3	1	0	0	4	0	0	0	0	0	0	9
Grand Total	2	12	2	0	0	16	2	1	0	0	0	3	0	12	2	0	1	14	1	0	1	0	0	2	**35**
Approach%	12.5%	75%	12.5%	0%		-	66.7%	33.3%	0%	0%		-	0%	85.7%	14.3%	0%		-	50%	0%	50%	0%		-	**-**
Totals %	5.7%	34.3%	5.7%	0%		45.7%	5.7%	2.9%	0%	0%		8.6%	0%	34.3%	5.7%	0%		40%	2.9%	0%	2.9%	0%		5.7%	**-**
PHF	0.5	0.6	0.5	0		0.67	0.5	0.25	0	0		0.38	0	0.75	0.5	0		0.88	0.25	0	0.25	0		0.5	**-**
Heavy	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Heavy %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Lights	2	12	2	0		16	2	0	0	0		2	0	12	2	0		14	1	0	1	0		2	**-**
Lights %	100%	100%	100%	0%		100%	100%	0%	0%	0%		66.7%	0%	100%	100%	0%		100%	100%	0%	100%	0%		100%	**-**
Buses	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%	**-**
Bicycles on Road	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	100%	0%	0%		33.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		**-**

Peak Hour: 08:00 AM - 09:00 AM **Weather: Overcast Clouds (12.35 °C)**

Peak Hour: 05:00 PM - 06:00 PM **Weather: Few Clouds (16.49 °C)**

Spectrum

Turning Movement Count
Location Name: JAMES STREET & JOHNSTON STREET
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Turning Movement Count (2 . JAMES STREET & JOHNSTON STREET)

Start Time	N Approach JAMES STREET						E Approach JOHNSTON STREET						S Approach JAMES STREET						W Approach JOHNSTON STREET						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15:00	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	
07:30:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2	
07:45:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5
08:00:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6
08:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	5
08:30:00	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
08:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
BREAK																										
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
16:15:00	1	0	1	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	4	
16:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	
16:45:00	2	0	3	0	0	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6	12
17:00:00	1	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	6	17
17:15:00	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	0	0	3	4	17
17:30:00	2	0	1	0	0	3	2	0	0	0	0	2	0	1	0	0	0	1	0	0	1	0	0	1	7	23
17:45:00	1	0	1	0	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	1	1	5	22
Grand Total	9	1	10	0	2	20	11	0	0	0	0	11	0	2	0	0	2	2	1	2	7	0	2	10	**43**	-
Approach%	45%	5%	50%	0%		-	100%	0%	0%	0%		-	0%	100%	0%	0%		-	10%	20%	70%	0%		-	**-**	-
Totals %	20.9%	2.3%	23.3%	0%		46.5%	25.6%	0%	0%	0%		25.6%	0%	4.7%	0%	0%		4.7%	2.3%	4.7%	16.3%	0%		23.3%	**-**	-
Heavy	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Heavy %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: JAMES STREET & JOHNSTON STREET
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 07:15 AM - 08:15 AM **Weather: Overcast Clouds (12.35 °C)**

Start Time	N Approach JAMES STREET						E Approach JOHNSTON STREET						S Approach JAMES STREET						W Approach JOHNSTON STREET						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:15:00	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
07:45:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00:00	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	5	0	0	0	0	5	0	1	0	0	0	1	0	0	0	0	0	0	**6**
Approach%	0%	0%	0%	0%		-	100%	0%	0%	0%		-	0%	100%	0%	0%		-	0%	0%	0%	0%		-	**-**
Totals %	0%	0%	0%	0%		0%	83.3%	0%	0%	0%		83.3%	0%	16.7%	0%	0%		16.7%	0%	0%	0%	0%		0%	**-**
PHF	0	0	0	0		0	0.63	0	0	0		0.63	0	0.25	0	0		0.25	0	0	0	0		0	**-**
Heavy	-	-	-	-			-	-	-	-			-	-	-	-			-	-	-	-			**-**
Heavy %	-	-	-	-		%	-	-	-	-		%	-	-	-	-		%	-	-	-	-		%	**-**
Lights	0	0	0	0		0	5	0	0	0		5	0	1	0	0		1	0	0	0	0		0	**-**
Lights %	0%	0%	0%	0%		0%	100%	0%	0%	0%		100%	0%	100%	0%	0%		100%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

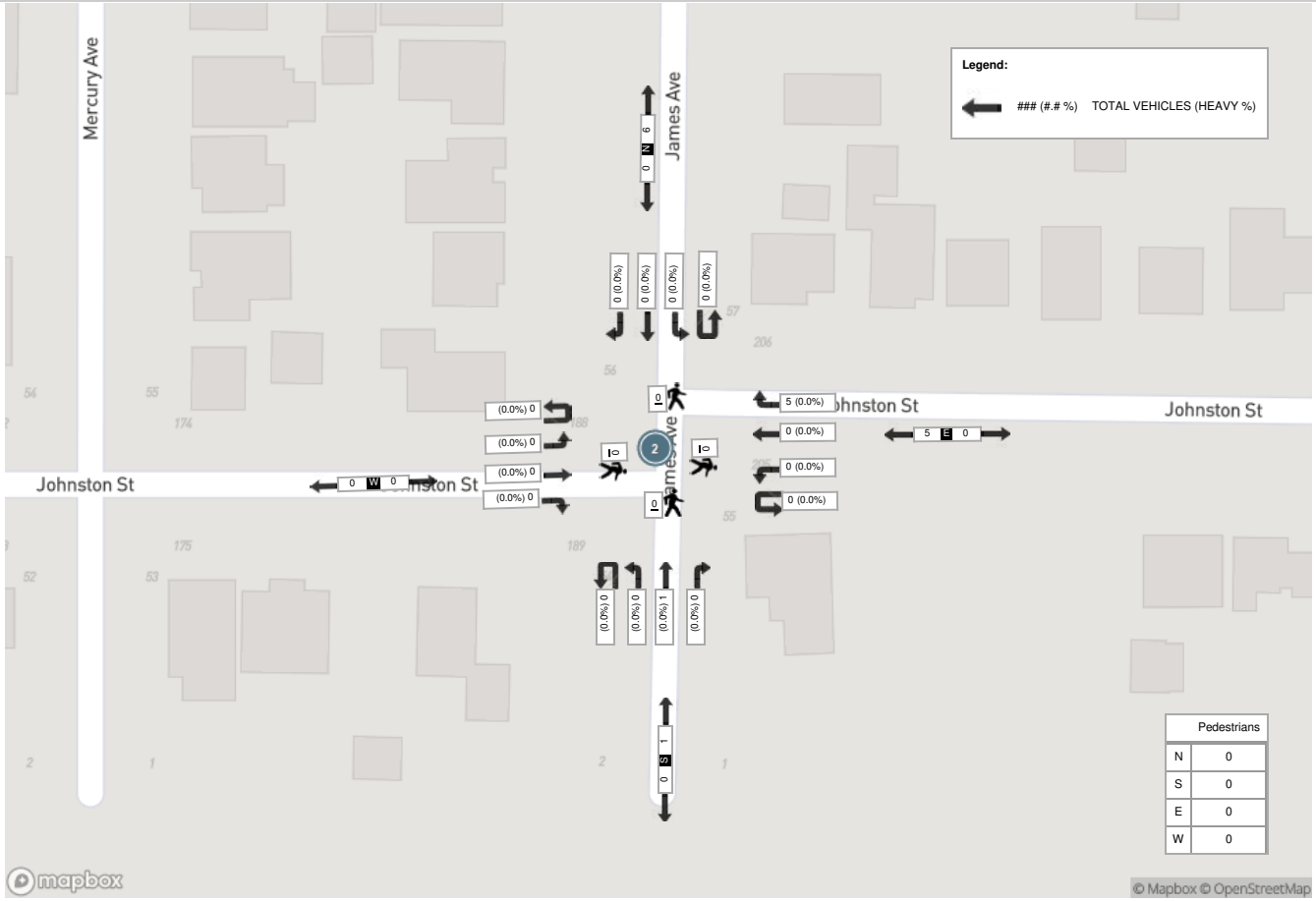
Turning Movement Count
Location Name: JAMES STREET & JOHNSTON STREET
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

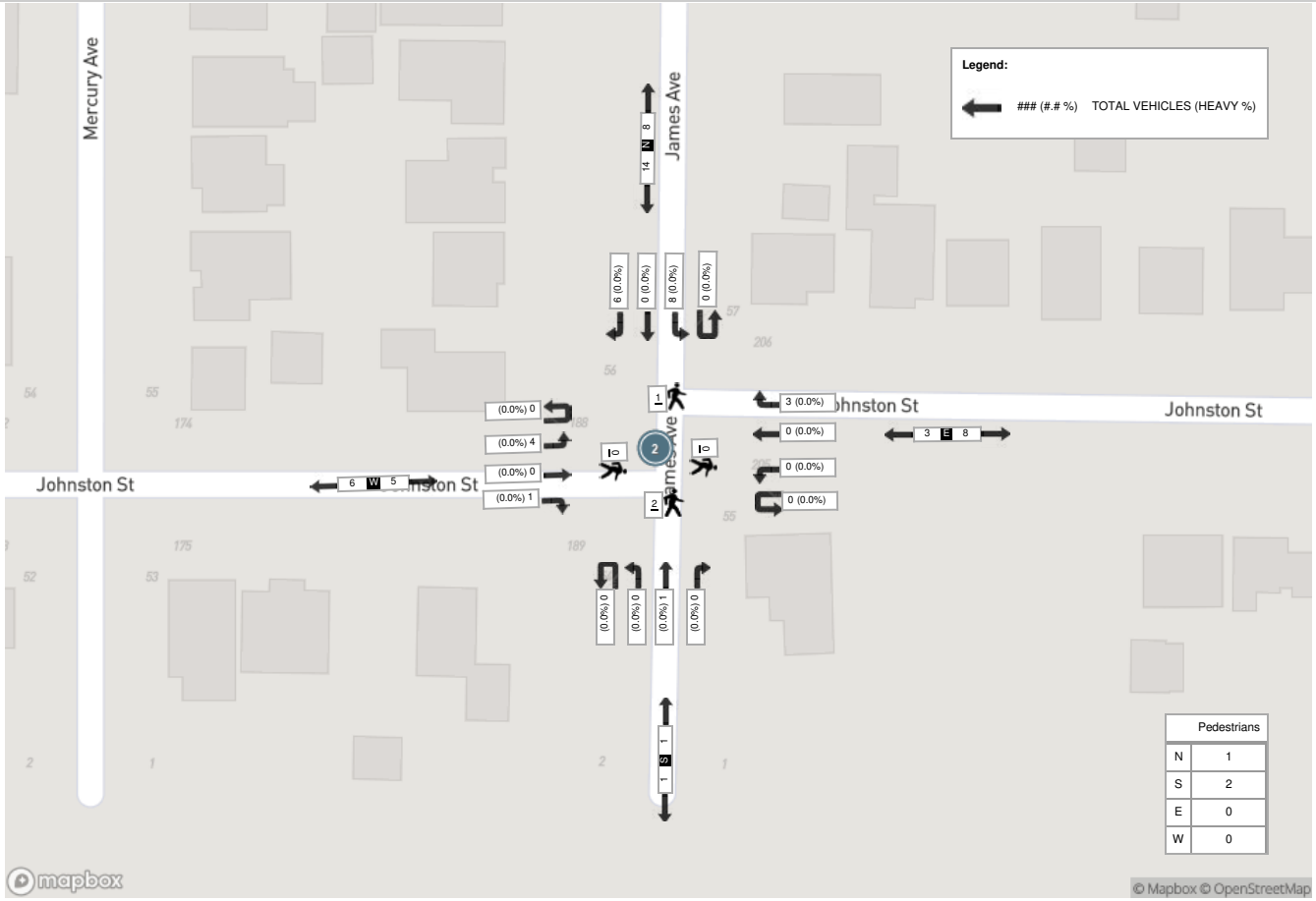
Peak Hour: 04:45 PM - 05:45 PM **Weather: Few Clouds (16.49 °C)**

