March 7, 2023

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**RE: Fergus Golf Club – Proposed Residential Redevelopment, UPDATED Transportation Considerations Report**

Dear Theyonas:

Attached please find BA Group's updated Transportation Considerations Report (Traffic Impact Study) for the proposed redevelopment at the Fergus Golf Club.

This report addresses the Town's comments though a comprehensive update to BA Group's February 2022 Urban Transportation Considerations Report that was completed for the same Site.

I can confirm that the enclosed report update has been prepared under my supervision and to the best of my knowledge is accurate and true.

I trust the foregoing is satisfactory.

Sincerely,
**BA Consulting Group Ltd.**

Deanna Green, MSc. P.Eng.
Associate

# FERGUS GOLF CLUB PROPOSED RESIDENTIAL RE-DEVELOPMENT

# URBAN TRANSPORTATION CONSIDERATIONS

## ZONING BY-LAW AMENDMENT, OFFICIAL PLAN AMENDMENT & PLAN OF SUBDIVISION

Township of Centre Wellington, Wellington County

Prepared For: 883890 Ontario Limited c/o Fergus Development Inc.

**UPDATED**

March 2023

45 St Clair Avenue West, Suite 300
Toronto, ON M4V 1K9
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# FERGUS GOLF CLUB REDEVELOPMENT

## Responses to Township of Centre Wellington

## Engineering and Transportation Study Comments

## March 2023

## RESPONSES TO ENGINEERING COMMENTS

**Comment**: 7.1 (1.1) Refer to attached Traffic Impact Study comments. These are to be addressed.

**Response:** The Traffic Impact Study comments have been reviewed and addressed as noted in the comments below.

**Comment**: 7.1 (1.2) Confirm if the intent is to remove the current Fergus Golf Club entrance to the north property.

**Response:** There are plans to close the existing golf club entrance on the west side of Wellington 19 and shift the access to align with the new access to the proposed site to create a 4-legged intersection.

## RESPONSES TO TRANSPORTATION STUDY COMMENTS

**Comment**: 7.5 (2.1) Area Road Network – Wellington Road 19 extends to Highway 6 in Fergus, not Robinson Road as described. Third Line is under the jurisdiction of the Township of Centre Wellington.

**Response**: The road network information has been revised in BA Group's updated Transportation Considerations Report.

**Comment**: 7.5 (3.1) Existing Traffic Volumes - Traffic counts were carried out for the study on March 2, 2021. This fell within the period that traffic volumes were affected to some extent by Covid 19 restrictions. No analysis was done to verify the counts. We compared the counts to 24 hour automatic counts taken in May 2018 by the County of Wellington on WR19 just west of the site. The County data shows volumes approximately 25 percent higher than in the report. Therefore, the Existing Traffic Data appears to be underrepresented, and should be corrected for Covid impacts. It would also have been preferable for the counts to have been taken during later spring or early fall, when existing golf course traffic would have been included (although estimated golf club traffic was accounted for later in the report). This would also have provided a more realistic estimate since activity related to Belwood Lake facilities would also account for more traffic during these periods.

**Response:** Subsequent traffic counts were collected in May 2022 and July 2022, and the July count was found to be the highest overall during the weekday and weekend peak hours. These counts were adopted as the basis for analysis, as described in **Section 3.1** of BA Group's updated Transportation Considerations Report.

**Comment**: 7.5 (3.3) Site Traffic Volumes – As noted above, traffic from the existing golf course has been estimated from ITE data, but it would have been better to schedule the traffic counts to capture actual golf course traffic. Site Traffic Distribution was based on existing distribution. The distribution should also have considered likely origin and destination. In our opinion, a larger distribution of site traffic to and from the closest urban centre of Fergus could be anticipated.

**Response:** The ITE rates adopted for BA Group's traffic analysis are considered to generate a conservative estimate of golf course traffic. In addition, no traffic volumes were removed from the network to account for the removal of uses on the south parcel of the golf club lands. The trip distribution has however been updated to reflect the updated base traffic counts undertaken in July. The largest share of trips is associated with the southwest direction along Wellington Road 19.

**Comment**: 7.5 (4.4) Capacity Analysis Results – The analysis shows no Level of Service concerns. However, the analysis should be revised for updated Existing Traffic Volumes as outlined above. A level of service analysis should be carried out for a single access to WR19, to show whether it would operate satisfactorily.

**Response:** The two previously proposed Site access points along Wellington Road 19 have been consolidated and the southern access has been removed, such that only one new access is proposed along Wellington Road 19 that aligns as a 4-legged intersection with the relocated golf club driveway. The traffic analysis results have been updated to reflect this single access with the updated base existing volumes.

**Comment**: 7.5 (6.0) Sight Distance Evaluation – The Report indicated that due to COVID, the sight distance calculations were carried out using aerial photos. It is not clear how COVID prevented the field measurement of sight distances. Given the crucial nature of these measurements and assessments, field measurements are required. Based on their aerial analysis, BA Group report that the required TAC sight distance requirements are met. However, both proposed accesses are located in or adjacent to horizontal curves. To the extent practical, entrances should be located to provide the best available sight distance. For the northerly (easterly) entrance the existing Steel Beam Guiderail at the pedestrian underpass may interfere with sight lines. This needs to be taken into account in the field measurements and analysis.

**Response:** As per BA Group's November 11, 2022 email to Howard Wray at Triton Engineering, it was confirmed that both the vertical and horizontal profile data obtained from surveys were also used to confirm the sight distances. In a November 14, 2022 response from Triton, it was confirmed that this methodology was acceptable provided it was based on a suitable number of elevation points. As per Triton's request, the profile will be included in the appendix of BA Group's updated

**Comment**: 7.5 (1.6 6.2) 3 Line – The Report identifies that there is no vertical curvature on Third Line that would affect sight distance. No photos were provided to verify this statement. These sight distances should be field measured as well.

**Response:** A sight distance assessment for 3 Line, inclusive of a vertical profile, will be included in BA Group's Transportation Considerations Report.

**Comment**: 7.5 (7.0) Evaluation for Left Turn Lanes on WR19 – The evaluation showed that left turn lanes are not warranted on WR19 using the MTO calculation. The calculations should be reviewed when the Existing Traffic is adjusted, and should also be carried out for a single access to WR19.

**Response:** The evaluation for left-turn lanes has been revised to reflect the updated counts and the consolidation of accesses on Wellington Road 19.

**Comment**: 7.5 (1.8) The Report does not adequately address the number and location of accesses to WR19. In accordance with County policy, access to County Roads should be limited, with sole access to adjacent local roads where available. The Report does not demonstrate that 2 accesses to WR19 are required. The southerly (westerly) access is within a horizontal curve, and is not well situated. The northerly (easterly) access needs a more thorough sight distance analysis. The preferred access location would be on the tangent more equidistance between the horizontal curves, but it is also preferable to have the access directly across from the Golf Course access on the north side. In this regard, the proposed location may be acceptable pending further sight distance review.

**Response:** The two previously proposed Site access points along Wellington Road 19 have been consolidated and the southern access has been removed, such that only one new access is proposed along Wellington Road 19 that aligns as a 4-legged intersection with the relocated golf club driveway. The traffic analysis results have been updated to reflect this single access with the updated base existing volumes. A more comprehensive sight distance analysis has been included in BA Group's updated Transportation Considerations Report.

**Comment**: 7.5 (1.9) The intersection of WR19 and Second Line should be included in the review.

**Response:** The intersection of Wellington Road 19 and 2 Line has been added to the traffic analysis in BA Group's updated Transportation Considerations Report.

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# 1.0 INTRODUCTION

BA Group was retained by 883890 Ontario Limited c/o Fergus Development Inc. to provide transportation consulting services related to a proposed residential re-development on a site municipally known as 8243 & 8282 Wellington Road 19, in the Township of Centre Wellington, in the County of Wellington. The existing golf course (the "Site") consists of two parcels; the northwest parcel ("NW Site"), situated on the north side of Wellington Road 19, and the southeast parcel ("SE Site"), situated on the south side of Wellington Road 19. The Site is surrounded by agricultural land to the north and west of the NW Site, and south of the SE Site. Third Line is adjacent to the east side of the Site and an existing residential dwelling exists on the west side of the SE Site. The Site location is illustrated in **Figure 1** and the Site context is in **Figure 2.**

This **updated** Transportation Considerations Report has been prepared as part of the **Zoning by-law Amendment, Official Plan Amendment & Draft Plan of Subdivision** being submitted to the Township of Centre Wellington, County of Wellington and GRCA.

## 1.1 BACKGROUND

This report includes a comprehensive update to BA Group's February 2022 Urban Transportation Considerations Report that was completed for the same Site. Highlights of the items addressed in this updated report include the following:

- Based on feedback from the Township and members of the public, the traffic analysis has been revised to incorporate updated traffic counts that were undertaken during the July peak summer travel periods along Wellington Road 19;
- The intersection of Wellington Road 19 and 2 Line has been added to the updated traffic analysis;
- The previously proposed Site access points along Wellington Road 19 have been consolidated and the southern access has been removed, such that only one new access is proposed along Wellington Road 19 that aligns as a 4-legged intersection with the relocated golf club driveway (the existing golf club driveway is to be closed);
- Additional information regarding the sight distance analysis undertaken at the proposed Site access/ golf club driveway on Wellington Road 19 has been included in the report; and
- The warrants for left-turn lanes on Wellington Road 19 have been updated with the new traffic volumes such that the construction of north-south left-turn lanes are now being recommended at the Site access/ golf club driveway along Wellington Road 19. The functional plan for these left-turn lanes has been provided as part of the updated transportation work.

## 1.2 EXISTING SITE CONTEXT

In 2010, the Fairview and Lake Belwood Golf Clubs were merged to form the Fergus Golf Club. Fairview, which was built in 1977, referred to as the SE Site, is 39.85ha and includes a 9-hole golf course. Lake Belwood (the NW Site) was constructed in 2000, is 42.35ha and includes a total of 18 holes. The total Site area is 82.20ha, and the proposed residential redevelopment will be located on the SE Site, while the communal water and wastewater services are integrated into the existing Golf Course, which will remain, on the NW Site.

## 1.3 PROPOSED DEVELOPMENT

The proposed development includes the construction of 118 single detached residential dwellings. The development statistics for the proposed development are summarized in **Table 1**. The proposed development is illustrated in **Figure 3** and the development concept plan is provided in **Appendix A.**

The proposed Site circulation includes a network of internal private roads (12 metre wide right-of-ways) with one full-movement access on Wellington Road 19 that aligns to form a 4-legged intersection with the relocated golf club driveway and two full-movement accesses along 3 Line. Once the golf club driveway on Wellington Road 19 has been shifted to the new location, the existing driveway is to be closed.

All new points of access on Wellington Road 19 and on 3 Line, will be unsignalized with stop control on the minor streets only. The cross-section for the proposed internal private road is provided in **Appendix B**.

### TABLE 1 DEVELOPMENT PROPOSAL

| Land Use | | Proposed Statistics |
|---|---|---|
|  | Single Detached Residential Dwellings | **118 units** |
|  | Site Access & Circulation | • 1 full access along Wellington Road 19 and 2 full accesses along 3 Line.<br>• An internal network of private roads with 12 metre right-of-ways. |

Notes:
1. Site statistics based on site plans prepared by GSP Group dated October 24, 2022.


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**FIGURE 1 SITE LOCATION**


**FIGURE 2 SITE CONTEXT**

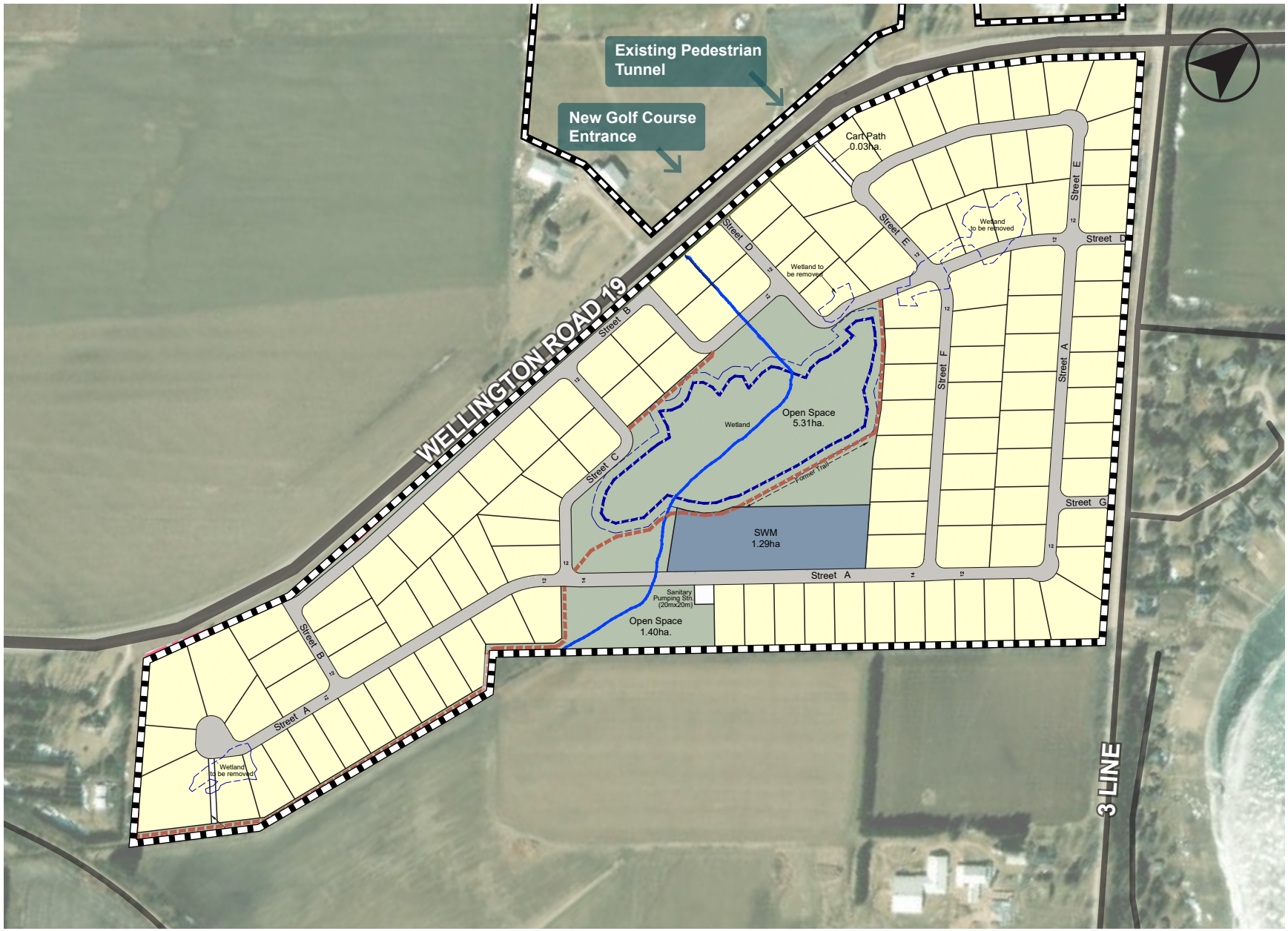


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**FIGURE 3 PROPOSED DEVELOPMENT**

## 1.4 STUDY SCOPE

**Development Concept Plan**

- A summary of the proposed development concept plan.
- An overview of the Site and the area-wide transportation system.
- A review of the transportation elements of the proposed development plan that includes access and circulation.

**Transportation Context**

- A description of the existing transportation context with consideration for the area road network and active transportation facilities.
- A description of future transportation changes and/or improvements to the area context such as planned road upgrades and active transportation improvements.

**Site Plan**

- A review of the functionality and appropriateness of the proposed internal private road network.

**Traffic Operations Review**

- An assessment of the existing traffic patterns and traffic volumes in the study area during the key weekday morning and afternoon peak hours.
- A comprehensive review of traffic-related changes that may occur in the area with consideration for corridor growth and construction of other area development projects.
- A review of traffic operations at intersections in the area under existing and future conditions including an assessment of the operational impacts of the proposed development.
- An assessment of the need for traffic signals/ all-way stop control on Wellington Road 19 as a result of Site traffic.

**Site Access Review**

- A review of the proposed access at Wellington Road 19 and the proposed accesses at 3 Line.
- Confirmation of the proposed traffic control at the Site access points.
- Evaluation of the sight distance at the proposed access points.
- Evaluation of the need for left-turn lanes at the Site access point on Wellington Road 19.

The findings of this review are summarized in the following sections.

# 2.0 TRANSPORTATION CONTEXT

## 2.1 AREA ROAD NETWORK

The existing area network of arterial roads, collector roads and local roads are described below and illustrated in **Figure 4.** The existing and future lane configuration and traffic control are shown in **Figure 5** and **Figure 6,** respectively**.**

**Wellington Road 19** is a northeast/southwest Wellington County arterial road that extends from Highway 6 in Fergus to the border between Wellington County and Dufferin County. In the vicinity of the Site, Wellington Road 19 has a rural 2-lane cross section with paved shoulders and a defacto speed limit of 80 km/h.

**3 Line** is a northwest/southeast Township of Centre Wellington local road that extends from Lake Belwood in the southeast to Wellington County Road 109 in the northwest. 3 Line is paved southeast of Wellington County Road 19 (adjacent to the proposed development) and the speed limit is not posted.

**2 Line** is a Township of Centre Wellington local road that extends from to the Ermosa Garafaxa Townline to Sideroad 25. 2 Line is paved and the speed limit is not posted.

## 2.2 AREA TRANSIT NETWORK

The Township of Centre Wellington does not currently operate a local public transit system and there are no plans to establish transit service in the vicinity of the Site. The closest public transit systems to the Site are in Guelph (30 km away), Elmira (30 km away) and Orangeville (35 km away). Guelph and Elmira (through bus travel to Waterloo) have multiple GO Transit connections and a VIA Rail station in Kitchener.

## 2.3 AREA CYCLING NETWORK

**Active Transportation Plan (2012)**
In 2012, Wellington County, in association with the seven local area municipalities and Wellington-Dufferin-Guelph (WDG) completed an Active Transportation Plan. The plan is a long-term strategy to create a pedestrian and cycling supportive environment that will encourage both utilitarian and recreational travel by walking and cycling, while promoting the importance of active lifestyles for residents and tourists.

Existing cycling facilities near the Site are described below. The Active Transportation Plan includes recommendations for a variety of improvements throughout the County. On Wellington Road 19, there are future plans to extend the paved shoulders east of 3 Line.

**Wellington Road 19**
In the vicinity of the Site, Wellington Road 19 includes paved shoulders for cyclists.

**Elora Cataract Trail**

Just south of Wellington Route 19 there is an off-road “spine route” know as the Elora Cataract Trail, a 47 kilometer long trail between Elora and Forks of Credit Provincial Park. The trail is located along the southern edge of the SE Site, and crosses 2 Line, 150 metres southeast of Wellington Road 19.

The existing area cycling facilities are displayed in **Figure 7**.

## 2.4 AREA PEDESTRIAN CONTEXT

There is an existing pedestrian tunnel under Wellington Road 19 which provides connectivity between the Site and the Fergus Golf Club (East & West).


**FIGURE 4 AREA ROAD NETWORK**

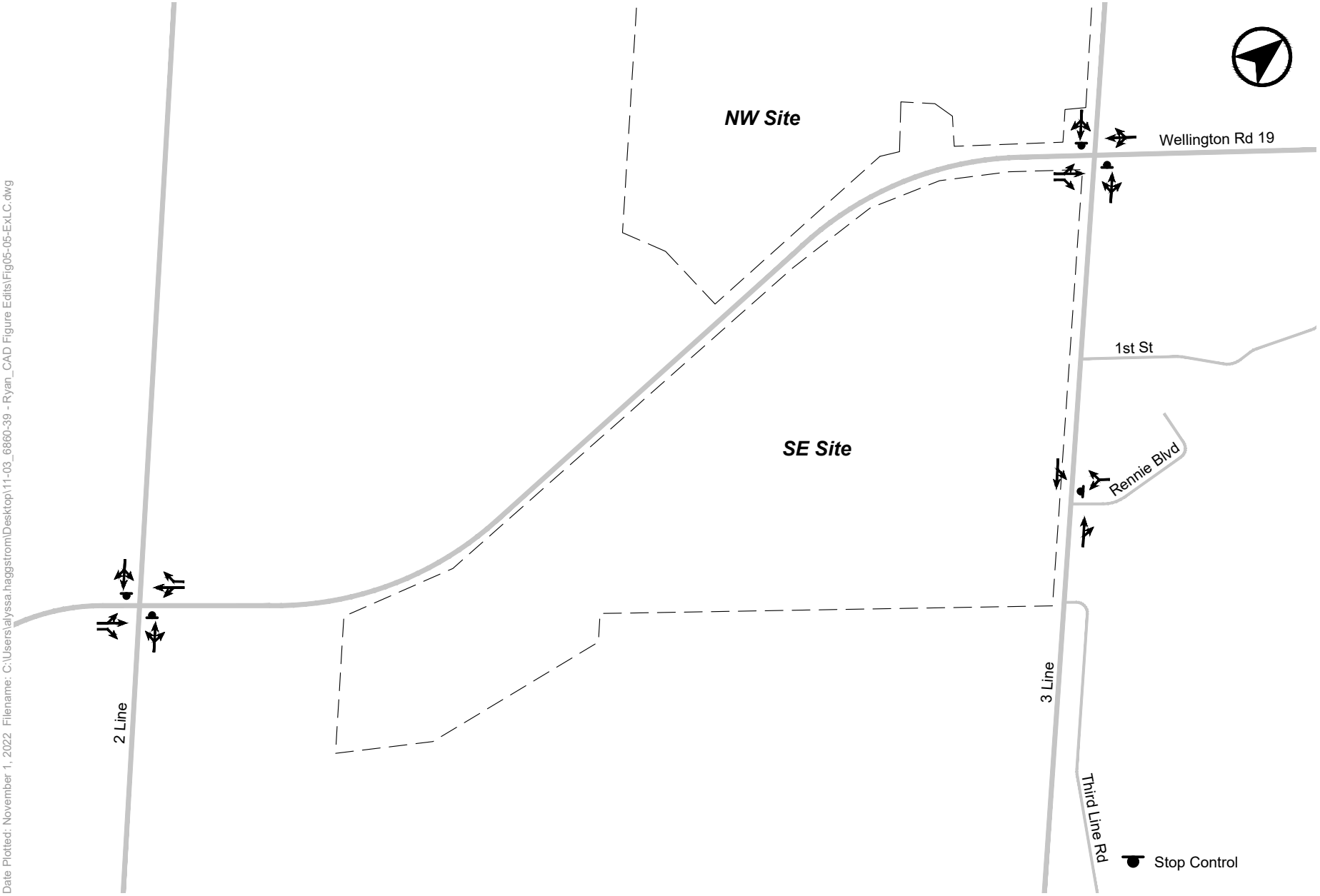




**FIGURE 5 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL**

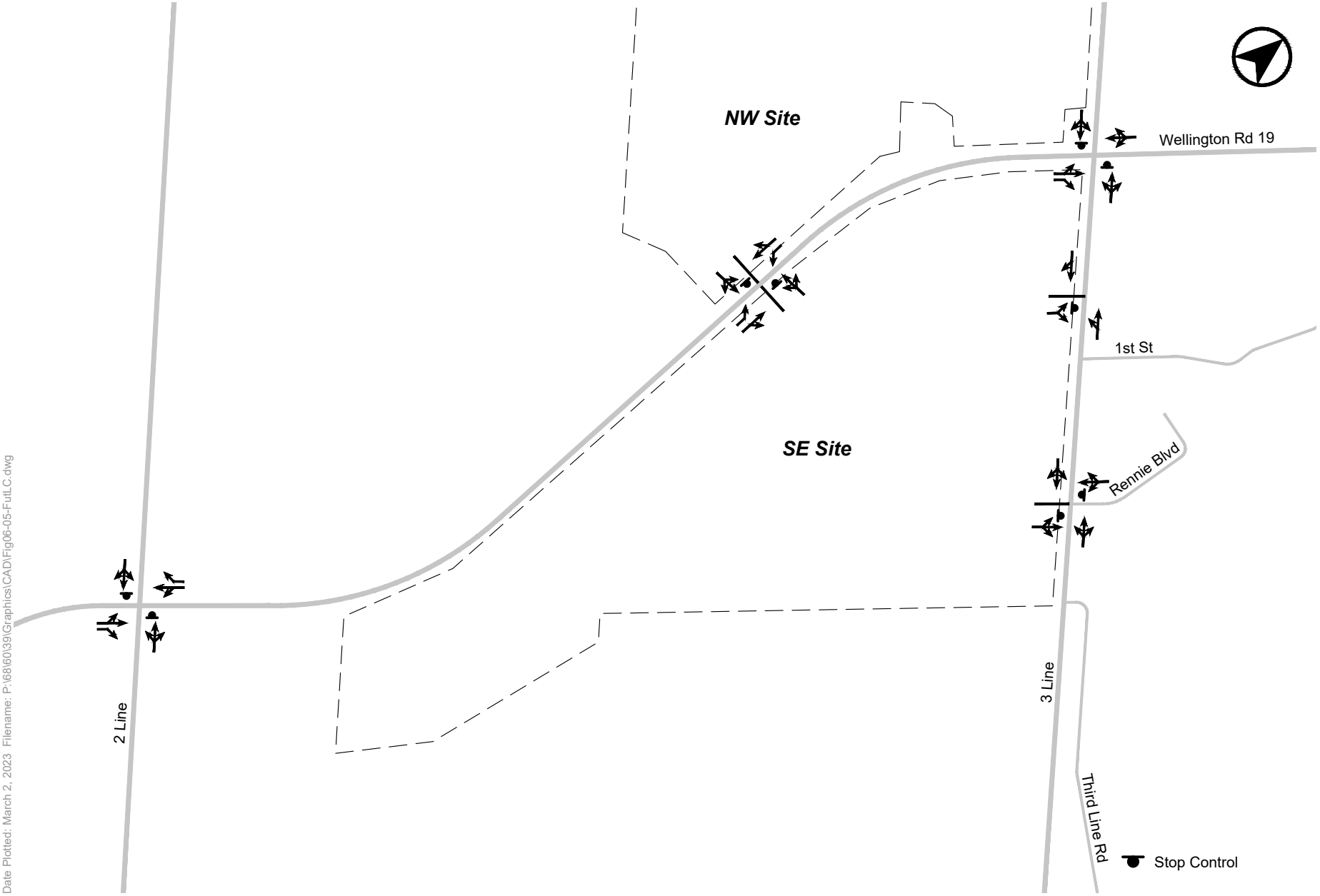


**FIGURE 6 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL**

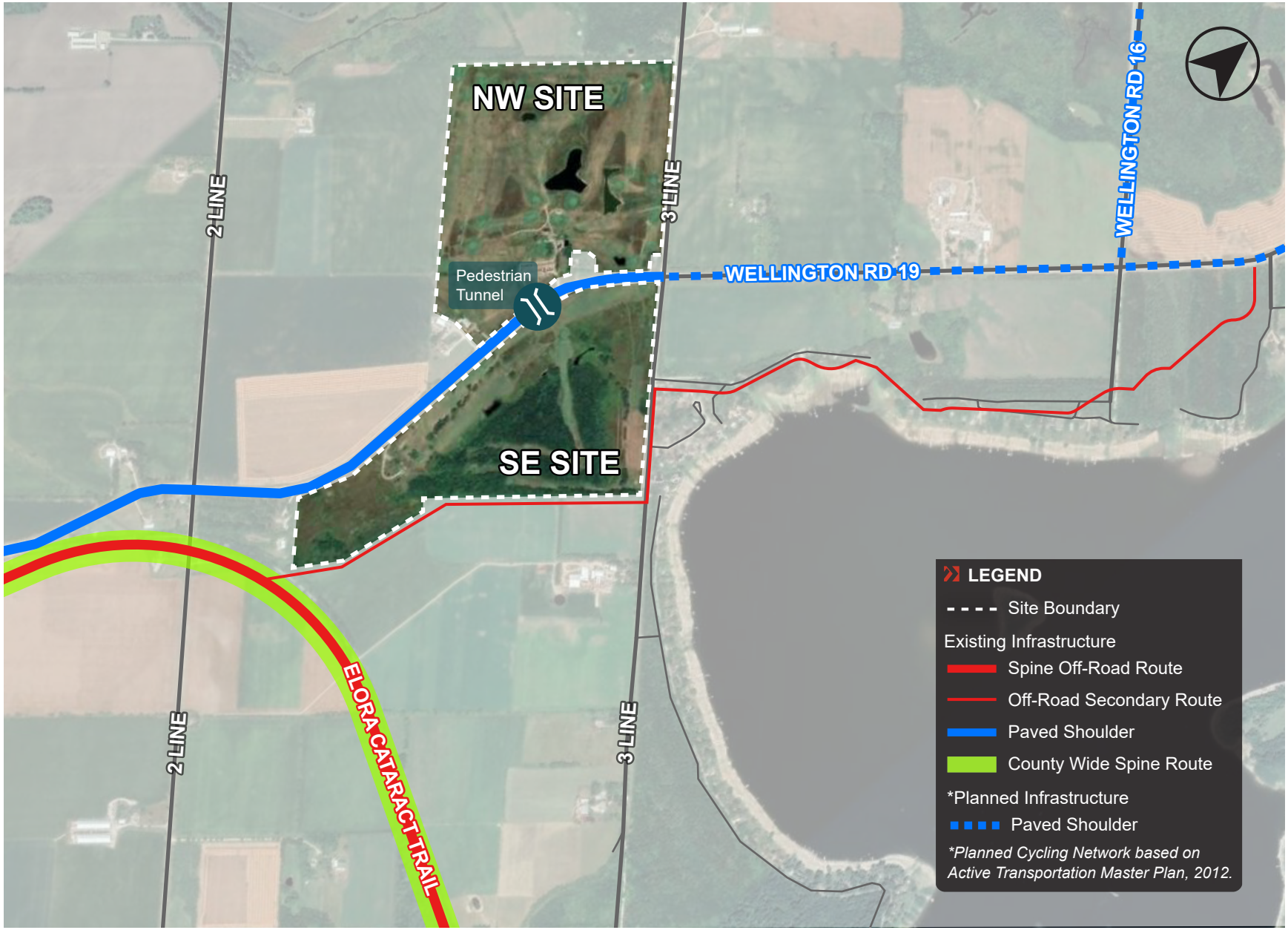


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**FIGURE 7 EXISTING & FUTURE AREA CYCLING AND PEDESTRIAN NETWORK**

# 3.0 TRAFFIC VOLUME FORECASTING

## 3.1 EXISTING TRAFFIC VOLUMES

Baseline existing turning movement volumes were established for the intersection of **Wellington Road 19 / 3 Line** and **Wellington Road 19 / 2 Line**, based on the most recently available traffic count data, collected by Spectrum Traffic Inc. on behalf of BA Group. The traffic data was collected in July of 2022, on two consecutive Saturdays and on a weekday, so that the traffic analysis was based on data collected during the peak summer months of the year. It is noted that the traffic data was collected on Saturday, July 2nd of the holiday weekend but in order to be conservative, as the traffic volumes were higher on the following Saturday, July 9th, the traffic analysis was based on the higher Saturday traffic volumes.

The July 2022 traffic count information is summarized in **Table 2**. Detailed traffic count data is provided in **Appendix C**.

### TABLE 2 EXISTING TRAFFIC COUNT INFORMATION

| Intersection | Date of Count | Source |
|---|---|---|
| Wellington Road 19 / 2 Line | Saturday, July 2, 2022[1]<br>Saturday, July 9th, 2022 and<br>Tuesday, July 12th, 2022 | Spectrum Traffic Inc. |
| Wellington Road 19 / 3 Line | | |

Note:
1. The Saturday, July 2 traffic counts were not used in the traffic analysis as the Saturday, July 9th traffic counts were higher.

Existing traffic volumes were rounded to the nearest 5 vehicles.

Existing traffic volumes for the weekday morning, weekday afternoon and Saturday peak hours adopted for the analysis are illustrated in **Figure 8**.

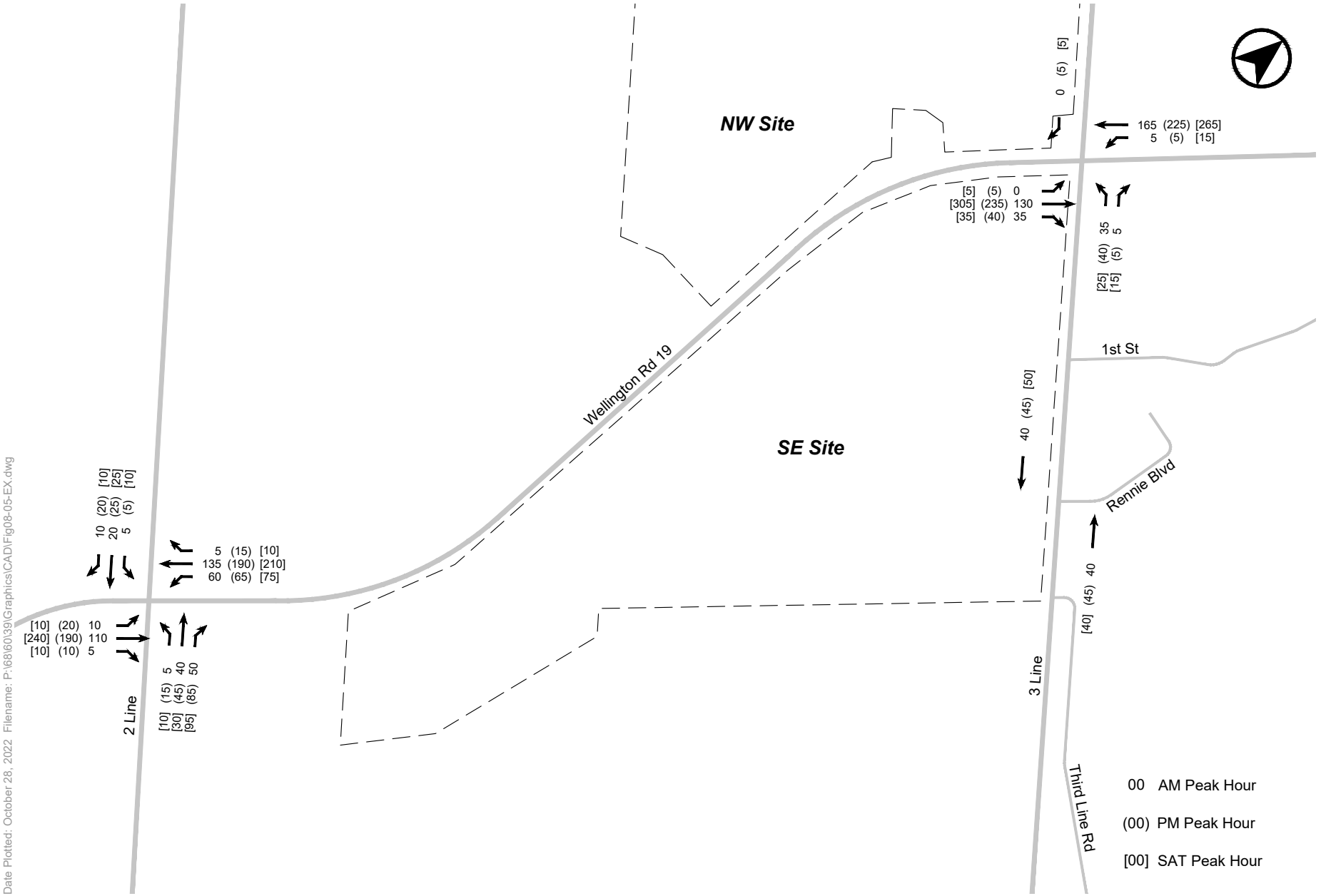


**FIGURE 8 EXISTING TRAFFIC VOLUMES**

## 3.2 BACKGROUND TRAFFIC ALLOWANCES

Forecasted background traffic volumes for the 2027 and 2032 horizon years account for changes to traffic conditions in the road network over time, due to additional development in the area and represent the summation of existing traffic volumes and growth along the Wellington Road 19 corridor. Traffic allowances for specific background developments were not included in the analysis, as there are no planned developments in the immediate vicinity of the Site.

### 3.2.1 General Corridor Growth

In order to conservatively capture development progress outside of the Site vicinity and study area for both horizon years of 2027 (Site build-out) and 2032 (five-years beyond build-out), a growth rate of 2% per year was applied during the weekday morning, weekday afternoon and Saturday peak hours.

General corridor growth allowances for both the 2027 and 2032 horizon years are illustrated in **Figure 9** and **Figure 10,** respectively.

### 3.2.2 Future Background Traffic Volumes

Future background traffic volumes in the 2027 and 2032 horizon years, representing the summation of the existing traffic volumes plus general corridor growth allowances, are illustrated in **Figure 11** and **Figure 12**, respectively.


**FIGURE 9 2027 CORRIDOR GROWTH TRAFFIC VOLUMES**

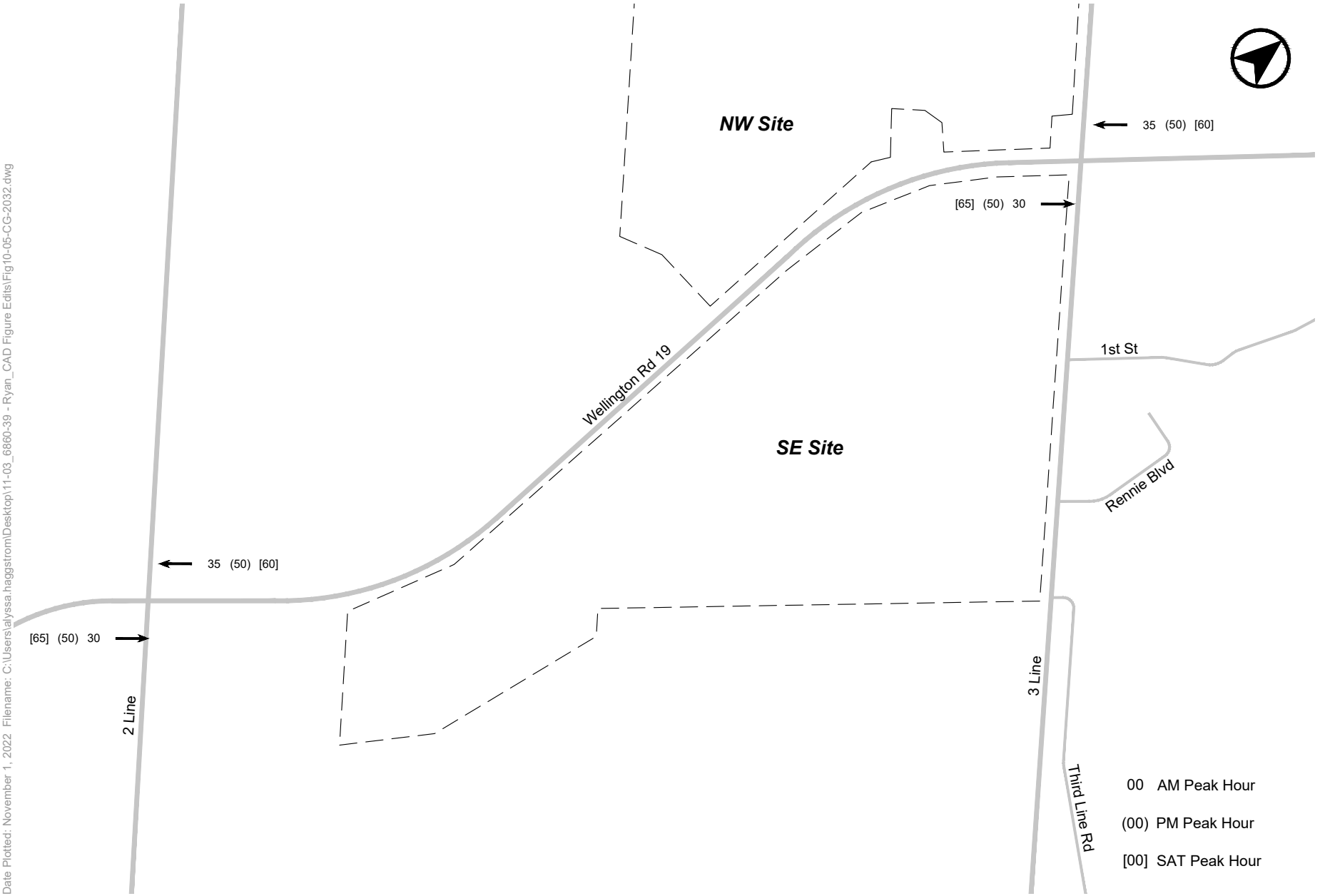


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**FIGURE 10 2032 CORRIDOR GROWTH TRAFFIC VOLUMES**

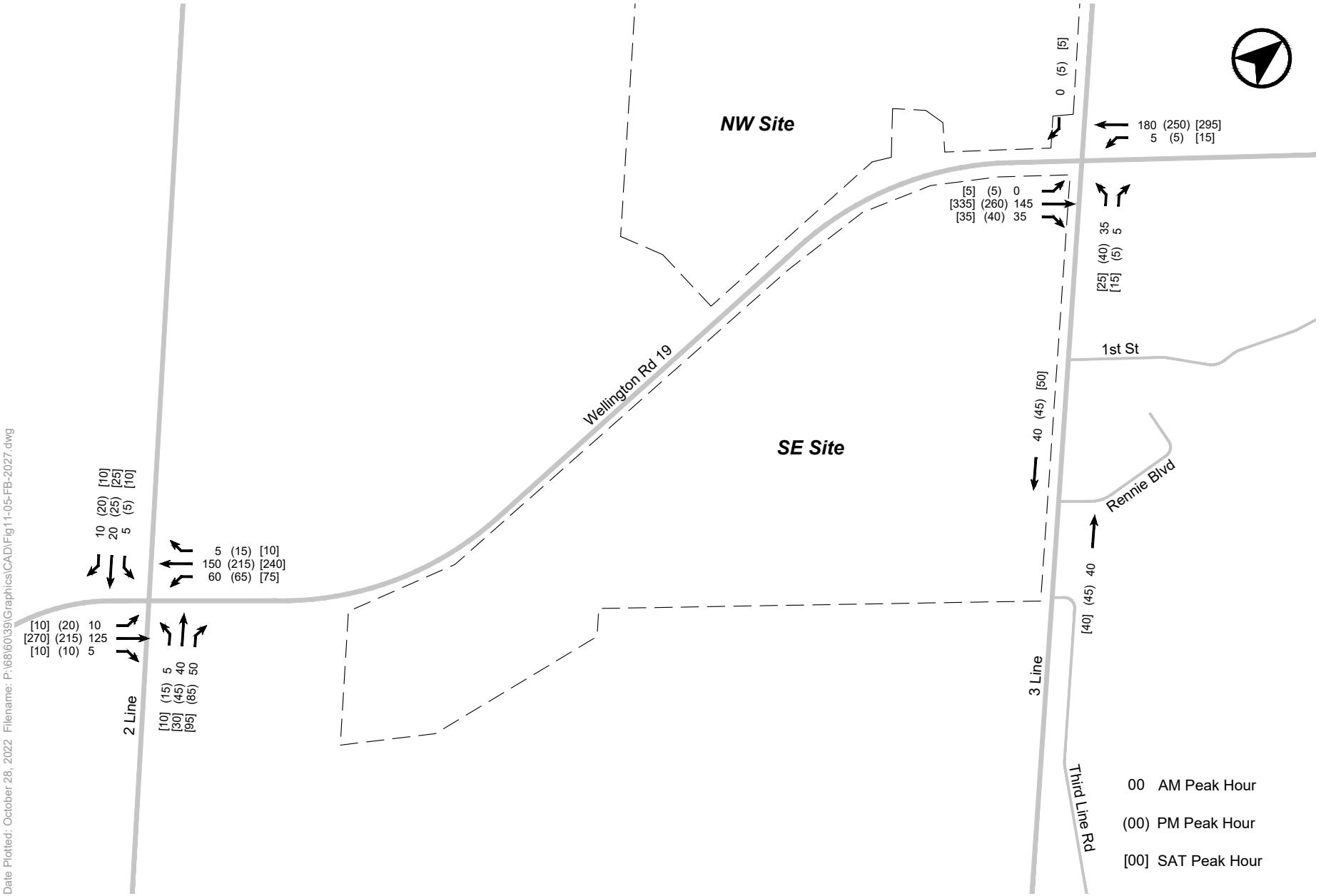



**FIGURE 11 2027 FUTURE BACKGROUND TRAFFIC VOLUMES**

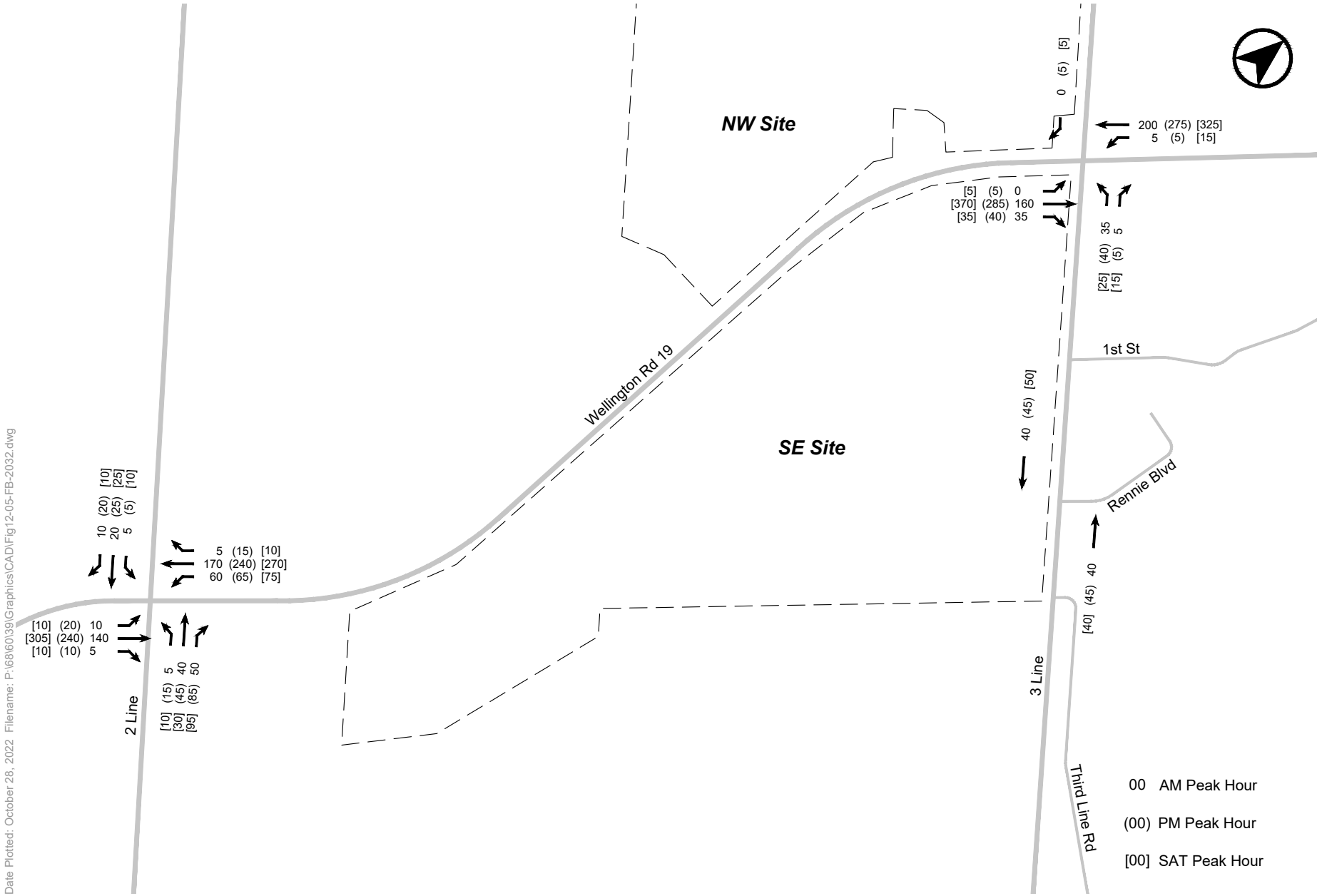



**FIGURE 12 2032 FUTURE BACKGROUND TRAFFIC VOLUMES**

## 3.3 SITE TRAFFIC VOLUMES

**Residential Trip Generation**

The residential trip generation potential of the proposed SE Site is based upon trip behaviour observed within the ITE Trip Generation Manual (10th Edition), Land Use Code (LUC) 210 (Single-Family Detached Housing). The trip rates and resultant trips are summarized in **Table 3**.

The Site anticipates in the order of 90, 120 and 110 two-way residential vehicle trips during the weekday morning, weekday afternoon and Saturday peak hours, respectively.

### TABLE 3 RESIDENTIAL TRIP GENERATION

| | AM Peak Hour | | | PM Peak Hour | | | Saturday Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | In | Out | 2-Way | In | Out | 2-Way | In | Out | 2-Way |
| Directional Distribution | 25% | 75% | 100% | 63% | 37% | 100% | 54% | 46% | 100% |
| Residential Trip Rate (trips/unit) | 0.19 | 0.56 | 0.74 | 0.62 | 0.37 | 0.99 | 0.50 | 0.42 | 0.92 |
| **Residential Site Trips (118 units)** | **25** | **65** | **90** | **75** | **45** | **120** | **60** | **50** | **110** |

Notes:
1. Site trips are rounded to the nearest 5 vehicles.

**Golf Course Trip Generation**

The trip generation potential of the golf course on the NW Site is based upon trip behaviour observed within the ITE Trip Generation Manual (11th Edition), Land Use Code (LUC) 430 (Golf Course). The trip rates and resultant trips are summarized in **Table 3**.

The traffic volumes generated by the golf club are expected to be in the order of 35 two-way vehicle trips during the weekday morning peak hour and 55 two-way vehicle trips during the weekday afternoon and Saturday peak hours.

### TABLE 4 GOLF COURSE TRIP GENERATION

| | AM Peak Hour | | | PM Peak Hour | | | Saturday Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | In | Out | 2-Way | In | Out | 2-Way | In | Out | 2-Way |
| Directional Distribution | 79% | 21% | 100% | 53% | 47% | 100% | 49% | 51% | 100% |
| Trip Rate (trips/hole) | 1.39 | 0.37 | 1.76 | 1.54 | 1.37 | 2.91 | 1.43 | 1.48 | 3.03 |
| **Golf Course Site Trips (18 holes)** | **25** | **10** | **35** | **30** | **25** | **55** | **25** | **30** | **55** |

Notes:
1. Site trips are rounded to the nearest 5 vehicles.

Since detailed existing traffic volumes associated with the golf course on the northwest Site were not available, a conservative approach was adopted, wherein the trips summarized in **Table 4** were added to the network to account for the new golf course entrance and no traffic volumes were removed.

**Trip Distribution**

The new trips for the Site in the weekday morning and afternoon peak hours were assigned to the study area road network based on the observed travel patterns at the intersection of **Wellington Road 19 / 3 Line** and at the intersection of **Wellington Road 19 / 2 Line**.

The Site traffic distribution is summarized in **Table 5**. Site traffic volumes on the area road network are illustrated in **Figure 13**.

### TABLE 5 SITE TRAFFIC DISTRIBUTION

| To / From Site | Corridor | Inbound | | | Outbound | | |
|---|---|---|---|---|---|---|---|
| | | AM | PM | Sat | AM | PM | Sat |
| North | 3 Line | 0% | 0% | 0% | 0% | 0% | 0% |
| South | 3 Line | 10% | 10% | 5% | 10% | 10% | 10% |
| North | 2 Line | 5% | 5% | 5% | 10% | 5% | 5% |
| South | 2 Line | 15% | 20% | 15% | 20% | 20% | 15% |
| East | Wellington Road 19 | 45% | 40% | 40% | 35% | 40% | 45% |
| West | Wellington Road 19 | 25% | 25% | 35% | 25% | 25% | 25% |
| **Total** | | **100%** | | | **100%** | | |

## 3.4 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes in the 2027 and 2032 horizon years reflect the sum of future background traffic volumes in the respective horizons with total SE and NW Site traffic volumes, and are summarized in **Figure 14** and **Figure 15**, respectively.

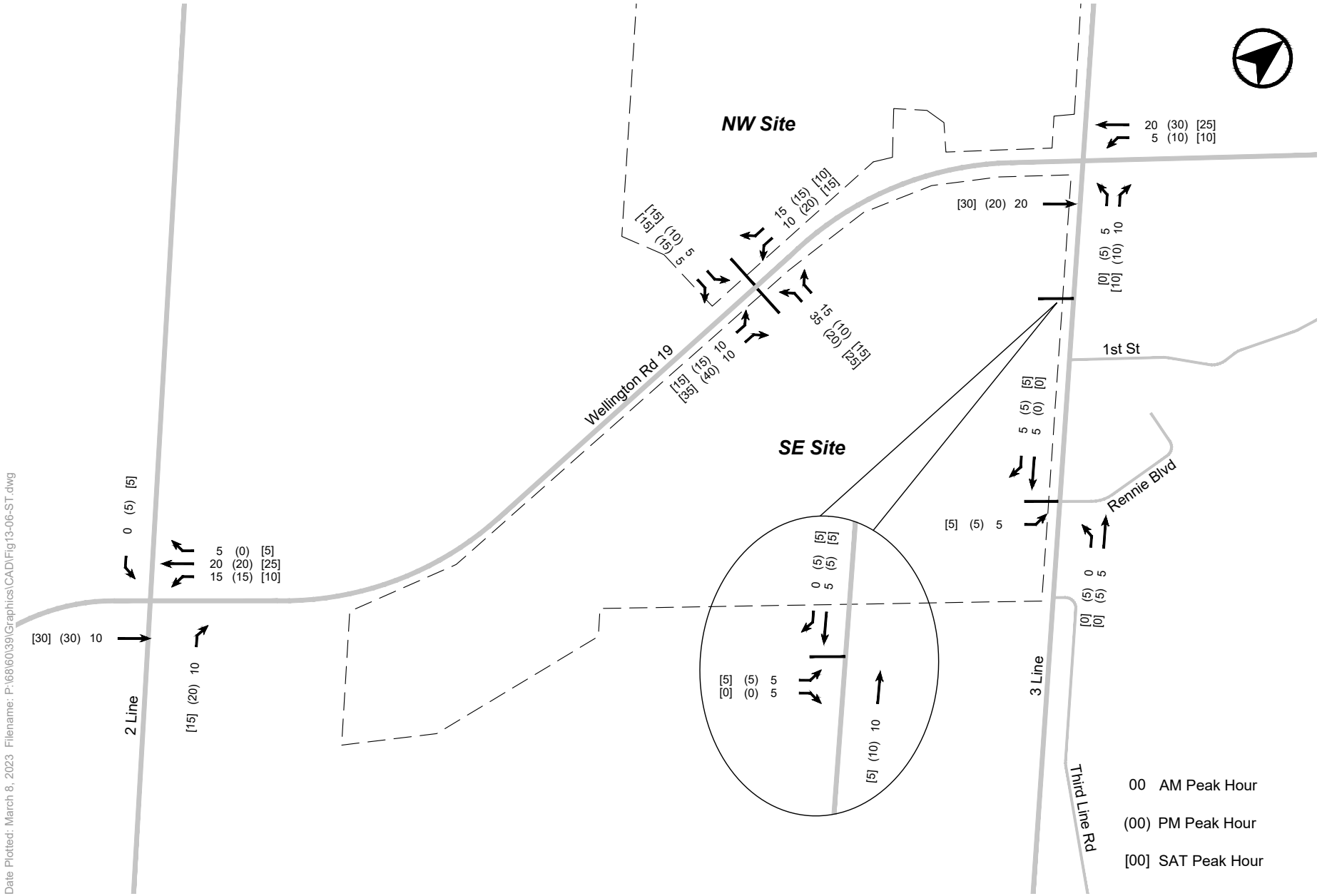



**FIGURE 13 SITE TRAFFIC VOLUMES**

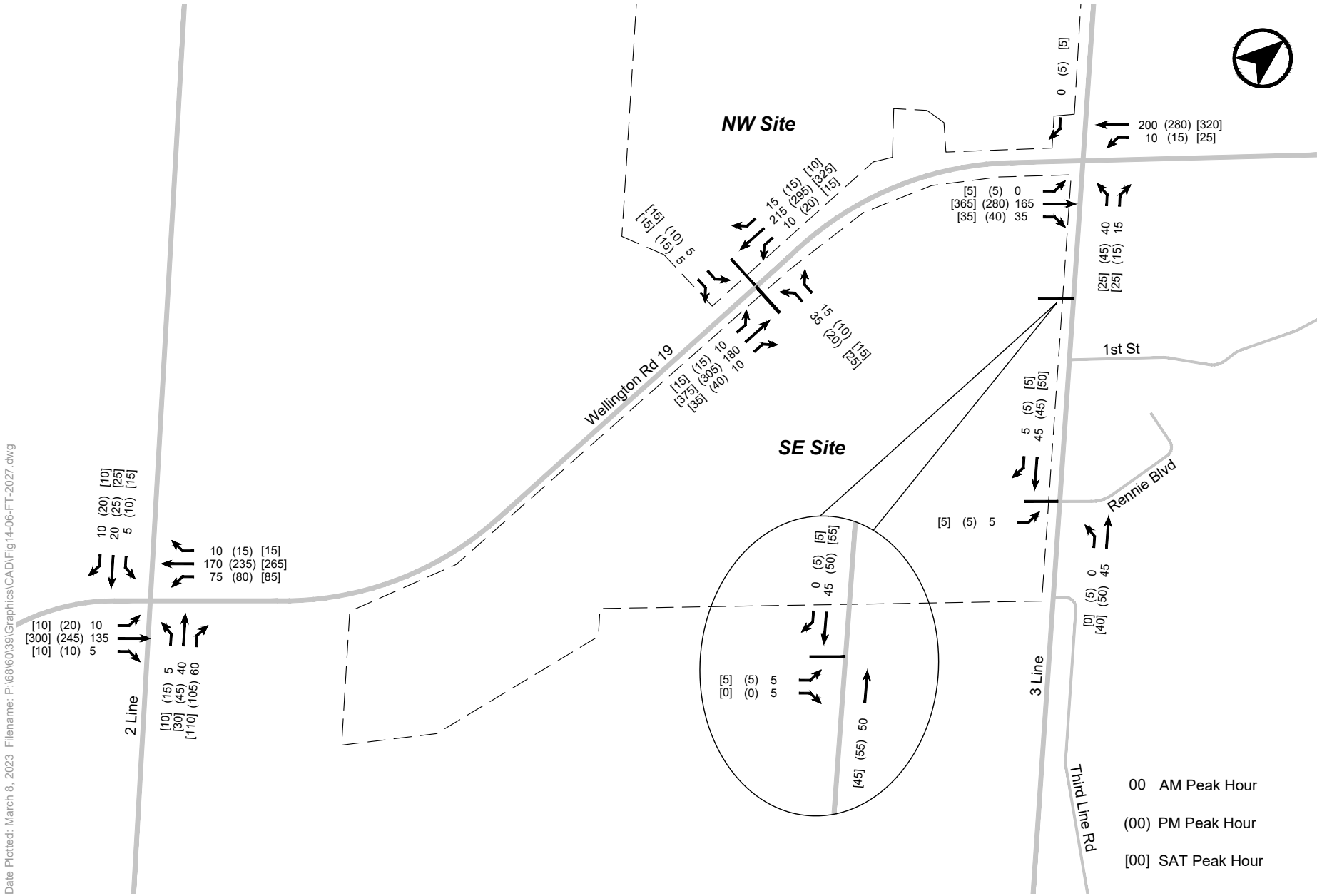



**FIGURE 14 2027 FUTURE TOTAL TRAFFIC VOLUMES**

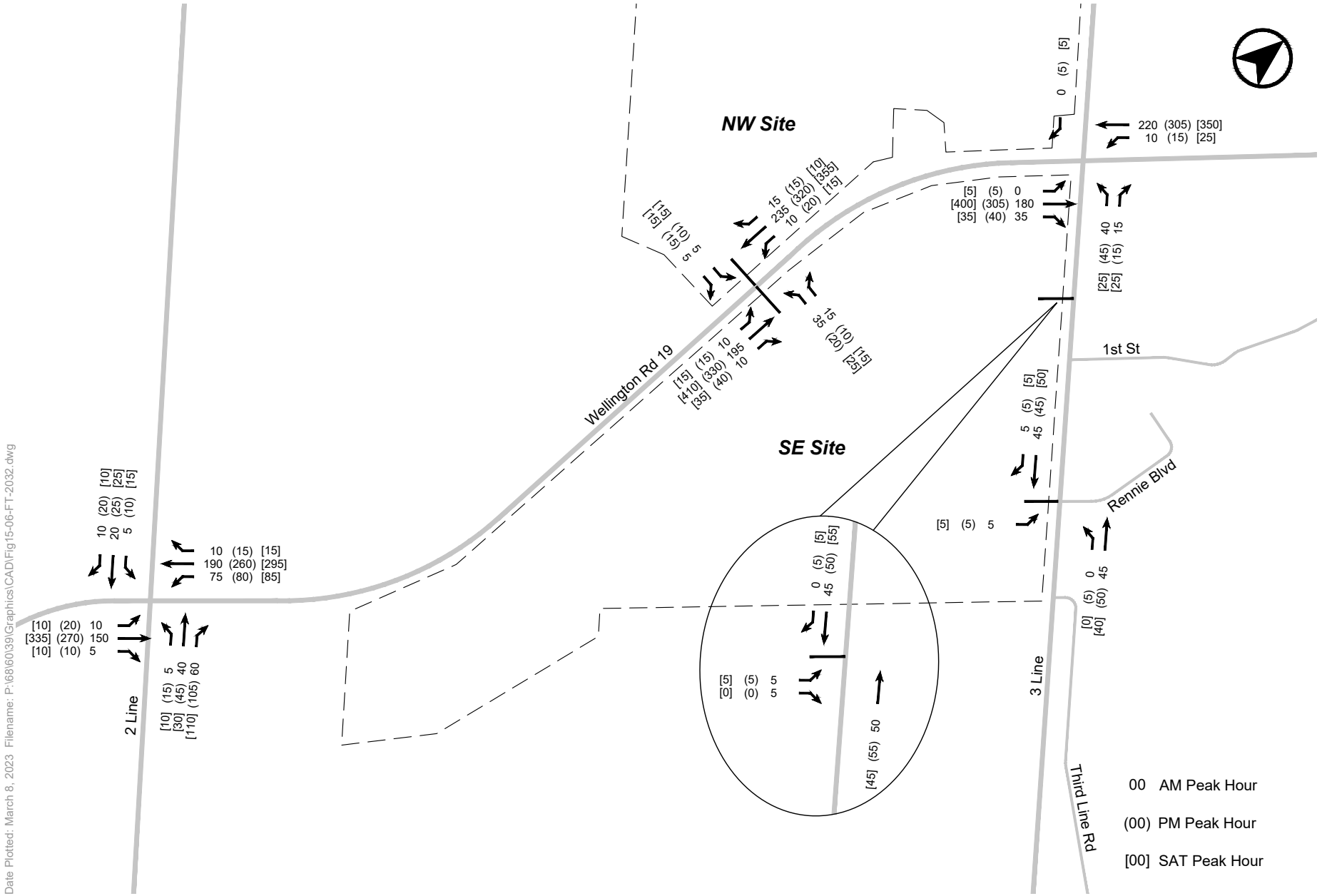



**FIGURE 15 2032 FUTURE TOTAL TRAFFIC VOLUMES**

# 4.0 TRAFFIC OPERATIONS ANALYSIS

## 4.1 TRAFFIC OPERATIONS SCENARIOS

A traffic operations analysis was completed for the following scenarios:

- Existing traffic conditions;
- Future background traffic conditions (2027 horizon year);
- Future total traffic conditions (2027 horizon year with full build-out);
- Future background traffic conditions (2032 horizon year at 5 years post build-out); and
- Future total traffic conditions (2032 horizon year at 5 years post build-out).

## 4.2 ANALYSIS METHODOLOGY

The intersection capacity analysis was completed using Synchro Version 11 and the Highway Capacity Manual (HCM 2000) methodology. For unsignalized intersections, including all intersections in the study area, level of service (LOS) characterizes operational conditions for key movements in terms of delay within the traffic stream[1]. LOS A represents a good level of service with short delays. LOS E and F represent longer delays.

## 4.3 INPUT AND CALIBRATION PARAMETERS

Key parameters adopted in the analysis include:

**Lane Configurations**
Lane configurations are based on existing configurations at the intersection of **Wellington Road 19 / 3 Line** and **Wellington Road 19 / 2 Line**. For all Site access driveways, there is assumed to be one lane in each direction of travel.

**Heavy Vehicle Percentages**
Heavy vehicle percentages were derived from existing turning movement counts. Where the intersection is not existing, as is the case with the Site accesses, the Synchro default of 2% is assumed for all movements.

**Pedestrian and Cycling Volumes**
Volumes of pedestrians and cyclists were derived from existing turning movement counts. Synchro defaults have been adopted for all other parameters.

[1] HCM Level of Service criteria for unsignalized intersections:
- LOS A: Control Delay ≤ 10s
- LOS B: 10s < Control Delay ≤ 15s
- LOS C: 15s < Control Delay ≤ 25s
- LOS D: 25s < Control Delay ≤ 35s
- LOS E: 35s < Control Delay ≤ 50s
- LOS F: Control Delay > 50s

## 4.4 CAPACITY ANALYSIS RESULTS

Intersections within the study area, including existing and planned for the future, operate acceptably under future conditions. No capacity-related mitigation measures are recommended for any of the Site intersections, as volumes remain relatively low under future total conditions in 2027 and 2032, with the exception of left-turn lanes on Wellington Road 19 at the Site access/ golf club driveway (discussed further in **Section 7.0**)

All movements at unsignalized intersections in the study area, including the Site accesses, are expected to operate acceptably at LOS B or better.

**Table 6** summarizes the capacity analysis results for intersections in the study area. Synchro reports are provided in **Appendix D.**

## TABLE 6 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS

| Key Movements | Existing | | 2027 Horizon Year | | | | 2032 Horizon Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Future Background | | Future Total | | Future Background | | Future Total | |
| | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS | Delay |
| **Wellington Road 19 / 2 Line** | | | | | | | | | | |
| EBTL | A (A) [A] | 0.7 (0.9) [0.4] | A (A) [A] | 0.6 (0.8) [0.4] | A (A) [A] | 0.6 (0.7) [0.3] | A (A) [A] | 0.6 (0.8) [0.3] | A (A) [A] | 0.5 (0.7) [0.3] |
| EBR | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] |
| WBTL | A (A) [A] | 2.6 (2.3) [2.5] | A (A) [A] | 2.4 (2.2) [2.4] | A (A) [A] | 2.7 (2.5) [2.5] | A (A) [A] | 2.3 (2.1) [2.3] | A (A) [A] | 2.5 (2.4) [2.5] |
| WBR | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] |
| NBTLR | B (B) [B] | 11.4 (14.2) [13.8] | B (C) [B] | 11.7 (15.0) [14.6] | B (C) [C] | 12.2 (16.5) [15.9] | B (C) [C] | 12.0 (16.0) [15.7] | B (C) [C] | 12.6 (17.2) [17.2] |
| SBTLR | B (B) [C] | 12.0 (13.8) [16.9] | B (B) [C] | 12.3 (14.5) [18.3] | B (C) [C] | 13.1 (17.5) [22.3] | B (C) [C] | 12.7 (15.3) [20.0] | B (C) [C] | 13.5 (18.8) [24.9] |
| **Wellington Road 19 / 3 Line** | | | | | | | | | | |
| EBLT | A (A) [A] | 0.0 (0.2) [0.2] | A (A) [A] | 0.0 (0.2) [0.1] | A (A) [A] | 0.0 (0.2) [0.1] | A (A) [A] | 0.0 (0.2) [0.1] | A (A) [A] | 0.0 (0.2) [0.1] |
| EBR | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.2) [0.1] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] | A (A) [A] | 0.0 (0.0) [0.0] |
| WBLTR | A (A) [A] | 0.2 (0.2) [0.5] | A (A) [A] | 0.2 (0.2) [0.5] | A (A) [A] | 0.4 (0.5) [0.8] | A (A) [A] | 0.2 (0.2) [0.5] | A (A) [A] | 0.4 (0.0) [0.0] |
| NBLTR | B (B) [B] | 11.0 (13.4) [13.9] | B (B) [B] | 11.3 (14.2) [14.9] | B (C) [C] | 11.6 (15.0) [15.4] | B (C) [C] | 11.7 (15.0) [16.0] | B (C) [C] | 12.0 (16.0) [16.6] |
| SBLTR | A (A) [A] | 0.0 (9.6) [9.8] | A (A) [B] | 0.0 (9.7) [10.0] | A (A) [B] | 0.0 (9.9) [10.2] | A (A) [B] | 0.0 (9.9) [10.3] | A (B) [B] | 0.0 (10.1) [10.4] |
| **Wellington Road 19 / Site Access** | | | | | | | | | | |
| EBL | Intersection does not exist. | | | | A (A) [A] | 7.8 (8.0) [8.1] | Intersection does not exist. | | A (A) [A] | 7.8 (8.1) [8.1] |
| EBTR | | | | | A (A) [A] | 0.2 (0.2) [0.2] | | | A (A) [A] | 0.2 (0.2) [0.2] |
| WBL | | | | | A (A) [A] | 7.7 (8.1) [8.3] | | | A (A) [A] | 7.7 (8.2) [8.4] |
| WBTR | | | | | A (A) [A] | 0.2 (0.4) [0.3] | | | A (A) [A] | 0.2 (0.4) [0.3] |
| NBLTR | | | | | B (C) [C] | 12.2 (15.5) [17.3] | | | B (C) [C] | 12.6 (16.5) [18.8] |
| SBLTR | | | | | B (B) [C] | 11.2 (13.1) [15.2] | | | B (B) [C] | 11.5 (13.7) [16.2] |
| **East Site Access / 3 Line** | | | | | | | | | | |
| EBLR | Intersection does not exist. | | | | A (A) [A] | 9.0 (9.1) [9.0] | Intersection does not exist. | | A (A) [A] | 9.0 (9.1) [9.0] |
| NBLT | | | | | A (A) [A] | 0.0 (0.6) [0.0] | | | A (A) [A] | 0.0 (0.6) [0.0] |
| **West Site Access / 3 Line** | | | | | | | | | | |
| EBLR | Intersection does not exist. | | | | A (A) [A] | 8.8 (9.1) [9.1] | Intersection does not exist. | | A (A) [A] | 8.8 (9.1) [9.1] |
| NBTL | | | | | A (A) [A] | 0.0 (0.0) [0.0] | | | A (A) [A] | 0.0 (0.0) [0.0] |

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. All delay values are in seconds (s).



# 5.0 TRAFFIC CONTROL EVALUATION

## 5.1 TRAFFIC SIGNAL WARRANTS

In order to ensure that the road network in the vicinity of the Site maintains acceptable operations in the future, traffic signals were considered at the proposed new Site access on Wellington Road 19, and at the intersections of **Wellington Road 19 / 3 Line** and **Wellington Road / 2 Line**, under 2032 future conditions. For the Site access on Wellington Road 19, the traffic signal warrant analysis was based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 7), while for the existing (two-way stop control) intersections, Justifications 1, 2 and 3 were used.

The results of the traffic signal warrant analysis are summarized in **Table 7**, **Table 8** and **Table 9**, with the relevant excerpts and detailed analysis provided in **Appendix E**.

### TABLE 7 TRAFFIC SIGNAL WARRANTS (2032) – WELLINGTON ROAD 19 / 3 LINE

| Justification | Description | Required | Hour Ending | | | | | | | | Percentage Compliance | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 Lane [Free Flow] | 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 | Average | Sectional |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches | 480 | 419 | 502 | 452 | 443 | 458 | 540 | 701 | 584 | | 40% |
| | | 100% | 80% | 100% | 80% | 80% | 80% | 100% | 100% | 100% | 90% | |
| | B. Vehicle volume, minor streets | 120 | 69 | 69 | 39 | 28 | 34 | 38 | 71 | 34 | | |
| | | 100% | 58% | 58% | 32% | 23% | 28% | 32% | 59% | 28% | 40% | |
| 2. Delay to Cross Traffic | A. Vehicle volume, major street | 480 | 433 | 433 | 413 | 415 | 424 | 502 | 630 | 550 | | 61% |
| | | 100% | 80% | 80% | 80% | 80% | 80% | 100% | 100% | 100% | 88% | |
| | B. Combined vehicle/pedestrian volume crossing artery from minor street | 50 | 18 | 55 | 26 | 24 | 24 | 26 | 59 | 24 | | |
| | | 100% | 37% | 100% | 52% | 48% | 49% | 52% | 100% | 48% | 61% | |
| **Overall Compliance is 61%[2]** | | | | | | | | | | | | |

Notes:
1. Relevant OTM excerpts are provided in **Appendix E**.
2. Justification 3 cannot be applied here since neither of the other justifications reaches 80% compliance.