Start Time	N Approach JAMES STREET						E Approach JOHNSTON STREET						S Approach JAMES STREET						W Approach JOHNSTON STREET						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	2	0	3	0	0	5	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6
17:00:00	1	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	6
17:15:00	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	0	0	3	4
17:30:00	2	0	1	0	0	3	2	0	0	0	0	2	0	1	0	0	0	1	0	0	1	0	0	1	7
Grand Total	6	0	8	0	1	14	3	0	0	0	0	3	0	1	0	0	2	1	1	0	4	0	0	5	**23**
Approach%	42.9%	0%	57.1%	0%		-	100%	0%	0%	0%		-	0%	100%	0%	0%		-	20%	0%	80%	0%		-	**-**
Totals %	26.1%	0%	34.8%	0%		60.9%	13%	0%	0%	0%		13%	0%	4.3%	0%	0%		4.3%	4.3%	0%	17.4%	0%		21.7%	**-**
PHF	0.75	0	0.5	0		0.7	0.38	0	0	0		0.38	0	0.25	0	0		0.25	0.25	0	0.5	0		0.42	**-**
Heavy	-	-	-	-			-	-	-	-			-	-	-	-			-	-	-	-			**-**
Heavy %	-	-	-	-		%	-	-	-	-		%	-	-	-	-		%	-	-	-	-		%	**-**
Lights	6	0	8	0		14	3	0	0	0		3	0	1	0	0		1	1	0	4	0		5	**-**
Lights %	100%	0%	100%	0%		100%	100%	0%	0%	0%		100%	0%	100%	0%	0%		100%	100%	0%	100%	0%		100%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	33.3%		-	-	-	-	0%		-	-	-	-	66.7%		-	-	-	-	0%		**-**

Peak Hour: 07:15 AM - 08:15 AM **Weather: Overcast Clouds (12.35 °C)**



Peak Hour: 04:45 PM - 05:45 PM **Weather: Few Clouds (16.49 °C)**



Spectrum

Turning Movement Count
Location Name: KILLALY STREET EAST & 553 KILLALY ST E
Date: Wed, Jun 14, 2023 Deployment Lead: Walter Fugaj

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Turning Movement Count (4 . KILLALY STREET EAST & 553 KILLALY ST E)

Start Time	E Approach KILLALY STREET EAST					S Approach 553 KILLALY ST E					W Approach KILLALY STREET EAST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
07:00:00	6	0	0	0	6	1	0	0	0	1	1	17	0	0	18	25	
07:15:00	18	0	0	0	18	0	0	0	0	0	0	18	0	0	18	36	
07:30:00	14	0	0	0	14	0	0	0	0	0	0	15	0	0	15	29	
07:45:00	17	0	0	0	17	0	0	0	0	0	0	17	0	0	17	34	124
08:00:00	21	0	0	0	21	0	0	0	0	0	1	22	0	0	23	44	143
08:15:00	27	0	0	0	27	0	0	0	0	0	1	16	0	0	17	44	151
08:30:00	33	1	0	0	34	0	2	0	0	2	0	22	0	0	22	58	180
08:45:00	43	0	0	0	43	0	1	0	0	1	0	32	0	0	32	76	222
BREAK																	
16:00:00	28	0	0	0	28	0	0	0	0	0	1	38	0	0	39	67	
16:15:00	29	0	0	0	29	0	0	0	0	0	0	34	0	0	34	63	
16:30:00	41	0	0	0	41	0	0	0	0	0	0	31	0	0	31	72	
16:45:00	35	0	0	0	35	0	0	0	0	0	0	24	1	0	25	60	262
17:00:00	33	0	0	0	33	0	1	0	0	1	1	27	0	0	28	62	257
17:15:00	37	0	0	0	37	0	0	0	0	0	0	29	0	0	29	66	260
17:30:00	20	0	0	0	20	0	0	0	0	0	0	34	1	0	35	55	243
17:45:00	33	0	0	0	33	0	1	0	0	1	0	27	0	0	27	61	244
Grand Total	435	1	0	0	436	1	5	0	0	6	5	403	2	0	410	**852**	-
Approach%	99.8%	0.2%	0%		-	16.7%	83.3%	0%		-	1.2%	98.3%	0.5%		-	**-**	-
Totals %	51.1%	0.1%	0%		51.2%	0.1%	0.6%	0%		0.7%	0.6%	47.3%	0.2%		48.1%	**-**	-
Heavy	30	0	0		-	0	1	0		-	1	19	0		-	**-**	-
Heavy %	6.9%	0%	0%		-	0%	20%	0%		-	20%	4.7%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (12.35 °C)

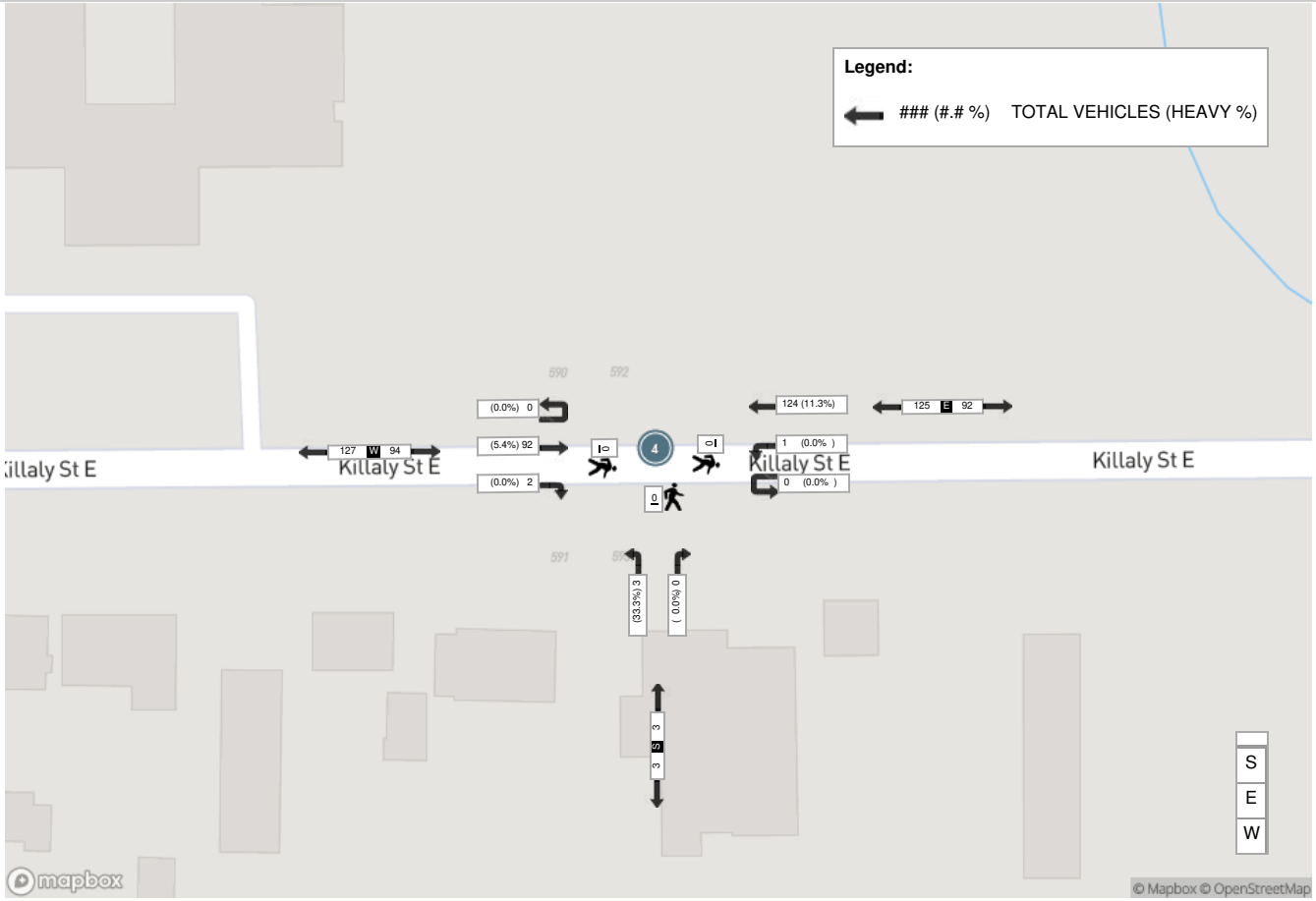
Start Time	E Approach KILLALY STREET EAST					S Approach 553 KILLALY ST E					W Approach KILLALY STREET EAST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:00:00	21	0	0	0	21	0	0	0	0	0	1	22	0	0	23	44
08:15:00	27	0	0	0	27	0	0	0	0	0	1	16	0	0	17	44
08:30:00	33	1	0	0	34	0	2	0	0	2	0	22	0	0	22	58
08:45:00	43	0	0	0	43	0	1	0	0	1	0	32	0	0	32	76
Grand Total	124	1	0	0	125	0	3	0	0	3	2	92	0	0	94	**222**
Approach%	99.2%	0.8%	0%		-	0%	100%	0%		-	2.1%	97.9%	0%		-	**-**
Totals %	55.9%	0.5%	0%		56.3%	0%	1.4%	0%		1.4%	0.9%	41.4%	0%		42.3%	**-**
PHF	0.72	0.25	0		0.73	0	0.38	0		0.38	0.5	0.72	0		0.73	**-**
Heavy	14	0	0		14	0	1	0		1	0	5	0		5	**-**
Heavy %	11.3%	0%	0%		11.2%	0%	33.3%	0%		33.3%	0%	5.4%	0%		5.3%	**-**
Lights	110	1	0		111	0	2	0		2	2	87	0		89	**-**
Lights %	88.7%	100%	0%		88.8%	0%	66.7%	0%		66.7%	100%	94.6%	0%		94.7%	**-**
Single-Unit Trucks	6	0	0		6	0	1	0		1	0	5	0		5	**-**
Single-Unit Trucks %	4.8%	0%	0%		4.8%	0%	33.3%	0%		33.3%	0%	5.4%	0%		5.3%	**-**
Buses	7	0	0		7	0	0	0		0	0	0	0		0	**-**
Buses %	5.6%	0%	0%		5.6%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	0%	0%	0%		0%	**-**

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 04:00 PM - 05:00 PM Weather: Few Clouds (16.49 °C)