## TABLE 8 TRAFFIC SIGNAL WARRANTS (2032) – WELLINGTON ROAD 19 / 2 LINE

| Justification | Description | Required | Hour Ending | | | | | | | | Percentage Compliance | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 Lane [Free Flow] | 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 | Average | Sectional |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches | 480 | 862 | 832 | 481 | 486 | 534 | 635 | 886 | 909 | | 92% |
| | | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| | B. Vehicle volume, minor streets | 120 | 204 | 204 | 90 | 116 | 110 | 136 | 232 | 205 | | |
| | | 100% | 100% | 100% | 75% | 80% | 80% | 100% | 100% | 100% | 92% | |
| 2. Delay to Cross Traffic | A. Vehicle volume, major street | 480 | 628 | 628 | 390 | 370 | 424 | 499 | 654 | 703 | | 48% |
| | | 100% | 100% | 100% | 80% | 77% | 80% | 100% | 100% | 100% | 92% | |
| | B. Combined vehicle/pedestrian volume crossing artery from minor street | 50 | 20 | 27 | 9 | 20 | 16 | 31 | 35 | 34 | | |
| | | 100% | 40% | 54% | 18% | 40% | 33% | 62% | 70% | 68% | 48% | |
| **Overall Compliance is 92%[2]** | | | | | | | | | | | | |

Notes:
1. Relevant OTM excerpts are provided in **Appendix E**.
2. Justification 3 cannot be applied here since neither of the other justifications reaches 80% compliance.

### TABLE 9 TRAFFIC SIGNAL WARRANTS (2032) – WELLINGTON ROAD 19 & SITE ACCESS

| Justification | Description | Minimum Requirement 1 Lane Highways [Free Flow] | Compliance | | |
|---|---|---|---|---|---|
| | | | Sectional | | Entire % (≥150)[2] |
| | | Base | Actual Traffic Volumes | % of Required | |
| **Wellington Road 19 / North Site Access** | | | | | |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches (average hour) | 480 | 333 | 69% | **24%** |
| | B[(1)]. Vehicle volume, along minor streets (average hour) | 120 | 29 | 24% | |
| 2. Delay to Cross Traffic | A. Vehicle volume, major street (average hour) | 480 | 304 | 63% | **40%** |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 50 | 20 | 40% | |
| **Overall Compliance is 40%** | | | | | |

Notes:
1. For future intersections, the warrant should be met with 150% (as opposed to 100% for an existing intersection with an 8-hour count estimate).
2. Average hourly volumes were derived based on the formula presented in the OTM Book 12.
   AHV = (weekday morning peak hour volumes + weekday afternoon peak hour volumes) ÷ 4
3. Relevant OTM excerpts are provided in **Appendix E**.

Based on the above assessments, under future total conditions in 2032, traffic signals are not warranted at the intersection of Wellington Road 19 & 3 Line (61% compliance) or at the proposed Site access on Wellington Road 19 (40% compliance).

Although the warrants for a traffic signal on Wellington Road 19 & 2 Line are not met, as the compliance score is 92% (peak summer months in 2032), the County should continue to monitor this intersection to determine if traffic signals are required in the future.

## 5.2 ALL-WAY STOP CONTROL WARRANT

An assessment for all-way stop control was also undertaken at the intersection of **Wellington Road 19 / 3 Line**, under 2032 future conditions. The warrant methodology outlined in OTM Book 5 was applied to determine whether all-way stop control was appropriate. The requirements for this warrant were not met, whether the intersection is considered a major road intersection or a minor road intersection. Thus, two-way stop control is considered to be appropriate for this intersection under 2032 future total conditions.

# 6.0 SIGHT DISTANCE EVALUATION

## 6.1 WELLINGTON ROAD 19

A comprehensive sight distance review was completed for the proposed new Site access/ golf club driveway along Wellington Road 19, utilizing both the vertical and horizontal profile data obtained from surveys. The horizontal and vertical profile data is provided in **Appendix F**.

Sight distances were evaluated in accordance with Transportation Association of Canada (TAC) guidelines for both stopping sight distance and turning sight distance, using a conservative design speed of 100 km/h (20 km/h over the speed limit of 80 km/h).

As shown in **Table 10**, the minimum required sight distance along Wellington Road 19 at the proposed Site access point / golf club driveway are met. It is however important to note that the available sight distance is dependent on the right-of-way being kept clear of vertical obstructions up to the ditch line. Tree trimming may be required to maintain adequate sight distance.

### TABLE 10 SIGHT DISTANCE (WELLINGTON ROAD 19 AT SITE ACCESS/ GOLF CLUB DRIVEWAY)

| Movement | TAC Minimum Requirement (metres) | Available Sight Distance (metres) |
|---|---|---|
| **Stopping Sight Distance (Design Speed of 100 km/h)** | | |
| **Site Access** | | |
| Left turn from Wellington Road 19 to North Site Access Road[1] | 185 | 430 |
| **Golf Club Driveway (re-located to align with new Site access)** | | |
| Left turn from Wellington Road 19 to NW Site | 185 | 270 |
| **Turning Sight Distance (Design Speed of 100 km/h)** | | |
| **Site Access** | | |
| Left-turn from North Site Access Road to Wellington Road 19 (stop condition)[2] | 210 | 210 |
| Right-turn from North Site Access Road to Wellington Road 19 (stop condition)[3] | 185 | 430 |
| **Golf Club Driveway (re-located to align with new Site access)** | | |
| Left-turn from Golf Course Driveway to Wellington Road 19 (stop condition)[2] | 210 | 300 |
| Right-turn from Golf Course Driveway to Wellington Road 19 (stop condition)[3] | 185 | 580 |

Notes:
1. Transportation Association of Canada (TAC) Manual, Table 2.5.2.
2. Transportation Association of Canada (TAC) Manual, Case B1; Table 9.9.4
3. Transportation Association of Canada (TAC) Manual, Case B2; Table 9.9.6

## 6.2 3 LINE

A comprehensive sight distance review was completed for the proposed two new Site accesses along 3 Line, utilizing both the vertical and horizontal profile data obtained from surveys. The horizontal and vertical profile data is provided in **Appendix F**.

Sight distances were evaluated in accordance with Transportation Association of Canada (TAC) guidelines for both stopping sight distance and turning sight distance, using a conservative design speed of 80 km/h

As shown in **Table 11**, the minimum required sight distance along 3 Line at the proposed Site access points are met. It is however important to note that the available sight distance is dependent on the right-of-way being kept clear of vertical obstructions up to the ditch line.

### TABLE 11 SIGHT DISTANCE (3 LINE AT SITE ACCESS POINTS)

| Movement | TAC Minimum Requirement (metres) | Available Sight Distance (metres) |
|---|---|---|
| **Stopping Sight Distance (Design Speed of 80 km/h)** | | |
| **Street D** | | |
| Left turn from Street D onto 3 Line[1] | 129 | 210 |
| **Street G** | | |
| Left turn from Street G onto 3 Line[1] | 129 | 170 |
| **Turning Sight Distance (Design Speed of 80 km/h)** | | |
| **Street D** | | |
| Left-turn from Street D onto 3 Line (stop condition)[2] | 170 | 210 |
| Left-turn from 3 Line onto Street D[3] | 125 | 205 |
| **Street G** | | |
| Left-turn from Street G onto 3 Line (stop condition)[2] | 170 | 170 |
| Left-turn from 3 Line onto Street G[3] | 125 | 480 |

Notes:
1. Transportation Association of Canada (TAC) Manual, Table 2.5.2.
2. Transportation Association of Canada (TAC) Manual, Case B1; Table 9.9.4
3. Transportation Association of Canada (TAC) Manual, Case F; Table 9.9.12

# 7.0 EVALUATION FOR LEFT-TURN LANES

As part of this report, detailed evaluations for left-turn lanes on Wellington Road 19 at the proposed Site access point/ golf club driveway and on Wellington Road 19 at 3 Line, were completed using the Ministry of Transportation Ontario (MTO) Geometric Design Standards for Ontario Highways. Since the defacto speed limit on Wellington Road 19 is 80 km/h, in order to be conservative, the evaluation was completed for a design speed of 90 km/h, as well as 100 km/h.

## 7.1 WELLINGTON ROAD 19 & SITE ACCESS/ GOLF CLUB DRIVEWAY

The highest left-turning volume at the Site access was estimated to be 20 vehicles and occurs during the weekday afternoon peak period. The highest left-turning volume at the re-located golf club driveway was estimated to be 15 vehicles and occurs during the weekday afternoon and Saturday peak period. As shown in the detailed evaluation in **Appendix H**, left-turn lanes are warranted on Wellington Road 19 at the Site access / re-located golf club driveway. For this reason, as part of the redevelopment of the Site, the construction of north-south left-turning lanes are recommended at the Site access / golf club driveway along Wellington Road 19.

## 7.2 WELLINGTON ROAD 19 & 3 LINE

The highest southbound left-turning volume on Wellington Road 19 at 3 Line, was estimated to be 15 vehicles during weekday afternoon peak period and up to 25 vehicles during the Saturday peak period. As shown in the detailed evaluation in **Appendix H**, left-turn lanes are very close to being warranted on Wellington Road 19 & 3 Line, under 2032 future background conditions. When left-turning Site traffic at the intersection is considered, the warrants for a left-turn are met for Saturday only. It is important to note that this assessment is based on the peak summer Saturday traffic volumes, which provides a very conservative assessment. For these reasons, it is recommended that this intersection be monitored in the future to assess the need for a southbound left-turn lane on Wellington Road 19 at 3 Line.

## 7.3 WELLINGTON ROAD 19 & 2 LINE

Under existing conditions, the westbound left-turning volume on Wellington Road 19 at 2 Line, is 65 vehicles during the afternoon peak hour and 75 vehicles during the Saturday peak hour. As shown in the detailed evaluation in **Appendix H**, left-turn lanes are warranted on Wellington Road 19 & 2 Line, under existing conditions, during the weekday afternoon peak hour conditions. It is recommended that this intersection be monitored in the future to confirm the need for a westbound left-turn lane on Wellington Road 19 at 2 Line.

# 8.0 SUMMARY AND CONCLUSIONS

BA Group was retained by 883890 Ontario Limited c/o Fergus Development Inc. to provide transportation consulting services related to a proposed residential re-development on a site municipally known as 8243 & 8282 Wellington Road 19, in the Township of Centre Wellington, in the County of Wellington. The existing golf course (the "Site") consists of two parcels; the northwest parcel ("NW Site"), situated on the north side of Wellington Road 19, and the southeast parcel ("SE Site"), situated on the south side of Wellington Road 19.

The proposed development includes the construction of 118 single-detached residential dwellings.

The proposed Site circulation and access includes a network of internal private roads (12 metre right-of-ways) with one full access along Wellington Road 19 and two full accesses along 3 Line. The access points on Wellington Road 19 and 3 Line will be unsignalized with stop control on the minor streets only.

There are plans to close the existing golf club driveway on the west side of Wellington Road 19 and shift the driveway to align with the new Site access to create a 4-legged intersection.

Key findings of the Transportation Considerations Report are summarized as follows:

**Transportation Context**

- The Site is adjacent to Wellington Road 19 and 3 Line. Wellington Road 19 is a Wellington County arterial road and 3 Line is a Wellington County local road.
- The Township of Centre Wellington does not currently operate a local public transit system and there are no plans at this time to establish transit service in the vicinity of the Site.
- In the vicinity of the Site, Wellington Road 19 includes paved shoulders for cyclists and there are future plans to extend the paved shoulders east of 3 Line.
- Just south of Wellington Route 19, there is an off-road “spine route” know as the Elora Cataract Trail, a 47 kilometer long trail between Elora and Forks of Credit Provincial Park. The trail is located along the southern edge of the SE Site, and crosses 2 Line, 150 metres southeast of Wellington Road 19.
- There is a pedestrian tunnel under Wellington Road 19 which provides connectivity between the SE Site and the NW Site

**Traffic Operations Analysis**

- The Site is forecast to generate 90, 120 and 110 two-way residential vehicle trips during the weekday morning, weekday afternoon and Saturday peak hours, respectively.

- The golf club is expected to generate in the order of 35 two-way vehicle trips during the weekday morning peak hour and 55 two-way vehicle trips during the weekday afternoon and Saturday peak hours. Since no information regarding existing traffic associated with the golf course on the NW Site was available, a conservative approach was adopted, wherein the estimated vehicle trips were added to the network to account for the new golf course entrance, and no traffic was removed.

- All intersections in the study area, including the Site access points, are expected to operate under capacity under future total conditions.

- Based on a detailed analysis using the Ontario Traffic Manual Book 12, under future total conditions in 2032, traffic signals are not warranted at the intersection of Wellington Road 19 & 3 Line or at either of the proposed Site accesses along Wellington Road 19.

**Sight Distance Assessment**

- Comprehensive sight distance reviews were completed along Wellington Road 19 at the proposed Site access/ golf club driveway intersection and along 3 Line at both proposed site access points, utilizing both the vertical and horizontal profile data obtained from surveys. All minimum required sight distances are met along both Wellington Road 19 and along 3 Line.

- It is important to note that the available sight distances are dependent on the right-of-ways being kept clear of vertical obstructions up to the ditch line. Tree trimming may be required to maintain adequate sight distance, particularly at the Site access along Wellington Road 19.

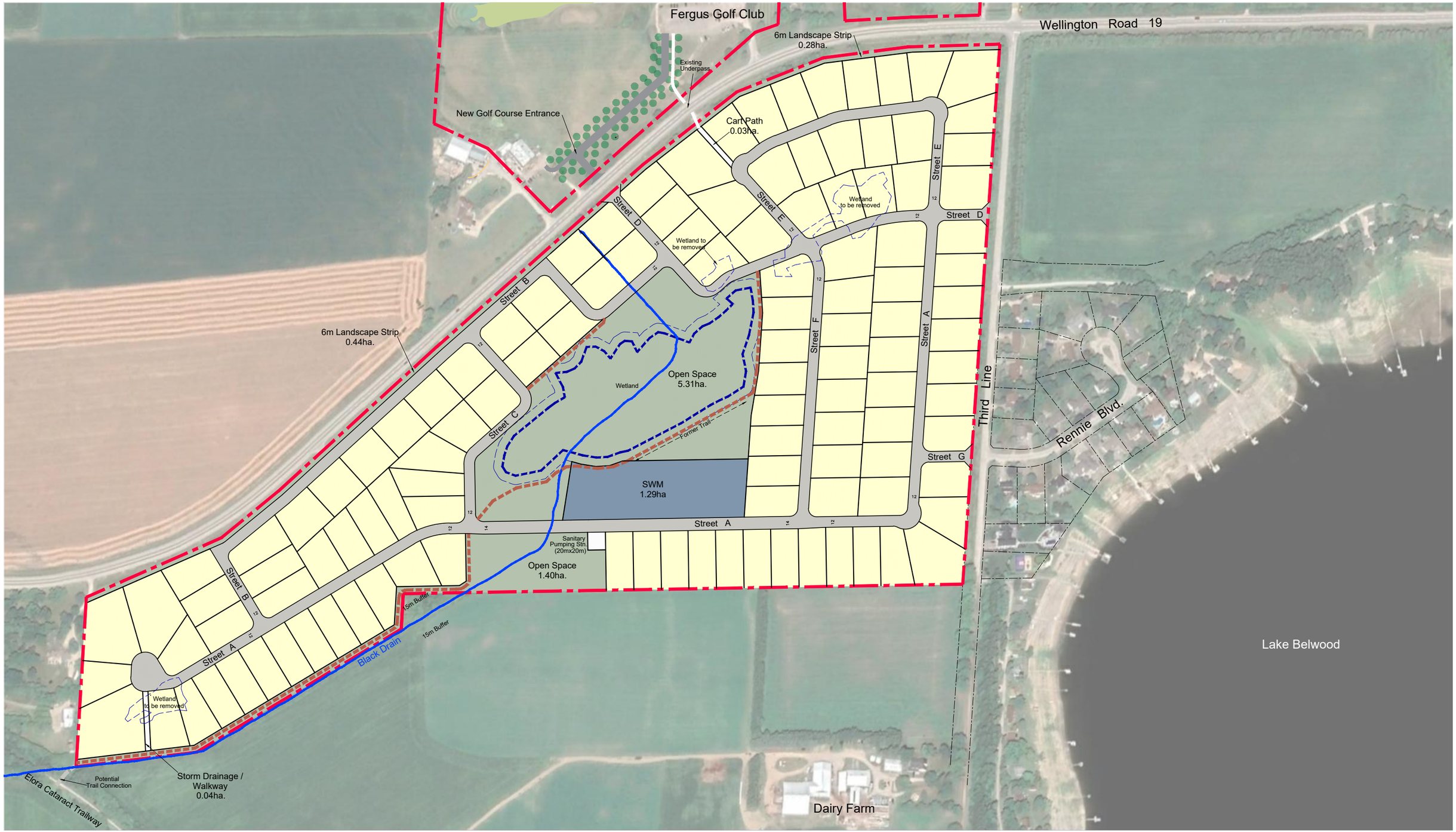
**Evaluation for Left-Turn Lanes**

- The evaluation for a left-turn lane on Wellington Road 19 at the proposed Site access/golf club driveway was completed for a design speed of 90 km/h, as well as 100 km/h. The highest left-turning volume at the Site access was estimated to be 20 vehicles and occurs during the afternoon peak period. The highest left-turning volume at the golf club driveway was estimated to be 15 vehicles and occurs during the afternoon and Saturday peak period. The evaluation confirmed that north-south left-turning lanes are required on Wellington Road 19 at the Site access/ golf club driveway.

- As part of the development of the Site, north-south left-turning lanes are recommended on Wellington Road 19 at the Site access/ golf club driveway.

**Based on the foregoing, with the implementation of the recommended road improvements, the proposed development can be accommodated on the future transportation network.**

# Appendix A
# Development Concept Plan




# DEVELOPMENT CONCEPT

## The Village At Fairview Greens

1/2 Acre Residential Lots
GRCA Wetland /
OP Core Greenlands
10m Wetland Buffer
Potential Trails

Site Area: 39.85ha. (98.5ac.)
No. of Lots: 118
Area of wetlands to be removed: 7,076sq.m.

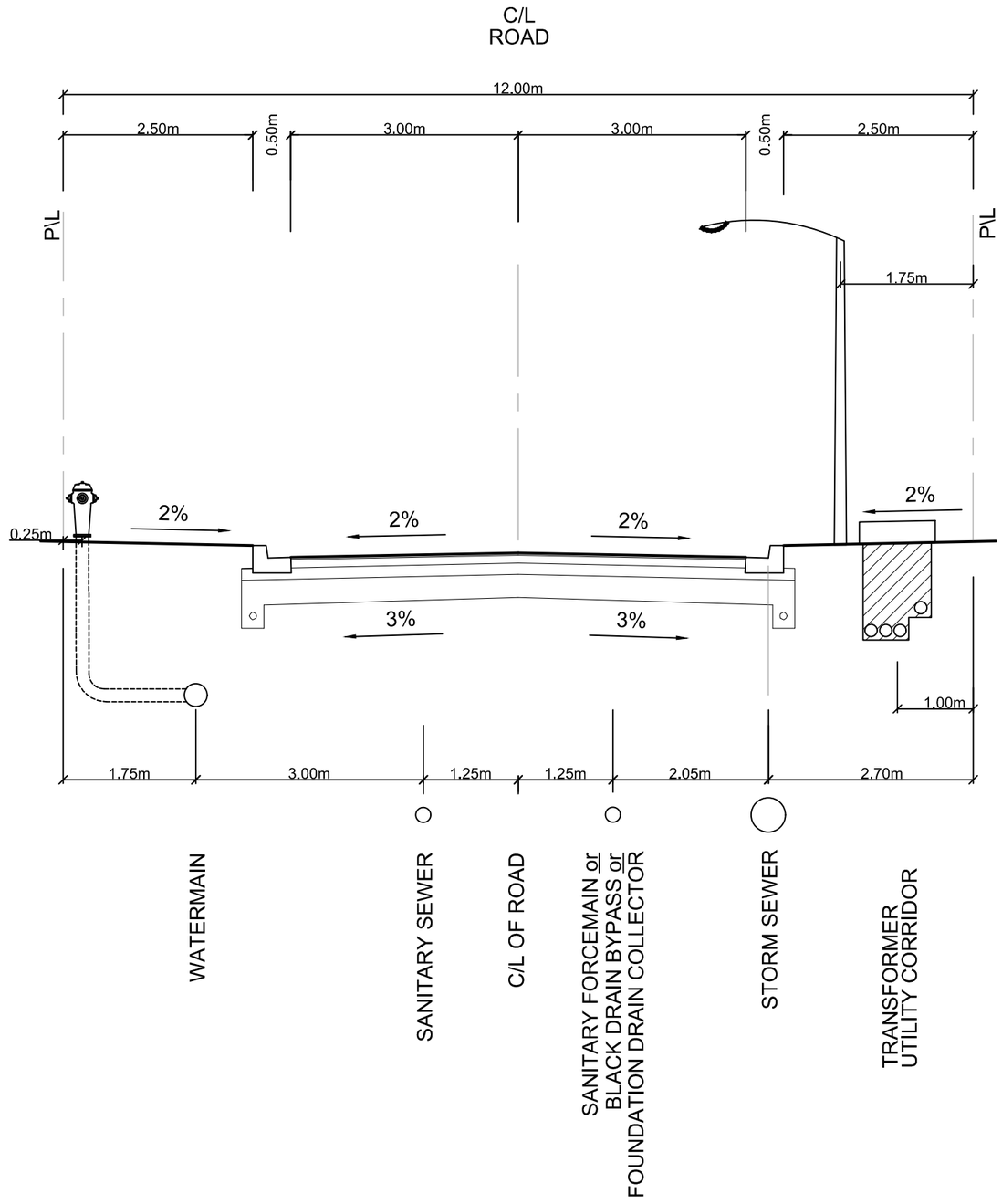
0 50 100 150 200 250 300
Metres

NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of lots are approximate and subject to more detailed design as well as municipal planning approvals.

Scale 1:4,000 | October 24, 2022 | Project No.: 21021 | Drawn By: SL

GSP group

# Appendix B
# Internal Roads Cross-Section




PROPOSED 12.0m PRIVATE ROAD WIDTH
N.T.S.

BURNSIDE

Client

**FERGUS DEVELOPMENT INC.**

Figure Title

**THE VILLAGE AT FAIRVIEW GREENS**

TYPICAL CROSS SECTION OF PROPOSED STREET - 12.0m WIDTH

| Drawn | Checked | Date | Figure No. |
|---|---|---|---|
| BF | DN | 22/10/18 | 8 |
| Scale | | Project No. | |
| N.T.S. | | 300052719 | |

# Appendix C
# Turning Movement Counts

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

## Turning Movement Count (2 . WELLINGTON RD 19 & 2 LINE)

| Start Time | N Approach 2 LINE | | | | | | E Approach WELLINGTON RD 19 | | | | | | S Approach 2 LINE | | | | | | W Approach WELLINGTON RD 19 | | | | | | 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 | | |
| 11:00:00 | 2 | 5 | 1 | 0 | 0 | 8 | 3 | 57 | 20 | 0 | 0 | 80 | 30 | 7 | 6 | 0 | 0 | 43 | 1 | 53 | 2 | 0 | 0 | 56 | 187 | |
| 11:15:00 | 4 | 10 | 1 | 0 | 0 | 15 | 4 | 68 | 13 | 0 | 0 | 85 | 11 | 11 | 1 | 0 | 0 | 23 | 2 | 45 | 2 | 0 | 0 | 49 | 172 | |
| 11:30:00 | 3 | 4 | 0 | 0 | 0 | 7 | 3 | 55 | 15 | 0 | 0 | 73 | 37 | 12 | 1 | 0 | 0 | 50 | 1 | 45 | 3 | 0 | 0 | 49 | 179 | |
| 11:45:00 | 5 | 6 | 2 | 0 | 0 | 13 | 2 | 58 | 12 | 0 | 0 | 72 | 28 | 14 | 3 | 0 | 0 | 45 | 1 | 53 | 5 | 0 | 0 | 59 | 189 | 727 |
| 12:00:00 | 2 | 8 | 7 | 0 | 0 | 17 | 7 | 42 | 14 | 0 | 0 | 63 | 34 | 7 | 6 | 0 | 0 | 47 | 3 | 52 | 5 | 0 | 0 | 60 | 187 | 727 |
| 12:15:00 | 1 | 9 | 1 | 0 | 0 | 11 | 1 | 70 | 12 | 0 | 0 | 83 | 24 | 8 | 2 | 0 | 0 | 34 | 1 | 49 | 8 | 0 | 0 | 58 | 186 | 741 |
| 12:30:00 | 7 | 8 | 0 | 0 | 0 | 15 | 2 | 54 | 19 | 0 | 0 | 75 | 23 | 7 | 2 | 0 | 0 | 32 | 3 | 50 | 2 | 0 | 0 | 55 | 177 | 739 |
| 12:45:00 | 6 | 6 | 3 | 0 | 0 | 15 | 3 | 51 | 12 | 0 | 0 | 66 | 21 | 1 | 1 | 0 | 0 | 23 | 2 | 50 | 1 | 0 | 0 | 53 | 157 | 707 |
| 13:00:00 | 2 | 7 | 6 | 0 | 0 | 15 | 5 | 45 | 11 | 0 | 0 | 61 | 21 | 6 | 3 | 0 | 0 | 30 | 4 | 41 | 2 | 0 | 0 | 47 | 153 | 673 |
| 13:15:00 | 2 | 12 | 2 | 0 | 0 | 16 | 4 | 48 | 13 | 0 | 0 | 65 | 26 | 7 | 7 | 0 | 0 | 40 | 1 | 51 | 3 | 0 | 0 | 55 | 176 | 663 |
| 13:30:00 | 4 | 7 | 2 | 0 | 0 | 13 | 2 | 50 | 12 | 0 | 0 | 64 | 33 | 9 | 0 | 0 | 0 | 42 | 2 | 47 | 2 | 0 | 0 | 51 | 170 | 656 |
| 13:45:00 | 4 | 3 | 1 | 0 | 0 | 8 | 3 | 56 | 15 | 0 | 0 | 74 | 29 | 9 | 3 | 0 | 0 | 41 | 4 | 63 | 2 | 0 | 0 | 69 | 192 | 691 |
| 14:00:00 | 3 | 6 | 1 | 0 | 0 | 10 | 5 | 60 | 22 | 0 | 0 | 87 | 21 | 8 | 1 | 0 | 0 | 30 | 4 | 62 | 2 | 0 | 0 | 68 | 195 | 733 |
| 14:15:00 | 0 | 6 | 5 | 0 | 0 | 11 | 2 | 53 | 20 | 0 | 0 | 75 | 21 | 3 | 3 | 0 | 0 | 27 | 1 | 62 | 4 | 0 | 0 | 67 | 180 | 737 |
| 14:30:00 | 3 | 10 | 3 | 0 | 0 | 16 | 1 | 43 | 17 | 0 | 0 | 61 | 26 | 10 | 4 | 0 | 0 | 40 | 3 | 53 | 2 | 0 | 0 | 58 | 175 | 742 |
| 14:45:00 | 3 | 5 | 2 | 0 | 0 | 10 | 3 | 50 | 10 | 0 | 0 | 63 | 25 | 6 | 5 | 0 | 0 | 36 | 1 | 60 | 2 | 0 | 0 | 63 | 172 | 722 |
| **Grand Total** | 51 | 112 | 37 | 0 | 0 | 200 | 50 | 860 | 237 | 0 | 0 | 1147 | 410 | 125 | 48 | 0 | 0 | 583 | 34 | 836 | 47 | 0 | 0 | 917 | **2847** | - |
| **Approach%** | 25.5% | 56% | 18.5% | 0% | | - | 4.4% | 75% | 20.7% | 0% | | - | 70.3% | 21.4% | 8.2% | 0% | | - | 3.7% | 91.2% | 5.1% | 0% | | - | **-** | - |
| **Totals %** | 1.8% | 3.9% | 1.3% | 0% | | 7% | 1.8% | 30.2% | 8.3% | 0% | | 40.3% | 14.4% | 4.4% | 1.7% | 0% | | 20.5% | 1.2% | 29.4% | 1.7% | 0% | | 32.2% | **-** | - |
| **Heavy** | 0 | 4 | 3 | 0 | | - | 1 | 5 | 1 | 0 | | - | 3 | 5 | 0 | 0 | | - | 0 | 3 | 0 | 0 | | - | **-** | - |
| **Heavy %** | 0% | 3.6% | 8.1% | 0% | | - | 2% | 0.6% | 0.4% | 0% | | - | 0.7% | 4% | 0% | 0% | | - | 0% | 0.4% | 0% | 0% | | - | **-** | - |
| **Bicycles** | 0 | 0 | 0 | 0 | | - | 0 | 1 | 1 | 0 | | - | 2 | 0 | 1 | 0 | | - | 1 | 0 | 0 | 0 | | - | **-** | - |
| **Bicycle %** | 0% | 0% | 0% | 0% | | - | 0% | 0.1% | 0.4% | 0% | | - | 0.5% | 0% | 2.1% | 0% | | - | 2.9% | 0% | 0% | 0% | | - | **-** | - |

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

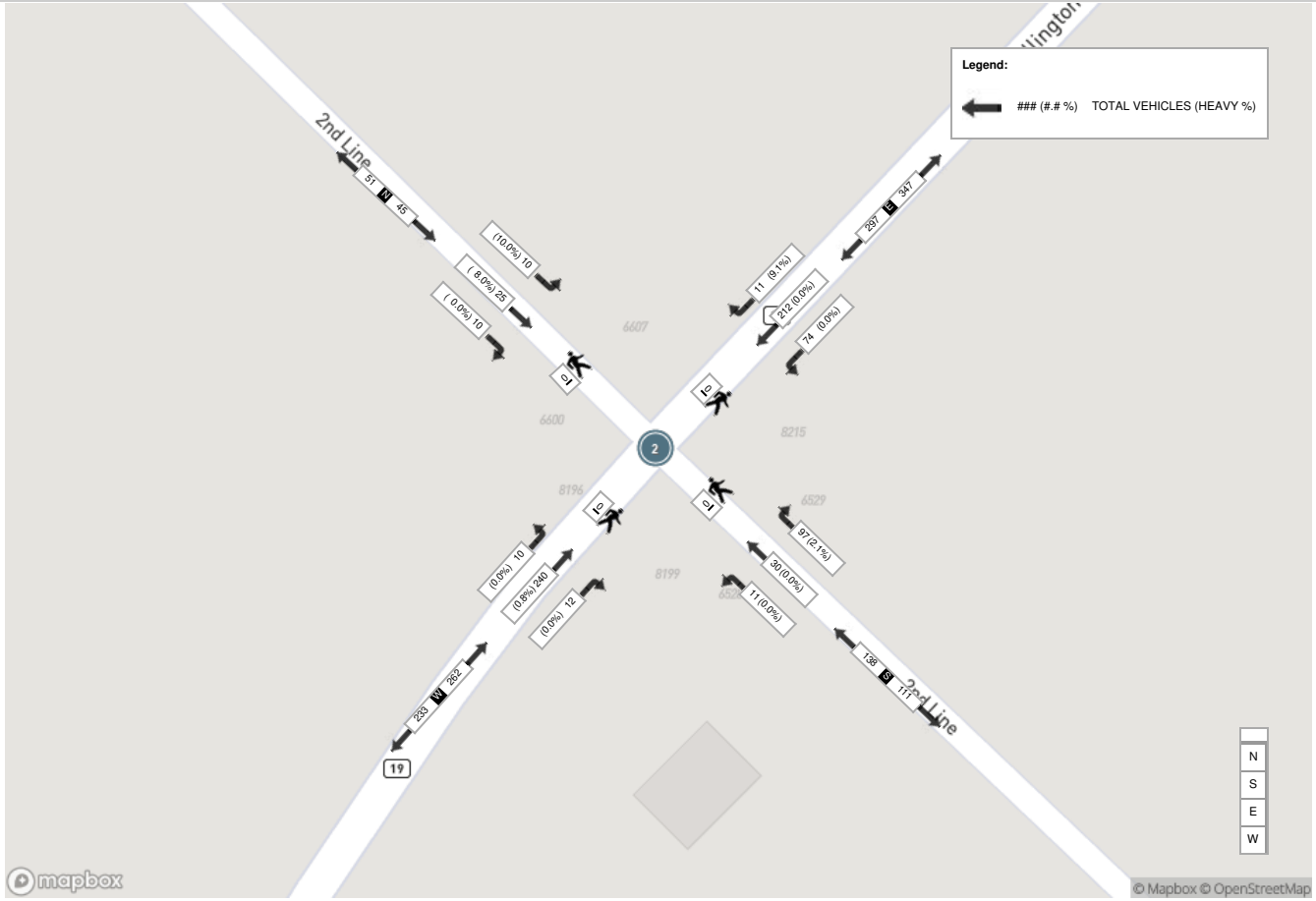
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 01:45 PM - 02:45 PM Weather: Clear Sky (20.39 °C)**

| Start Time | N Approach 2 LINE | | | | | | E Approach WELLINGTON RD 19 | | | | | | S Approach 2 LINE | | | | | | W Approach WELLINGTON RD 19 | | | | | | 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 | |
| 13:45:00 | 4 | 3 | 1 | 0 | 0 | 8 | 3 | 56 | 15 | 0 | 0 | 74 | 29 | 9 | 3 | 0 | 0 | 41 | 4 | 63 | 2 | 0 | 0 | 69 | 192 |
| 14:00:00 | 3 | 6 | 1 | 0 | 0 | 10 | 5 | 60 | 22 | 0 | 0 | 87 | 21 | 8 | 1 | 0 | 0 | 30 | 4 | 62 | 2 | 0 | 0 | 68 | 195 |
| 14:15:00 | 0 | 6 | 5 | 0 | 0 | 11 | 2 | 53 | 20 | 0 | 0 | 75 | 21 | 3 | 3 | 0 | 0 | 27 | 1 | 62 | 4 | 0 | 0 | 67 | 180 |
| 14:30:00 | 3 | 10 | 3 | 0 | 0 | 16 | 1 | 43 | 17 | 0 | 0 | 61 | 26 | 10 | 4 | 0 | 0 | 40 | 3 | 53 | 2 | 0 | 0 | 58 | 175 |
| **Grand Total** | 10 | 25 | 10 | 0 | 0 | 45 | 11 | 212 | 74 | 0 | 0 | 297 | 97 | 30 | 11 | 0 | 0 | 138 | 12 | 240 | 10 | 0 | 0 | 262 | **742** |
| **Approach%** | 22.2% | 55.6% | 22.2% | 0% | | - | 3.7% | 71.4% | 24.9% | 0% | | - | 70.3% | 21.7% | 8% | 0% | | - | 4.6% | 91.6% | 3.8% | 0% | | - | **-** |
| **Totals %** | 1.3% | 3.4% | 1.3% | 0% | | 6.1% | 1.5% | 28.6% | 10% | 0% | | 40% | 13.1% | 4% | 1.5% | 0% | | 18.6% | 1.6% | 32.3% | 1.3% | 0% | | 35.3% | **-** |
| **PHF** | 0.63 | 0.63 | 0.5 | 0 | | 0.7 | 0.55 | 0.88 | 0.84 | 0 | | 0.85 | 0.84 | 0.75 | 0.69 | 0 | | 0.84 | 0.75 | 0.95 | 0.63 | 0 | | 0.95 | **-** |
| **Heavy** | 0 | 2 | 1 | 0 | | 3 | 1 | 0 | 0 | 0 | | 1 | 2 | 0 | 0 | 0 | | 2 | 0 | 2 | 0 | 0 | | 2 | **-** |
| **Heavy %** | 0% | 8% | 10% | 0% | | 6.7% | 9.1% | 0% | 0% | 0% | | 0.3% | 2.1% | 0% | 0% | 0% | | 1.4% | 0% | 0.8% | 0% | 0% | | 0.8% | **-** |
| **Lights** | 10 | 23 | 9 | 0 | | 42 | 10 | 212 | 74 | 0 | | 296 | 95 | 30 | 11 | 0 | | 136 | 12 | 238 | 10 | 0 | | 260 | **-** |
| **Lights %** | 100% | 92% | 90% | 0% | | 93.3% | 90.9% | 100% | 100% | 0% | | 99.7% | 97.9% | 100% | 100% | 0% | | 98.6% | 100% | 99.2% | 100% | 0% | | 99.2% | **-** |
| **Single-Unit Trucks** | 0 | 0 | 0 | 0 | | 0 | 1 | 0 | 0 | 0 | | 1 | 2 | 0 | 0 | 0 | | 2 | 0 | 2 | 0 | 0 | | 2 | **-** |
| **Single-Unit Trucks %** | 0% | 0% | 0% | 0% | | 0% | 9.1% | 0% | 0% | 0% | | 0.3% | 2.1% | 0% | 0% | 0% | | 1.4% | 0% | 0.8% | 0% | 0% | | 0.8% | **-** |
| **Articulated Trucks** | 0 | 2 | 1 | 0 | | 3 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | **-** |
| **Articulated Trucks %** | 0% | 8% | 10% | 0% | | 6.7% | 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 | - | 1 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | **-** |
| **Bicycles on Road%** | - | - | - | - | % | | - | - | - | - | % | | - | - | - | - | % | | - | - | - | - | % | | **-** |

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 01:45 PM - 02:45 PM Weather: Clear Sky (20.39 °C)**