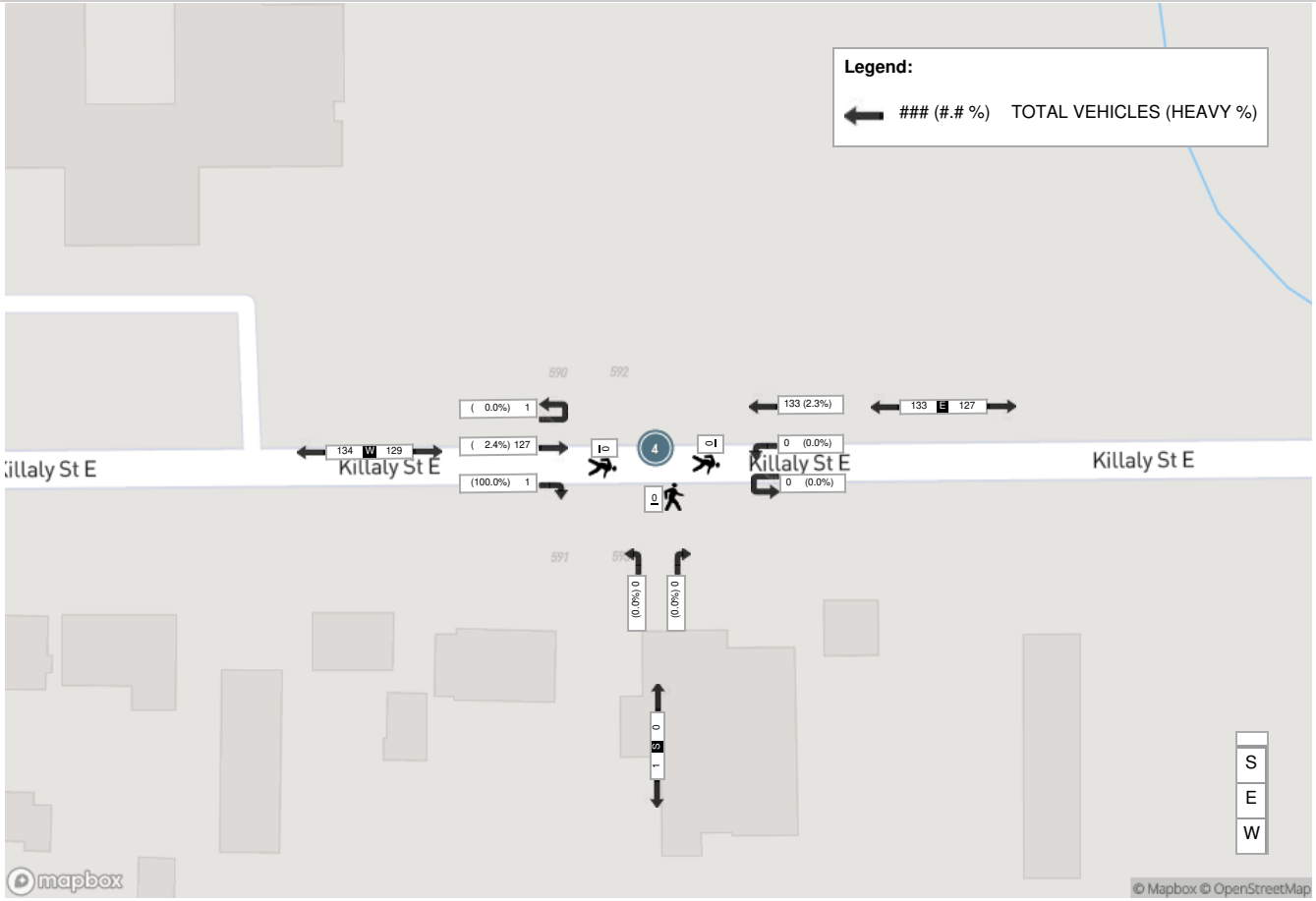
Start Time	E Approach KILLALY STREET EAST					S Approach 553 KILLALY ST E					W Approach KILLALY STREET EAST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:00:00	28	0	0	0	28	0	0	0	0	0	1	38	0	0	39	67
16:15:00	29	0	0	0	29	0	0	0	0	0	0	34	0	0	34	63
16:30:00	41	0	0	0	41	0	0	0	0	0	0	31	0	0	31	72
16:45:00	35	0	0	0	35	0	0	0	0	0	0	24	1	0	25	60
Grand Total	133	0	0	0	133	0	0	0	0	0	1	127	1	0	129	**262**
Approach%	100%	0%	0%		-	0%	0%	0%		-	0.8%	98.4%	0.8%		-	**-**
Totals %	50.8%	0%	0%		50.8%	0%	0%	0%		0%	0.4%	48.5%	0.4%		49.2%	**-**
PHF	0.81	0	0		0.81	0	0	0		0	0.25	0.84	0.25		0.83	**-**
Heavy	3	0	0		3	0	0	0		0	1	3	0		4	**-**
Heavy %	2.3%	0%	0%		2.3%	0%	0%	0%		0%	100%	2.4%	0%		3.1%	**-**
Lights	130	0	0		130	0	0	0		0	0	124	1		125	**-**
Lights %	97.7%	0%	0%		97.7%	0%	0%	0%		0%	0%	97.6%	100%		96.9%	**-**
Single-Unit Trucks	1	0	0		1	0	0	0		0	1	2	0		3	**-**
Single-Unit Trucks %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	100%	1.6%	0%		2.3%	**-**
Buses	1	0	0		1	0	0	0		0	0	1	0		1	**-**
Buses %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	0%	0.8%	0%		0.8%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	0%	0%	0%		0%	**-**

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (12.35 °C)



GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 04:00 PM - 05:00 PM Weather: Few Clouds (16.49 °C)



GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Turning Movement Count (1 . KILLALY STREET EAST & JAMES STREET)

Start Time	E Approach KILLALY STREET EAST					S Approach JAMES STREET					W Approach KILLALY STREET EAST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
07:00:00	8	0	0	0	8	1	5	0	0	6	3	20	0	0	23	37	
07:15:00	18	0	0	0	18	2	2	0	0	4	1	17	0	0	18	40	
07:30:00	14	0	0	0	14	1	3	0	0	4	1	13	0	0	14	32	
07:45:00	21	0	0	0	21	1	8	0	0	9	2	17	0	0	19	49	158
08:00:00	24	0	0	0	24	2	5	0	0	7	0	28	0	0	28	59	180
08:15:00	22	0	0	0	22	1	2	0	0	3	1	24	0	0	25	50	190
08:30:00	39	1	0	0	40	3	1	0	0	4	2	34	0	0	36	80	238
08:45:00	64	3	0	0	67	2	2	0	3	4	0	43	0	0	43	114	303
BREAK																	
16:00:00	27	0	0	0	27	1	1	0	0	2	2	38	0	0	40	69	
16:15:00	36	1	0	0	37	0	1	0	0	1	3	36	0	0	39	77	
16:30:00	35	4	0	0	39	1	2	0	0	3	0	31	0	0	31	73	
16:45:00	36	3	0	0	39	0	2	0	0	2	5	30	0	0	35	76	295
17:00:00	27	5	0	0	32	0	2	0	0	2	3	29	0	0	32	66	292
17:15:00	43	1	0	0	44	1	2	0	0	3	1	29	0	0	30	77	292
17:30:00	21	1	0	0	22	3	4	0	0	7	4	34	0	0	38	67	286
17:45:00	33	0	0	0	33	0	5	0	0	5	8	27	0	0	35	73	283
Grand Total	468	19	0	0	487	19	47	0	3	66	36	450	0	0	486	**1039**	-
Approach%	96.1%	3.9%	0%		-	28.8%	71.2%	0%		-	7.4%	92.6%	0%		-	**-**	-
Totals %	45%	1.8%	0%		46.9%	1.8%	4.5%	0%		6.4%	3.5%	43.3%	0%		46.8%	**-**	-
Heavy	33	0	0		-	0	0	0		-	0	23	0		-	**-**	-
Heavy %	7.1%	0%	0%		-	0%	0%	0%		-	0%	5.1%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (12.35 °C)

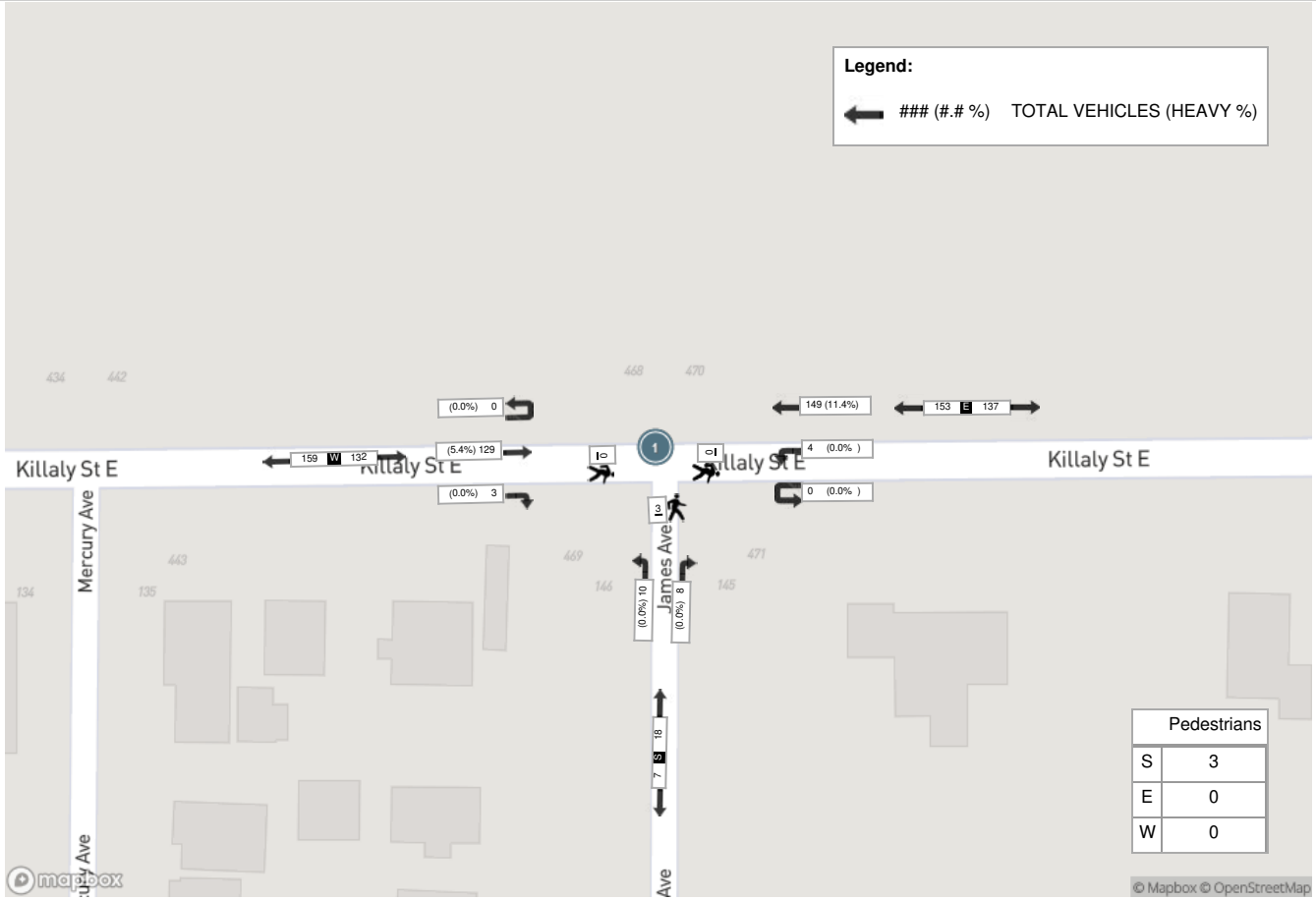
Start Time	E Approach KILLALY STREET EAST					S Approach JAMES STREET					W Approach KILLALY STREET EAST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:00:00	24	0	0	0	24	2	5	0	0	7	0	28	0	0	28	59
08:15:00	22	0	0	0	22	1	2	0	0	3	1	24	0	0	25	50
08:30:00	39	1	0	0	40	3	1	0	0	4	2	34	0	0	36	80
08:45:00	64	3	0	0	67	2	2	0	3	4	0	43	0	0	43	114
Grand Total	149	4	0	0	153	8	10	0	3	18	3	129	0	0	132	**303**
Approach%	97.4%	2.6%	0%		-	44.4%	55.6%	0%		-	2.3%	97.7%	0%		-	**-**
Totals %	49.2%	1.3%	0%		50.5%	2.6%	3.3%	0%		5.9%	1%	42.6%	0%		43.6%	**-**
PHF	0.58	0.33	0		0.57	0.67	0.5	0		0.64	0.38	0.75	0		0.77	**-**
Heavy	17	0	0		17	0	0	0		0	0	7	0		7	**-**
Heavy %	11.4%	0%	0%		11.1%	0%	0%	0%		0%	0%	5.4%	0%		5.3%	**-**
Lights	132	4	0		136	8	10	0		18	3	122	0		125	**-**
Lights %	88.6%	100%	0%		88.9%	100%	100%	0%		100%	100%	94.6%	0%		94.7%	**-**
Single-Unit Trucks	5	0	0		5	0	0	0		0	0	3	0		3	**-**
Single-Unit Trucks %	3.4%	0%	0%		3.3%	0%	0%	0%		0%	0%	2.3%	0%		2.3%	**-**
Buses	11	0	0		11	0	0	0		0	0	4	0		4	**-**
Buses %	7.4%	0%	0%		7.2%	0%	0%	0%		0%	0%	3.1%	0%		3%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0.7%	0%	0%		0.7%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	100%		-	-	-	0%		**-**

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

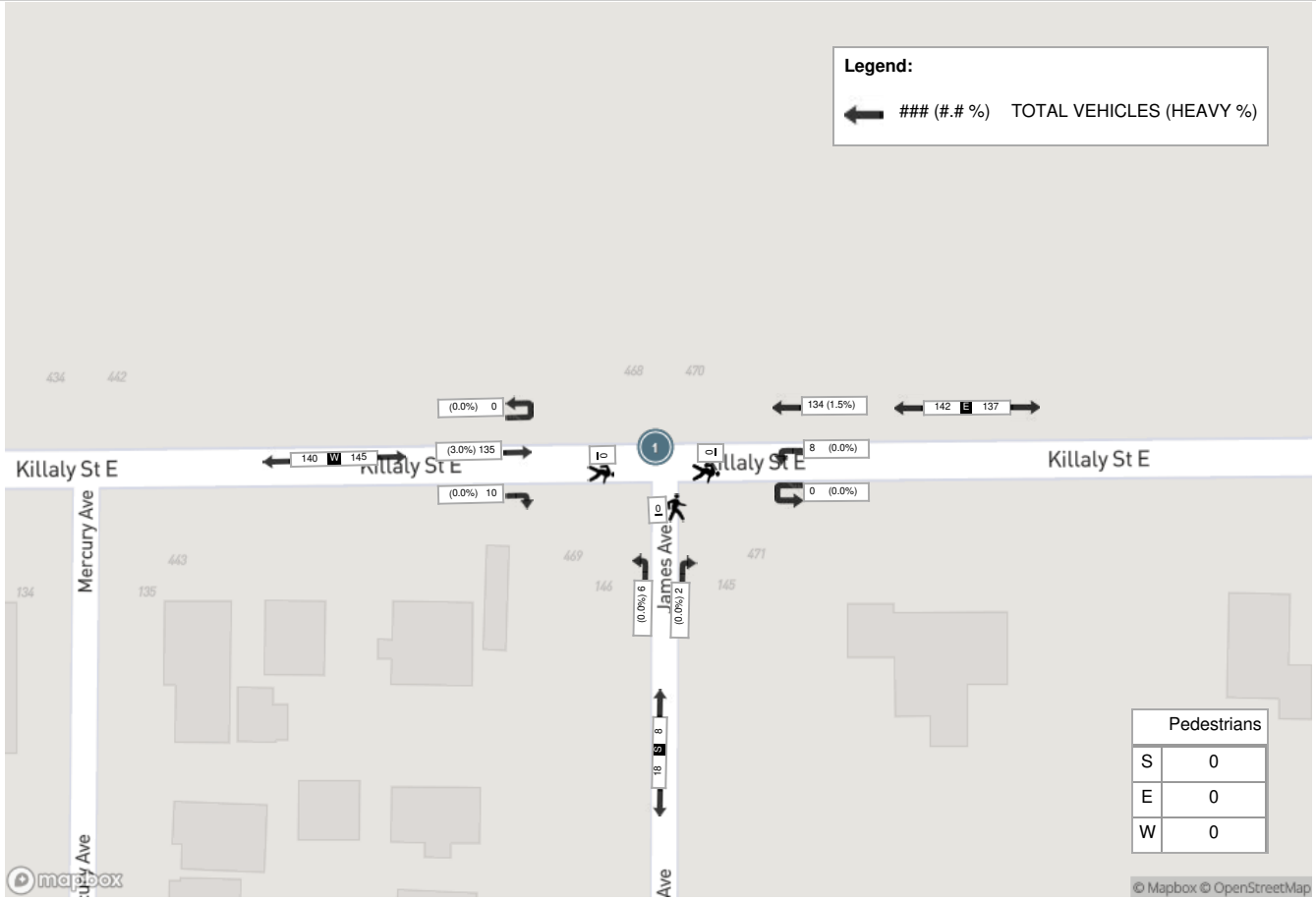
Peak Hour: 04:00 PM - 05:00 PM Weather: Few Clouds (16.49 °C)

Start Time	E Approach KILLALY STREET EAST					S Approach JAMES STREET					W Approach KILLALY STREET EAST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:00:00	27	0	0	0	27	1	1	0	0	2	2	38	0	0	40	69
16:15:00	36	1	0	0	37	0	1	0	0	1	3	36	0	0	39	77
16:30:00	35	4	0	0	39	1	2	0	0	3	0	31	0	0	31	73
16:45:00	36	3	0	0	39	0	2	0	0	2	5	30	0	0	35	76
Grand Total	134	8	0	0	142	2	6	0	0	8	10	135	0	0	145	**295**
Approach%	94.4%	5.6%	0%		-	25%	75%	0%		-	6.9%	93.1%	0%		-	**-**
Totals %	45.4%	2.7%	0%		48.1%	0.7%	2%	0%		2.7%	3.4%	45.8%	0%		49.2%	**-**
PHF	0.93	0.5	0		0.91	0.5	0.75	0		0.67	0.5	0.89	0		0.91	**-**
Heavy	2	0	0		2	0	0	0		0	0	4	0		4	**-**
Heavy %	1.5%	0%	0%		1.4%	0%	0%	0%		0%	0%	3%	0%		2.8%	**-**
Lights	132	8	0		140	2	6	0		8	10	131	0		141	**-**
Lights %	98.5%	100%	0%		98.6%	100%	100%	0%		100%	100%	97%	0%		97.2%	**-**
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	3	0		3	**-**
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	2.2%	0%		2.1%	**-**
Buses	1	0	0		1	0	0	0		0	0	1	0		1	**-**
Buses %	0.7%	0%	0%		0.7%	0%	0%	0%		0%	0%	0.7%	0%		0.7%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	**-**
Articulated Trucks %	0.7%	0%	0%		0.7%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (12.35 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Few Clouds (16.49 °C)



Appendix D

Synchro Outputs

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	129	3	4	149	10	8
Future Volume (vph)	129	3	4	149	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.941	
Flt Protected				0.999	0.973	
Satd. Flow (prot)	1826	0	0	1733	1759	0
Flt Permitted				0.999	0.973	
Satd. Flow (perm)	1826	0	0	1733	1759	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	5%	0%	0%	11%	0%	0%
Adj. Flow (vph)	168	4	5	194	13	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	0	0	199	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	129	3	4	149	10	8
Future Volume (Veh/h)	129	3	4	149	10	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	168	4	5	194	13	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			172		374	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		374	170
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1417		629	879

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	172	199	23
Volume Left	0	5	13
Volume Right	4	0	10
cSH	1700	1417	718
Volume to Capacity	0.10	0.00	0.03
Queue Length 95th (m)	0.0	0.1	0.8
Control Delay (s)	0.0	0.2	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.2
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		21.1%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	2	1	124	3	0
Future Volume (vph)	92	2	1	124	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997					
Flt Protected					0.950	
Satd. Flow (prot)	1826	0	0	1732	1372	0
Flt Permitted					0.950	
Satd. Flow (perm)	1826	0	0	1732	1372	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	5%	0%	0%	11%	33%	0%
Adj. Flow (vph)	126	3	1	170	4	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	0	171	4	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	92	2	1	124	3	0
Future Volume (Veh/h)	92	2	1	124	3	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	126	3	1	170	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			129		300	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		300	128
tC, single (s)			4.1		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1469		631	928

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	129	171	4
Volume Left	0	1	4
Volume Right	3	0	0
cSH	1700	1469	631
Volume to Capacity	0.08	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.7
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		17.3%	ICU Level of Service
Analysis Period (min)		15	

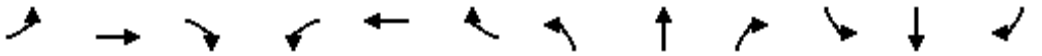
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	3	6	0	0	3
Future Volume (vph)	0	3	6	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1662	0	1746	0	0	1921
Flt Permitted						
Satd. Flow (perm)	1662	0	1746	0	0	1921
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	10%	0%	0%	0%
Adj. Flow (vph)	0	7	14	0	0	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	14	0	0	7
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	3	6	0	0	3
Future Volume (Veh/h)	0	3	6	0	0	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	0	7	14	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	14			14	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	14			14	
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	99			100	
cM capacity (veh/h)	1001	1072			1617	