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

## Turning Movement Count (2 . WELLINGTON RD 19 & 2 LINE)

| Start Time | N Approach 2 LINE | | | | | | E Approach WELLINGTON RD 19 | | | | | | S Approach 2 LINE | | | | | | W Approach WELLINGTON RD 19 | | | | | | 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 | 3 | 5 | 0 | 0 | 0 | 8 | 1 | 21 | 9 | 0 | 0 | 31 | 15 | 2 | 0 | 0 | 0 | 17 | 1 | 22 | 0 | 0 | 0 | 23 | 79 | |
| 07:15:00 | 1 | 12 | 1 | 0 | 0 | 14 | 2 | 21 | 7 | 0 | 0 | 30 | 5 | 1 | 1 | 0 | 0 | 7 | 2 | 19 | 0 | 0 | 0 | 21 | 72 | |
| 07:30:00 | 4 | 11 | 5 | 0 | 0 | 20 | 2 | 24 | 15 | 0 | 0 | 41 | 8 | 3 | 0 | 0 | 0 | 11 | 0 | 27 | 1 | 0 | 0 | 28 | 100 | |
| 07:45:00 | 4 | 6 | 2 | 0 | 0 | 12 | 1 | 36 | 10 | 0 | 0 | 47 | 15 | 17 | 3 | 0 | 0 | 35 | 0 | 25 | 1 | 0 | 0 | 26 | 120 | 371 |
| 08:00:00 | 3 | 10 | 2 | 0 | 0 | 15 | 0 | 35 | 19 | 0 | 0 | 54 | 9 | 6 | 1 | 0 | 0 | 16 | 1 | 24 | 3 | 0 | 0 | 28 | 113 | 405 |
| 08:15:00 | 3 | 4 | 2 | 0 | 0 | 9 | 2 | 33 | 18 | 0 | 0 | 53 | 10 | 10 | 0 | 0 | 0 | 20 | 3 | 25 | 1 | 0 | 0 | 29 | 111 | 444 |
| 08:30:00 | 1 | 1 | 1 | 0 | 0 | 3 | 1 | 29 | 13 | 0 | 0 | 43 | 18 | 6 | 0 | 0 | 0 | 24 | 0 | 35 | 3 | 0 | 0 | 38 | 108 | 452 |
| 08:45:00 | 8 | 7 | 2 | 0 | 0 | 17 | 1 | 41 | 10 | 0 | 0 | 52 | 9 | 8 | 0 | 0 | 0 | 17 | 8 | 24 | 0 | 0 | 0 | 32 | 118 | 450 |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16:00:00 | 4 | 7 | 0 | 0 | 0 | 11 | 4 | 40 | 17 | 0 | 0 | 61 | 30 | 9 | 2 | 0 | 0 | 41 | 2 | 38 | 5 | 0 | 0 | 45 | 158 | |
| 16:15:00 | 8 | 9 | 2 | 0 | 0 | 19 | 2 | 50 | 16 | 0 | 0 | 68 | 17 | 10 | 2 | 0 | 0 | 29 | 1 | 36 | 3 | 0 | 0 | 40 | 156 | |
| 16:30:00 | 4 | 5 | 1 | 0 | 0 | 10 | 3 | 47 | 15 | 0 | 0 | 65 | 26 | 11 | 6 | 0 | 0 | 43 | 2 | 53 | 1 | 0 | 0 | 56 | 174 | |
| 16:45:00 | 7 | 4 | 2 | 0 | 0 | 13 | 5 | 37 | 19 | 0 | 0 | 61 | 21 | 9 | 2 | 0 | 0 | 32 | 4 | 54 | 6 | 0 | 0 | 64 | 170 | 658 |
| 17:00:00 | 1 | 8 | 0 | 0 | 0 | 9 | 7 | 55 | 13 | 0 | 0 | 75 | 21 | 15 | 3 | 0 | 0 | 39 | 2 | 49 | 9 | 0 | 0 | 60 | 183 | 683 |
| 17:15:00 | 2 | 7 | 2 | 0 | 0 | 11 | 6 | 25 | 12 | 0 | 0 | 43 | 19 | 8 | 4 | 0 | 0 | 31 | 5 | 39 | 6 | 1 | 0 | 51 | 136 | 663 |
| 17:30:00 | 7 | 10 | 0 | 0 | 0 | 17 | 2 | 38 | 8 | 0 | 0 | 48 | 15 | 15 | 1 | 0 | 0 | 31 | 2 | 34 | 4 | 0 | 0 | 40 | 136 | 625 |
| 17:45:00 | 6 | 8 | 2 | 0 | 0 | 16 | 0 | 20 | 10 | 0 | 0 | 30 | 11 | 6 | 3 | 0 | 0 | 20 | 4 | 35 | 5 | 0 | 0 | 44 | 110 | 565 |
| **Grand Total** | 66 | 114 | 24 | 0 | 0 | 204 | 39 | 552 | 211 | 0 | 0 | 802 | 249 | 136 | 28 | 0 | 0 | 413 | 37 | 539 | 48 | 1 | 0 | 625 | **2044** | - |
| **Approach%** | 32.4% | 55.9% | 11.8% | 0% | | - | 4.9% | 68.8% | 26.3% | 0% | | - | 60.3% | 32.9% | 6.8% | 0% | | - | 5.9% | 86.2% | 7.7% | 0.2% | | - | **-** | - |
| **Totals %** | 3.2% | 5.6% | 1.2% | 0% | | 10% | 1.9% | 27% | 10.3% | 0% | | 39.2% | 12.2% | 6.7% | 1.4% | 0% | | 20.2% | 1.8% | 26.4% | 2.3% | 0% | | 30.6% | **-** | - |
| **Heavy** | 2 | 6 | 1 | 0 | | - | 2 | 19 | 6 | 0 | | - | 11 | 11 | 1 | 0 | | - | 1 | 17 | 0 | 0 | | - | **-** | - |
| **Heavy %** | 3% | 5.3% | 4.2% | 0% | | - | 5.1% | 3.4% | 2.8% | 0% | | - | 4.4% | 8.1% | 3.6% | 0% | | - | 2.7% | 3.2% | 0% | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (19.12 °C)**

| Start Time | N Approach 2 LINE | | | | | | E Approach WELLINGTON RD 19 | | | | | | S Approach 2 LINE | | | | | | W Approach WELLINGTON RD 19 | | | | | | 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 | |
| 07:45:00 | 4 | 6 | 2 | 0 | 0 | 12 | 1 | 36 | 10 | 0 | 0 | 47 | 15 | 17 | 3 | 0 | 0 | 35 | 0 | 25 | 1 | 0 | 0 | 26 | 120 |
| 08:00:00 | 3 | 10 | 2 | 0 | 0 | 15 | 0 | 35 | 19 | 0 | 0 | 54 | 9 | 6 | 1 | 0 | 0 | 16 | 1 | 24 | 3 | 0 | 0 | 28 | 113 |
| 08:15:00 | 3 | 4 | 2 | 0 | 0 | 9 | 2 | 33 | 18 | 0 | 0 | 53 | 10 | 10 | 0 | 0 | 0 | 20 | 3 | 25 | 1 | 0 | 0 | 29 | 111 |
| 08:30:00 | 1 | 1 | 1 | 0 | 0 | 3 | 1 | 29 | 13 | 0 | 0 | 43 | 18 | 6 | 0 | 0 | 0 | 24 | 0 | 35 | 3 | 0 | 0 | 38 | 108 |
| **Grand Total** | 11 | 21 | 7 | 0 | 0 | 39 | 4 | 133 | 60 | 0 | 0 | 197 | 52 | 39 | 4 | 0 | 0 | 95 | 4 | 109 | 8 | 0 | 0 | 121 | **452** |
| **Approach%** | 28.2% | 53.8% | 17.9% | 0% | | - | 2% | 67.5% | 30.5% | 0% | | - | 54.7% | 41.1% | 4.2% | 0% | | - | 3.3% | 90.1% | 6.6% | 0% | | - | **-** |
| **Totals %** | 2.4% | 4.6% | 1.5% | 0% | | 8.6% | 0.9% | 29.4% | 13.3% | 0% | | 43.6% | 11.5% | 8.6% | 0.9% | 0% | | 21% | 0.9% | 24.1% | 1.8% | 0% | | 26.8% | **-** |
| **PHF** | 0.69 | 0.53 | 0.88 | 0 | | 0.65 | 0.5 | 0.92 | 0.79 | 0 | | 0.91 | 0.72 | 0.57 | 0.33 | 0 | | 0.68 | 0.33 | 0.78 | 0.67 | 0 | | 0.8 | **-** |
| **Heavy** | 1 | 0 | 0 | 0 | | 1 | 0 | 4 | 3 | 0 | | 7 | 5 | 2 | 0 | 0 | | 7 | 0 | 8 | 0 | 0 | | 8 | **-** |
| **Heavy %** | 9.1% | 0% | 0% | 0% | | 2.6% | 0% | 3% | 5% | 0% | | 3.6% | 9.6% | 5.1% | 0% | 0% | | 7.4% | 0% | 7.3% | 0% | 0% | | 6.6% | **-** |
| **Lights** | 10 | 21 | 7 | 0 | | 38 | 4 | 129 | 57 | 0 | | 190 | 47 | 37 | 4 | 0 | | 88 | 4 | 101 | 8 | 0 | | 113 | **-** |
| **Lights %** | 90.9% | 100% | 100% | 0% | | 97.4% | 100% | 97% | 95% | 0% | | 96.4% | 90.4% | 94.9% | 100% | 0% | | 92.6% | 100% | 92.7% | 100% | 0% | | 93.4% | **-** |
| **Single-Unit Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 4 | 3 | 0 | | 7 | 2 | 0 | 0 | 0 | | 2 | 0 | 5 | 0 | 0 | | 5 | **-** |
| **Single-Unit Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 3% | 5% | 0% | | 3.6% | 3.8% | 0% | 0% | 0% | | 2.1% | 0% | 4.6% | 0% | 0% | | 4.1% | **-** |
| **Buses** | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 1 | 0 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | **-** |
| **Buses %** | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 1.9% | 0% | 0% | 0% | | 1.1% | 0% | 0% | 0% | 0% | | 0% | **-** |
| **Articulated Trucks** | 1 | 0 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 2 | 2 | 0 | 0 | | 4 | 0 | 3 | 0 | 0 | | 3 | **-** |
| **Articulated Trucks %** | 9.1% | 0% | 0% | 0% | | 2.6% | 0% | 0% | 0% | 0% | | 0% | 3.8% | 5.1% | 0% | 0% | | 4.2% | 0% | 2.8% | 0% | 0% | | 2.5% | **-** |

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.71 °C)**

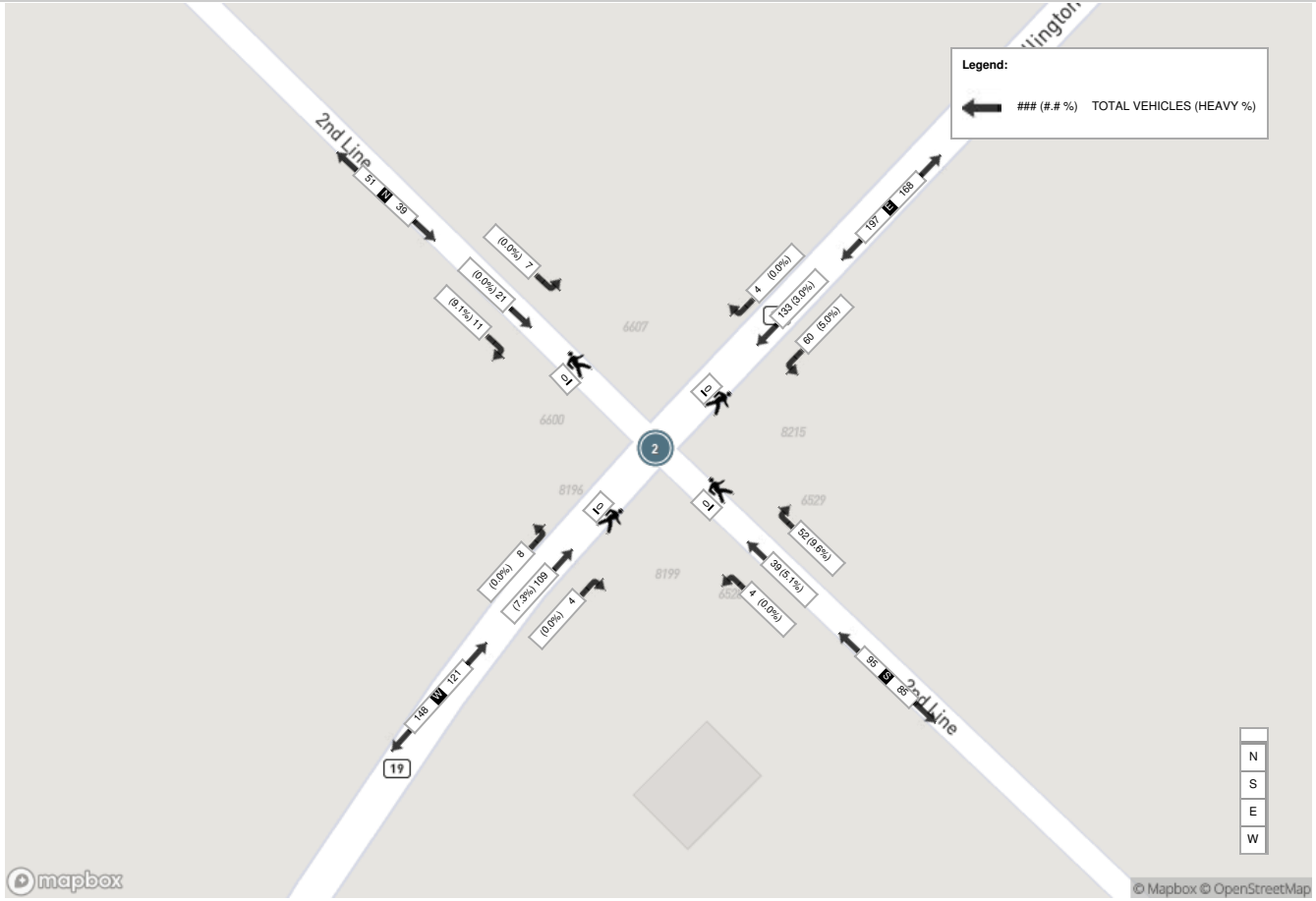
| Start Time | N Approach 2 LINE | | | | | | E Approach WELLINGTON RD 19 | | | | | | S Approach 2 LINE | | | | | | W Approach WELLINGTON RD 19 | | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | 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 | |
| 16:15:00 | 8 | 9 | 2 | 0 | 0 | 19 | 2 | 50 | 16 | 0 | 0 | 68 | 17 | 10 | 2 | 0 | 0 | 29 | 1 | 36 | 3 | 0 | 0 | 40 | 156 |
| 16:30:00 | 4 | 5 | 1 | 0 | 0 | 10 | 3 | 47 | 15 | 0 | 0 | 65 | 26 | 11 | 6 | 0 | 0 | 43 | 2 | 53 | 1 | 0 | 0 | 56 | 174 |
| 16:45:00 | 7 | 4 | 2 | 0 | 0 | 13 | 5 | 37 | 19 | 0 | 0 | 61 | 21 | 9 | 2 | 0 | 0 | 32 | 4 | 54 | 6 | 0 | 0 | 64 | 170 |
| 17:00:00 | 1 | 8 | 0 | 0 | 0 | 9 | 7 | 55 | 13 | 0 | 0 | 75 | 21 | 15 | 3 | 0 | 0 | 39 | 2 | 49 | 9 | 0 | 0 | 60 | 183 |
| **Grand Total** | 20 | 26 | 5 | 0 | 0 | 51 | 17 | 189 | 63 | 0 | 0 | 269 | 85 | 45 | 13 | 0 | 0 | 143 | 9 | 192 | 19 | 0 | 0 | 220 | **683** |
| **Approach%** | 39.2% | 51% | 9.8% | 0% | | - | 6.3% | 70.3% | 23.4% | 0% | | - | 59.4% | 31.5% | 9.1% | 0% | | - | 4.1% | 87.3% | 8.6% | 0% | | - | **-** |
| **Totals %** | 2.9% | 3.8% | 0.7% | 0% | | 7.5% | 2.5% | 27.7% | 9.2% | 0% | | 39.4% | 12.4% | 6.6% | 1.9% | 0% | | 20.9% | 1.3% | 28.1% | 2.8% | 0% | | 32.2% | **-** |
| **PHF** | 0.63 | 0.72 | 0.63 | 0 | | 0.67 | 0.61 | 0.86 | 0.83 | 0 | | 0.9 | 0.82 | 0.75 | 0.54 | 0 | | 0.83 | 0.56 | 0.89 | 0.53 | 0 | | 0.86 | **-** |
| **Heavy** | 1 | 1 | 0 | 0 | | 2 | 1 | 5 | 2 | 0 | | 8 | 2 | 3 | 1 | 0 | | 6 | 0 | 2 | 0 | 0 | | 2 | **-** |
| **Heavy %** | 5% | 3.8% | 0% | 0% | | 3.9% | 5.9% | 2.6% | 3.2% | 0% | | 3% | 2.4% | 6.7% | 7.7% | 0% | | 4.2% | 0% | 1% | 0% | 0% | | 0.9% | **-** |
| **Lights** | 19 | 25 | 5 | 0 | | 49 | 16 | 184 | 61 | 0 | | 261 | 83 | 42 | 12 | 0 | | 137 | 9 | 190 | 19 | 0 | | 218 | **-** |
| **Lights %** | 95% | 96.2% | 100% | 0% | | 96.1% | 94.1% | 97.4% | 96.8% | 0% | | 97% | 97.6% | 93.3% | 92.3% | 0% | | 95.8% | 100% | 99% | 100% | 0% | | 99.1% | **-** |
| **Single-Unit Trucks** | 1 | 1 | 0 | 0 | | 2 | 0 | 5 | 1 | 0 | | 6 | 2 | 2 | 1 | 0 | | 5 | 0 | 1 | 0 | 0 | | 1 | **-** |
| **Single-Unit Trucks %** | 5% | 3.8% | 0% | 0% | | 3.9% | 0% | 2.6% | 1.6% | 0% | | 2.2% | 2.4% | 4.4% | 7.7% | 0% | | 3.5% | 0% | 0.5% | 0% | 0% | | 0.5% | **-** |
| **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% | **-** |
| **Articulated Trucks** | 0 | 0 | 0 | 0 | | 0 | 1 | 0 | 1 | 0 | | 2 | 0 | 1 | 0 | 0 | | 1 | 0 | 1 | 0 | 0 | | 1 | **-** |
| **Articulated Trucks %** | 0% | 0% | 0% | 0% | | 0% | 5.9% | 0% | 1.6% | 0% | | 0.7% | 0% | 2.2% | 0% | 0% | | 0.7% | 0% | 0.5% | 0% | 0% | | 0.5% | **-** |

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 07:45 AM - 08:45 AM** **Weather: Clear Sky (19.12 °C)**

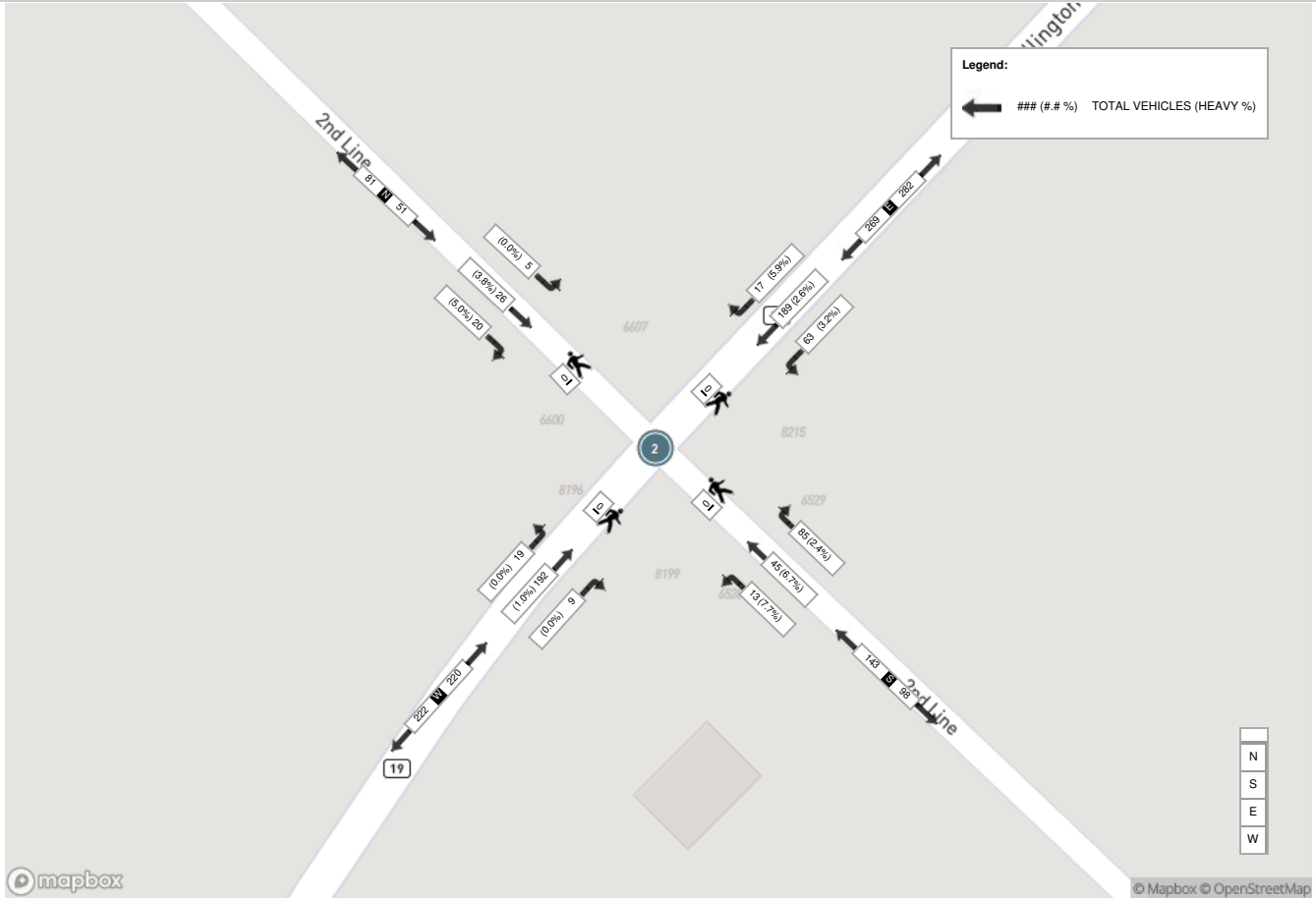


Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 2 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 04:15 PM - 05:15 PM** **Weather: Broken Clouds (24.71 °C)**



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

## Turning Movement Count (1 . WELLINGTON RD 19 & 3 LINE)

| Start Time | N Approach THIRD LINE | | | | | | E Approach WELLINGTON COUNTY RD 19 | | | | | | S Approach THIRD LINE | | | | | | W Approach WELLINGTON COUNTY RD 19 | | | | | | 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 | | |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 6 | 0 | 0 | 72 | 5 | 0 | 10 | 0 | 0 | 15 | 12 | 70 | 0 | 0 | 0 | 82 | 169 | |
| 11:15:00 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 71 | 1 | 0 | 0 | 72 | 3 | 0 | 8 | 0 | 0 | 11 | 4 | 53 | 0 | 0 | 0 | 57 | 142 | |
| 11:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 0 | 0 | 0 | 67 | 2 | 0 | 3 | 0 | 0 | 5 | 7 | 64 | 0 | 0 | 0 | 71 | 143 | |
| 11:45:00 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 60 | 2 | 0 | 0 | 62 | 0 | 0 | 9 | 0 | 0 | 9 | 4 | 72 | 1 | 0 | 0 | 77 | 149 | 603 |
| 12:00:00 | 3 | 1 | 2 | 0 | 0 | 6 | 1 | 53 | 0 | 0 | 0 | 54 | 1 | 1 | 5 | 0 | 0 | 7 | 6 | 82 | 3 | 0 | 0 | 91 | 158 | 592 |
| 12:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 2 | 0 | 0 | 81 | 1 | 0 | 3 | 0 | 0 | 4 | 2 | 73 | 0 | 0 | 0 | 75 | 160 | 610 |
| 12:30:00 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 63 | 1 | 0 | 0 | 64 | 3 | 0 | 8 | 0 | 0 | 11 | 5 | 63 | 2 | 1 | 0 | 71 | 147 | 614 |
| 12:45:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 60 | 3 | 0 | 0 | 63 | 0 | 0 | 8 | 0 | 0 | 8 | 4 | 62 | 1 | 0 | 0 | 67 | 139 | 604 |
| 13:00:00 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 48 | 0 | 0 | 0 | 48 | 2 | 0 | 4 | 0 | 0 | 6 | 8 | 60 | 1 | 0 | 0 | 69 | 124 | 570 |
| 13:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 61 | 0 | 0 | 0 | 63 | 0 | 0 | 4 | 0 | 0 | 4 | 7 | 64 | 0 | 0 | 0 | 71 | 138 | 548 |
| 13:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 | 3 | 0 | 0 | 58 | 0 | 0 | 3 | 0 | 0 | 3 | 10 | 70 | 0 | 1 | 0 | 81 | 142 | 543 |
| 13:45:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 69 | 7 | 0 | 0 | 76 | 3 | 1 | 5 | 0 | 0 | 9 | 10 | 79 | 1 | 0 | 0 | 90 | 176 | 580 |
| 14:00:00 | 2 | 1 | 0 | 0 | 0 | 3 | 0 | 66 | 2 | 0 | 0 | 68 | 3 | 0 | 12 | 0 | 0 | 15 | 9 | 71 | 0 | 0 | 0 | 80 | 166 | 622 |
| 14:15:00 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 64 | 4 | 0 | 0 | 68 | 7 | 1 | 6 | 0 | 0 | 14 | 5 | 83 | 2 | 0 | 0 | 90 | 173 | 657 |
| 14:30:00 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 51 | 2 | 0 | 0 | 53 | 0 | 1 | 8 | 0 | 0 | 9 | 8 | 69 | 0 | 0 | 0 | 77 | 141 | 656 |
| 14:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 60 | 2 | 0 | 0 | 63 | 2 | 0 | 6 | 0 | 0 | 8 | 4 | 81 | 1 | 0 | 0 | 86 | 157 | 637 |
| **Grand Total** | 9 | 4 | 6 | 0 | 0 | 19 | 4 | 993 | 35 | 0 | 0 | 1032 | 32 | 4 | 102 | 0 | 0 | 138 | 105 | 1116 | 12 | 2 | 0 | 1235 | **2424** | - |
| **Approach%** | 47.4% | 21.1% | 31.6% | 0% | | - | 0.4% | 96.2% | 3.4% | 0% | | - | 23.2% | 2.9% | 73.9% | 0% | | - | 8.5% | 90.4% | 1% | 0.2% | | - | **-** | - |
| **Totals %** | 0.4% | 0.2% | 0.2% | 0% | | 0.8% | 0.2% | 41% | 1.4% | 0% | | 42.6% | 1.3% | 0.2% | 4.2% | 0% | | 5.7% | 4.3% | 46% | 0.5% | 0.1% | | 50.9% | **-** | - |
| **Heavy** | 1 | 0 | 0 | 0 | | - | 0 | 9 | 0 | 0 | | - | 0 | 0 | 0 | 0 | | - | 0 | 7 | 2 | 0 | | - | **-** | - |
| **Heavy %** | 11.1% | 0% | 0% | 0% | | - | 0% | 0.9% | 0% | 0% | | - | 0% | 0% | 0% | 0% | | - | 0% | 0.6% | 16.7% | 0% | | - | **-** | - |
| **Bicycles** | 0 | 0 | 0 | 0 | | - | 0 | 1 | 0 | 0 | | - | 2 | 0 | 1 | 0 | | - | 0 | 1 | 0 | 0 | | - | **-** | - |
| **Bicycle %** | 0% | 0% | 0% | 0% | | - | 0% | 0.1% | 0% | 0% | | - | 6.3% | 0% | 1% | 0% | | - | 0% | 0.1% | 0% | 0% | | - | **-** | - |

Spectrum

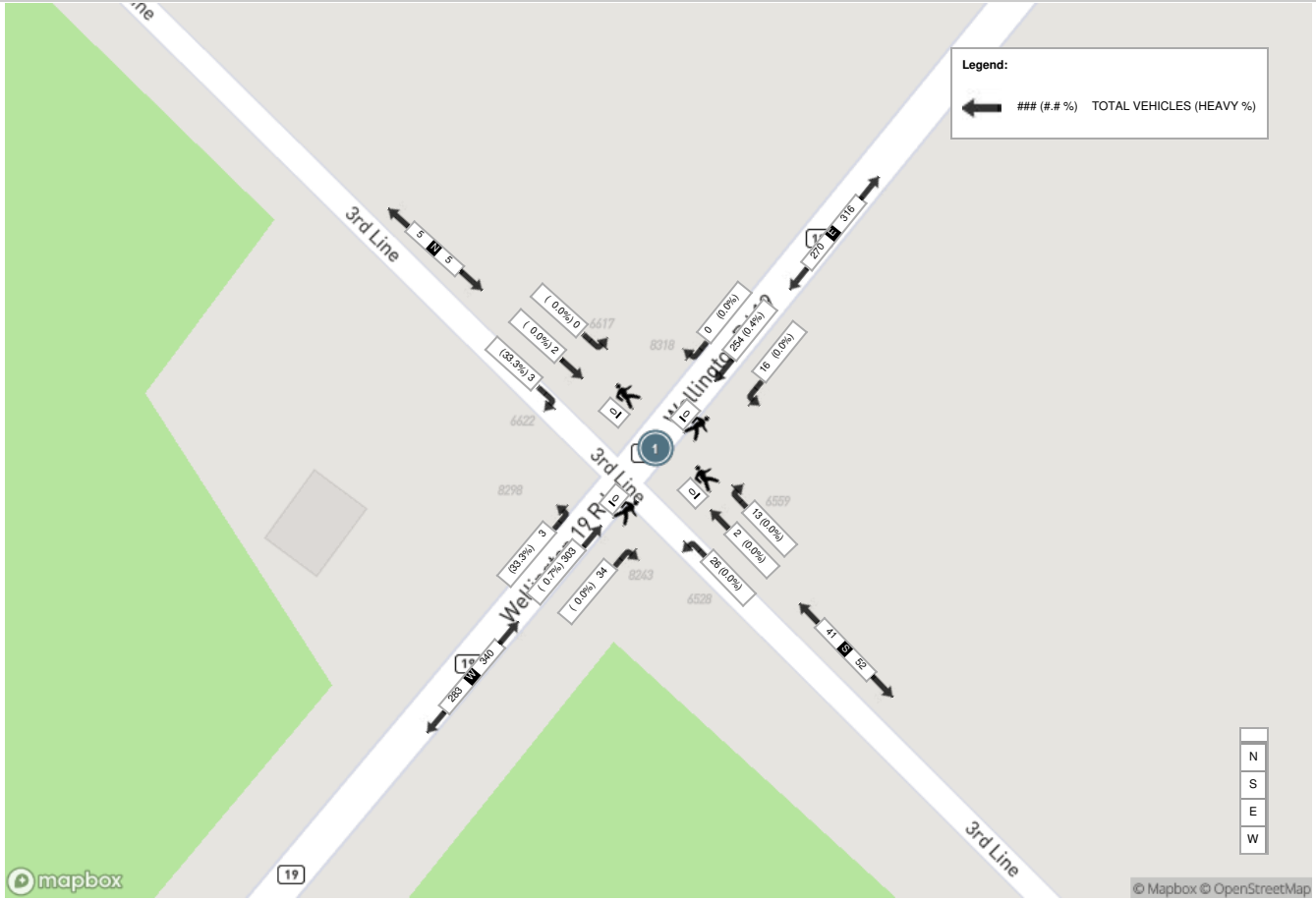
Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

**Peak Hour: 01:30 PM - 02:30 PM Weather: Clear Sky (20.39 °C)**

| Start Time | N Approach THIRD LINE | | | | | | E Approach WELLINGTON COUNTY RD 19 | | | | | | S Approach THIRD LINE | | | | | | W Approach WELLINGTON COUNTY RD 19 | | | | | | 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 | |
| 13:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 | 3 | 0 | 0 | 58 | 0 | 0 | 3 | 0 | 0 | 3 | 10 | 70 | 0 | 1 | 0 | 81 | 142 |
| 13:45:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 69 | 7 | 0 | 0 | 76 | 3 | 1 | 5 | 0 | 0 | 9 | 10 | 79 | 1 | 0 | 0 | 90 | 176 |
| 14:00:00 | 2 | 1 | 0 | 0 | 0 | 3 | 0 | 66 | 2 | 0 | 0 | 68 | 3 | 0 | 12 | 0 | 0 | 15 | 9 | 71 | 0 | 0 | 0 | 80 | 166 |
| 14:15:00 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 64 | 4 | 0 | 0 | 68 | 7 | 1 | 6 | 0 | 0 | 14 | 5 | 83 | 2 | 0 | 0 | 90 | 173 |
| **Grand Total** | 3 | 2 | 0 | 0 | 0 | 5 | 0 | 254 | 16 | 0 | 0 | 270 | 13 | 2 | 26 | 0 | 0 | 41 | 34 | 303 | 3 | 1 | 0 | 341 | **657** |
| **Approach%** | 60% | 40% | 0% | 0% | | - | 0% | 94.1% | 5.9% | 0% | | - | 31.7% | 4.9% | 63.4% | 0% | | - | 10% | 88.9% | 0.9% | 0.3% | | - | **-** |
| **Totals %** | 0.5% | 0.3% | 0% | 0% | | 0.8% | 0% | 38.7% | 2.4% | 0% | | 41.1% | 2% | 0.3% | 4% | 0% | | 6.2% | 5.2% | 46.1% | 0.5% | 0.2% | | 51.9% | **-** |
| **PHF** | 0.38 | 0.5 | 0 | 0 | | 0.42 | 0 | 0.92 | 0.57 | 0 | | 0.89 | 0.46 | 0.5 | 0.54 | 0 | | 0.68 | 0.85 | 0.91 | 0.38 | 0.25 | | 0.95 | **-** |
| **Heavy** | 1 | 0 | 0 | 0 | | 1 | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 2 | 1 | 0 | | 3 | **-** |
| **Heavy %** | 33.3% | 0% | 0% | 0% | | 20% | 0% | 0.4% | 0% | 0% | | 0.4% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.7% | 33.3% | 0% | | 0.9% | **-** |
| **Lights** | 2 | 2 | 0 | 0 | | 4 | 0 | 253 | 16 | 0 | | 269 | 13 | 2 | 26 | 0 | | 41 | 34 | 301 | 2 | 1 | | 338 | **-** |
| **Lights %** | 66.7% | 100% | 0% | 0% | | 80% | 0% | 99.6% | 100% | 0% | | 99.6% | 100% | 100% | 100% | 0% | | 100% | 100% | 99.3% | 66.7% | 100% | | 99.1% | **-** |
| **Single-Unit Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | 0 | | 2 | **-** |
| **Single-Unit Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.7% | 0% | 0% | | 0.6% | **-** |
| **Articulated Trucks** | 1 | 0 | 0 | 0 | | 1 | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 1 | 0 | | 1 | **-** |
| **Articulated Trucks %** | 33.3% | 0% | 0% | 0% | | 20% | 0% | 0.4% | 0% | 0% | | 0.4% | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 33.3% | 0% | | 0.3% | **-** |
| **Bicycles on Road** | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | 0 | - | 0 | 1 | 0 | 0 | 0 | - | **-** |
| **Bicycles on Road%** | - | - | - | - | % | | - | - | - | - | % | | - | - | - | - | % | | - | - | - | - | % | | **-** |