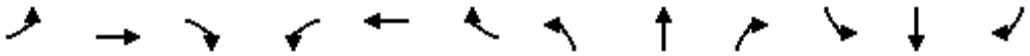
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	14	7
Volume Left	0	0	0
Volume Right	7	0	0
cSH	1072	1700	1617
Volume to Capacity	0.01	0.01	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.4	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.4	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	13.3%	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)	0	0	0	0	0	5	0	1	0	0	0	0
Future Volume (vph)	0	0	0	0	0	5	0	1	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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					0.865							
Flt Protected												
Satd. Flow (prot)	0	1921	0	0	1662	0	0	1921	0	0	1921	0
Flt Permitted												
Satd. Flow (perm)	0	1921	0	0	1662	0	0	1921	0	0	1921	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	20	0	4	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	20	0	0	4	0	0	0	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	5	0	1	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	5	0	1	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	0	0	0	0	0	20	0	4	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	24	4	0	4	4	4	0			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24	4	0	4	4	4	0			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	98	100			100		
cM capacity (veh/h)	974	896	1091	1022	896	1085	1636			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	20	4	0
Volume Left	0	0	0	0
Volume Right	0	20	0	0
cSH	1700	1085	1636	1700
Volume to Capacity	0.00	0.02	0.00	0.00
Queue Length 95th (m)	0.0	0.4	0.0	0.0
Control Delay (s)	0.0	8.4	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	0.0	8.4	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	135	10	8	134	6	2
Future Volume (vph)	135	10	8	134	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.970	
Flt Protected				0.997	0.963	
Satd. Flow (prot)	1852	0	0	1880	1795	0
Flt Permitted				0.997	0.963	
Satd. Flow (perm)	1852	0	0	1880	1795	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	148	11	9	147	7	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	159	0	0	156	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	135	10	8	134	6	2
Future Volume (Veh/h)	135	10	8	134	6	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	148	11	9	147	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			159		318	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		318	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1433		675	898

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	159	156	9
Volume Left	0	9	7
Volume Right	11	0	2
cSH	1700	1433	714
Volume to Capacity	0.09	0.01	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.5	10.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.1
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	128	1	0	133	0	0
Future Volume (vph)	128	1	0	133	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					
Flt Protected						
Satd. Flow (prot)	1863	0	0	1883	1921	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1883	1921	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	3%	2%	0%	2%	0%	0%
Adj. Flow (vph)	154	1	0	160	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	155	0	0	160	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 10.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	128	1	0	133	0	0
Future Volume (Veh/h)	128	1	0	133	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	154	1	0	160	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			155		314	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			155		314	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1438		683	897

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	155	160	0
Volume Left	0	0	0
Volume Right	1	0	0
cSH	1700	1438	1700
Volume to Capacity	0.09	0.00	0.01
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		10.3%	ICU Level of Service
Analysis Period (min)		15	

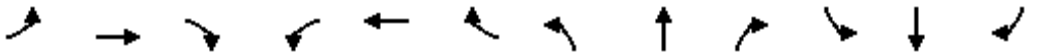
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	2	12	0	2	12
Future Volume (vph)	0	2	12	0	2	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.993
Satd. Flow (prot)	1662	0	1921	0	0	1908
Flt Permitted						0.993
Satd. Flow (perm)	1662	0	1921	0	0	1908
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	4	24	0	4	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	24	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	12	0	2	12
Future Volume (Veh/h)	0	2	12	0	2	12
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	0	4	24	0	4	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	56	24			24	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	56	24			24	
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)	954	1058			1604	

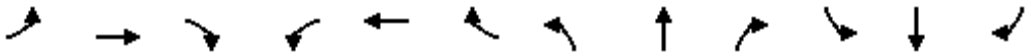
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	24	28
Volume Left	0	0	4
Volume Right	4	0	0
cSH	1058	1700	1604
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	1.1
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	1.1
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.3%	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	0	1	0	0	3	0	1	0	8	0	6
Future Volume (vph)	4	0	1	0	0	3	0	1	0	8	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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			0.865						0.943	
Flt Protected		0.960									0.972	
Satd. Flow (prot)	0	1802	0	0	1662	0	0	1921	0	0	1761	0
Flt Permitted		0.960									0.972	
Satd. Flow (perm)	0	1802	0	0	1662	0	0	1921	0	0	1761	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	0	2	0	0	7	0	2	0	19	0	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	7	0	0	2	0	0	33	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	1	0	0	3	0	1	0	8	0	6
Future Volume (Veh/h)	4	0	1	0	0	3	0	1	0	8	0	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	10	0	2	0	0	7	0	2	0	19	0	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	54	47	7	49	54	2	14			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54	47	7	49	54	2	14			2		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	99	100			99		
cM capacity (veh/h)	935	839	1081	946	831	1088	1617			1634		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	7	2	33
Volume Left	10	0	0	19
Volume Right	2	7	0	14
cSH	956	1088	1617	1634
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (m)	0.3	0.1	0.0	0.3
Control Delay (s)	8.8	8.3	0.0	4.2
Lane LOS	A	A		A
Approach Delay (s)	8.8	8.3	0.0	4.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	17.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	142	3	4	164	11	8
Future Volume (vph)	142	3	4	164	11	8
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	0.997				0.944	
Flt Protected				0.999	0.972	
Satd. Flow (prot)	1682	0	0	1596	1624	0
Flt Permitted				0.999	0.972	
Satd. Flow (perm)	1682	0	0	1596	1624	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	5%	0%	0%	11%	0%	0%
Adj. Flow (vph)	184	4	5	213	14	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	0	0	218	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	142	3	4	164	11	8
Future Volume (Veh/h)	142	3	4	164	11	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	184	4	5	213	14	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			188		409	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			188		409	186
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1398		600	861

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	188	218	24
Volume Left	0	5	14
Volume Right	4	0	10
cSH	1700	1398	687
Volume to Capacity	0.11	0.00	0.03
Queue Length 95th (m)	0.0	0.1	0.8
Control Delay (s)	0.0	0.2	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.4
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	22.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	101	2	1	136	3	0
Future Volume (vph)	101	2	1	136	3	0
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	0.997					
Flt Protected					0.950	
Satd. Flow (prot)	1682	0	0	1595	1264	0
Flt Permitted					0.950	
Satd. Flow (perm)	1682	0	0	1595	1264	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	5%	0%	0%	11%	33%	0%
Adj. Flow (vph)	138	3	1	186	4	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	141	0	0	187	4	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	101	2	1	136	3	0
Future Volume (Veh/h)	101	2	1	136	3	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	138	3	1	186	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			141		328	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			141		328	140
tC, single (s)			4.1		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1455		607	914

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	141	187	4
Volume Left	0	1	4
Volume Right	3	0	0
cSH	1700	1455	607
Volume to Capacity	0.08	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		18.6%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	3	6	0	0	3
Future Volume (vph)	0	3	6	0	0	3
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	0.865					
Flt Protected						
Satd. Flow (prot)	1531	0	1609	0	0	1769
Flt Permitted						
Satd. Flow (perm)	1531	0	1609	0	0	1769
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	10%	0%	0%	0%
Adj. Flow (vph)	0	7	14	0	0	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	14	0	0	7
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

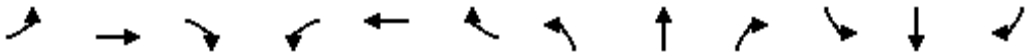
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	3	6	0	0	3
Future Volume (Veh/h)	0	3	6	0	0	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	0	7	14	0	0	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	14			14	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	14			14	
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	99			100	
cM capacity (veh/h)	1001	1072			1617	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	14	7
Volume Left	0	0	0
Volume Right	7	0	0
cSH	1072	1700	1617
Volume to Capacity	0.01	0.01	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.4	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.4	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	13.3%	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)	0	0	0	0	0	5	0	1	0	0	0	0
Future Volume (vph)	0	0	0	0	0	5	0	1	0	0	0	0
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					0.865							
Flt Protected												
Satd. Flow (prot)	0	1769	0	0	1531	0	0	1769	0	0	1769	0
Flt Permitted												
Satd. Flow (perm)	0	1769	0	0	1531	0	0	1769	0	0	1769	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	20	0	4	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	20	0	0	4	0	0	0	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	5	0	1	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	5	0	1	0	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	0	0	0	0	0	20	0	4	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	24	4	0	4	4	4	0			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24	4	0	4	4	4	0			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	98	100			100		
cM capacity (veh/h)	974	896	1091	1022	896	1085	1636			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	20	4	0
Volume Left	0	0	0	0
Volume Right	0	20	0	0
cSH	1700	1085	1636	1700
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (m)	0.0	0.4	0.0	0.0
Control Delay (s)	0.0	8.4	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	0.0	8.4	0.0	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	149	11	8	147	6	2
Future Volume (vph)	149	11	8	147	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.970	
Flt Protected				0.997	0.963	
Satd. Flow (prot)	1852	0	0	1880	1795	0
Flt Permitted				0.997	0.963	
Satd. Flow (perm)	1852	0	0	1880	1795	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	164	12	9	162	7	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	0	0	171	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	149	11	8	147	6	2
Future Volume (Veh/h)	149	11	8	147	6	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	164	12	9	162	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			176		350	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			176		350	170
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1412		647	879

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	176	171	9
Volume Left	0	9	7
Volume Right	12	0	2
cSH	1700	1412	687
Volume to Capacity	0.10	0.01	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.4	10.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	10.3
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	141	1	0	146	0	0
Future Volume (vph)	141	1	0	146	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					
Flt Protected						
Satd. Flow (prot)	1863	0	0	1883	1921	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1883	1921	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	3%	2%	0%	2%	0%	0%
Adj. Flow (vph)	170	1	0	176	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	0	0	176	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 11.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	141	1	0	146	0	0
Future Volume (Veh/h)	141	1	0	146	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	170	1	0	176	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			171		346	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			171		346	170
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1418		654	879

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	171	176	0
Volume Left	0	0	0
Volume Right	1	0	0
cSH	1700	1418	1700
Volume to Capacity	0.10	0.00	0.01
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		11.0%	ICU Level of Service
Analysis Period (min)		15	

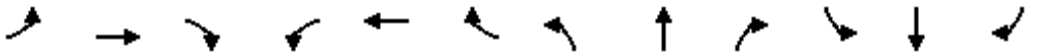
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	2	13	0	2	13
Future Volume (vph)	0	2	13	0	2	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.993
Satd. Flow (prot)	1662	0	1921	0	0	1908
Flt Permitted						0.993
Satd. Flow (perm)	1662	0	1921	0	0	1908
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	4	26	0	4	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	26	0	0	30
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	2	13	0	2	13
Future Volume (Veh/h)	0	2	13	0	2	13
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	0	4	26	0	4	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	60	26			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	60	26			26	
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)	949	1056			1601	

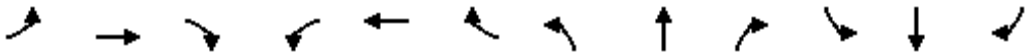
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	26	30
Volume Left	0	0	4
Volume Right	4	0	0
cSH	1056	1700	1601
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	1.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.3%	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	0	1	0	0	3	0	1	0	8	0	6
Future Volume (vph)	4	0	1	0	0	3	0	1	0	8	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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			0.865						0.943	
Flt Protected		0.960									0.972	
Satd. Flow (prot)	0	1802	0	0	1662	0	0	1921	0	0	1761	0
Flt Permitted		0.960									0.972	
Satd. Flow (perm)	0	1802	0	0	1662	0	0	1921	0	0	1761	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	0	2	0	0	7	0	2	0	19	0	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	7	0	0	2	0	0	33	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	1	0	0	3	0	1	0	8	0	6
Future Volume (Veh/h)	4	0	1	0	0	3	0	1	0	8	0	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	10	0	2	0	0	7	0	2	0	19	0	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	54	47	7	49	54	2	14			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54	47	7	49	54	2	14			2		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	99	100			99		
cM capacity (veh/h)	935	839	1081	946	831	1088	1617			1634		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	7	2	33
Volume Left	10	0	0	19
Volume Right	2	7	0	14
cSH	956	1088	1617	1634
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (m)	0.3	0.1	0.0	0.3
Control Delay (s)	8.8	8.3	0.0	4.2
Lane LOS	A	A		A
Approach Delay (s)	8.8	8.3	0.0	4.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	17.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	147	20	8	180	65	20
Future Volume (vph)	147	20	8	180	65	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984				0.968	
Flt Protected				0.998	0.963	
Satd. Flow (prot)	1811	0	0	1734	1791	0
Flt Permitted				0.998	0.963	
Satd. Flow (perm)	1811	0	0	1734	1791	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	5%	0%	0%	11%	0%	0%
Adj. Flow (vph)	191	26	10	234	84	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	217	0	0	244	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	147	20	8	180	65	20
Future Volume (Veh/h)	147	20	8	180	65	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	191	26	10	234	84	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			217		458	204
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		458	204
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		85	97
cM capacity (veh/h)			1365		560	842