**Peak Hour: 01:30 PM - 02:30 PM Weather: Clear Sky (20.39 °C)**



Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

## Turning Movement Count (1 . WELLINGTON RD 19 & 3 LINE)

| Start Time | N Approach THIRD LINE | | | | | | E Approach WELLINGTON COUNTY RD 19 | | | | | | S Approach THIRD LINE | | | | | | W Approach WELLINGTON COUNTY RD 19 | | | | | | 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 | 30 | 0 | 0 | 0 | 30 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 30 | 0 | 0 | 0 | 31 | 64 | |
| 07:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 29 | 1 | 0 | 2 | 0 | 0 | 3 | 3 | 25 | 0 | 0 | 0 | 28 | 60 | |
| 07:30:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 31 | 0 | 0 | 3 | 0 | 0 | 3 | 4 | 27 | 0 | 0 | 0 | 31 | 65 | |
| 07:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 1 | 0 | 0 | 46 | 2 | 0 | 2 | 0 | 0 | 4 | 4 | 40 | 1 | 0 | 0 | 45 | 95 | 284 |
| 08:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 3 | 0 | 0 | 38 | 1 | 1 | 18 | 0 | 0 | 20 | 10 | 23 | 0 | 0 | 0 | 33 | 91 | 311 |
| 08:15:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 42 | 1 | 0 | 0 | 43 | 2 | 0 | 8 | 0 | 0 | 10 | 9 | 30 | 0 | 0 | 0 | 39 | 93 | 344 |
| 08:30:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 41 | 1 | 0 | 0 | 42 | 1 | 0 | 7 | 0 | 0 | 8 | 9 | 39 | 1 | 0 | 0 | 49 | 100 | 379 |
| 08:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 48 | 2 | 0 | 12 | 0 | 0 | 14 | 5 | 25 | 1 | 0 | 0 | 31 | 93 | 377 |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16:00:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 50 | 0 | 0 | 0 | 50 | 0 | 0 | 13 | 0 | 0 | 13 | 17 | 52 | 0 | 0 | 0 | 69 | 133 | |
| 16:15:00 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 51 | 2 | 0 | 0 | 53 | 2 | 0 | 14 | 0 | 0 | 16 | 8 | 38 | 4 | 0 | 0 | 50 | 121 | |
| 16:30:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 48 | 1 | 0 | 0 | 49 | 1 | 0 | 11 | 0 | 0 | 12 | 14 | 64 | 0 | 0 | 0 | 78 | 140 | |
| 16:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 53 | 1 | 0 | 10 | 0 | 0 | 11 | 9 | 58 | 1 | 0 | 0 | 68 | 132 | 526 |
| 17:00:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 62 | 0 | 0 | 0 | 62 | 1 | 0 | 4 | 0 | 0 | 5 | 9 | 58 | 1 | 0 | 0 | 68 | 136 | 529 |
| 17:15:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 42 | 0 | 0 | 2 | 0 | 0 | 2 | 7 | 48 | 2 | 0 | 0 | 57 | 101 | 509 |
| 17:30:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 44 | 1 | 0 | 0 | 45 | 0 | 0 | 4 | 0 | 0 | 4 | 5 | 46 | 0 | 0 | 0 | 51 | 101 | 470 |
| 17:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 27 | 2 | 0 | 4 | 0 | 0 | 6 | 0 | 42 | 0 | 0 | 0 | 42 | 75 | 413 |
| **Grand Total** | 7 | 0 | 1 | 0 | 0 | 8 | 0 | 678 | 10 | 0 | 0 | 688 | 18 | 1 | 115 | 0 | 0 | 134 | 114 | 645 | 11 | 0 | 0 | 770 | **1600** | - |
| **Approach%** | 87.5% | 0% | 12.5% | 0% | | - | 0% | 98.5% | 1.5% | 0% | | - | 13.4% | 0.7% | 85.8% | 0% | | - | 14.8% | 83.8% | 1.4% | 0% | | - | - | - |
| **Totals %** | 0.4% | 0% | 0.1% | 0% | | 0.5% | 0% | 42.4% | 0.6% | 0% | | 43% | 1.1% | 0.1% | 7.2% | 0% | | 8.4% | 7.1% | 40.3% | 0.7% | 0% | | 48.1% | - | - |
| **Heavy** | 0 | 0 | 0 | 0 | | - | 0 | 27 | 1 | 0 | | - | 2 | 0 | 0 | 0 | | - | 2 | 28 | 0 | 0 | | - | - | - |
| **Heavy %** | 0% | 0% | 0% | 0% | | - | 0% | 4% | 10% | 0% | | - | 11.1% | 0% | 0% | 0% | | - | 1.8% | 4.3% | 0% | 0% | | - | - | - |
| **Bicycles** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - |
| **Bicycle %** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - |

Spectrum

Turning Movement Count
Location Name: WELLINGTON RD 19 & 3 LINE
Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

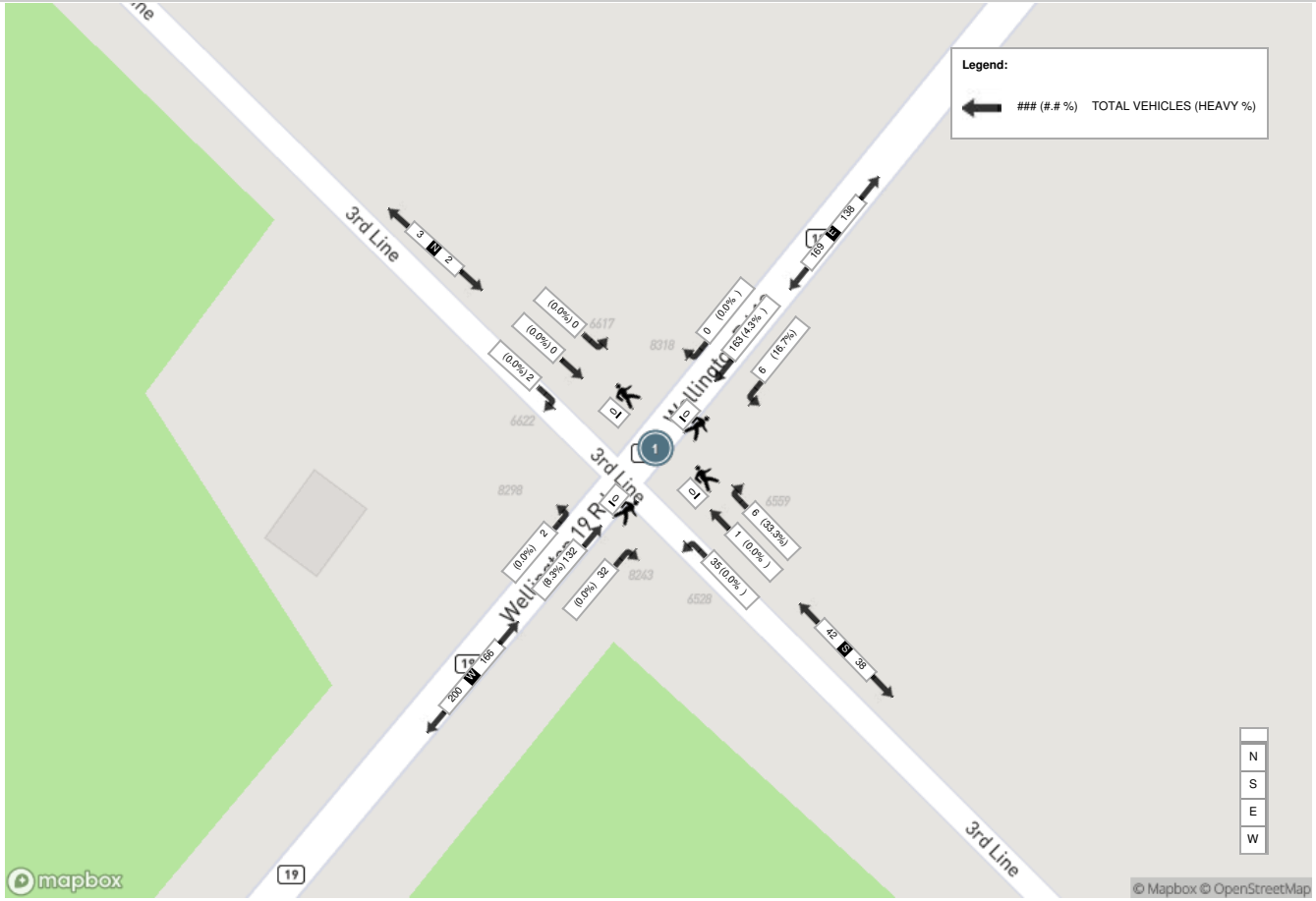
**Peak Hour: 07:45 AM - 08:45 AM** **Weather: Clear Sky (19.12 °C)**

| Start Time | N Approach THIRD LINE | | | | | | E Approach WELLINGTON COUNTY RD 19 | | | | | | S Approach THIRD LINE | | | | | | W Approach WELLINGTON COUNTY RD 19 | | | | | | 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 | |
| 07:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 1 | 0 | 0 | 46 | 2 | 0 | 2 | 0 | 0 | 4 | 4 | 40 | 1 | 0 | 0 | 45 | 95 |
| 08:00:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 3 | 0 | 0 | 38 | 1 | 1 | 18 | 0 | 0 | 20 | 10 | 23 | 0 | 0 | 0 | 33 | 91 |
| 08:15:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 42 | 1 | 0 | 0 | 43 | 2 | 0 | 8 | 0 | 0 | 10 | 9 | 30 | 0 | 0 | 0 | 39 | 93 |
| 08:30:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 41 | 1 | 0 | 0 | 42 | 1 | 0 | 7 | 0 | 0 | 8 | 9 | 39 | 1 | 0 | 0 | 49 | 100 |
| **Grand Total** | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 163 | 6 | 0 | 0 | 169 | 6 | 1 | 35 | 0 | 0 | 42 | 32 | 132 | 2 | 0 | 0 | 166 | **379** |
| **Approach%** | 100% | 0% | 0% | 0% | | - | 0% | 96.4% | 3.6% | 0% | | - | 14.3% | 2.4% | 83.3% | 0% | | - | 19.3% | 79.5% | 1.2% | 0% | | - | **-** |
| **Totals %** | 0.5% | 0% | 0% | 0% | | 0.5% | 0% | 43% | 1.6% | 0% | | 44.6% | 1.6% | 0.3% | 9.2% | 0% | | 11.1% | 8.4% | 34.8% | 0.5% | 0% | | 43.8% | **-** |
| **PHF** | 0.5 | 0 | 0 | 0 | | 0.5 | 0 | 0.91 | 0.5 | 0 | | 0.92 | 0.75 | 0.25 | 0.49 | 0 | | 0.53 | 0.8 | 0.83 | 0.5 | 0 | | 0.85 | **-** |
| **Heavy** | 0 | 0 | 0 | 0 | | 0 | 0 | 7 | 1 | 0 | | 8 | 2 | 0 | 0 | 0 | | 2 | 0 | 11 | 0 | 0 | | 11 | **-** |
| **Heavy %** | 0% | 0% | 0% | 0% | | 0% | 0% | 4.3% | 16.7% | 0% | | 4.7% | 33.3% | 0% | 0% | 0% | | 4.8% | 0% | 8.3% | 0% | 0% | | 6.6% | **-** |
| **Lights** | 2 | 0 | 0 | 0 | | 2 | 0 | 156 | 5 | 0 | | 161 | 4 | 1 | 35 | 0 | | 40 | 32 | 121 | 2 | 0 | | 155 | **-** |
| **Lights %** | 100% | 0% | 0% | 0% | | 100% | 0% | 95.7% | 83.3% | 0% | | 95.3% | 66.7% | 100% | 100% | 0% | | 95.2% | 100% | 91.7% | 100% | 0% | | 93.4% | **-** |
| **Single-Unit Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 7 | 1 | 0 | | 8 | 2 | 0 | 0 | 0 | | 2 | 0 | 6 | 0 | 0 | | 6 | **-** |
| **Single-Unit Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 4.3% | 16.7% | 0% | | 4.7% | 33.3% | 0% | 0% | 0% | | 4.8% | 0% | 4.5% | 0% | 0% | | 3.6% | **-** |
| **Articulated Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 5 | 0 | 0 | | 5 | **-** |
| **Articulated Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0% | 3.8% | 0% | 0% | | 3% | **-** |

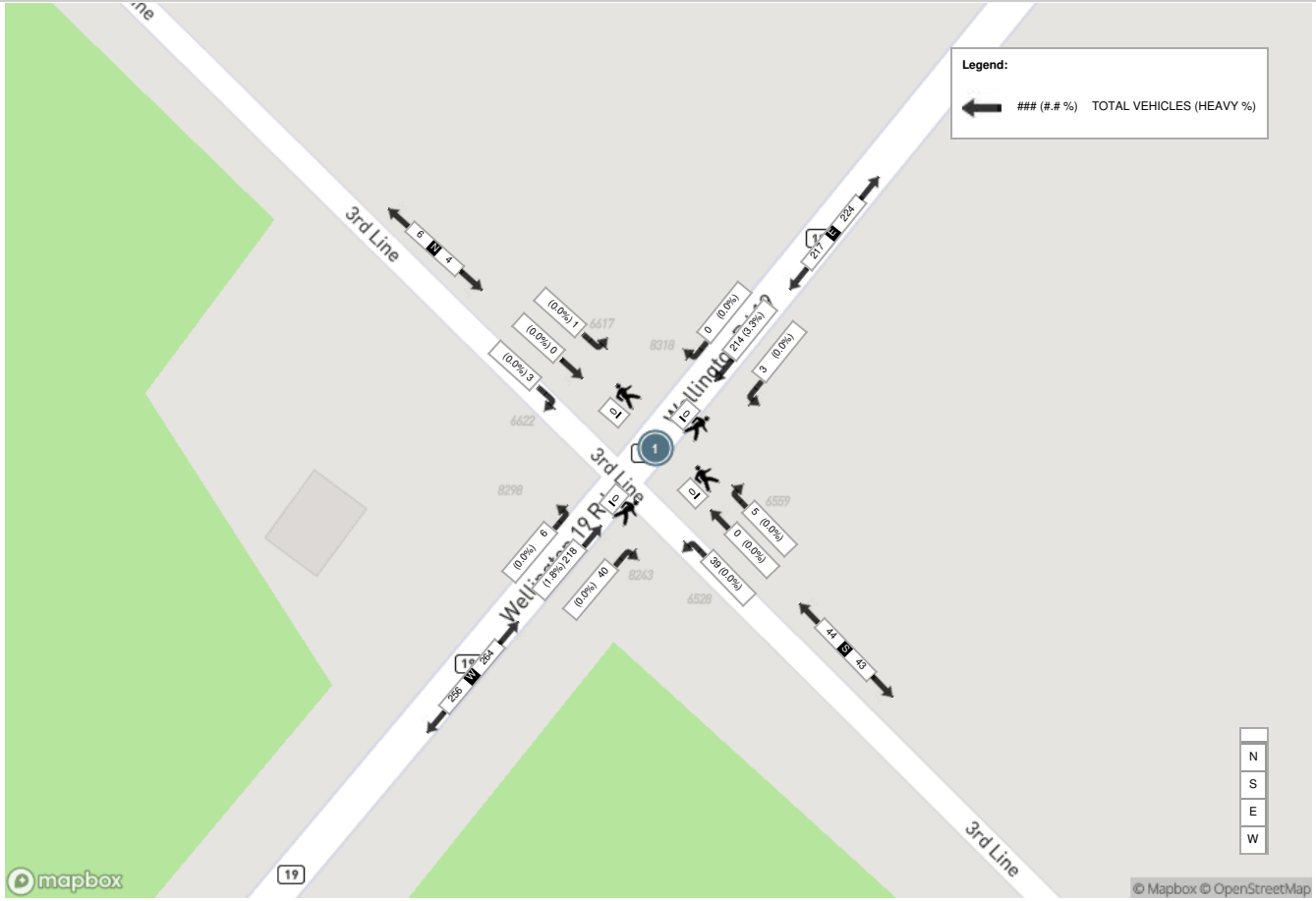
**Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (24.71 °C)**

| Start Time | N Approach THIRD LINE | | | | | | E Approach WELLINGTON COUNTY RD 19 | | | | | | S Approach THIRD LINE | | | | | | W Approach WELLINGTON COUNTY RD 19 | | | | | | 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 | |
| 16:15:00 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 51 | 2 | 0 | 0 | 53 | 2 | 0 | 14 | 0 | 0 | 16 | 8 | 38 | 4 | 0 | 0 | 50 | 121 |
| 16:30:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 48 | 1 | 0 | 0 | 49 | 1 | 0 | 11 | 0 | 0 | 12 | 14 | 64 | 0 | 0 | 0 | 78 | 140 |
| 16:45:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 53 | 1 | 0 | 10 | 0 | 0 | 11 | 9 | 58 | 1 | 0 | 0 | 68 | 132 |
| 17:00:00 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 62 | 0 | 0 | 0 | 62 | 1 | 0 | 4 | 0 | 0 | 5 | 9 | 58 | 1 | 0 | 0 | 68 | 136 |
| **Grand Total** | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 214 | 3 | 0 | 0 | 217 | 5 | 0 | 39 | 0 | 0 | 44 | 40 | 218 | 6 | 0 | 0 | 264 | **529** |
| **Approach%** | 75% | 0% | 25% | 0% | | - | 0% | 98.6% | 1.4% | 0% | | - | 11.4% | 0% | 88.6% | 0% | | - | 15.2% | 82.6% | 2.3% | 0% | | - | **-** |
| **Totals %** | 0.6% | 0% | 0.2% | 0% | | 0.8% | 0% | 40.5% | 0.6% | 0% | | 41% | 0.9% | 0% | 7.4% | 0% | | 8.3% | 7.6% | 41.2% | 1.1% | 0% | | 49.9% | **-** |
| **PHF** | 0.75 | 0 | 0.25 | 0 | | 0.5 | 0 | 0.86 | 0.38 | 0 | | 0.88 | 0.63 | 0 | 0.7 | 0 | | 0.69 | 0.71 | 0.85 | 0.38 | 0 | | 0.85 | **-** |
| **Heavy** | 0 | 0 | 0 | 0 | | 0 | 0 | 7 | 0 | 0 | | 7 | 0 | 0 | 0 | 0 | | 0 | 0 | 4 | 0 | 0 | | 4 | **-** |
| **Heavy %** | 0% | 0% | 0% | 0% | | 0% | 0% | 3.3% | 0% | 0% | | 3.2% | 0% | 0% | 0% | 0% | | 0% | 0% | 1.8% | 0% | 0% | | 1.5% | **-** |
| **Lights** | 3 | 0 | 1 | 0 | | 4 | 0 | 207 | 3 | 0 | | 210 | 5 | 0 | 39 | 0 | | 44 | 40 | 214 | 6 | 0 | | 260 | **-** |
| **Lights %** | 100% | 0% | 100% | 0% | | 100% | 0% | 96.7% | 100% | 0% | | 96.8% | 100% | 0% | 100% | 0% | | 100% | 100% | 98.2% | 100% | 0% | | 98.5% | **-** |
| **Single-Unit Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 5 | 0 | 0 | | 5 | 0 | 0 | 0 | 0 | | 0 | 0 | 3 | 0 | 0 | | 3 | **-** |
| **Single-Unit Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 2.3% | 0% | 0% | | 2.3% | 0% | 0% | 0% | 0% | | 0% | 0% | 1.4% | 0% | 0% | | 1.1% | **-** |
| **Articulated Trucks** | 0 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | 0 | | 2 | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 0 | 0 | | 1 | **-** |
| **Articulated Trucks %** | 0% | 0% | 0% | 0% | | 0% | 0% | 0.9% | 0% | 0% | | 0.9% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.5% | 0% | 0% | | 0.4% | **-** |

**Peak Hour: 07:45 AM - 08:45 AM** **Weather: Clear Sky (19.12 °C)**



**Peak Hour: 04:15 PM - 05:15 PM** **Weather: Broken Clouds (24.71 °C)**



# Appendix D
# Synchro Worksheets

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 130 | 35 | 5 | 165 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 0 | 130 | 35 | 5 | 165 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 141 | 38 | 5 | 179 | 0 | 38 | 0 | 5 | 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 | 179 | | | 179 | | | 330 | 330 | 141 | 335 | 368 | 179 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 179 | | | 179 | | | 330 | 330 | 141 | 335 | 368 | 179 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 94 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1397 | | | 1397 | | | 622 | 587 | 907 | 614 | 559 | 864 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 141 | 38 | 184 | 43 | 0 |
| Volume Left | 0 | 0 | 5 | 38 | 0 |
| Volume Right | 0 | 38 | 0 | 5 | 0 |
| cSH | 1397 | 1700 | 1397 | 645 | 1700 |
| Volume to Capacity | 0.00 | 0.02 | 0.00 | 0.07 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.1 | 1.7 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.2 | 11.0 | 0.0 |
| Lane LOS | | | A | B | A |
| Approach Delay (s) | 0.0 | | 0.2 | 11.0 | 0.0 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.3 | | | | |
| Intersection Capacity Utilization | 22.7% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 110 | 5 | 60 | 135 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Future Volume (Veh/h) | 10 | 110 | 5 | 60 | 135 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 120 | 5 | 65 | 147 | 5 | 5 | 43 | 54 | 5 | 22 | 11 |
| 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 | 152 | | | 125 | | | 441 | 424 | 120 | 494 | 424 | 147 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 152 | | | 125 | | | 441 | 424 | 120 | 494 | 424 | 147 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 96 | | | 99 | 91 | 94 | 99 | 96 | 99 |
| cM capacity (veh/h) | 1441 | | | 1474 | | | 486 | 498 | 937 | 413 | 498 | 905 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 131 | 5 | 212 | 5 | 102 | 38 |
| Volume Left | 11 | 0 | 65 | 0 | 5 | 5 |
| Volume Right | 0 | 5 | 0 | 5 | 54 | 11 |
| cSH | 1441 | 1700 | 1474 | 1700 | 661 | 555 |
| Volume to Capacity | 0.01 | 0.00 | 0.04 | 0.00 | 0.15 | 0.07 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.1 | 0.0 | 4.3 | 1.8 |
| Control Delay (s) | 0.7 | 0.0 | 2.6 | 0.0 | 11.4 | 12.0 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.7 | | 2.5 | | 11.4 | 12.0 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.6 | | | | |
| Intersection Capacity Utilization | 29.8% | 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) | 5 | 235 | 40 | 5 | 225 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 235 | 40 | 5 | 225 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 255 | 43 | 5 | 245 | 0 | 43 | 0 | 5 | 0 | 0 | 5 |
| 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 | 245 | | | 298 | | | 525 | 520 | 255 | 525 | 563 | 245 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 245 | | | 298 | | | 525 | 520 | 255 | 525 | 563 | 245 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 91 | 100 | 99 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1321 | | | 1263 | | | 458 | 457 | 784 | 457 | 432 | 794 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 260 | 43 | 250 | 48 | 5 |
| Volume Left | 5 | 0 | 5 | 43 | 0 |
| Volume Right | 0 | 43 | 0 | 5 | 5 |
| cSH | 1321 | 1700 | 1263 | 478 | 794 |
| Volume to Capacity | 0.00 | 0.03 | 0.00 | 0.10 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.1 | 2.7 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.2 | 13.4 | 9.6 |
| Lane LOS | A | | A | B | A |
| Approach Delay (s) | 0.2 | | 0.2 | 13.4 | 9.6 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.3 | | | | |
| Intersection Capacity Utilization | 31.7% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 190 | 10 | 65 | 190 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Future Volume (Veh/h) | 20 | 190 | 10 | 65 | 190 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 207 | 11 | 71 | 207 | 16 | 16 | 49 | 92 | 5 | 27 | 22 |
| 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 | 223 | | | 218 | | | 636 | 616 | 207 | 716 | 611 | 207 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 223 | | | 218 | | | 636 | 616 | 207 | 716 | 611 | 207 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 95 | | | 95 | 87 | 89 | 98 | 93 | 97 |
| cM capacity (veh/h) | 1346 | | | 1352 | | | 341 | 378 | 833 | 262 | 381 | 833 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 229 | 11 | 278 | 16 | 157 | 54 |
| Volume Left | 22 | 0 | 71 | 0 | 16 | 5 |
| Volume Right | 0 | 11 | 0 | 16 | 92 | 22 |
| cSH | 1346 | 1700 | 1352 | 1700 | 548 | 464 |
| Volume to Capacity | 0.02 | 0.01 | 0.05 | 0.01 | 0.29 | 0.12 |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.3 | 0.0 | 9.4 | 3.1 |
| Control Delay (s) | 0.9 | 0.0 | 2.3 | 0.0 | 14.2 | 13.8 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.8 | | 2.2 | | 14.2 | 13.8 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.1 | | | | |
| Intersection Capacity Utilization | 45.9% | 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) | 5 | 305 | 35 | 15 | 265 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 305 | 35 | 15 | 265 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 332 | 38 | 16 | 288 | 0 | 27 | 0 | 16 | 0 | 0 | 5 |
| 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 | 288 | | | 370 | | | 667 | 662 | 332 | 678 | 700 | 288 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 288 | | | 370 | | | 667 | 662 | 332 | 678 | 700 | 288 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 93 | 100 | 98 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1274 | | | 1189 | | | 365 | 375 | 710 | 353 | 357 | 751 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 337 | 38 | 304 | 43 | 5 |
| Volume Left | 5 | 0 | 16 | 27 | 0 |
| Volume Right | 0 | 38 | 0 | 16 | 5 |
| cSH | 1274 | 1700 | 1189 | 446 | 751 |
| Volume to Capacity | 0.00 | 0.02 | 0.01 | 0.10 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.3 | 2.5 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.5 | 13.9 | 9.8 |
| Lane LOS | A | | A | B | A |
| Approach Delay (s) | 0.1 | | 0.5 | 13.9 | 9.8 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.2 | | | | |
| Intersection Capacity Utilization | 41.8% | 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) | 10 | 240 | 10 | 75 | 210 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Future Volume (Veh/h) | 10 | 240 | 10 | 75 | 210 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 261 | 11 | 82 | 228 | 11 | 11 | 33 | 103 | 11 | 27 | 11 |
| 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 | 239 | | | 272 | | | 700 | 686 | 261 | 794 | 686 | 228 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 239 | | | 272 | | | 700 | 686 | 261 | 794 | 686 | 228 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 94 | | | 96 | 90 | 87 | 95 | 92 | 99 |
| cM capacity (veh/h) | 1328 | | | 1291 | | | 311 | 344 | 778 | 233 | 344 | 811 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 272 | 11 | 310 | 11 | 147 | 49 |
| Volume Left | 11 | 0 | 82 | 0 | 11 | 11 |
| Volume Right | 0 | 11 | 0 | 11 | 103 | 11 |
| cSH | 1328 | 1700 | 1291 | 1700 | 557 | 352 |
| Volume to Capacity | 0.01 | 0.01 | 0.06 | 0.01 | 0.26 | 0.14 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.6 | 0.0 | 8.4 | 3.8 |
| Control Delay (s) | 0.4 | 0.0 | 2.5 | 0.0 | 13.8 | 16.9 |
| Lane LOS | A | | A | | B | C |
| Approach Delay (s) | 0.4 | | 2.5 | | 13.8 | 16.9 |
| Approach LOS | | | | | B | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.7 | | | | |
| Intersection Capacity Utilization | 47.0% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 145 | 35 | 5 | 180 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 0 | 145 | 35 | 5 | 180 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 158 | 38 | 5 | 196 | 0 | 38 | 0 | 5 | 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 | 196 | | | 196 | | | 364 | 364 | 158 | 369 | 402 | 196 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 196 | | | 196 | | | 364 | 364 | 158 | 369 | 402 | 196 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 94 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1377 | | | 1377 | | | 590 | 562 | 887 | 583 | 535 | 845 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 158 | 38 | 201 | 43 | 0 |
| Volume Left | 0 | 0 | 5 | 38 | 0 |
| Volume Right | 0 | 38 | 0 | 5 | 0 |
| cSH | 1377 | 1700 | 1377 | 614 | 1700 |
| Volume to Capacity | 0.00 | 0.02 | 0.00 | 0.07 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.1 | 1.8 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.2 | 11.3 | 0.0 |
| Lane LOS | | | A | B | A |
| Approach Delay (s) | 0.0 | | 0.2 | 11.3 | 0.0 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.2 | | | | |
| Intersection Capacity Utilization | 23.5% | 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) | 10 | 125 | 5 | 60 | 150 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Future Volume (Veh/h) | 10 | 125 | 5 | 60 | 150 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 136 | 5 | 65 | 163 | 5 | 5 | 43 | 54 | 5 | 22 | 11 |
| 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 | 168 | | | 141 | | | 473 | 456 | 136 | 526 | 456 | 163 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 168 | | | 141 | | | 473 | 456 | 136 | 526 | 456 | 163 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 96 | | | 99 | 91 | 94 | 99 | 95 | 99 |
| cM capacity (veh/h) | 1422 | | | 1455 | | | 462 | 477 | 918 | 392 | 477 | 887 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 147 | 5 | 228 | 5 | 102 | 38 |
| Volume Left | 11 | 0 | 65 | 0 | 5 | 5 |
| Volume Right | 0 | 5 | 0 | 5 | 54 | 11 |
| cSH | 1422 | 1700 | 1455 | 1700 | 639 | 533 |
| Volume to Capacity | 0.01 | 0.00 | 0.04 | 0.00 | 0.16 | 0.07 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.1 | 0.0 | 4.5 | 1.8 |
| Control Delay (s) | 0.6 | 0.0 | 2.4 | 0.0 | 11.7 | 12.3 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.6 | | 2.4 | | 11.7 | 12.3 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.4 | | | | |
| Intersection Capacity Utilization | 34.4% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 260 | 40 | 5 | 250 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 260 | 40 | 5 | 250 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 283 | 43 | 5 | 272 | 0 | 43 | 0 | 5 | 0 | 0 | 5 |
| 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 | 272 | | | 326 | | | 580 | 575 | 283 | 580 | 618 | 272 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 272 | | | 326 | | | 580 | 575 | 283 | 580 | 618 | 272 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 90 | 100 | 99 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1291 | | | 1234 | | | 420 | 425 | 756 | 420 | 402 | 767 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 288 | 43 | 277 | 48 | 5 |
| Volume Left | 5 | 0 | 5 | 43 | 0 |
| Volume Right | 0 | 43 | 0 | 5 | 5 |
| cSH | 1291 | 1700 | 1234 | 441 | 767 |
| Volume to Capacity | 0.00 | 0.03 | 0.00 | 0.11 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.1 | 2.9 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.2 | 14.2 | 9.7 |
| Lane LOS | A | | A | B | A |
| Approach Delay (s) | 0.1 | | 0.2 | 14.2 | 9.7 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.3 | | | | |
| Intersection Capacity Utilization | 33.0% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 215 | 10 | 65 | 215 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Future Volume (Veh/h) | 20 | 215 | 10 | 65 | 215 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 234 | 11 | 71 | 234 | 16 | 16 | 49 | 92 | 5 | 27 | 22 |
| 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 | 250 | | | 245 | | | 690 | 670 | 234 | 770 | 665 | 234 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 250 | | | 245 | | | 690 | 670 | 234 | 770 | 665 | 234 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 95 | | | 95 | 86 | 89 | 98 | 92 | 97 |
| cM capacity (veh/h) | 1316 | | | 1321 | | | 312 | 352 | 805 | 238 | 354 | 805 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 256 | 11 | 305 | 16 | 157 | 54 |
| Volume Left | 22 | 0 | 71 | 0 | 16 | 5 |
| Volume Right | 0 | 11 | 0 | 16 | 92 | 22 |
| cSH | 1316 | 1700 | 1321 | 1700 | 515 | 433 |
| Volume to Capacity | 0.02 | 0.01 | 0.05 | 0.01 | 0.30 | 0.12 |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.4 | 0.0 | 10.2 | 3.4 |
| Control Delay (s) | 0.8 | 0.0 | 2.2 | 0.0 | 15.0 | 14.5 |
| Lane LOS | A | | A | | C | B |
| Approach Delay (s) | 0.8 | | 2.1 | | 15.0 | 14.5 |
| Approach LOS | | | | | C | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.0 | | | | |
| Intersection Capacity Utilization | 48.6% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 335 | 35 | 15 | 295 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 335 | 35 | 15 | 295 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 364 | 38 | 16 | 321 | 0 | 27 | 0 | 16 | 0 | 0 | 5 |
| 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 | 321 | | | 402 | | | 732 | 727 | 364 | 743 | 765 | 321 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 321 | | | 402 | | | 732 | 727 | 364 | 743 | 765 | 321 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 92 | 100 | 98 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1239 | | | 1157 | | | 330 | 344 | 681 | 319 | 327 | 720 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 369 | 38 | 337 | 43 | 5 |
| Volume Left | 5 | 0 | 16 | 27 | 0 |
| Volume Right | 0 | 38 | 0 | 16 | 5 |
| cSH | 1239 | 1700 | 1157 | 408 | 720 |
| Volume to Capacity | 0.00 | 0.02 | 0.01 | 0.11 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.3 | 2.8 | 0.2 |
| Control Delay (s) | 0.1 | 0.0 | 0.5 | 14.9 | 10.0 |
| Lane LOS | A | | A | B | B |
| Approach Delay (s) | 0.1 | | 0.5 | 14.9 | 10.0 |
| Approach LOS | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.2 | | | | |
| Intersection Capacity Utilization | 43.4% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 270 | 10 | 75 | 240 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Future Volume (Veh/h) | 10 | 270 | 10 | 75 | 240 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 293 | 11 | 82 | 261 | 11 | 11 | 33 | 103 | 11 | 27 | 11 |
| 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 | 272 | | | 304 | | | 764 | 751 | 293 | 860 | 751 | 261 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 272 | | | 304 | | | 764 | 751 | 293 | 860 | 751 | 261 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 93 | | | 96 | 90 | 86 | 95 | 91 | 99 |
| cM capacity (veh/h) | 1291 | | | 1257 | | | 279 | 315 | 746 | 207 | 315 | 778 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 304 | 11 | 343 | 11 | 147 | 49 |
| Volume Left | 11 | 0 | 82 | 0 | 11 | 11 |
| Volume Right | 0 | 11 | 0 | 11 | 103 | 11 |
| cSH | 1291 | 1700 | 1257 | 1700 | 521 | 320 |
| Volume to Capacity | 0.01 | 0.01 | 0.07 | 0.01 | 0.28 | 0.15 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.7 | 0.0 | 9.2 | 4.3 |
| Control Delay (s) | 0.4 | 0.0 | 2.4 | 0.0 | 14.6 | 18.3 |
| Lane LOS | A | | A | | B | C |
| Approach Delay (s) | 0.3 | | 2.3 | | 14.6 | 18.3 |
| Approach LOS | | | | | B | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.6 | | | | |
| Intersection Capacity Utilization | 50.2% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 180 | 10 | 10 | 215 | 15 | 35 | 0 | 15 | 5 | 0 | 5 |
| Future Volume (Veh/h) | 10 | 180 | 10 | 10 | 215 | 15 | 35 | 0 | 15 | 5 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 196 | 11 | 11 | 234 | 16 | 38 | 0 | 16 | 5 | 0 | 5 |
| 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 | 250 | | | 207 | | | 484 | 496 | 202 | 498 | 493 | 242 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 250 | | | 207 | | | 484 | 496 | 202 | 498 | 493 | 242 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 92 | 100 | 98 | 99 | 100 | 99 |
| cM capacity (veh/h) | 1316 | | | 1364 | | | 484 | 468 | 839 | 468 | 469 | 797 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 7 | 211 | 7 | 254 | 54 | 10 |
| Volume Left | 7 | 4 | 7 | 4 | 38 | 5 |
| Volume Right | 0 | 11 | 0 | 16 | 16 | 5 |
| cSH | 1316 | 1316 | 1364 | 1364 | 553 | 589 |
| Volume to Capacity | 0.01 | 0.01 | 0.01 | 0.01 | 0.10 | 0.02 |
| Queue Length 95th (m) | 0.2 | 0.2 | 0.2 | 0.2 | 2.6 | 0.4 |
| Control Delay (s) | 7.8 | 0.2 | 7.7 | 0.2 | 12.2 | 11.2 |
| Lane LOS | A | A | A | A | B | B |
| Approach Delay (s) | 0.5 | | 0.4 | | 12.2 | 11.2 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.8 | | | | |
| Intersection Capacity Utilization | 21.0% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 135 | 5 | 75 | 170 | 10 | 5 | 40 | 60 | 5 | 20 | 10 |
| Future Volume (Veh/h) | 10 | 135 | 5 | 75 | 170 | 10 | 5 | 40 | 60 | 5 | 20 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 147 | 5 | 82 | 185 | 11 | 5 | 43 | 65 | 5 | 22 | 11 |
| 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 | 196 | | | 152 | | | 540 | 529 | 147 | 604 | 523 | 185 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 196 | | | 152 | | | 540 | 529 | 147 | 604 | 523 | 185 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 94 | | | 99 | 90 | 93 | 99 | 95 | 99 |
| cM capacity (veh/h) | 1389 | | | 1441 | | | 411 | 428 | 905 | 337 | 432 | 862 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 158 | 5 | 267 | 11 | 113 | 38 |
| Volume Left | 11 | 0 | 82 | 0 | 5 | 5 |
| Volume Right | 0 | 5 | 0 | 11 | 65 | 11 |
| cSH | 1389 | 1700 | 1441 | 1700 | 613 | 484 |
| Volume to Capacity | 0.01 | 0.00 | 0.06 | 0.01 | 0.18 | 0.08 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.4 | 0.0 | 5.4 | 2.0 |
| Control Delay (s) | 0.6 | 0.0 | 2.7 | 0.0 | 12.2 | 13.1 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.6 | | 2.6 | | 12.2 | 13.1 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.5 | | | | |
| Intersection Capacity Utilization | 37.4% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 5 | 0 | 50 | 45 | 0 |
| Future Volume (Veh/h) | 5 | 5 | 0 | 50 | 45 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 54 | 49 | 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 | 103 | 49 | 49 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 103 | 49 | 49 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 895 | 1020 | 1558 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 10 | 54 | 49 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 5 | 0 | 0 |
| cSH | 953 | 1558 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.3 | 0.0 | 0.0 |
| Control Delay (s) | 8.8 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 8.8 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.8 | | |
| 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 | 165 | 35 | 10 | 200 | 0 | 40 | 0 | 15 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 0 | 165 | 35 | 10 | 200 | 0 | 40 | 0 | 15 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 179 | 38 | 11 | 217 | 0 | 43 | 0 | 16 | 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 | 217 | | | 217 | | | 418 | 418 | 179 | 434 | 456 | 217 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 217 | | | 217 | | | 418 | 418 | 179 | 434 | 456 | 217 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 92 | 100 | 98 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1353 | | | 1353 | | | 542 | 522 | 864 | 519 | 496 | 823 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 179 | 38 | 228 | 59 | 0 |
| Volume Left | 0 | 0 | 11 | 43 | 0 |
| Volume Right | 0 | 38 | 0 | 16 | 0 |
| cSH | 1353 | 1700 | 1353 | 603 | 1700 |
| Volume to Capacity | 0.00 | 0.02 | 0.01 | 0.10 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.2 | 2.6 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.4 | 11.6 | 0.0 |
| Lane LOS | | | A | B | A |
| Approach Delay (s) | 0.0 | | 0.4 | 11.6 | 0.0 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 1.6 | | |
| Intersection Capacity Utilization | 28.7% | ICU Level of Service | | A |
| Analysis Period (min) | | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 245 | 10 | 80 | 235 | 15 | 15 | 45 | 105 | 10 | 25 | 20 |
| Future Volume (Veh/h) | 20 | 245 | 10 | 80 | 235 | 15 | 15 | 45 | 105 | 10 | 25 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 266 | 11 | 87 | 255 | 16 | 16 | 49 | 114 | 11 | 27 | 22 |
| 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 | 271 | | | 277 | | | 774 | 755 | 266 | 878 | 750 | 255 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 271 | | | 277 | | | 774 | 755 | 266 | 878 | 750 | 255 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 93 | | | 94 | 84 | 85 | 94 | 91 | 97 |
| cM capacity (veh/h) | 1292 | | | 1286 | | | 268 | 310 | 773 | 189 | 312 | 784 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 288 | 11 | 342 | 16 | 179 | 60 |
| Volume Left | 22 | 0 | 87 | 0 | 16 | 11 |
| Volume Right | 0 | 11 | 0 | 16 | 114 | 22 |
| cSH | 1292 | 1700 | 1286 | 1700 | 490 | 347 |
| Volume to Capacity | 0.02 | 0.01 | 0.07 | 0.01 | 0.37 | 0.17 |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.7 | 0.0 | 13.3 | 4.9 |
| Control Delay (s) | 0.7 | 0.0 | 2.5 | 0.0 | 16.5 | 17.5 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.7 | | 2.4 | | 16.5 | 17.5 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.7 | | | |
| Intersection Capacity Utilization | 51.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 45 | 45 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 45 | 45 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 49 | 49 | 5 |
| 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 | 100 | 52 | 54 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 100 | 52 | 54 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 898 | 1016 | 1551 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 49 | 54 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 898 | 1551 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.0 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.4 | | | |
| 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) | 5 | 280 | 40 | 15 | 280 | 0 | 45 | 0 | 15 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 280 | 40 | 15 | 280 | 0 | 45 | 0 | 15 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 304 | 43 | 16 | 304 | 0 | 49 | 0 | 16 | 0 | 0 | 5 |
| 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 | 304 | | | 347 | | | 655 | 650 | 304 | 666 | 693 | 304 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 304 | | | 347 | | | 655 | 650 | 304 | 666 | 693 | 304 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 87 | 100 | 98 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1257 | | | 1212 | | | 372 | 382 | 736 | 360 | 360 | 736 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 309 | 43 | 320 | 65 | 5 |
| Volume Left | 5 | 0 | 16 | 49 | 0 |
| Volume Right | 0 | 43 | 0 | 16 | 5 |
| cSH | 1257 | 1700 | 1212 | 423 | 736 |
| Volume to Capacity | 0.00 | 0.03 | 0.01 | 0.15 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.3 | 4.3 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.5 | 15.0 | 9.9 |
| Lane LOS | A | | A | C | A |
| Approach Delay (s) | 0.1 | | 0.5 | 15.0 | 9.9 |
| Approach LOS | | | | C | A |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1.7 | | | |
| Intersection Capacity Utilization | 43.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 15 | 305 | 40 | 20 | 295 | 15 | 20 | 0 | 10 | 10 | 0 | 15 |
| Future Volume (Veh/h) | 15 | 305 | 40 | 20 | 295 | 15 | 20 | 0 | 10 | 10 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 332 | 43 | 22 | 321 | 16 | 22 | 0 | 11 | 11 | 0 | 16 |
| 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 | 337 | | | 375 | | | 766 | 766 | 354 | 748 | 780 | 329 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 337 | | | 375 | | | 766 | 766 | 354 | 748 | 780 | 329 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 98 | | | 93 | 100 | 98 | 97 | 100 | 98 |
| cM capacity (veh/h) | 1222 | | | 1183 | | | 305 | 322 | 690 | 316 | 316 | 712 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 11 | 380 | 15 | 344 | 33 | 27 |
| Volume Left | 11 | 5 | 15 | 7 | 22 | 11 |
| Volume Right | 0 | 43 | 0 | 16 | 11 | 16 |
| cSH | 1222 | 1222 | 1183 | 1183 | 374 | 471 |
| Volume to Capacity | 0.01 | 0.01 | 0.02 | 0.02 | 0.09 | 0.06 |
| Queue Length 95th (m) | 0.3 | 0.3 | 0.5 | 0.5 | 2.3 | 1.5 |
| Control Delay (s) | 8.0 | 0.2 | 8.1 | 0.4 | 15.5 | 13.1 |
| Lane LOS | A | A | A | A | C | B |
| Approach Delay (s) | 0.5 | | 0.7 | | 15.5 | 13.1 |
| Approach LOS | | | | | C | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1.6 | | | |
| Intersection Capacity Utilization | 26.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 5 | 50 | 45 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 5 | 50 | 45 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 54 | 49 | 5 |
| 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 | 116 | 52 | 54 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 116 | 52 | 54 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 878 | 1016 | 1551 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 59 | 54 |
| Volume Left | 5 | 5 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 878 | 1551 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.1 | 0.0 |
| Control Delay (s) | 9.1 | 0.6 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.1 | 0.6 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.7 | | |
| Intersection Capacity Utilization | | 16.8% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 55 | 50 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 55 | 50 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 60 | 54 | 5 |
| 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 | 116 | 56 | 59 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 116 | 56 | 59 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 880 | 1010 | 1545 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 60 | 59 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 880 | 1545 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.1 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.4 | | |
| 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) | 15 | 375 | 35 | 15 | 325 | 10 | 25 | 0 | 15 | 15 | 0 | 15 |
| Future Volume (Veh/h) | 15 | 375 | 35 | 15 | 325 | 10 | 25 | 0 | 15 | 15 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 408 | 38 | 16 | 353 | 11 | 27 | 0 | 16 | 16 | 0 | 16 |
| 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 | 364 | | | 446 | | | 860 | 855 | 427 | 846 | 868 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 364 | | | 446 | | | 860 | 855 | 427 | 846 | 868 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 90 | 100 | 97 | 94 | 100 | 98 |
| cM capacity (veh/h) | 1195 | | | 1114 | | | 264 | 287 | 628 | 269 | 282 | 686 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 11 | 451 | 11 | 369 | 43 | 32 |
| Volume Left | 11 | 5 | 11 | 5 | 27 | 16 |
| Volume Right | 0 | 38 | 0 | 11 | 16 | 16 |
| cSH | 1195 | 1195 | 1114 | 1114 | 337 | 386 |
| Volume to Capacity | 0.01 | 0.01 | 0.01 | 0.01 | 0.13 | 0.08 |
| Queue Length 95th (m) | 0.3 | 0.3 | 0.3 | 0.3 | 3.5 | 2.2 |
| Control Delay (s) | 8.1 | 0.2 | 8.3 | 0.3 | 17.3 | 15.2 |
| Lane LOS | A | A | A | A | C | C |
| Approach Delay (s) | 0.4 | | 0.5 | | 17.3 | 15.2 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.8 | | | | |
| Intersection Capacity Utilization | 27.1% | 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) | 10 | 300 | 10 | 85 | 265 | 15 | 10 | 30 | 110 | 15 | 25 | 10 |
| Future Volume (Veh/h) | 10 | 300 | 10 | 85 | 265 | 15 | 10 | 30 | 110 | 15 | 25 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 326 | 11 | 92 | 288 | 16 | 11 | 33 | 120 | 16 | 27 | 11 |
| 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 | 304 | | | 337 | | | 844 | 836 | 326 | 956 | 831 | 288 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 304 | | | 337 | | | 844 | 836 | 326 | 956 | 831 | 288 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 92 | | | 95 | 88 | 83 | 91 | 90 | 99 |
| cM capacity (veh/h) | 1257 | | | 1222 | | | 242 | 278 | 715 | 168 | 280 | 751 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 337 | 11 | 380 | 16 | 164 | 54 |
| Volume Left | 11 | 0 | 92 | 0 | 11 | 16 |
| Volume Right | 0 | 11 | 0 | 16 | 120 | 11 |
| cSH | 1257 | 1700 | 1222 | 1700 | 494 | 262 |
| Volume to Capacity | 0.01 | 0.01 | 0.08 | 0.01 | 0.33 | 0.21 |
| Queue Length 95th (m) | 0.2 | 0.0 | 2.0 | 0.0 | 11.5 | 6.1 |
| Control Delay (s) | 0.3 | 0.0 | 2.5 | 0.0 | 15.9 | 22.3 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.3 | | 2.4 | | 15.9 | 22.3 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.1 | | | | |
| Intersection Capacity Utilization | 54.3% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 45 | 55 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 45 | 55 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 49 | 60 | 5 |
| 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 | 112 | 62 | 65 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 112 | 62 | 65 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 885 | 1002 | 1537 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 49 | 65 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 885 | 1537 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.04 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.1 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.4 | | |
| 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) | 5 | 365 | 35 | 25 | 320 | 0 | 25 | 0 | 25 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 365 | 35 | 25 | 320 | 0 | 25 | 0 | 25 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 397 | 38 | 27 | 348 | 0 | 27 | 0 | 27 | 0 | 0 | 5 |
| 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 | 348 | | | 435 | | | 814 | 809 | 397 | 836 | 847 | 348 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 348 | | | 435 | | | 814 | 809 | 397 | 836 | 847 | 348 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 98 | | | 91 | 100 | 96 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1211 | | | 1125 | | | 288 | 306 | 652 | 269 | 290 | 695 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 402 | 38 | 375 | 54 | 5 |
| Volume Left | 5 | 0 | 27 | 27 | 0 |
| Volume Right | 0 | 38 | 0 | 27 | 5 |
| cSH | 1211 | 1700 | 1125 | 400 | 695 |
| Volume to Capacity | 0.00 | 0.02 | 0.02 | 0.14 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.6 | 3.7 | 0.2 |
| Control Delay (s) | 0.1 | 0.0 | 0.8 | 15.4 | 10.2 |
| Lane LOS | A | | A | C | B |
| Approach Delay (s) | 0.1 | | 0.8 | 15.4 | 10.2 |
| Approach LOS | | | | C | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 1.4 | | |
| Intersection Capacity Utilization | 53.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 140 | 5 | 60 | 170 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Future Volume (Veh/h) | 10 | 140 | 5 | 60 | 170 | 5 | 5 | 40 | 50 | 5 | 20 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 152 | 5 | 65 | 185 | 5 | 5 | 43 | 54 | 5 | 22 | 11 |
| 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 | 190 | | | 157 | | | 511 | 494 | 152 | 564 | 494 | 185 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 190 | | | 157 | | | 511 | 494 | 152 | 564 | 494 | 185 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 95 | | | 99 | 91 | 94 | 99 | 95 | 99 |
| cM capacity (veh/h) | 1396 | | | 1435 | | | 435 | 454 | 900 | 368 | 454 | 862 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 163 | 5 | 250 | 5 | 102 | 38 |
| Volume Left | 11 | 0 | 65 | 0 | 5 | 5 |
| Volume Right | 0 | 5 | 0 | 5 | 54 | 11 |
| cSH | 1396 | 1700 | 1435 | 1700 | 614 | 508 |
| Volume to Capacity | 0.01 | 0.00 | 0.05 | 0.00 | 0.17 | 0.07 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.1 | 0.0 | 4.7 | 1.9 |
| Control Delay (s) | 0.6 | 0.0 | 2.3 | 0.0 | 12.0 | 12.7 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.6 | | 2.2 | | 12.0 | 12.7 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.2 | | | | |
| Intersection Capacity Utilization | 36.2% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 40 | 50 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 40 | 50 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 43 | 54 | 5 |
| 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 | 100 | 56 | 59 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 100 | 56 | 59 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 899 | 1010 | 1545 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 43 | 59 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 899 | 1545 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.0 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 0.4 | | | | |
| 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) | 20 | 240 | 10 | 65 | 240 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Future Volume (Veh/h) | 20 | 240 | 10 | 65 | 240 | 15 | 15 | 45 | 85 | 5 | 25 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 261 | 11 | 71 | 261 | 16 | 16 | 49 | 92 | 5 | 27 | 22 |
| 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 | 277 | | | 272 | | | 744 | 724 | 261 | 824 | 719 | 261 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 277 | | | 272 | | | 744 | 724 | 261 | 824 | 719 | 261 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 95 | | | 94 | 85 | 88 | 98 | 92 | 97 |
| cM capacity (veh/h) | 1286 | | | 1291 | | | 285 | 327 | 778 | 216 | 329 | 778 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 283 | 11 | 332 | 16 | 157 | 54 |
| Volume Left | 22 | 0 | 71 | 0 | 16 | 5 |
| Volume Right | 0 | 11 | 0 | 16 | 92 | 22 |
| cSH | 1286 | 1700 | 1291 | 1700 | 484 | 404 |
| Volume to Capacity | 0.02 | 0.01 | 0.05 | 0.01 | 0.32 | 0.13 |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.4 | 0.0 | 11.1 | 3.7 |
| Control Delay (s) | 0.8 | 0.0 | 2.1 | 0.0 | 16.0 | 15.3 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.7 | | 2.0 | | 16.0 | 15.3 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.0 | | | | |
| Intersection Capacity Utilization | 51.2% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 160 | 35 | 5 | 200 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 0 | 160 | 35 | 5 | 200 | 0 | 35 | 0 | 5 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 174 | 38 | 5 | 217 | 0 | 38 | 0 | 5 | 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 | 217 | | | 212 | | | 401 | 401 | 174 | 406 | 439 | 217 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 217 | | | 212 | | | 401 | 401 | 174 | 406 | 439 | 217 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 93 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1353 | | | 1358 | | | 558 | 536 | 869 | 551 | 510 | 823 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 174 | 38 | 222 | 43 | 0 |
| Volume Left | 0 | 0 | 5 | 38 | 0 |
| Volume Right | 0 | 38 | 0 | 5 | 0 |
| cSH | 1353 | 1700 | 1358 | 582 | 1700 |
| Volume to Capacity | 0.00 | 0.02 | 0.00 | 0.07 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.1 | 1.9 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.2 | 11.7 | 0.0 |
| Lane LOS | | | A | B | A |
| Approach Delay (s) | 0.0 | | 0.2 | 11.7 | 0.0 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.1 | | | | |
| Intersection Capacity Utilization | 24.5% | 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) | 10 | 305 | 10 | 75 | 270 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Future Volume (Veh/h) | 10 | 305 | 10 | 75 | 270 | 10 | 10 | 30 | 95 | 10 | 25 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 332 | 11 | 82 | 293 | 11 | 11 | 33 | 103 | 11 | 27 | 11 |
| 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 | 304 | | | 343 | | | 836 | 822 | 332 | 930 | 822 | 293 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 304 | | | 343 | | | 836 | 822 | 332 | 930 | 822 | 293 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 93 | | | 96 | 88 | 85 | 94 | 91 | 99 |
| cM capacity (veh/h) | 1257 | | | 1216 | | | 247 | 286 | 710 | 182 | 286 | 746 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 343 | 11 | 375 | 11 | 147 | 49 |
| Volume Left | 11 | 0 | 82 | 0 | 11 | 11 |
| Volume Right | 0 | 11 | 0 | 11 | 103 | 11 |
| cSH | 1257 | 1700 | 1216 | 1700 | 482 | 289 |
| Volume to Capacity | 0.01 | 0.01 | 0.07 | 0.01 | 0.31 | 0.17 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.7 | 0.0 | 10.2 | 4.8 |
| Control Delay (s) | 0.3 | 0.0 | 2.3 | 0.0 | 15.7 | 20.0 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.3 | | 2.2 | | 15.7 | 20.0 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.6 | | | | |
| Intersection Capacity Utilization | 53.6% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 285 | 40 | 5 | 275 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 285 | 40 | 5 | 275 | 0 | 40 | 0 | 5 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 310 | 43 | 5 | 299 | 0 | 43 | 0 | 5 | 0 | 0 | 5 |
| 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 | 299 | | | 353 | | | 634 | 629 | 310 | 634 | 672 | 299 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 299 | | | 353 | | | 634 | 629 | 310 | 634 | 672 | 299 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 89 | 100 | 99 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1262 | | | 1206 | | | 387 | 396 | 730 | 387 | 374 | 741 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 315 | 43 | 304 | 48 | 5 |
| Volume Left | 5 | 0 | 5 | 43 | 0 |
| Volume Right | 0 | 43 | 0 | 5 | 5 |
| cSH | 1262 | 1700 | 1206 | 407 | 741 |
| Volume to Capacity | 0.00 | 0.03 | 0.00 | 0.12 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.1 | 3.2 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.2 | 15.0 | 9.9 |
| Lane LOS | A | | A | C | A |
| Approach Delay (s) | 0.1 | | 0.2 | 15.0 | 9.9 |
| Approach LOS | | | | C | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.2 | | | | |
| Intersection Capacity Utilization | 34.3% | 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) | 10 | 150 | 5 | 75 | 190 | 10 | 5 | 40 | 60 | 5 | 20 | 10 |
| Future Volume (Veh/h) | 10 | 150 | 5 | 75 | 190 | 10 | 5 | 40 | 60 | 5 | 20 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 163 | 5 | 82 | 207 | 11 | 5 | 43 | 65 | 5 | 22 | 11 |
| 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 | | | 168 | | | 578 | 567 | 163 | 642 | 561 | 207 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 218 | | | 168 | | | 578 | 567 | 163 | 642 | 561 | 207 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 94 | | | 99 | 89 | 93 | 98 | 95 | 99 |
| cM capacity (veh/h) | 1364 | | | 1422 | | | 387 | 407 | 887 | 316 | 411 | 839 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 174 | 5 | 289 | 11 | 113 | 38 |
| Volume Left | 11 | 0 | 82 | 0 | 5 | 5 |
| Volume Right | 0 | 5 | 0 | 11 | 65 | 11 |
| cSH | 1364 | 1700 | 1422 | 1700 | 589 | 460 |
| Volume to Capacity | 0.01 | 0.00 | 0.06 | 0.01 | 0.19 | 0.08 |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.5 | 0.0 | 5.6 | 2.1 |
| Control Delay (s) | 0.5 | 0.0 | 2.5 | 0.0 | 12.6 | 13.5 |
| Lane LOS | A | | A | | B | B |
| Approach Delay (s) | 0.5 | | 2.4 | | 12.6 | 13.5 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 4.4 | | | | |
| Intersection Capacity Utilization | 39.2% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 370 | 35 | 15 | 325 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 370 | 35 | 15 | 325 | 0 | 25 | 0 | 15 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 402 | 38 | 16 | 353 | 0 | 27 | 0 | 16 | 0 | 0 | 5 |
| 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 | 353 | | | 440 | | | 802 | 797 | 402 | 813 | 835 | 353 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 353 | | | 440 | | | 802 | 797 | 402 | 813 | 835 | 353 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 91 | 100 | 98 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1206 | | | 1120 | | | 296 | 314 | 648 | 286 | 298 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 407 | 38 | 369 | 43 | 5 |
| Volume Left | 5 | 0 | 16 | 27 | 0 |
| Volume Right | 0 | 38 | 0 | 16 | 5 |
| cSH | 1206 | 1700 | 1120 | 371 | 691 |
| Volume to Capacity | 0.00 | 0.02 | 0.01 | 0.12 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.3 | 3.1 | 0.2 |
| Control Delay (s) | 0.1 | 0.0 | 0.5 | 16.0 | 10.3 |
| Lane LOS | A | | A | C | B |
| Approach Delay (s) | 0.1 | | 0.5 | 16.0 | 10.3 |
| Approach LOS | | | | C | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.1 | | | | |
| Intersection Capacity Utilization | 44.9% | 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 | 180 | 35 | 10 | 220 | 0 | 40 | 0 | 15 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 0 | 180 | 35 | 10 | 220 | 0 | 40 | 0 | 15 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 196 | 38 | 11 | 239 | 0 | 43 | 0 | 16 | 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 | 239 | | | 234 | | | 457 | 457 | 196 | 473 | 495 | 239 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 239 | | | 234 | | | 457 | 457 | 196 | 473 | 495 | 239 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 92 | 100 | 98 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1328 | | | 1333 | | | 511 | 496 | 845 | 489 | 472 | 800 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 196 | 38 | 250 | 59 | 0 |
| Volume Left | 0 | 0 | 11 | 43 | 0 |
| Volume Right | 0 | 38 | 0 | 16 | 0 |
| cSH | 1328 | 1700 | 1333 | 572 | 1700 |
| Volume to Capacity | 0.00 | 0.02 | 0.01 | 0.10 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.2 | 2.7 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.4 | 12.0 | 0.0 |
| Lane LOS | | | A | B | A |
| Approach Delay (s) | 0.0 | | 0.4 | 12.0 | 0.0 |
| Approach LOS | | | | B | A |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.5 | | | | |
| Intersection Capacity Utilization | 29.7% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 195 | 10 | 10 | 235 | 15 | 35 | 0 | 15 | 5 | 0 | 5 |
| Future Volume (Veh/h) | 10 | 195 | 10 | 10 | 235 | 15 | 35 | 0 | 15 | 5 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 212 | 11 | 11 | 255 | 16 | 38 | 0 | 16 | 5 | 0 | 5 |
| 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 | 271 | | | 223 | | | 522 | 532 | 218 | 535 | 530 | 263 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 271 | | | 223 | | | 522 | 532 | 218 | 535 | 530 | 263 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 92 | 100 | 98 | 99 | 100 | 99 |
| cM capacity (veh/h) | 1292 | | | 1346 | | | 457 | 446 | 822 | 442 | 447 | 776 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 7 | 227 | 7 | 275 | 54 | 10 |
| Volume Left | 7 | 4 | 7 | 4 | 38 | 5 |
| Volume Right | 0 | 11 | 0 | 16 | 16 | 5 |
| cSH | 1292 | 1292 | 1346 | 1346 | 526 | 563 |
| Volume to Capacity | 0.01 | 0.01 | 0.01 | 0.01 | 0.10 | 0.02 |
| Queue Length 95th (m) | 0.2 | 0.2 | 0.2 | 0.2 | 2.7 | 0.4 |
| Control Delay (s) | 7.8 | 0.2 | 7.7 | 0.2 | 12.6 | 11.5 |
| Lane LOS | A | A | A | A | B | B |
| Approach Delay (s) | 0.4 | | 0.4 | | 12.6 | 11.5 |
| Approach LOS | | | | | B | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.7 | | | | |
| Intersection Capacity Utilization | 21.5% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 45 | 45 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 45 | 45 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 49 | 49 | 5 |
| 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 | 100 | 52 | 54 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 100 | 52 | 54 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 898 | 1016 | 1551 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 49 | 54 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 898 | 1551 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.0 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | | 13.3% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 5 | 0 | 50 | 45 | 0 |
| Future Volume (Veh/h) | 5 | 5 | 0 | 50 | 45 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 54 | 49 | 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 | 103 | 49 | 49 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 103 | 49 | 49 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 895 | 1020 | 1558 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 10 | 54 | 49 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 5 | 0 | 0 |
| cSH | 953 | 1558 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.3 | 0.0 | 0.0 |
| Control Delay (s) | 8.8 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 8.8 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.8 | |
| 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) | 15 | 330 | 40 | 20 | 320 | 15 | 20 | 0 | 10 | 10 | 0 | 15 |
| Future Volume (Veh/h) | 15 | 330 | 40 | 20 | 320 | 15 | 20 | 0 | 10 | 10 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 359 | 43 | 22 | 348 | 16 | 22 | 0 | 11 | 11 | 0 | 16 |
| 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 | 364 | | | 402 | | | 820 | 820 | 380 | 802 | 834 | 356 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 364 | | | 402 | | | 820 | 820 | 380 | 802 | 834 | 356 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 98 | | | 92 | 100 | 98 | 96 | 100 | 98 |
| cM capacity (veh/h) | 1195 | | | 1157 | | | 280 | 300 | 667 | 290 | 294 | 688 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 11 | 407 | 15 | 371 | 33 | 27 |
| Volume Left | 11 | 5 | 15 | 7 | 22 | 11 |
| Volume Right | 0 | 43 | 0 | 16 | 11 | 16 |
| cSH | 1195 | 1195 | 1157 | 1157 | 347 | 441 |
| Volume to Capacity | 0.01 | 0.01 | 0.02 | 0.02 | 0.10 | 0.06 |
| Queue Length 95th (m) | 0.3 | 0.3 | 0.5 | 0.5 | 2.5 | 1.6 |
| Control Delay (s) | 8.1 | 0.2 | 8.2 | 0.4 | 16.5 | 13.7 |
| Lane LOS | A | A | A | A | C | B |
| Approach Delay (s) | 0.4 | | 0.7 | | 16.5 | 13.7 |
| Approach LOS | | | | | C | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.6 | | | | |
| Intersection Capacity Utilization | 27.1% | 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) | 20 | 270 | 10 | 80 | 260 | 15 | 15 | 45 | 105 | 10 | 25 | 20 |
| Future Volume (Veh/h) | 20 | 270 | 10 | 80 | 260 | 15 | 15 | 45 | 105 | 10 | 25 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 22 | 293 | 11 | 87 | 283 | 16 | 16 | 49 | 114 | 11 | 27 | 22 |
| 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 | 299 | | | 304 | | | 830 | 810 | 293 | 932 | 805 | 283 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 299 | | | 304 | | | 830 | 810 | 293 | 932 | 805 | 283 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 93 | | | 93 | 83 | 85 | 94 | 91 | 97 |
| cM capacity (veh/h) | 1262 | | | 1257 | | | 244 | 287 | 746 | 170 | 289 | 756 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 315 | 11 | 370 | 16 | 179 | 60 |
| Volume Left | 22 | 0 | 87 | 0 | 16 | 11 |
| Volume Right | 0 | 11 | 0 | 16 | 114 | 22 |
| cSH | 1262 | 1700 | 1257 | 1700 | 460 | 320 |
| Volume to Capacity | 0.02 | 0.01 | 0.07 | 0.01 | 0.39 | 0.19 |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.8 | 0.0 | 14.5 | 5.4 |
| Control Delay (s) | 0.7 | 0.0 | 2.4 | 0.0 | 17.7 | 18.8 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.7 | | 2.3 | | 17.7 | 18.8 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 5.7 | | | | |
| Intersection Capacity Utilization | 54.5% | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 55 | 50 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 55 | 50 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 60 | 54 | 5 |
| 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 | 116 | 56 | 59 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 116 | 56 | 59 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 880 | 1010 | 1545 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 60 | 59 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 880 | 1545 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.1 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.4 | | |
| 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) | 5 | 305 | 40 | 15 | 305 | 0 | 45 | 0 | 15 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 305 | 40 | 15 | 305 | 0 | 45 | 0 | 15 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 332 | 43 | 16 | 332 | 0 | 49 | 0 | 16 | 0 | 0 | 5 |
| 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 | 332 | | | 375 | | | 711 | 706 | 332 | 722 | 749 | 332 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 332 | | | 375 | | | 711 | 706 | 332 | 722 | 749 | 332 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 99 | | | 86 | 100 | 98 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1227 | | | 1183 | | | 341 | 354 | 710 | 330 | 335 | 710 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 337 | 43 | 348 | 65 | 5 |
| Volume Left | 5 | 0 | 16 | 49 | 0 |
| Volume Right | 0 | 43 | 0 | 16 | 5 |
| cSH | 1227 | 1700 | 1183 | 391 | 710 |
| Volume to Capacity | 0.00 | 0.03 | 0.01 | 0.17 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.3 | 4.7 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 0.5 | 16.0 | 10.1 |
| Lane LOS | A | | A | C | B |
| Approach Delay (s) | 0.1 | | 0.5 | 16.0 | 10.1 |
| Approach LOS | | | | C | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 1.7 | | |
| Intersection Capacity Utilization | 45.0% | ICU Level of Service | | A |
| Analysis Period (min) | | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 335 | 10 | 85 | 295 | 15 | 10 | 30 | 110 | 15 | 25 | 10 |
| Future Volume (Veh/h) | 10 | 335 | 10 | 85 | 295 | 15 | 10 | 30 | 110 | 15 | 25 | 10 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 364 | 11 | 92 | 321 | 16 | 11 | 33 | 120 | 16 | 27 | 11 |
| 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 | 337 | | | 375 | | | 916 | 907 | 364 | 1028 | 902 | 321 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 337 | | | 375 | | | 916 | 907 | 364 | 1028 | 902 | 321 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 92 | | | 95 | 87 | 82 | 89 | 89 | 98 |
| cM capacity (veh/h) | 1222 | | | 1183 | | | 214 | 252 | 681 | 147 | 254 | 720 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 375 | 11 | 413 | 16 | 164 | 54 |
| Volume Left | 11 | 0 | 92 | 0 | 11 | 16 |
| Volume Right | 0 | 11 | 0 | 16 | 120 | 11 |
| cSH | 1222 | 1700 | 1183 | 1700 | 457 | 234 |
| Volume to Capacity | 0.01 | 0.01 | 0.08 | 0.01 | 0.36 | 0.23 |
| Queue Length 95th (m) | 0.2 | 0.0 | 2.0 | 0.0 | 12.9 | 6.9 |
| Control Delay (s) | 0.3 | 0.0 | 2.5 | 0.0 | 17.2 | 24.9 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.3 | | 2.4 | | 17.2 | 24.9 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.1 | | | |
| Intersection Capacity Utilization | 57.7% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 5 | 50 | 45 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 5 | 50 | 45 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 54 | 49 | 5 |
| 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 | 116 | 52 | 54 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 116 | 52 | 54 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 878 | 1016 | 1551 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 59 | 54 |
| Volume Left | 5 | 5 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 878 | 1551 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.1 | 0.0 |
| Control Delay (s) | 9.1 | 0.6 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.1 | 0.6 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.7 | | | |
| Intersection Capacity Utilization | 16.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 400 | 35 | 25 | 350 | 0 | 25 | 0 | 25 | 0 | 0 | 5 |
| Future Volume (Veh/h) | 5 | 400 | 35 | 25 | 350 | 0 | 25 | 0 | 25 | 0 | 0 | 5 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 435 | 38 | 27 | 380 | 0 | 27 | 0 | 27 | 0 | 0 | 5 |
| 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 | 380 | | | 473 | | | 884 | 879 | 435 | 906 | 917 | 380 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 380 | | | 473 | | | 884 | 879 | 435 | 906 | 917 | 380 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 98 | | | 90 | 100 | 96 | 100 | 100 | 99 |
| cM capacity (veh/h) | 1178 | | | 1089 | | | 258 | 278 | 621 | 240 | 264 | 667 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 440 | 38 | 407 | 54 | 5 |
| Volume Left | 5 | 0 | 27 | 27 | 0 |
| Volume Right | 0 | 38 | 0 | 27 | 5 |
| cSH | 1178 | 1700 | 1089 | 365 | 667 |
| Volume to Capacity | 0.00 | 0.02 | 0.02 | 0.15 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.6 | 4.1 | 0.2 |
| Control Delay (s) | 0.1 | 0.0 | 0.8 | 16.6 | 10.4 |
| Lane LOS | A | | A | C | B |
| Approach Delay (s) | 0.1 | | 0.8 | 16.6 | 10.4 |
| Approach LOS | | | | C | B |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.4 | | | | |
| Intersection Capacity Utilization | 55.2% | ICU Level of Service | B | | |
| Analysis Period (min) | 15 | | | | |





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 15 | 410 | 35 | 15 | 355 | 10 | 25 | 0 | 15 | 15 | 0 | 15 |
| Future Volume (Veh/h) | 15 | 410 | 35 | 15 | 355 | 10 | 25 | 0 | 15 | 15 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 446 | 38 | 16 | 386 | 11 | 27 | 0 | 16 | 16 | 0 | 16 |
| 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 | 397 | | | 484 | | | 931 | 926 | 465 | 918 | 940 | 392 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 397 | | | 484 | | | 931 | 926 | 465 | 918 | 940 | 392 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 89 | 100 | 97 | 93 | 100 | 98 |
| cM capacity (veh/h) | 1162 | | | 1079 | | | 236 | 261 | 597 | 240 | 256 | 657 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 11 | 489 | 11 | 402 | 43 | 32 |
| Volume Left | 11 | 5 | 11 | 5 | 27 | 16 |
| Volume Right | 0 | 38 | 0 | 11 | 16 | 16 |
| cSH | 1162 | 1162 | 1079 | 1079 | 304 | 352 |
| Volume to Capacity | 0.01 | 0.01 | 0.01 | 0.01 | 0.14 | 0.09 |
| Queue Length 95th (m) | 0.3 | 0.3 | 0.4 | 0.4 | 3.9 | 2.4 |
| Control Delay (s) | 8.1 | 0.2 | 8.4 | 0.3 | 18.8 | 16.2 |
| Lane LOS | A | A | A | A | C | C |
| Approach Delay (s) | 0.4 | | 0.5 | | 18.8 | 16.2 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| Average Delay | 1.8 | | | | |
| Intersection Capacity Utilization | 28.0% | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 40 | 50 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 40 | 50 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 43 | 54 | 5 |
| 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 | 100 | 56 | 59 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 100 | 56 | 59 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 899 | 1010 | 1545 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 43 | 59 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 899 | 1545 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.0 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | | 13.3% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 0 | 0 | 45 | 55 | 5 |
| Future Volume (Veh/h) | 5 | 0 | 0 | 45 | 55 | 5 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 0 | 49 | 60 | 5 |
| 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 | 112 | 62 | 65 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 112 | 62 | 65 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 100 | 100 | | | |
| cM capacity (veh/h) | 885 | 1002 | 1537 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 5 | 49 | 65 |
| Volume Left | 5 | 0 | 0 |
| Volume Right | 0 | 0 | 5 |
| cSH | 885 | 1537 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.04 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 |
| Lane LOS | A | | |
| Approach Delay (s) | 9.1 | 0.0 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | | 13.3% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

# Appendix E
# Signal Warrant Excerpts and Analysis

## 4.4 Justification 1 – Minimum Vehicle Volume

### Purpose

The Minimum Vehicle Volume Justification is intended for applications where the principal reason for installing a traffic signal is the cumulative delay produced by a large volume of intersecting traffic at an unsignalized intersection.

Justification 1A reflects the lowest total traffic on all approaches, and Justification 1B reflects the lowest volume on the minor road for which the average delay is similar for both signalized and unsignalized conditions. Therefore, this justification is intended to address the minimum volume conditions for which signalization can be used to minimize total average vehicle delay at the intersection.

As volumes increase beyond threshold criteria, delay to traffic on the minor road will increase, and the overall delay for the intersection will be greater than would be the case if minor delays were distributed between both main and minor roadways.

### Standard

The need for a traffic signal must be considered if both Justification 1A and Justification 1B are 100% fulfilled.

If Justifications 1A and 1B do not reach or exceed 100%, but are at least 80% fulfilled, the lesser fulfilled of the Justifications 1A or 1B can be used in the assessment of Justification 3, the Combination Justification.

In applying Justification 1 (Minimum Vehicle Volume) for "T" intersections, the justification values for the minor street are increased by 50%. This approach reflects the reduction in traffic volumes due to the lack of one of the approaches.

Table 12 may be used for Justification 1: Minimum Vehicle Volume. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural conditions (see Section 4.2 for definitions).

### Guidelines

Justification 1 evaluates total intersection volume and total minor road volume. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. Each one of the highest eight hours of the entering volumes is compared to the justification value. The justification should be met for each of the eight hours. "Sectional Percent" is calculated in Table 12 for reference purposes, and may indicate how close an intersection is to achieving full justification. "Total Across" is calculated by adding all 8-hour compliance percentages. The Compliance % figures used in Table 12 must not exceed 100%.