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	244	110
Volume Left	0	10	84
Volume Right	26	0	26
cSH	1700	1365	609
Volume to Capacity	0.13	0.01	0.18
Queue Length 95th (m)	0.0	0.2	5.0
Control Delay (s)	0.0	0.4	12.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	12.2
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	113	7	3	140	19	6
Future Volume (vph)	113	7	3	140	19	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.992				0.968	
Flt Protected				0.999	0.963	
Satd. Flow (prot)	1820	0	0	1733	1430	0
Flt Permitted				0.999	0.963	
Satd. Flow (perm)	1820	0	0	1733	1430	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	5%	0%	0%	11%	33%	0%
Adj. Flow (vph)	155	10	4	192	26	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	165	0	0	196	34	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.8%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	113	7	3	140	19	6
Future Volume (Veh/h)	113	7	3	140	19	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	155	10	4	192	26	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			165		360	160
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		360	160
tC, single (s)			4.1		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			1426		580	890

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	165	196	34
Volume Left	0	4	26
Volume Right	10	0	8
cSH	1700	1426	632
Volume to Capacity	0.10	0.00	0.05
Queue Length 95th (m)	0.0	0.1	1.3
Control Delay (s)	0.0	0.2	11.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	11.0
Approach LOS			B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	19.8%	ICU Level of Service	A
Analysis Period (min)	15		

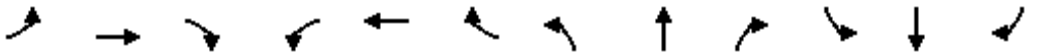
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	10	65	0	2	21
Future Volume (vph)	0	10	65	0	2	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.995
Satd. Flow (prot)	1662	0	1746	0	0	1912
Flt Permitted						0.995
Satd. Flow (perm)	1662	0	1746	0	0	1912
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	10%	0%	0%	0%
Adj. Flow (vph)	0	24	155	0	5	50
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	155	0	0	55
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 13.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	10	65	0	2	21
Future Volume (Veh/h)	0	10	65	0	2	21
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	0	24	155	0	5	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	215	155			155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	215	155			155	
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	97			100	
cM capacity (veh/h)	775	896			1438	

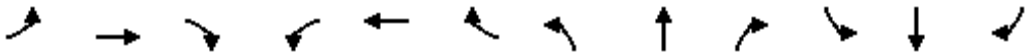
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	24	155	55
Volume Left	0	0	5
Volume Right	24	0	0
cSH	896	1700	1438
Volume to Capacity	0.03	0.09	0.00
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	9.1	0.0	0.7
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.7
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	13.4%	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)	0	0	0	0	0	64	0	1	0	18	0	0
Future Volume (vph)	0	0	0	0	0	64	0	1	0	18	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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					0.865							
Flt Protected											0.950	
Satd. Flow (prot)	0	1921	0	0	1662	0	0	1921	0	0	1825	0
Flt Permitted											0.950	
Satd. Flow (perm)	0	1921	0	0	1662	0	0	1921	0	0	1825	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	0	0	0	0	256	0	4	0	72	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	256	0	0	4	0	0	72	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	64	0	1	0	18	0	0
Future Volume (Veh/h)	0	0	0	0	0	64	0	1	0	18	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	0	0	0	0	0	256	0	4	0	72	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	404	148	0	148	148	4	0			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	404	148	0	148	148	4	0			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	76	100			96		
cM capacity (veh/h)	414	714	1091	797	714	1085	1636			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	256	4	72
Volume Left	0	0	0	72
Volume Right	0	256	0	0
cSH	1700	1085	1636	1631
Volume to Capacity	0.01	0.24	0.00	0.04
Queue Length 95th (m)	0.0	7.0	0.0	1.1
Control Delay (s)	0.0	9.3	0.0	7.3
Lane LOS	A	A		A
Approach Delay (s)	0.0	9.3	0.0	7.3
Approach LOS	A	A		

Intersection Summary				
Average Delay	8.8			
Intersection Capacity Utilization	18.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	154	28	12	163	60	14
Future Volume (vph)	154	28	12	163	60	14
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	0.979				0.975	
Flt Protected				0.997	0.961	
Satd. Flow (prot)	1662	0	0	1600	1658	0
Flt Permitted				0.997	0.961	
Satd. Flow (perm)	1662	0	0	1600	1658	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	97.3			347.4	223.8	
Travel Time (s)	7.3			26.1	16.8	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	5%	0%	0%	11%	0%	0%
Adj. Flow (vph)	200	36	16	212	78	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	236	0	0	228	96	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	154	28	12	163	60	14
Future Volume (Veh/h)	154	28	12	163	60	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	200	36	16	212	78	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			236		462	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			236		462	218
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		86	98
cM capacity (veh/h)			1343		555	827

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	236	228	96
Volume Left	0	16	78
Volume Right	36	0	18
cSH	1700	1343	591
Volume to Capacity	0.14	0.01	0.16
Queue Length 95th (m)	0.0	0.3	4.4
Control Delay (s)	0.0	0.6	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	12.3
Approach LOS			B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	153	6	2	150	16	6
Future Volume (vph)	153	6	2	150	16	6
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	0.995				0.964	
Flt Protected				0.999	0.965	
Satd. Flow (prot)	1680	0	0	1595	1325	0
Flt Permitted				0.999	0.965	
Satd. Flow (perm)	1680	0	0	1595	1325	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	347.4			224.2	144.4	
Travel Time (s)	26.1			16.8	10.8	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	5%	0%	0%	11%	33%	0%
Adj. Flow (vph)	210	8	3	205	22	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	218	0	0	208	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	153	6	2	150	16	6
Future Volume (Veh/h)	153	6	2	150	16	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	210	8	3	205	22	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			218		425	214
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		425	214
tC, single (s)			4.1		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.3
p0 queue free %			100		96	99
cM capacity (veh/h)			1364		530	831

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	218	208	30
Volume Left	0	3	22
Volume Right	8	0	8
cSH	1700	1364	587
Volume to Capacity	0.13	0.00	0.05
Queue Length 95th (m)	0.0	0.1	1.2
Control Delay (s)	0.0	0.1	11.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.5
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

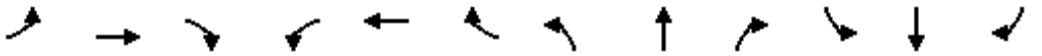
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	9	72	0	4	31
Future Volume (vph)	0	9	72	0	4	31
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected						0.994
Satd. Flow (prot)	1531	0	1609	0	0	1759
Flt Permitted						0.994
Satd. Flow (perm)	1531	0	1609	0	0	1759
Link Speed (k/h)	48		48			48
Link Distance (m)	142.9		113.7			223.8
Travel Time (s)	10.7		8.5			16.8
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	10%	0%	0%	0%
Adj. Flow (vph)	0	21	171	0	10	74
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	171	0	0	84
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24	14		14	24	
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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	9	72	0	4	31
Future Volume (Veh/h)	0	9	72	0	4	31
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Hourly flow rate (vph)	0	21	171	0	10	74
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	265	171			171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265	171			171	
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	98			99	
cM capacity (veh/h)	723	878			1418	

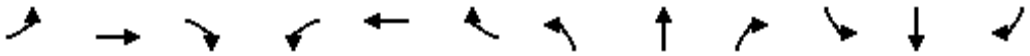
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	21	171	84
Volume Left	0	0	10
Volume Right	21	0	0
cSH	878	1700	1418
Volume to Capacity	0.02	0.10	0.01
Queue Length 95th (m)	0.6	0.0	0.2
Control Delay (s)	9.2	0.0	0.9
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.9
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	15.4%	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	0	1	0	0	62	0	1	0	26	0	6
Future Volume (vph)	4	0	1	0	0	62	0	1	0	26	0	6
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		0.966			0.865						0.975	
Flt Protected		0.964									0.961	
Satd. Flow (prot)	0	1648	0	0	1531	0	0	1769	0	0	1658	0
Flt Permitted		0.964									0.961	
Satd. Flow (perm)	0	1648	0	0	1531	0	0	1769	0	0	1658	0
Link Speed (k/h)		48			48			48			48	
Link Distance (m)		88.0			141.5			45.7			113.7	
Travel Time (s)		6.6			10.6			3.4			8.5	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	0	2	0	0	248	0	4	0	104	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	248	0	0	4	0	0	128	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)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	1	0	0	62	0	1	0	26	0	6
Future Volume (Veh/h)	4	0	1	0	0	62	0	1	0	26	0	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Hourly flow rate (vph)	6	0	2	0	0	248	0	4	0	104	0	24
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	472	224	12	226	236	4	24			4		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	472	224	12	226	236	4	24			4		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	77	100			94		
cM capacity (veh/h)	371	635	1074	697	626	1085	1604			1631		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	248	4	128
Volume Left	6	0	0	104
Volume Right	2	248	0	24
cSH	444	1085	1604	1631
Volume to Capacity	0.02	0.23	0.00	0.06
Queue Length 95th (m)	0.4	6.7	0.0	1.6
Control Delay (s)	13.3	9.3	0.0	6.1
Lane LOS	B	A		A
Approach Delay (s)	13.3	9.3	0.0	6.1
Approach LOS	B	A		

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	19.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix E

Transportation Tomorrow Survey 2016

Tue Jun 20 2023 11:22:48 GMT-0400 (Eastern Daylight Time) - Run Time: 2660ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest

Column: Planning district of origin - pd_orig

RowG:

ColG:(59)

TblG:

Filters:

Start time of trip - start_time In 600-900

and

Trip purpose of origin - purp_orig In h

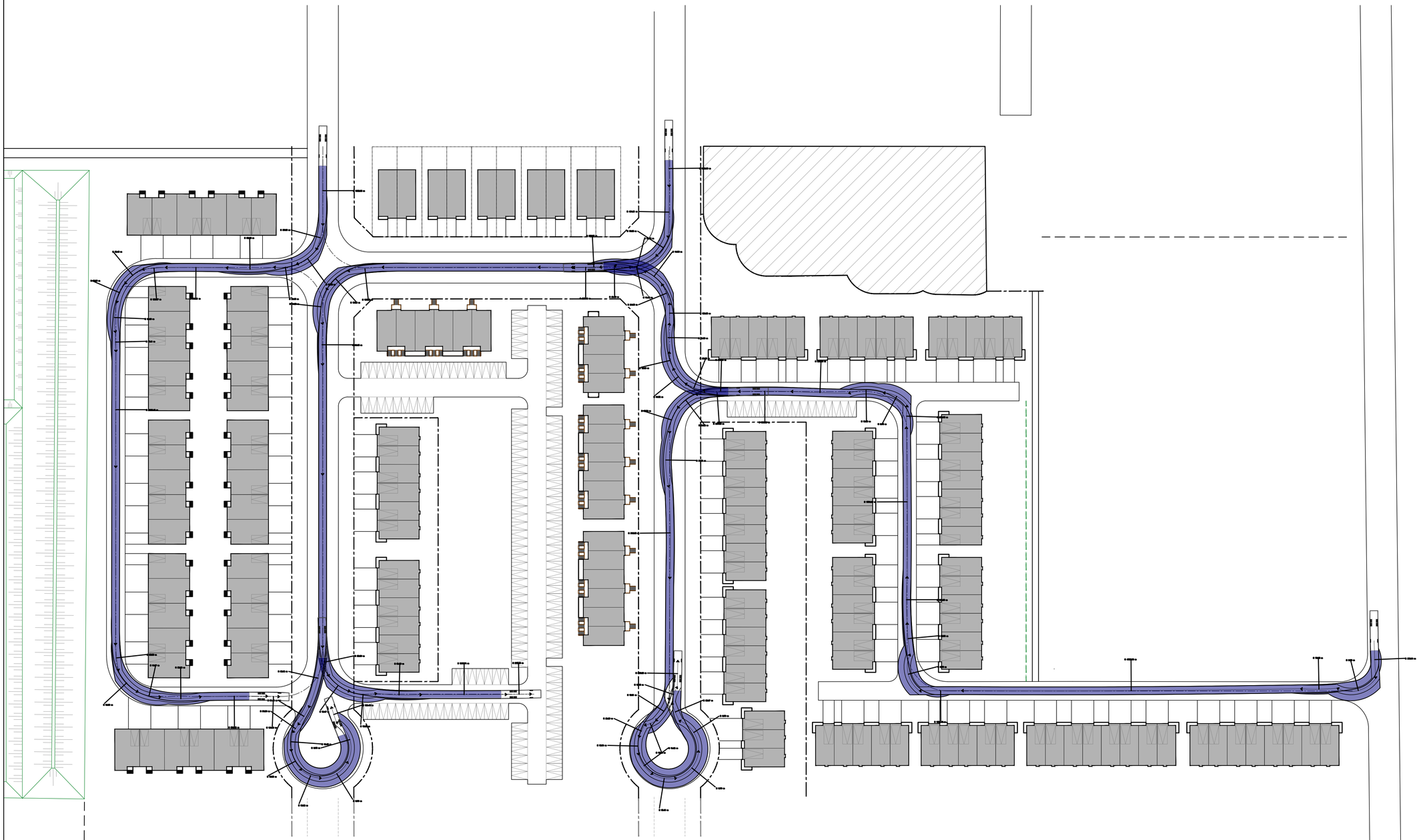
Trip 2016

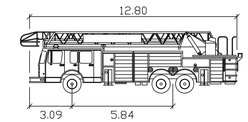
Table:

,1				E	W		
Mississauga	46	1%					
Oakville	11	0%					
Hamilton	53	1%					
Grimsby	82	1%					
Pelham	60	1%					
Niagara-on-the-	67	1%					
St. Catharines	571	9%		25%	75%	142.75	428.25
Thorold	77	1%					
Niagara Falls	331	5%		50%	50%	165.5	165.5
Welland	910	15%		25%	75%	227.5	682.5
Port Colborne	3208	53%			100%	0	3208
Fort Erie	452	7%		100%		452	0
Wainfleet	103	2%					
Wellesley	31	1%					
Haldimand-Norf	58	1%					
Sum	**6060**						
			5472			**987.75**	**4484.25**
						0.18051	0.81949
						20%	80%

Appendix F

AutoTURN Swept Path Analysis





Aerial Fire

	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

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0 25mm

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	10/28/21

Author	R.A	Designer	R.A
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

Client
SG REAL ESTATE DEVELOPMENTS LP III

Project
KILLALY STREET EAST

Date October 28, 2021

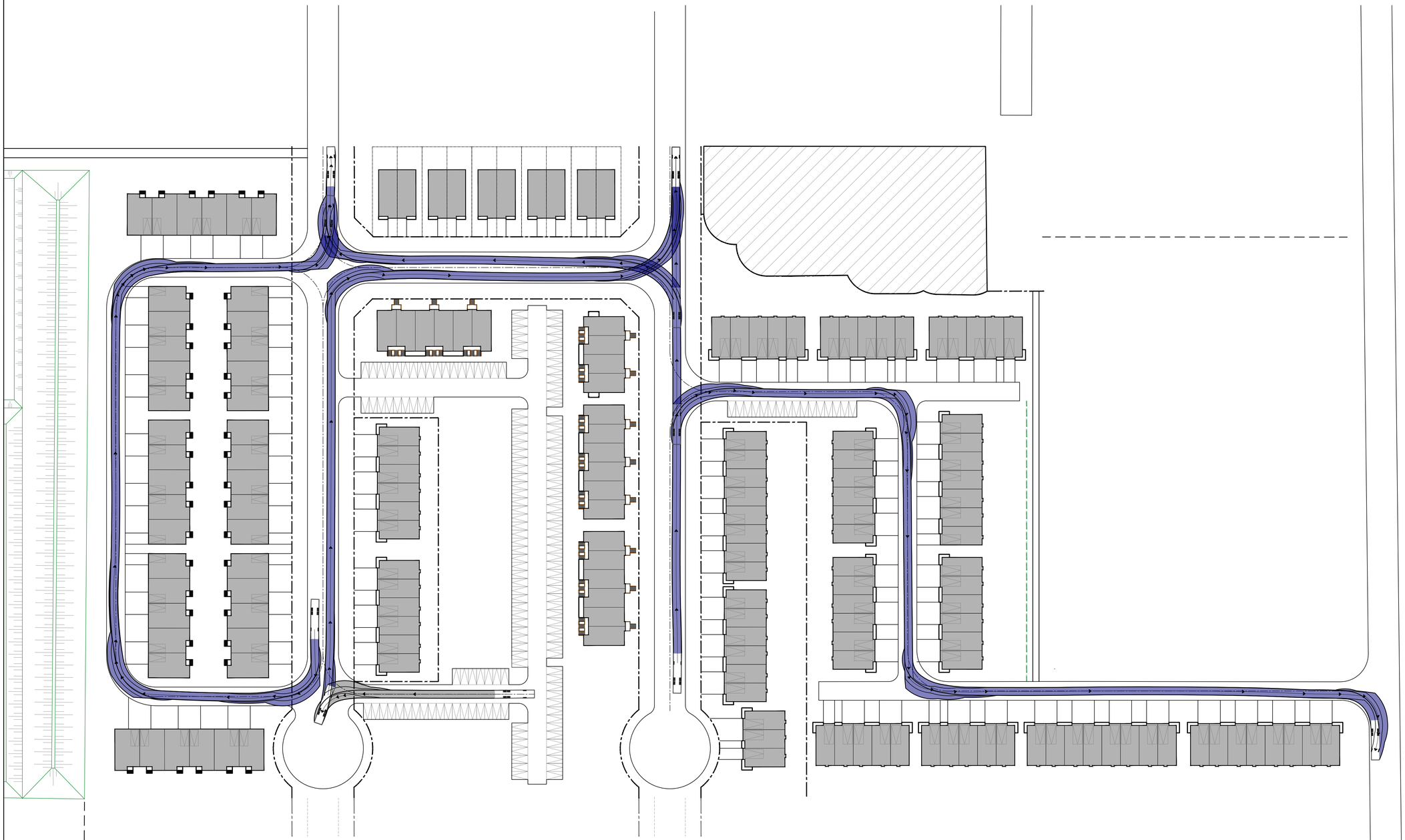
Scale NTS

Project No. -

Title
VEHICLE MANEUVERING DIAGRAM - FIRE TRUCK (INBOUND)

Size ANSI D

Sheet No. AT-101



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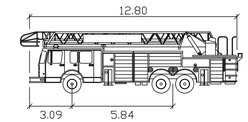

Aerial Fire

	meters
Width	: 2.54
Track	: 2.54
Lock to Lock Time	: 6.0
Steering Angle	: 37.0

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Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

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Project
KILLALY STREET EAST

Date October 28, 2021

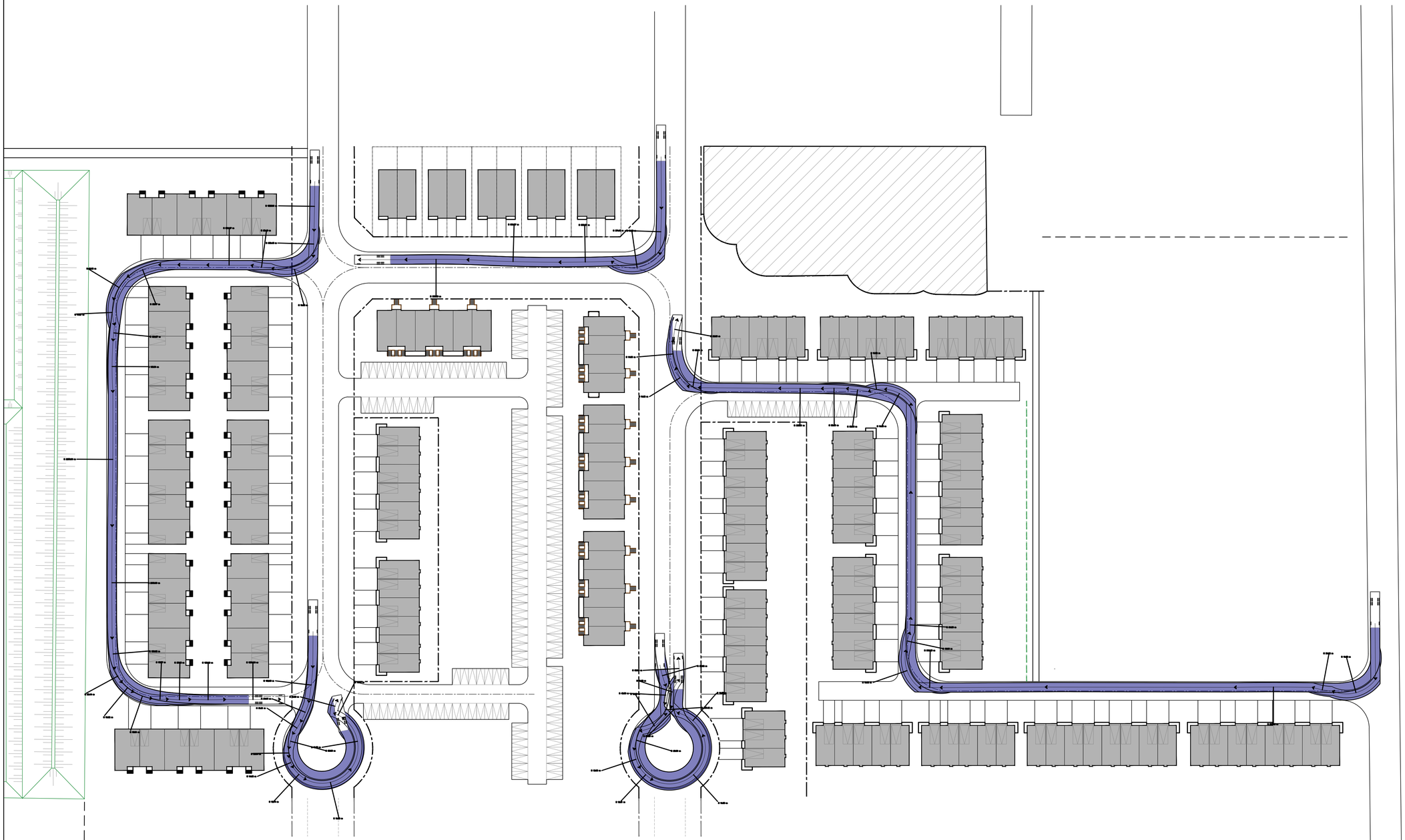
Scale NTS

Project No. -

Title
VEHICLE MANEUVERING DIAGRAM - FIRE TRUCK (OUTBOUND)

Size ANSI D

Sheet No. AT-102



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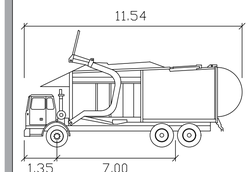

NR_GRBG12.8M_OUT_RAD

meters

Width	: 2.98
Track	: 2.98
Lock to Lock Time	: 3.0
Steering Angle	: 37.2

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	10/28/21

Author	R.A	Designer	R.A
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

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Project

KILLALY STREET EAST

Date: October 28, 2021

Scale: NTS

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Title

VEHICLE MANEUVERING DIAGRAM - WASTE COLLECTION TRUCK (INBOUND)

Size: ANSI D

Sheet No.: AT-103

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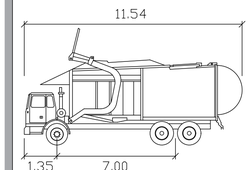

NR_GRBG12.8M_OUT_RAD
meters
Width : 2.98
Track : 2.98
Lock to Lock Time : 3.0
Steering Angle : 37.2

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	10/28/21

Author	R.A	Designer	R.A
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

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Date: October 28, 2021

Scale: NTS

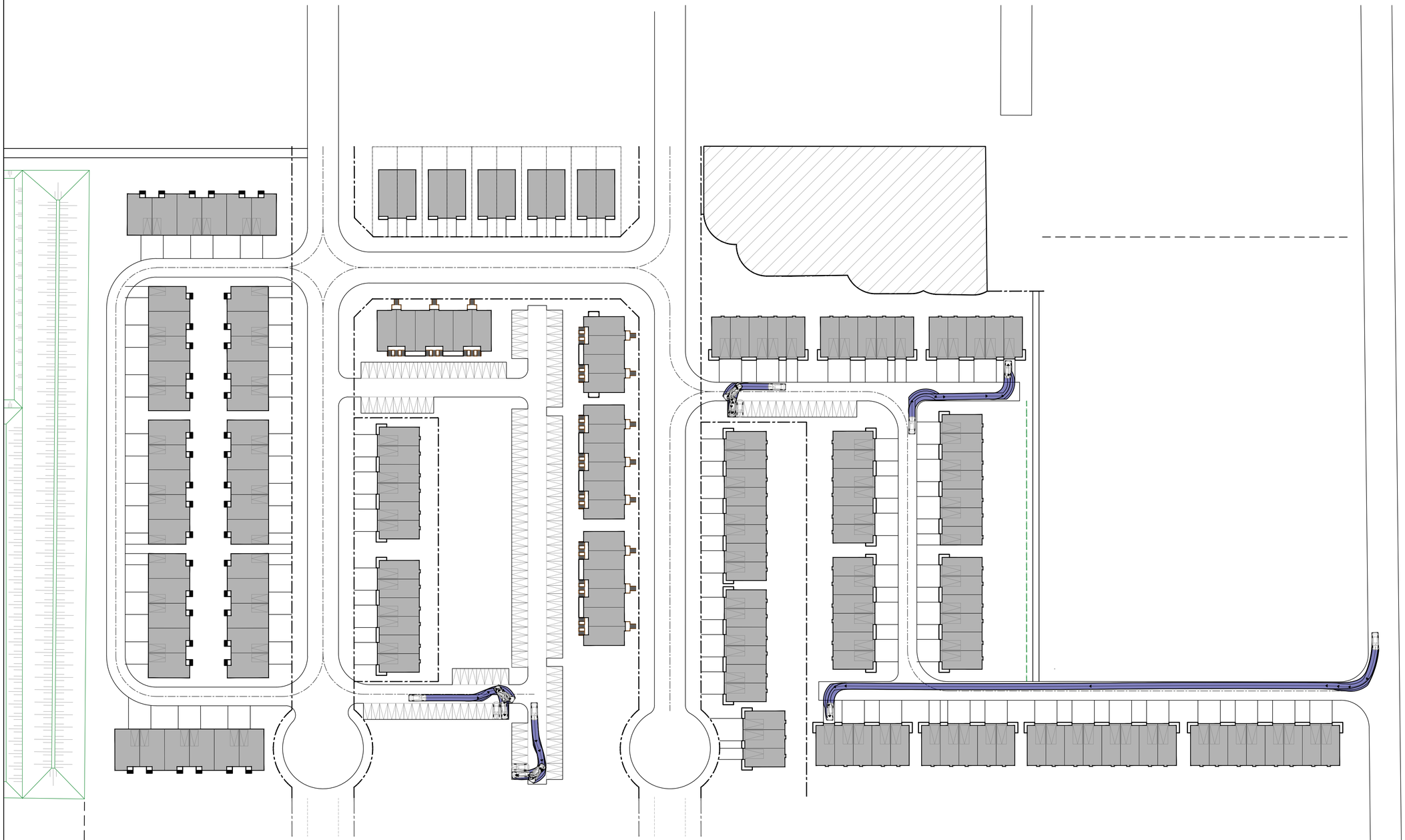
Project No.: -

Title

VEHICLE MANEUVERING DIAGRAM - WASTE COLLECTION TRUCK (OUTBOUND)

Size: ANSI D

Sheet No.: AT-104



P

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

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1	First Submission	W.M	W.M	10/28/21

Author	R.A	Designer	R.A
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

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Date	Scale
October 28, 2021	NTS

Project No.
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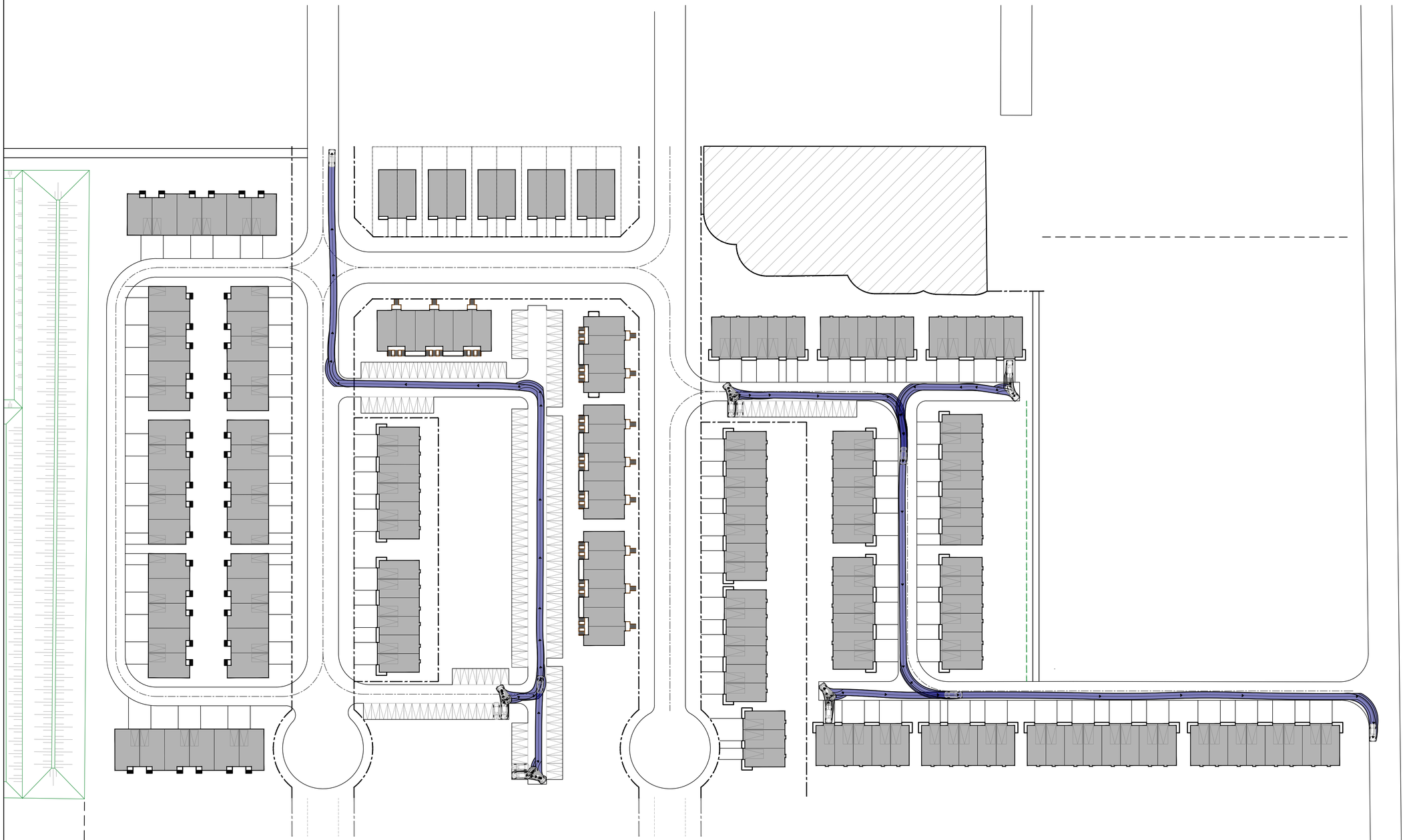
Title

VEHICLE MANEUVERING DIAGRAM - PASSENGER VEHICLE (INBOUND)

Size
ANSI D

Sheet No.
AT-105

Plot Date: 31 July 2023 - 9:08 AM Plotted By: Raf Andrenacci Path and Filename: N:\CA\Mississauga\Projects\Legacy\SernasTransTech\Projects\2023\Killaly Street TIS\Drawings\Killaly Street AutoTURN June2023_recover.dwg



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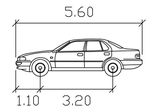

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	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	6.0
Steering Angle	: 35.9

No.	Issue	Checked	Approved	Date
1	First Submission	W.M	W.M	10/28/21

Author	R.A	Designer	R.A
Drafting Check	W.M	Design Check	W.M
Project Manager	W.M	Project Director	W.M

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Project

KILLALY STREET EAST

Date: October 28, 2021

Scale: NTS

Project No.: -

Title

VEHICLE MANEUVERING DIAGRAM - PASSENGER VEHICLE (OUTBOUND)

Size: ANSI D

Sheet No.: AT-106

Plot Date: 31 July 2023 - 9:08 AM Plotted By: Raf Andrenacci Path and Filename: N:\CA\Mississauga\Projects\Legacy\SernasTransTech\Projects\2023\Killaly Street TIS\Drawings\Killaly Street AutoTURN June2023_recover.dwg


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