**Table 12 – Justification 1 – Minimum Vehicle Volume**

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

| | MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) | | | | PERCENTAGE WARRANT | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROACH LANES | 1 | | 2 or MORE | | HOUR ENDING | | | | | | | | TOTAL ACROSS |
| FLOW CONDITION | FREE FLOW ☐ | RESTR. FLOW ☐ | FREE FLOW ☐ | RESTR. FLOW ☐ | | | | | | | | | |
| A. ALL APPROACH LANES | 480 (385) | 720 (575) | 600 (480) | 900 (720) | | | | | | | | | |
| 100% FULFILLED | | | | | | | | | | | | | SECTIONAL PERCENT |
| 80% FULFILLED | | | | | | | | | | | | | |
| ACTUAL % IF BELOW 80% VALUE | | | | | | | | | | | | | |
| | | | | | | | | | | | | TOTAL DOWN / 8 = | |
| B. MINOR STREET BOTH APPROACHES | 120* (95)* | 170* (135)* | 120* (95)* | 170* (135)* | | | | | | | | | TOTAL ACROSS |
| 100% FULFILLED | | | | | | | | | | | | | SECTIONAL PERCENT |
| 80% FULFILLED | | | | | | | | | | | | | |
| ACTUAL % IF BELOW 80% VALUE | | | | | | | | | | | | | |
| | | | | | | | | | | | | TOTAL DOWN / 8 = | |

* For "T" intersections, these values should be increased by 50%.

## 4.5 Justification 2 – Delay to Cross Traffic

### Purpose

The Delay to Cross Traffic Justification is intended for applications where the traffic volume on the main road is so heavy that traffic on the minor road suffers excessive delay or hazard in entering or crossing the main road.

### Standard

The need for a traffic signal must be considered if both Justification 2A and Justification 2B are 100% fulfilled. If Justifications 2A or 2B do not meet or exceed 100%, but both are at least 80% fulfilled, the lesser fulfilled of the justifications 2A or 2B can be used in the assessment of Justification 3, the Combination Justification.

Table 13 may be used for Justification 2: Delay to Cross Traffic. Restricted Flow is applicable to Urban Conditions, while Free Flow is applicable to Rural Conditions (see Section 4.2 for definitions).

**Table 13 – Justification 2 – Delay to Cross Traffic**

100% SATISFIED – YES ☐ NO ☐
80% SATISFIED – YES ☐ NO ☐

| | MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) | | | | PERCENTAGE WARRANT | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROACH LANES | 1 | | 2 or MORE | | HOUR ENDING | | | | | | | | |
| FLOW CONDITION | FREE FLOW ☐ | RESTR. FLOW ☐ | FREE FLOW ☐ | RESTR. FLOW ☐ | | | | | | | | TOTAL ACROSS | |
| A. MAJOR STREET BOTH APPROACHES | 480 (385) | 720 (575) | 600 (480) | 900 (720) | | | | | | | | | |
| 100% FULFILLED | | | | | | | | | | | | | SECTIONAL PERCENT |
| 80% FULFILLED | | | | | | | | | | | | | |
| ACTUAL % IF BELOW 80% VALUE | | | | | | | | | | | | | |
| | | | | | | | | | | | | TOTAL DOWN / 8 = | |
| B. TRAFFIC CROSSING MAJOR STREET | 50 (40) | 75 (60) | 50 (40) | 75 (60) | | | | | | | | TOTAL ACROSS | |
| 100% FULFILLED | | | | | | | | | | | | | SECTIONAL PERCENT |
| 80% FULFILLED | | | | | | | | | | | | | |
| ACTUAL % IF BELOW 80% VALUE | | | | | | | | | | | | | |
| | | | | | | | | | | | | TOTAL DOWN / 8 = | |

## Guidelines

Justification 2 evaluates major road volume and minor road movements that cross the intersection. The hours selected should represent the eight highest hours of the 24-hour traffic volume, and they do not have to be consecutive hours. The entering volumes of each of the highest eight hours are compared to the justification value. The justification is met if the justification value is 100% and fulfilled by each of the eight hours.

"Sectional Percent" is calculated in Table 13 for reference purposes, and may indicate how close an intersection is to achieving full justification. "Total Across" is calculated by adding all 8-hour compliance percentages. The Compliance % figures used in Table 13 must not exceed 100%.

As right turns are not considered as traffic crossing a road, they should be deleted from the combined pedestrian and vehicle volume in the Delay to Cross Traffic Justification. In one-way street systems, left turns from a one-way street into another one-way street should be treated in a similar manner to right turns, and be deleted from the justification.

When applying Justification 2B, the crossing volume consists of the sum of:

1. The number of pedestrians crossing the main road
2. Total left turns from both the side road approaches
3. The highest through volume from one of the side road approaches
4. Fifty percent of the heavier left-turn traffic movement from the main road when both of the following criteria are met:

   a) The left-turn volume is greater than 120 vehicles per hour

   b) The total of the heavier left-turn volume plus its opposing volume is greater than 720 vehicles per hour

e) Pedestrian Grade Separations In cases of very heavy pedestrian and traffic volumes, it may be economically viable to construct pedestrian bridges or tunnels.

4. The priority placed on implementing a new pedestrian crossing device should reflect the proximity and convenience of existing crossings; a higher priority should be placed on crossings where no reasonable alternatives exist within walking distance.

## 4.10 Justification 7 – Projected Volumes

In some cases, it is desired to determine the future need for traffic signals at an existing or planned intersection. There are two basic scenarios. The first is that the intersection may exist and all that is changing is the addition of one or more developments which will add traffic to the intersection. The second is a development which will require, or be associated with, the construction of one or more new legs at an existing intersection or a completely new intersection or roadway.

The prediction of future traffic demands is based on knowledge of growth in roadway usage, growth of local traffic generators and predicted traffic volumes, obtained from a traffic impact study, transportation planning study, environmental assessment or other similar evaluation. The preferred approach is that eight-hour volume projections are estimated as part of the engineering study and evaluated against Justifications 1, 2 or 3. It is incumbent upon the road authority to ensure that the calculation methodology is sound and is based on good data, so that there is a high level of confidence in the predicted traffic volumes.

For future development, especially where the intersection or road may not exist, eight-hour volumes may be difficult to obtain or predict with the necessary accuracy. If eight-hour volumes are unavailable or not considered to be of sufficient accuracy, Peak Hour Volumes (PHV) may be estimated as part of the transportation studies and reduced to Average Hourly Volumes (AHV) for comparison with traffic signal justifications for projected volumes.

**Table 21 – Justification 7 – Projected Volumes**

| Justification | Description | Minimum Requirement 1 Lane Highways | | Minimum Requirement 2 or more lanes | | Compliance | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Sectional | | Entire % |
| | | Free Flow | Restr. Flow | Free Flow | Restr. Flow | Numerical | % | |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches (average hour) | 480 | 720 | 600 | 900 | | | |
| | B. Vehicle volume, along minor streets (average hour) | 120 | 170 | 120 | 170 | | | |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 480 | 720 | 600 | 900 | | | |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 50 | 75 | 120 | 170 | | | |

*Note: For "T" intersections, these values should be increased by 50%.

The Average Hourly Volume for a typical day can be estimated from the Peak Hour Volumes using the following relationships:

$$AHV = \frac{PHV}{2} \quad \textbf{or} \quad AHV = \frac{amPHV + pmPHV}{4}$$

Alternately, the Average Hourly Volume for the eight highest hours of an average day can be estimated from Annual Average Daily Traffic (AADT) volume using the following relationship:

$$AHV = \frac{AADT}{16}$$

Where:

AHV = Average hourly volume

AADT = Annual average daily traffic

### Analysis Using Eight-hour Volumes

If eight-hour projections are available, Justifications 1, 2 or 3 should be used. For the situation of an existing intersection with new development, Justifications 1 or 2 need to be met to 100%, or Justification 3 needs to be met to 80%.

For developments where new intersections or roadways are to be built, there is more uncertainty in the volume projections as the estimate requires projections of background traffic as well as development traffic. For this reason, where new intersection or roadway construction is required, Justifications 1 or 2 must be met to 120%.

### Analysis Using Average Hour Volume

In the case that the volume estimates are based on the expansion of peak hour volumes or average daily traffic, the effect on Justifications 1 or 2 of the requirement to meet the warrant for each of eight hours would be lessened by averaging. As well, increased uncertainty is introduced by estimating from as little as one hour of traffic volume. For this reason, the thresholds are raised and, for traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a 50% increase for a future intersection or roadway. For example, under restricted flow and two lanes, the AHV for Part 1A of Justification 7 must be met to 900 x 1.20 = 1080 vph.

Note that future volumes may include side street traffic attracted to the new traffic signal since the signal may provide a significant reduction in delay.

**Table 22 – Future Development: Volume Expansion Required to Meet Justifications**

| Roadway Condition | Full Eight-hour Count Estimate Available | | AHV Only Available |
|---|---|---|---|
| | Justification 1 or 2 | Justification 3 | Justification 7 |
| Both Intersecting Roads Exist; Development is Future | 100% | 80% | 120% |
| One Road, Both Roads and/or Intersection are Future; Development is Future | 120% | N/A | 150% |

**Project No.** 6860-39
**Intersection** Wellington Road 19 / 2 Line **Base Scenario**

**ITE 210 - Single-Family Detached Housing Temporal Variation**

| Time Ending | % of daily total | % of daily peak hour |
|---|---|---|
| 8:00 | 6.7 | 100% |
| 9:00 | 6.2 | 93% |
| 12:00 | 5.2 | 78% |
| 13:00 | 5.5 | 61% |
| 14:00 | 6 | 67% |
| 16:00 | 7.2 | 80% |
| 17:00 | 9 | 100% |
| 18:00 | 8.8 | 98% |

**Temporal Variation**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | AM Peak |
| 9:00 | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | |
| 12:00 | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | |
| 13:00 | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | |
| 14:00 | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | |
| 16:00 | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | |
| 17:00 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | PM Peak |
| 18:00 | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | |

**Existing Volumes**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 11 | 44 | 106 | 4 | 25 | 14 | 12 | 196 | 5 | 60 | 238 | 12 | |
| 9:00 | 11 | 23 | 102 | 11 | 31 | 16 | 16 | 201 | 9 | 57 | 217 | 13 | AM Peak |
| 12:00 | 3 | 11 | 52 | 1 | 5 | 10 | 7 | 101 | 6 | 58 | 122 | 0 | |
| 13:00 | 10 | 8 | 65 | 2 | 13 | 3 | 7 | 99 | 9 | 49 | 103 | 2 | |
| 14:00 | 5 | 7 | 61 | 3 | 13 | 4 | 6 | 126 | 14 | 60 | 106 | 2 | |
| 16:00 | 18 | 12 | 58 | 4 | 10 | 14 | 10 | 161 | 11 | 59 | 123 | 3 | |
| 17:00 | 14 | 31 | 110 | 11 | 29 | 12 | 9 | 202 | 12 | 52 | 200 | 14 | PM Peak |
| 18:00 | 13 | 27 | 94 | 11 | 27 | 9 | 10 | 237 | 9 | 69 | 206 | 11 | |

**2032 Corridor Growth Volumes**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 38 | 0 | |
| 9:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 35 | 0 | AM Peak |
| 12:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 29 | 0 | |
| 13:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 31 | 0 | |
| 14:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 33 | 0 | |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 40 | 0 | |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 50 | 0 | PM Peak |
| 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 49 | 0 | |

**Site Traffic**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 11 | 0 | 16 | 22 | 5 | |
| 9:00 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 15 | 20 | 5 | AM Peak |
| 12:00 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 | 0 | 13 | 17 | 4 | |
| 13:00 | 0 | 0 | 12 | 3 | 0 | 0 | 0 | 18 | 0 | 9 | 12 | 0 | |
| 14:00 | 0 | 0 | 13 | 3 | 0 | 0 | 0 | 20 | 0 | 10 | 13 | 0 | |
| 16:00 | 0 | 0 | 16 | 4 | 0 | 0 | 0 | 24 | 0 | 12 | 16 | 0 | |
| 17:00 | 0 | 0 | 20 | 5 | 0 | 0 | 0 | 30 | 0 | 15 | 20 | 0 | PM Peak |
| 18:00 | 0 | 0 | 20 | 5 | 0 | 0 | 0 | 29 | 0 | 15 | 20 | 0 | |

**2032 Future Total**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | All | Minor | Major | Minor Veh+ped |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 11 | 44 | 117 | 4 | 25 | 14 | 12 | 239 | 5 | 76 | 297 | 17 | 862 | 204 | 628 | 20 |
| 9:00 | 11 | 23 | 112 | 11 | 31 | 16 | 16 | 241 | 9 | 72 | 272 | 18 | 832 | 204 | 628 | 27 |
| 12:00 | 3 | 11 | 60 | 1 | 5 | 10 | 7 | 135 | 6 | 71 | 168 | 4 | 481 | 90 | 390 | 9 |
| 13:00 | 10 | 8 | 77 | 5 | 13 | 3 | 7 | 148 | 9 | 58 | 146 | 2 | 486 | 116 | 370 | 20 |
| 14:00 | 5 | 7 | 74 | 6 | 13 | 4 | 6 | 179 | 14 | 70 | 153 | 2 | 534 | 110 | 424 | 16 |
| 16:00 | 18 | 12 | 74 | 8 | 10 | 14 | 10 | 225 | 11 | 71 | 179 | 3 | 635 | 136 | 499 | 31 |
| 17:00 | 14 | 31 | 130 | 16 | 29 | 12 | 9 | 282 | 12 | 67 | 270 | 14 | 886 | 232 | 654 | 35 |
| 18:00 | 13 | 27 | 114 | 16 | 27 | 9 | 10 | 315 | 9 | 84 | 274 | 11 | 909 | 205 | 703 | 34 |

**8-Hour Volume**

| Future Total (2031) | | | |
|---|---|---|---|
| Time Ending | | Major | Minor |
| 8:00 | | 647 | 215 |
| 9:00 | | 628 | 204 |
| 12:00 | | 390 | 90 |
| 13:00 | | 370 | 116 |
| 14:00 | | 424 | 110 |
| 16:00 | | 499 | 136 |
| 17:00 | | 654 | 232 |
| 18:00 | | 703 | 205 |
| **Total** | | **4316** | **1309** |

**TRAFFIC SIGNAL WARRANTS - OTM Book 12, Justifications 1 & 2**

**FUTURE**

| Justification | Requirement 1 lane Free Flow | Hour Ending 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 | Average | Percent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Min Vehicle Volumes | | | | | | | | | | | |
| A. Vehicle volumes all approaches | **480** | 862 | 832 | 481 | 486 | 534 | 635 | 886 | 909 | | |
| | **Score** | ##### | ##### | ##### | ##### | ##### | ##### | ##### | ##### | | |
| | | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| B. Vehicle volumes, minor streets | **120** | 204 | 204 | 90 | 116 | 110 | 136 | 232 | 205 | | 92% |
| | **Score** | ##### | ##### | *75%* | *97%* | *91%* | ##### | ##### | ##### | | |
| | | 100% | 100% | 75% | 80% | 80% | 100% | 100% | 100% | 92% | |
| 2. Delay to Cross Traffic | | | | | | | | | | | |
| A. Vehicle volumes, major street | **480** | 628 | 628 | 390 | 370 | 424 | 499 | 654 | 703 | | |
| | **Score** | ##### | ##### | *81%* | *77%* | *88%* | ##### | ##### | ##### | | |
| | | 100% | 100% | 80% | 77% | 80% | 100% | 100% | 100% | 92% | |
| B. Combined vehicle+ped minor street | **50** | 20 | 27 | 9 | 20 | 16 | 31 | 35 | 34 | | 48% |
| | score | *40%* | *54%* | *18%* | *40%* | *33%* | *62%* | *70%* | *68%* | | |
| | | 40% | 54% | 18% | 40% | 33% | 62% | 70% | 68% | 48% | |

**OVERALL WARRANT FOR TRAFFIC SIGNAL IS 92%**

**Project No.** 6860-39
**Intersection** Wellington Road 19 / 3 Line **Base Scenario**

**ITE 210 - Single-Family Detached Housing Temporal Variation**

| Time Ending | % of daily total | % of daily peak hour |
|---|---|---|
| 8:00 | 6.7 | 100% |
| 9:00 | 6.2 | 93% |
| 12:00 | 5.2 | 78% |
| 13:00 | 5.5 | 61% |
| 14:00 | 6 | 67% |
| 16:00 | 7.2 | 80% |
| 17:00 | 9 | 100% |
| 18:00 | 8.8 | 98% |

**Temporal Variation**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | AM Peak |
| 9:00 | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | 93% | |
| 12:00 | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | 78% | |
| 13:00 | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | 61% | |
| 14:00 | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | 67% | |
| 16:00 | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | 80% | |
| 17:00 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | PM Peak |
| 18:00 | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% | |

**Existing Volumes**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 8 | 0 | 5 | 0 | 0 | 0 | 1 | 122 | 12 | 1 | 135 | 0 | |
| 9:00 | 45 | 1 | 6 | 0 | 0 | 2 | 2 | 117 | 33 | 5 | 166 | 0 | AM Peak |
| 12:00 | 15 | 0 | 5 | 2 | 0 | 4 | 1 | 151 | 10 | 4 | 155 | 0 | |
| 13:00 | 16 | 0 | 3 | 0 | 0 | 0 | 4 | 152 | 22 | 5 | 132 | 2 | |
| 14:00 | 16 | 0 | 6 | 0 | 0 | 2 | 2 | 156 | 17 | 2 | 139 | 1 | |
| 16:00 | 16 | 0 | 7 | 1 | 0 | 2 | 3 | 191 | 16 | 9 | 155 | 0 | |
| 17:00 | 48 | 0 | 4 | 1 | 0 | 3 | 5 | 212 | 48 | 3 | 202 | 0 | PM Peak |
| 18:00 | 14 | 0 | 3 | 0 | 0 | 2 | 3 | 194 | 21 | 1 | 175 | 0 | |

**2032 Corridor Growth Volumes**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 38 | 0 | |
| 9:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 35 | 0 | AM Peak |
| 12:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 29 | 0 | |
| 13:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 31 | 0 | |
| 14:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 33 | 0 | |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 40 | 0 | |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 50 | 0 | PM Peak |
| 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 49 | 0 | |

**Site Traffic**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 5 | 0 | 11 | 0 | 0 | 0 | 0 | 22 | 0 | 5 | 22 | 0 | |
| 9:00 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 20 | 0 | 5 | 20 | 0 | AM Peak |
| 12:00 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 17 | 0 | 4 | 17 | 0 | |
| 13:00 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 12 | 0 | 6 | 18 | 0 | |
| 14:00 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 13 | 0 | 7 | 20 | 0 | |
| 16:00 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 16 | 0 | 8 | 24 | 0 | |
| 17:00 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 20 | 0 | 10 | 30 | 0 | PM Peak |
| 18:00 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 20 | 0 | 10 | 29 | 0 | |

**2032 Future Total**

| Time Ending | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | All | Minor | Major | Minor Veh+ped |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8:00 | 13 | 0 | 16 | 0 | 0 | 0 | 1 | 176 | 12 | 6 | 194 | 0 | 419 | 69 | 433 | 18 |
| 9:00 | 50 | 1 | 16 | 0 | 0 | 2 | 2 | 167 | 33 | 10 | 221 | 0 | 502 | 69 | 433 | 55 |
| 12:00 | 19 | 0 | 13 | 2 | 0 | 4 | 1 | 193 | 10 | 8 | 201 | 0 | 452 | 39 | 413 | 26 |
| 13:00 | 19 | 0 | 9 | 0 | 0 | 0 | 4 | 195 | 22 | 11 | 181 | 2 | 443 | 28 | 415 | 24 |
| 14:00 | 19 | 0 | 13 | 0 | 0 | 2 | 2 | 203 | 17 | 9 | 192 | 1 | 458 | 34 | 424 | 24 |
| 16:00 | 20 | 0 | 15 | 1 | 0 | 2 | 3 | 247 | 16 | 17 | 219 | 0 | 540 | 38 | 502 | 26 |
| 17:00 | 53 | 0 | 14 | 1 | 0 | 3 | 5 | 282 | 48 | 13 | 282 | 0 | 701 | 71 | 630 | 59 |
| 18:00 | 19 | 0 | 13 | 0 | 0 | 2 | 3 | 262 | 21 | 11 | 253 | 0 | 584 | 34 | 550 | 24 |

**8-Hour Volume**

| Future Total (2031) | | | |
|---|---|---|---|
| Time Ending | | Major | Minor |
| 8:00 | | 390 | 29 |
| 9:00 | | 433 | 69 |
| 12:00 | | 413 | 39 |
| 13:00 | | 415 | 28 |
| 14:00 | | 424 | 34 |
| 16:00 | | 502 | 38 |
| 17:00 | | 630 | 71 |
| 18:00 | | 550 | 34 |
| **Total** | | **3757** | **342** |

**TRAFFIC SIGNAL WARRANTS - OTM Book 12, Justifications 1 & 2**

| Justification | Requirement | FUTURE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 lane | | | | | | | | | |
| | Free Flow | Hour Ending | | | | | | | | Averaçonal Percent |
| | | 8:00 | 9:00 | 12:00 | 13:00 | 14:00 | 16:00 | 17:00 | 18:00 | |
| 1. Min Vehicle Volumes | | | | | | | | | | |
| A. Vehicle volumes all approaches | **480** | 419 | 502 | 452 | 443 | 458 | 540 | 701 | 584 | |
| | **Score** | *87%* | *####* | *94%* | *92%* | *95%* | *####* | *####* | *####* | |
| | | 80% | 100% | 80% | 80% | 80% | 100% | 100% | 100% | 90% |
| B. Vehicle volumes, minor streets | **120** | 69 | 69 | 39 | 28 | 34 | 38 | 71 | 34 | 40% |
| | **Score** | *58%* | *58%* | *32%* | *23%* | *28%* | *32%* | *59%* | *28%* | |
| | | 58% | 58% | 32% | 23% | 28% | 32% | 59% | 28% | 40% |
| 2. Delay to Cross Traffic | | | | | | | | | | |
| A. Vehicle volumes, major street | **480** | 433 | 433 | 413 | 415 | 424 | 502 | 630 | 550 | |
| | **Score** | *90%* | *90%* | *86%* | *86%* | *88%* | *####* | *####* | *####* | |
| | | 80% | 80% | 80% | 80% | 80% | 100% | 100% | 100% | 88% |
| B. Combined vehicle+ped minor street | **50** | 18 | 55 | 26 | 24 | 24 | 26 | 59 | 24 | 61% |
| | score | *37%* | *####* | *52%* | *48%* | *49%* | *52%* | *####* | *48%* | |
| | | 37% | 100% | 52% | 48% | 49% | 52% | 100% | 48% | 61% |

**OVERALL WARRANT FOR TRAFFIC SIGNAL IS 61%**

# OTM BOOK 12 - JUSTIFICATION 7 - Wellington Road 19 / North Site Access

**STEP 1**

| | All Approaches | Minor Streets | Major Street | Combined Vehicle and Pedestrian Crossing Artery from Minor Streets | | |
|---|---|---|---|---|---|---|
| amPHV | 535 | 60 | 475 | 45 | (40+5) | Lefts + peds |
| pmPHV | 795 | 55 | 740 | 35 | (30+5) | Lefts + peds |
| AHV | **333** | **29** | **304** | **20** | AHV = (amPHV+pmPHV)/4 | |
| | | **1B** | 2A | **2B** | | |

**STEP 2**

**JUSTIFICATION 7**

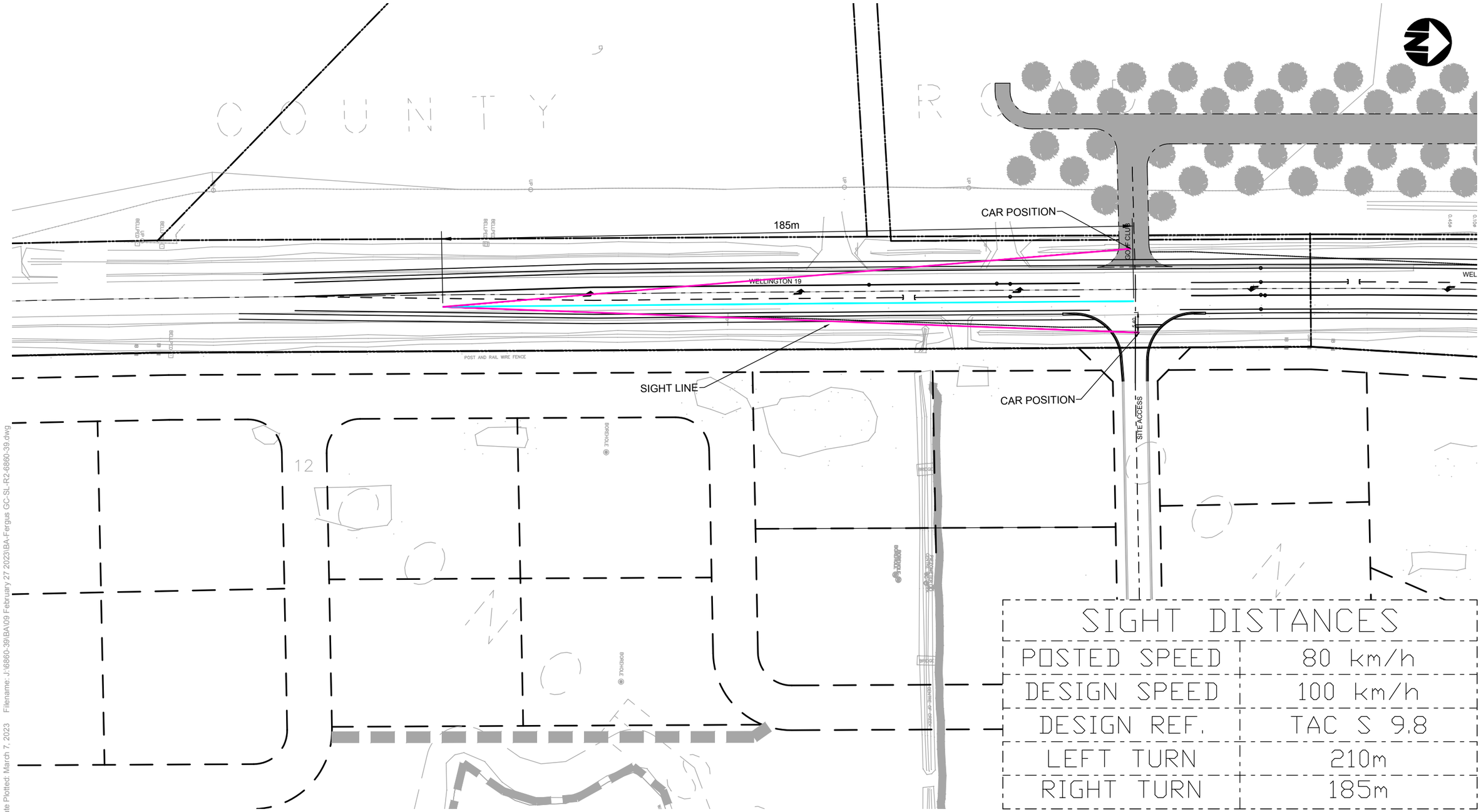
| Justification | Description | Minimum Requirement 1 Lane Highways | | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Sectional | | ENTIRE |
| | | Free Flow | Restr. Flow | Restr. Flow | Free Flow | Numerical | % | % |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches (average hour) | Does not apply. | | | 480 | 333 | 69% | 24% |
| | B. Vehicle volume, along minor streets (average hour) | | | | 120 | 29 | 24% | |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | | | | 480 | 304 | 63% | 40% |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | | | | 50 | 20 | 40% | |

**Note: For "T" intersections, 1B values should be increased by 50%.* ***(The intersection is not a "T" configuration thus values are increased in the above table.)***

Result: 40%
Required: 150%
NOT WARRANTED

**Analysis Using Average Hour Volume**
For traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a **50% increase for a future intersection** or roadway.

# Appendix F
# Sight Distance Assessments




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | 80 km/h |
| DESIGN SPEED | 100 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 210m |
| RIGHT TURN | 185m |

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2.6860-39.dwg

BA Group

# FERGUS GOLF CLUB SOUTH

SIGHT LINE REVIEW

WELLINGTON 19 LOOKING SOUTH

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-01

CAR POSITION

GOLF CLUB

210m

WELLINGTON 19

TON 19

CAR POSITION

SITE ACCESS

SIGHT LINE

POST AND RAIL WIRE FENCE

| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | 80 km/h |
| DESIGN SPEED | 100 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 210m |
| RIGHT TURN | 185m |

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg

BA Group

# FERGUS GOLF CLUB SOUTH

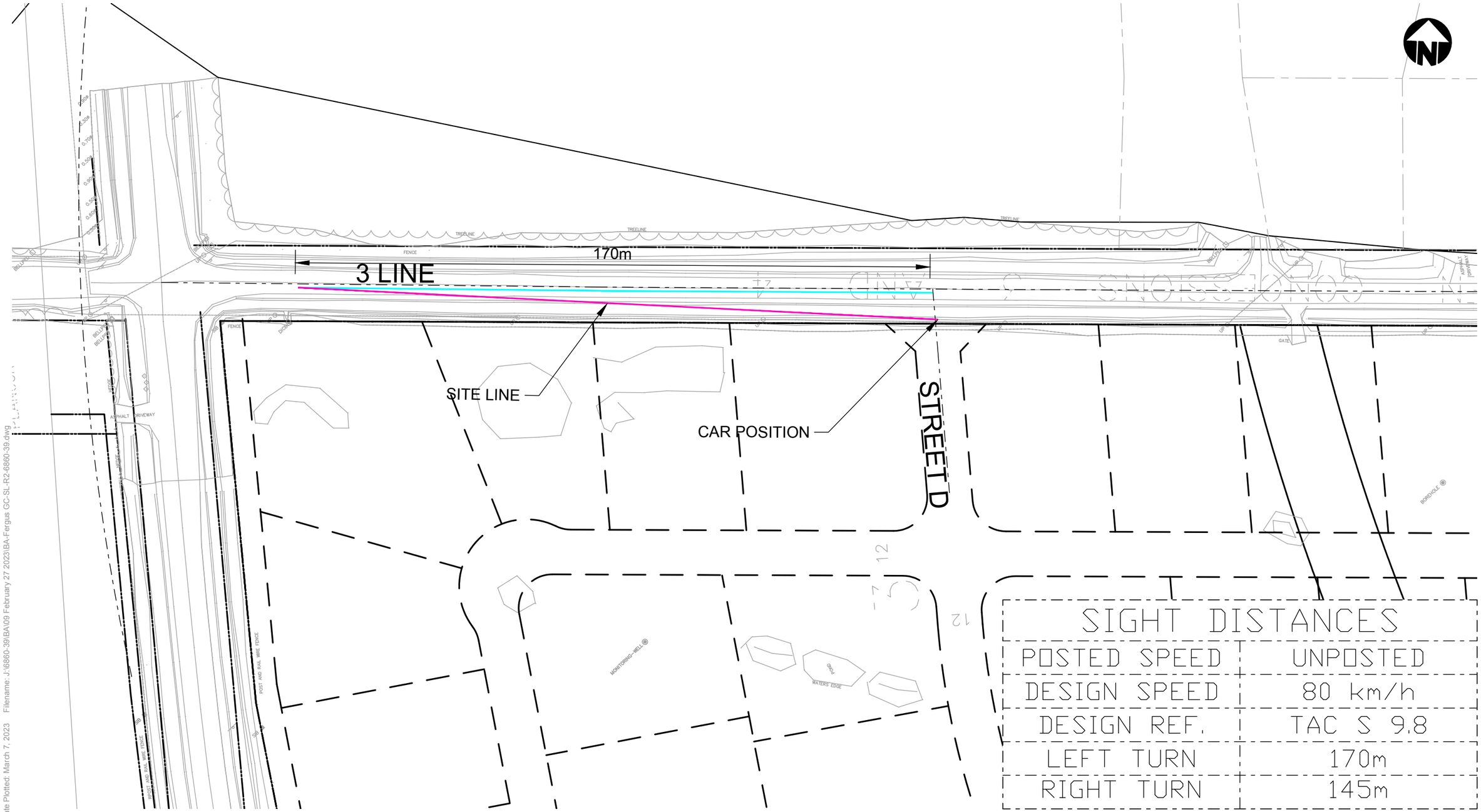
## SIGHT LINE REVIEW

## WELLINGTON 19 LOOKING NORTH

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-02




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 80 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg

BA Group

# FERGUS GOLF CLUB SOUTH

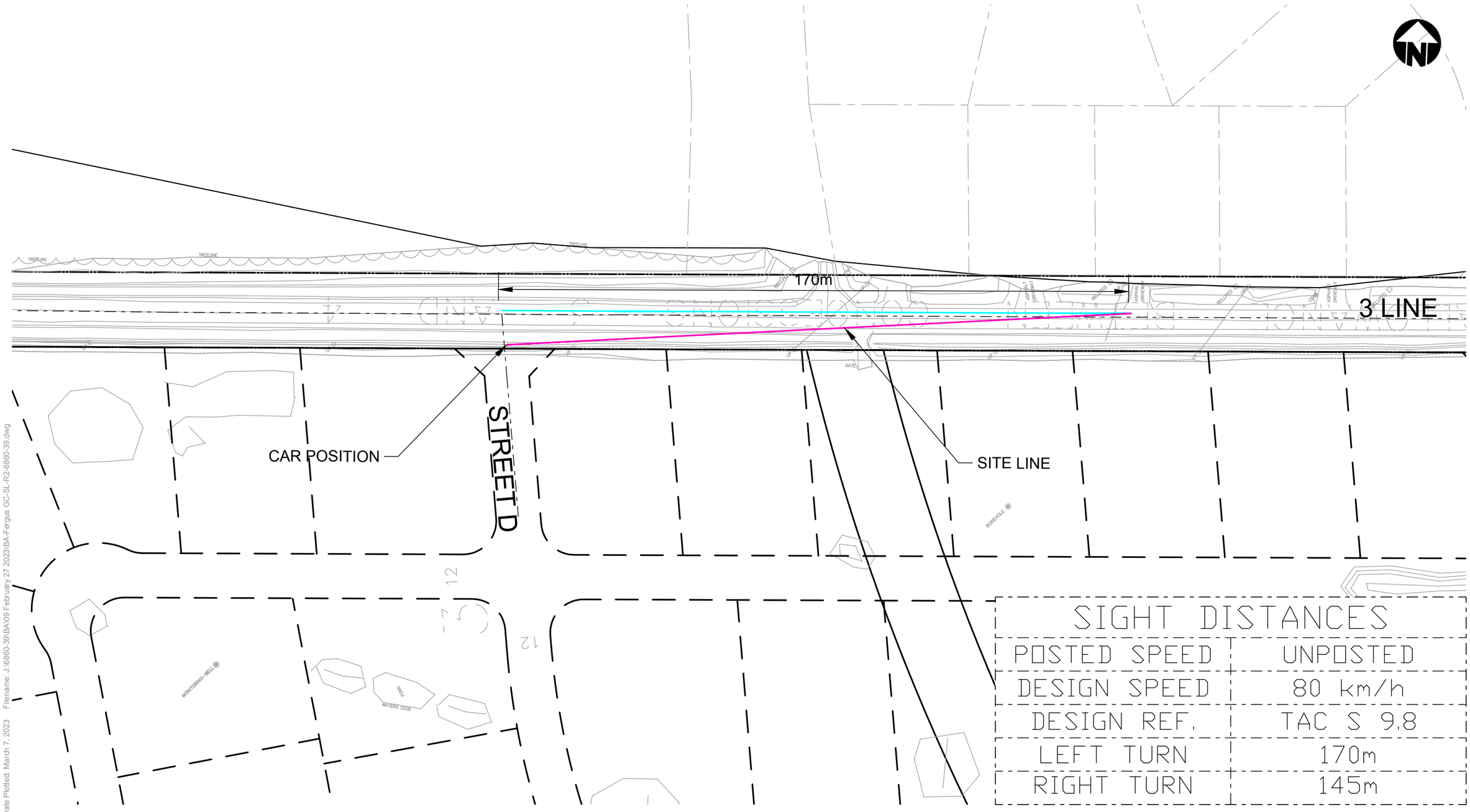
SIGHT LINE REVIEW

STREET D - EASTBOUND LEFT

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-03




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 80 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |

BA Group

# FERGUS GOLF CLUB SOUTH

SIGHT LINE REVIEW

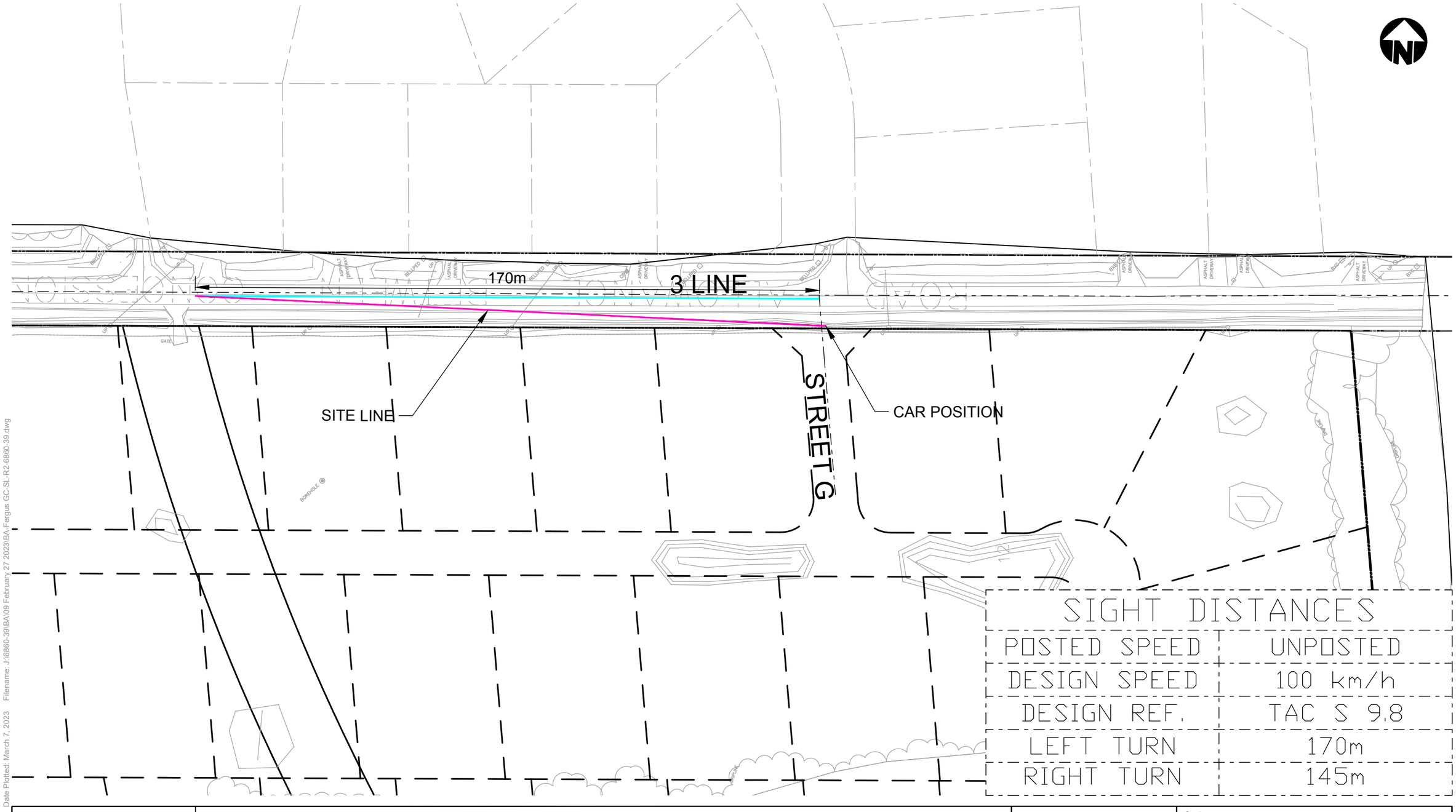
STREET D - EASTBOUND RIGHT

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-04

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 100 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |

BA Group

# FERGUS GOLF CLUB SOUTH

SIGHT LINE REVIEW

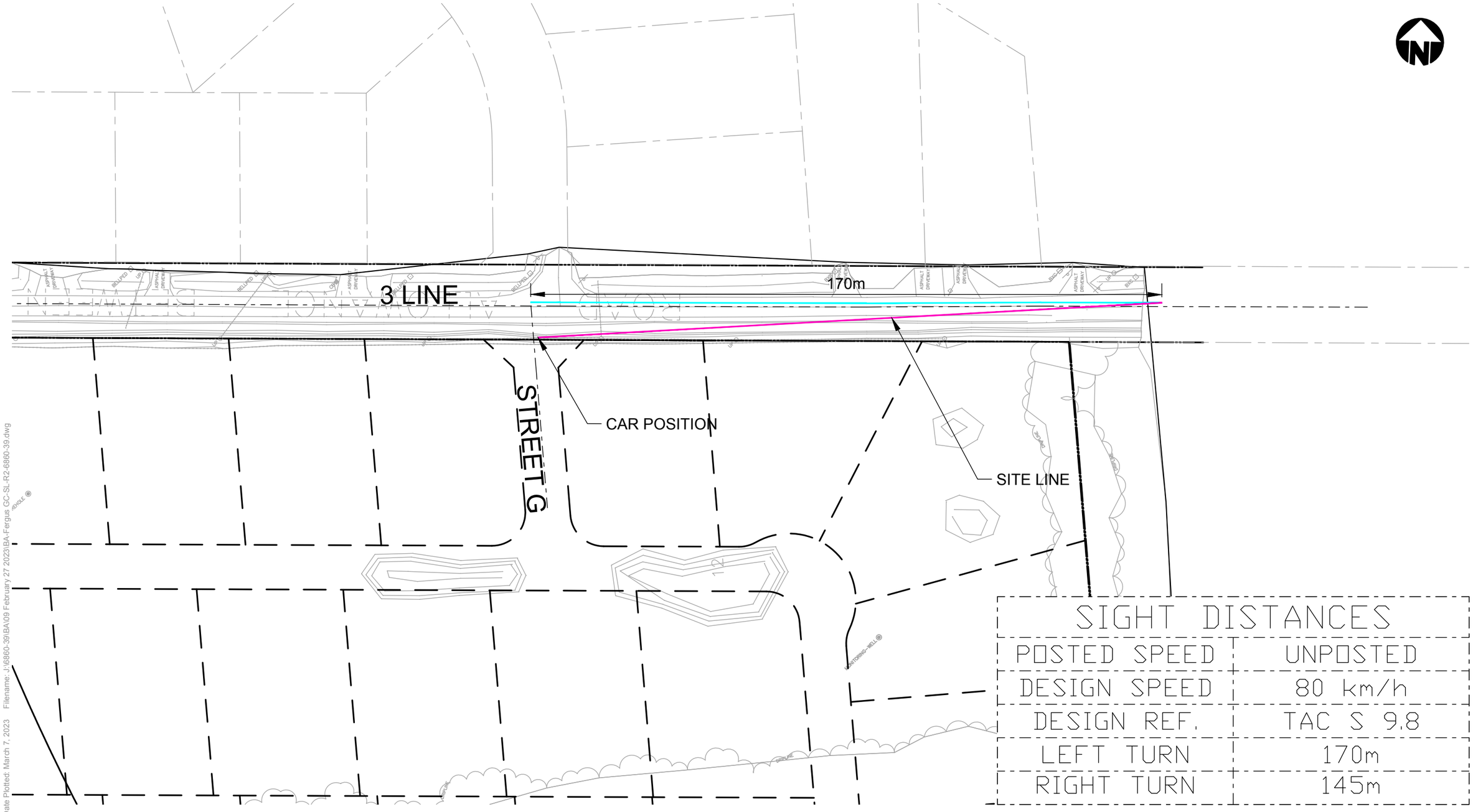
STREET G - EASTBOUND LEFT

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-05

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 80 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg

BA Group

# FERGUS GOLF CLUB SOUTH

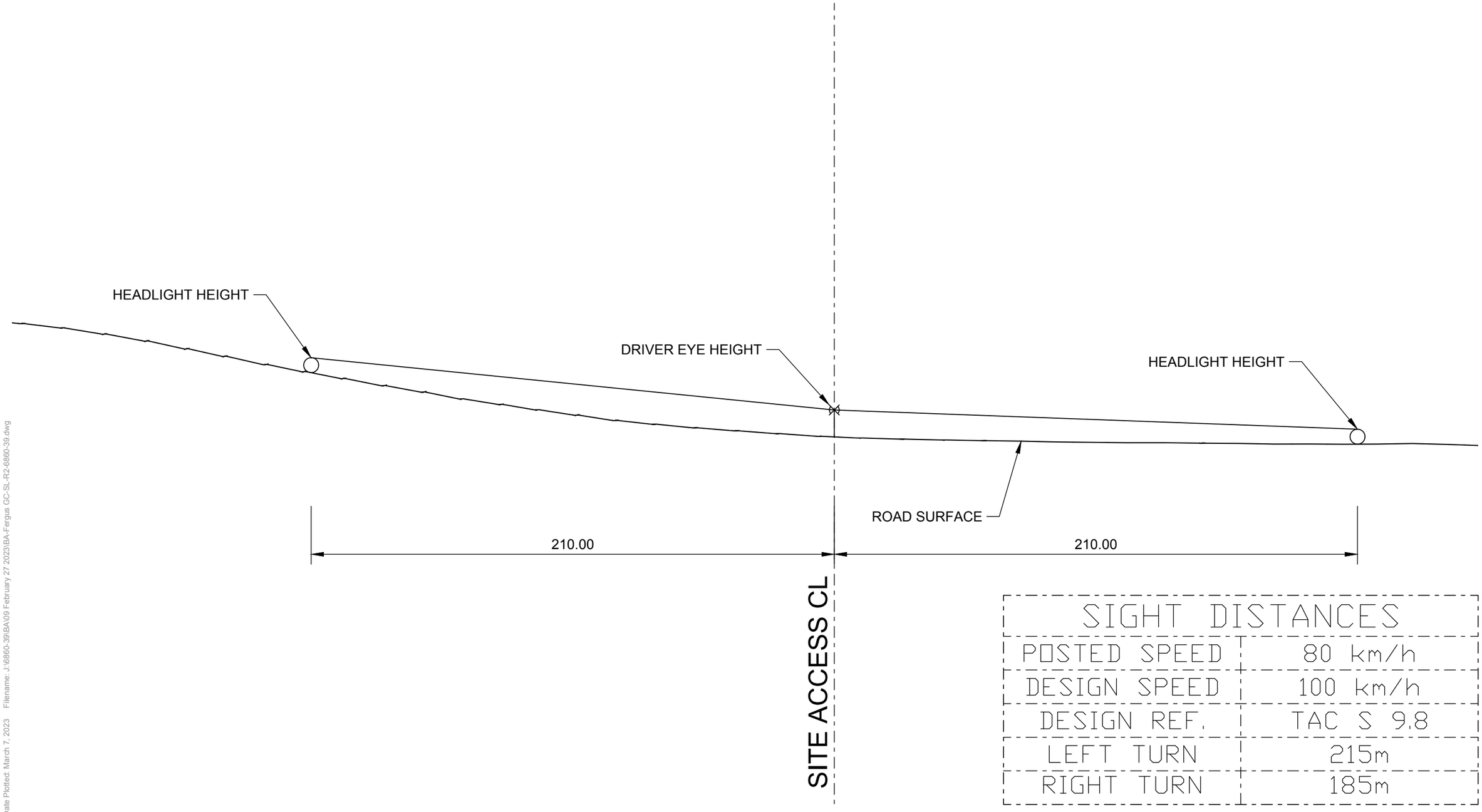
SIGHT LINE REVIEW

STREET G - EASTBOUND RIGHT

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. SL-06




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | 80 km/h |
| DESIGN SPEED | 100 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 215m |
| RIGHT TURN | 185m |



BA Group

# FERGUS GOLF CLUB SOUTH

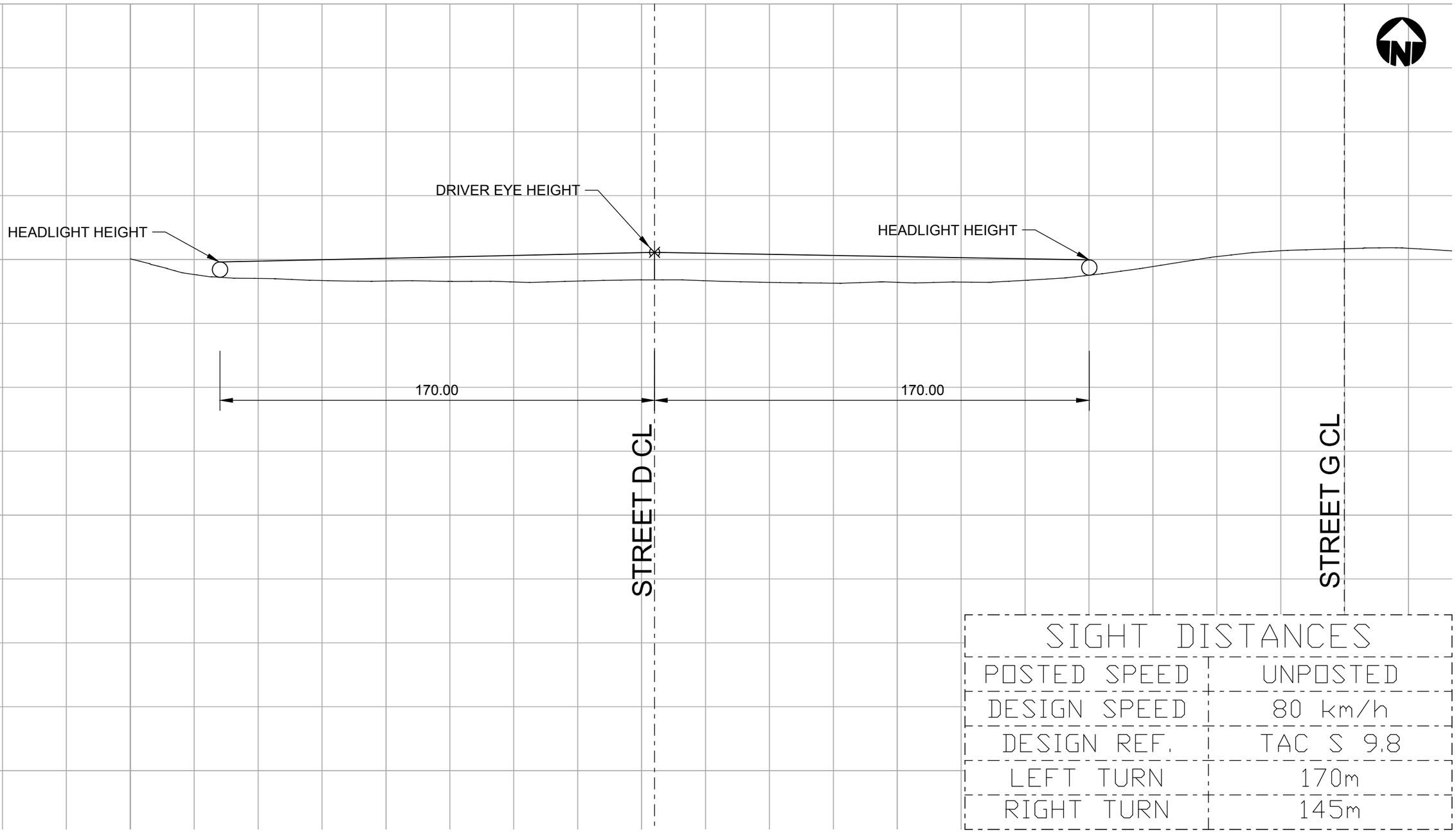
SIGHT LINE REVIEW

WELLINGTON 19 AT SITE ACCESS / GOLF CLUB

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Horizontal Scale 0 10 20 30 40 50m
1:1,000
10:1 VERTICAL EXAGGERATION

Drawing No.
SL-07




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 80 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |



BA Group

# FERGUS GOLF CLUB SOUTH

## SIGHT LINE REVIEW

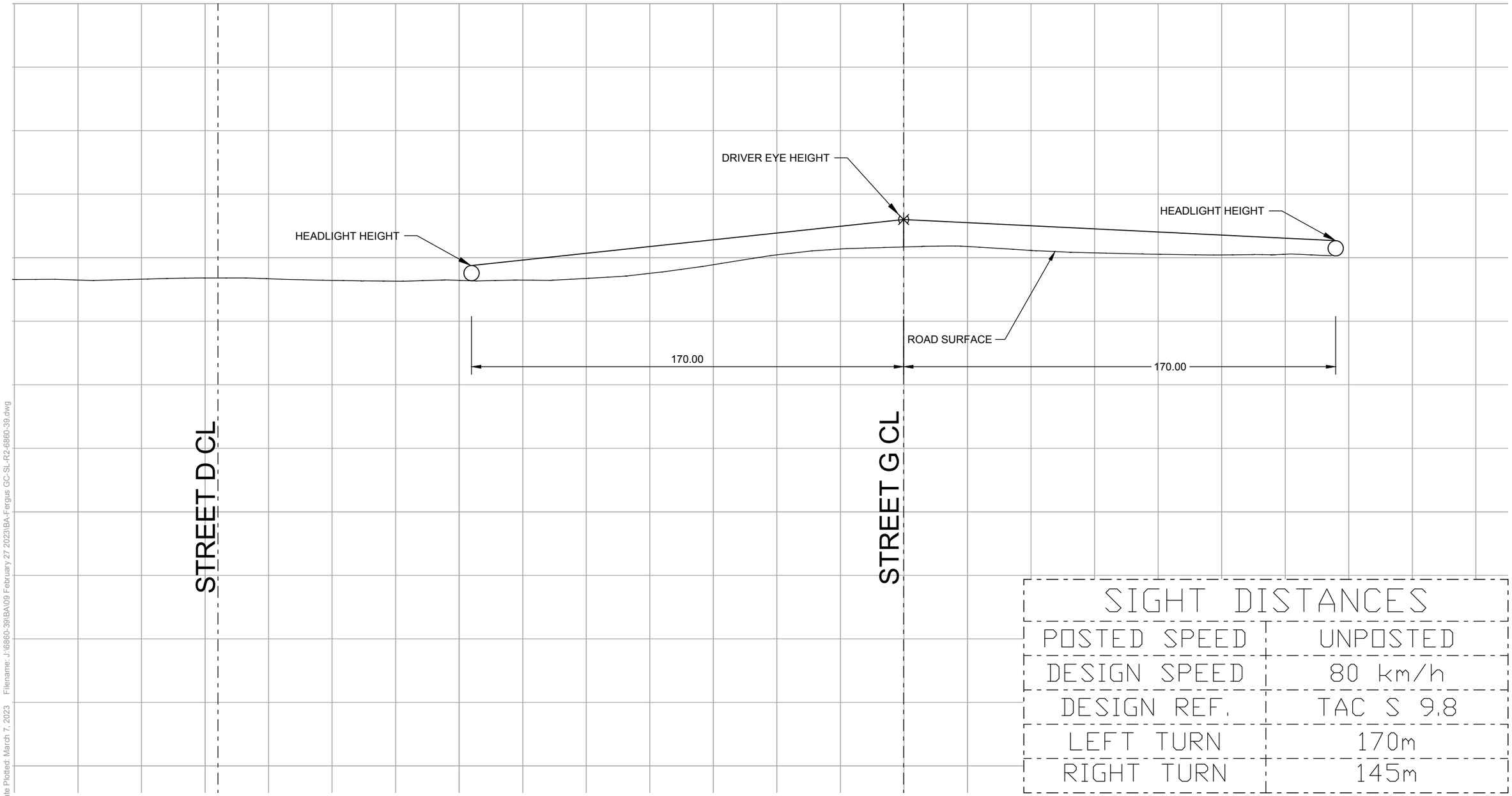
## 3 LINE PROFILE AT STREET D

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Horizontal Scale 1:1,000 (0 10 20 30 40 50m)

10:1 VERTICAL EXAGGERATION

Drawing No. SL-08




| SIGHT DISTANCES | |
|---|---|
| POSTED SPEED | UNPOSTED |
| DESIGN SPEED | 80 km/h |
| DESIGN REF. | TAC S 9.8 |
| LEFT TURN | 170m |
| RIGHT TURN | 145m |

Date Plotted: March 7, 2023 Filename: J:\6860-39\BA\09 February 27 2023\BA-Fergus GC-SL-R2-6860-39.dwg

BA Group

# FERGUS GOLF CLUB SOUTH

SIGHT LINE REVIEW

3 LINE PROFILE AT STREET G

| | |
|---|---|
| Project: | FERGUS GOLF CLUB |
| Project No. | 6960-39 |
| Date: | MARCH 06, 2023 |
| Revised: | -- |

Horizontal Scale 1:1,000 0 10 20 30 40 50m

10:1 VERTICAL EXAGGERATION

Drawing No.

SL-09

# Appendix G
# Correspondence with Triton Engineering

| | |
|---|---|
| **From:** | Deanna Green |
| **To:** | "Howard Wray" |
| **Cc:** | Eric Gilmour |
| **Subject:** | RE: Fergus Golf Club Development Peer Review |
| **Date:** | November 14, 2022 8:30:16 AM |
| **Attachments:** | image001.jpg<br>image004.jpg<br>image005.jpg |

---

Howard,

Thank you so much for this additional information. We will provide further information - such as the profile - in our revised report regarding the use of survey data.

Regards,

Deanna

---

**From:** Howard Wray <hwray@tritoneng.on.ca>
**Sent:** November 14, 2022 8:27 AM
**To:** Deanna Green <Deanna.Green@bagroup.com>
**Cc:** Eric Gilmour <Eric.Gilmour@bagroup.com>
**Subject:** RE: Fergus Golf Club Development Peer Review

Hi Deanna,

No problem with contacting me.

My reference to Field Measurements would include an analysis based on a survey. Provided it was based on a suitable number of elevation points, arial data could be sufficient. Please provide the profile as an attachment.

Regards,

Howard Wray, P. Eng.

Triton Engineering Services Limited
229 Broadway, Unit 1 Orangeville, ON L9W 1K4
Tel (519) 941-0330 ext 223 • Fax (519) 941-1830 • *www.tritoneng.on.ca*



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**From:** Deanna Green <Deanna.Green@bagroup.com>
**Sent:** November 11, 2022 3:35 PM
**To:** Howard Wray <hwray@tritoneng.on.ca>
**Cc:** Eric Gilmour <Eric.Gilmour@bagroup.com>

**Subject:** Fergus Golf Club Development Peer Review

Howard,

I hope that it's ok to follow up with you directly. If not…please feel free to redirect me.☺

We just wanted to follow up on the comment that was provided to us regarding the proposed Fergus Golf Club development. Your comments (attached) that a sight distance field measurement is required to confirm sight distance at the new access points along Wellington 19. Please note that the south access has been eliminated and the new site plan includes only the north access, to be aligned with a relocated golf club driveway.

BA Group's February 2022 report stated that:

> *"Due to COVID, a comprehensive sight distance review was completed for the two proposed access points to the SE Site utilizing aerial photos."*

**We wanted to follow up to confirm that both the vertical and horizontal profile data obtained from surveys were also used to confirm the sight distance.**

Before we make arrangements for a field study to confirm the sight distance, we wanted to confirm that a field study is still required, even if we have confirmed the sight distance with both horizontal and vertical survey data.

We look forward to hearing from you.

Thank you.

Deanna

**Deanna Green, MSc.P.Eng.**
**Associate**

**BA Consulting Group Ltd.**
300 - 45 St. Clair Ave. W.
Toronto, ON M4V 1K9

**TEL** 416 961 7110 x149
**EMAIL** Deanna.Green@bagroup.com

Image removed by sender. BA Consulting Group Ltd

# Appendix H
# Left-Turn Lane Warrant Analysis

# Left-Turn Lane Warrant Analysis (Future Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

**AM Peak Period:**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 195$

Opposing Traffic Volume: $V_O = 250$

Left Turn Traffic Volume: $V_L = 10$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

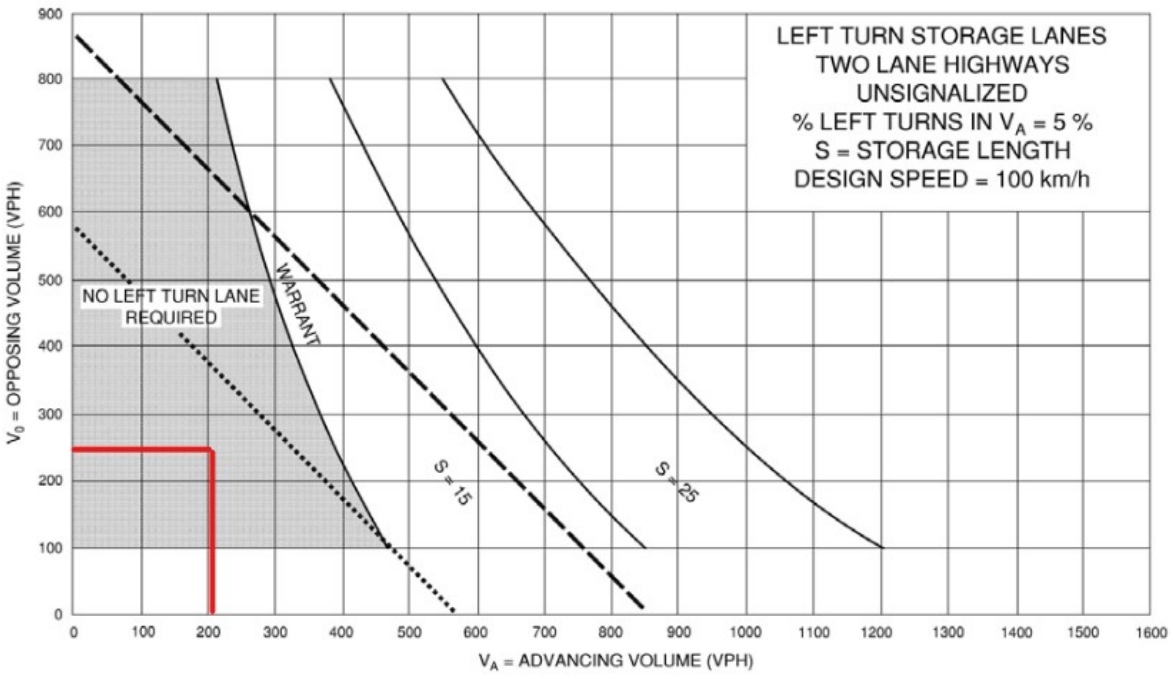
$$Advancing\ Traffic\ Volume\ V_A = 195 + 10$$

$$Advancing\ Traffic\ Volume\ V_A = 205$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{205} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.9\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 235$

Opposing Traffic Volume: $V_O = 205$

Left Turn Traffic Volume: $V_L = 10$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

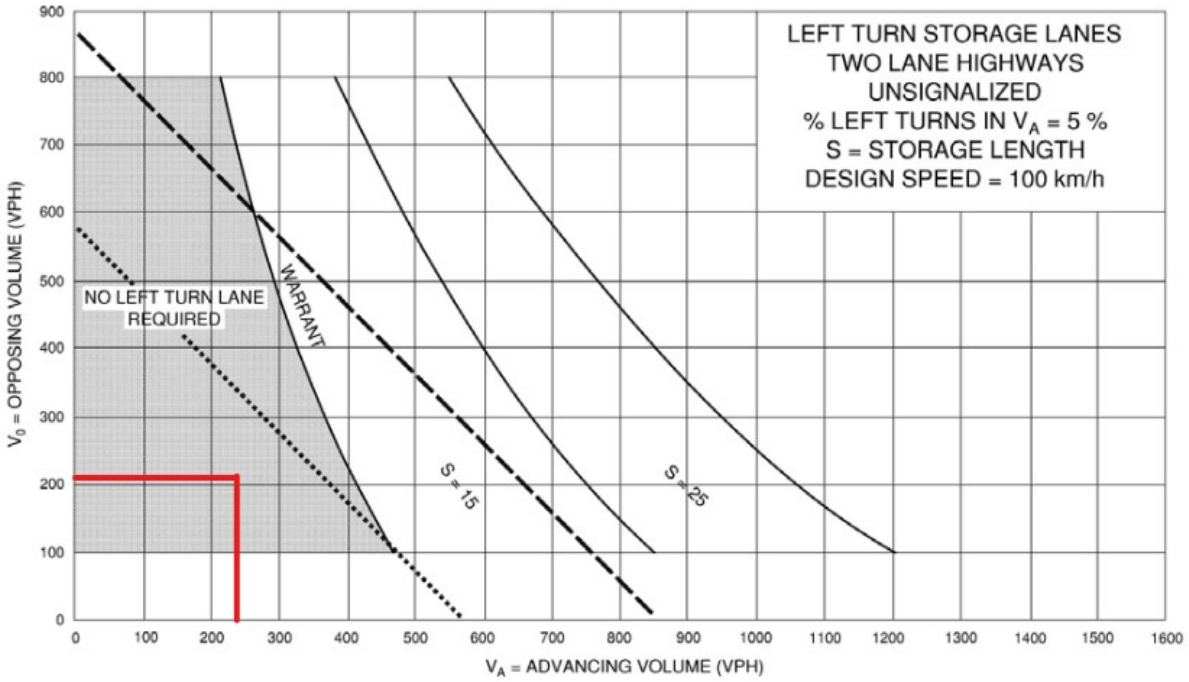
$$Advancing\ Traffic\ Volume\ V_A = 235 + 10$$

$$Advancing\ Traffic\ Volume\ V_A = 245$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{245} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.1\%$$



**PM Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 330$

Opposing Traffic Volume: $V_O = 340$

Left Turn Traffic Volume: $V_L = 15$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

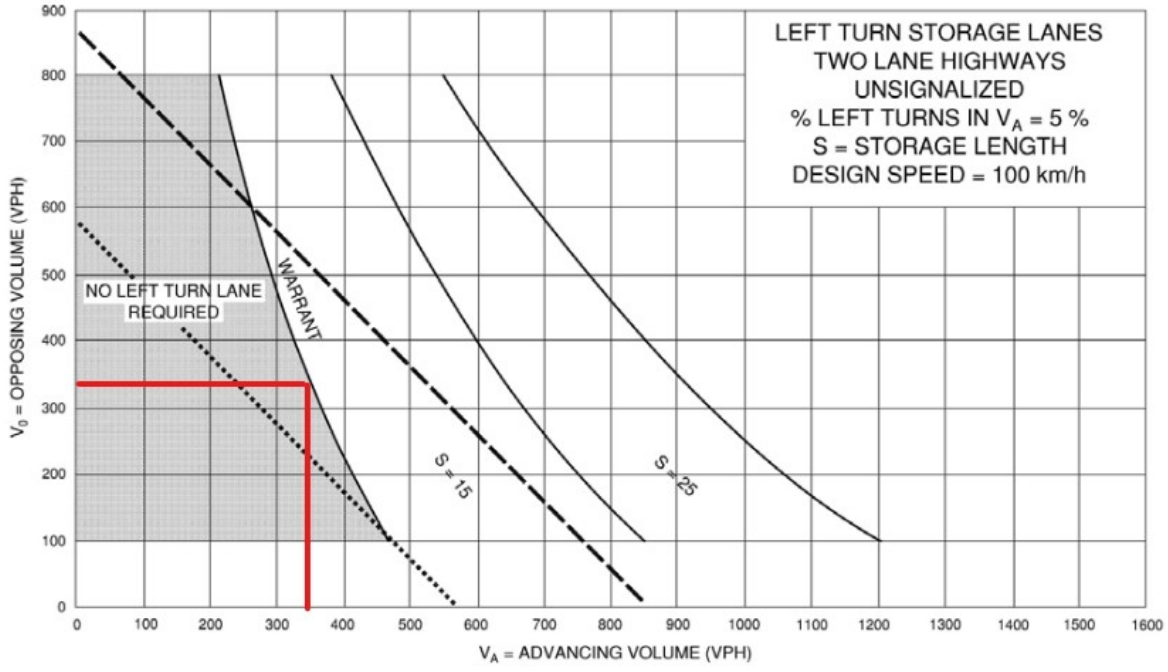
$$Advancing\ Traffic\ Volume\ V_A = 330 + 15$$

$$Advancing\ Traffic\ Volume\ V_A = 345$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{345} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.3\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 320$

Opposing Traffic Volume: $V_O = 370$

Left Turn Traffic Volume: $V_L = 20$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

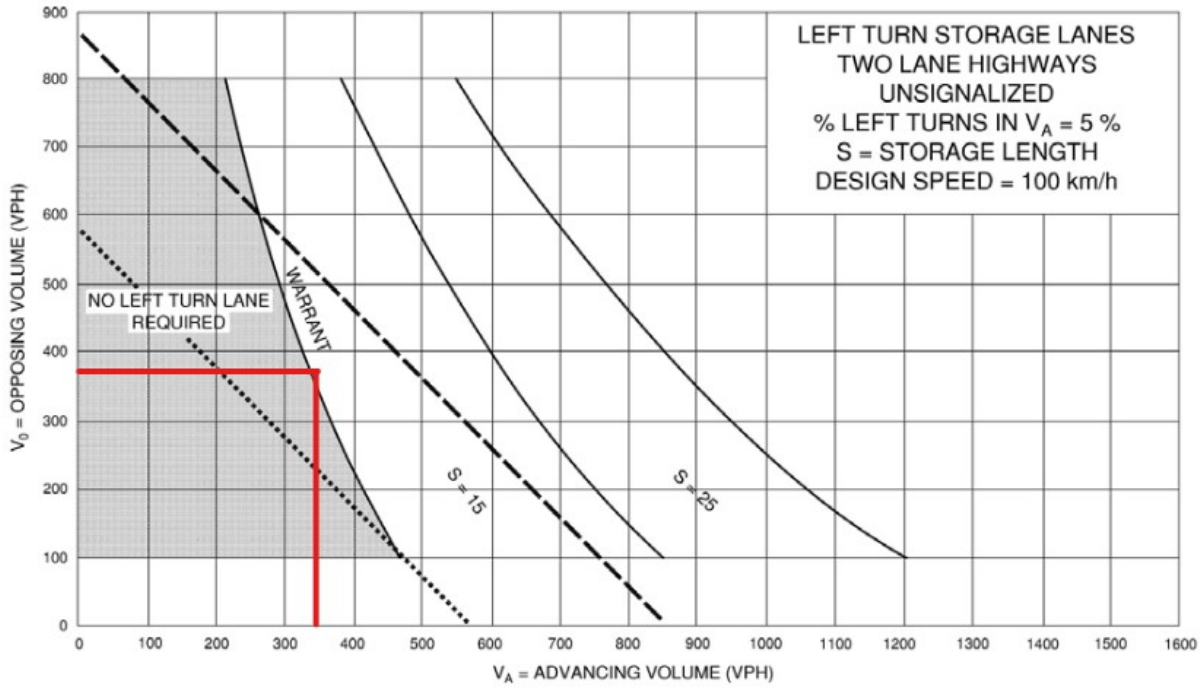
$$Advancing\ Traffic\ Volume\ V_A = 320 + 20$$

$$Advancing\ Traffic\ Volume\ V_A = 340$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{20}{340} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 5.9\%$$



**SAT Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 410$

Opposing Traffic Volume: $V_O = 380$

Left Turn Traffic Volume: $V_L = 15$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

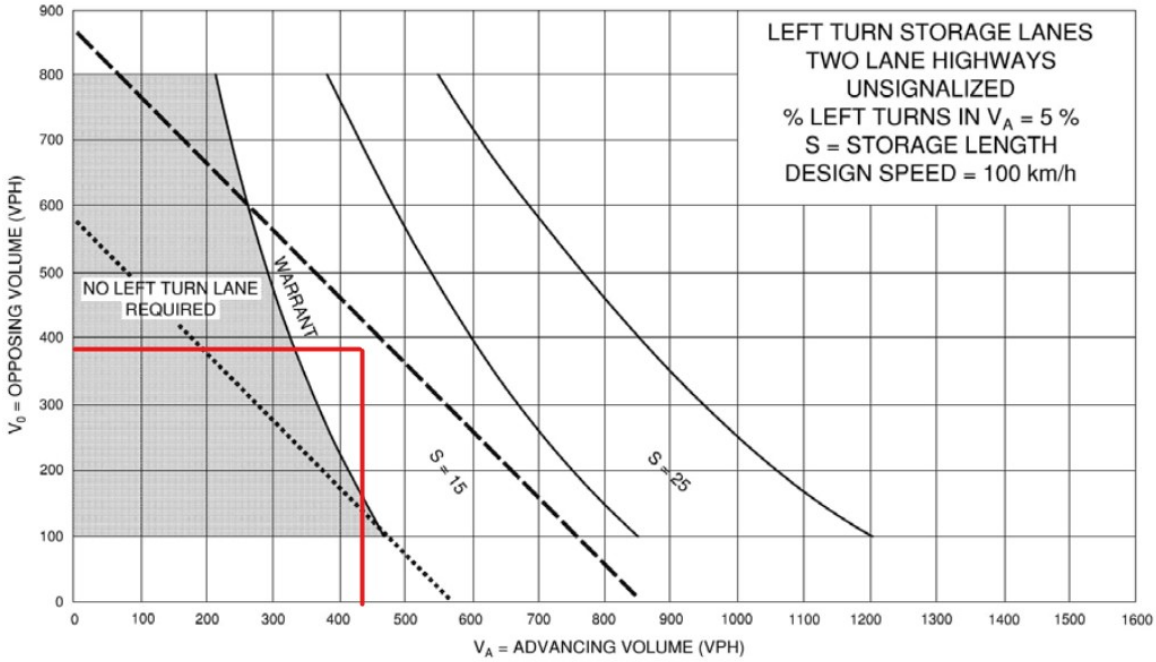
$$Advancing\ Traffic\ Volume\ V_A = 410 + 15$$

$$Advancing\ Traffic\ Volume\ V_A = 425$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{425} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 3.5\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 355$

Opposing Traffic Volume: $V_O = 460$

Left Turn Traffic Volume: $V_L = 15$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

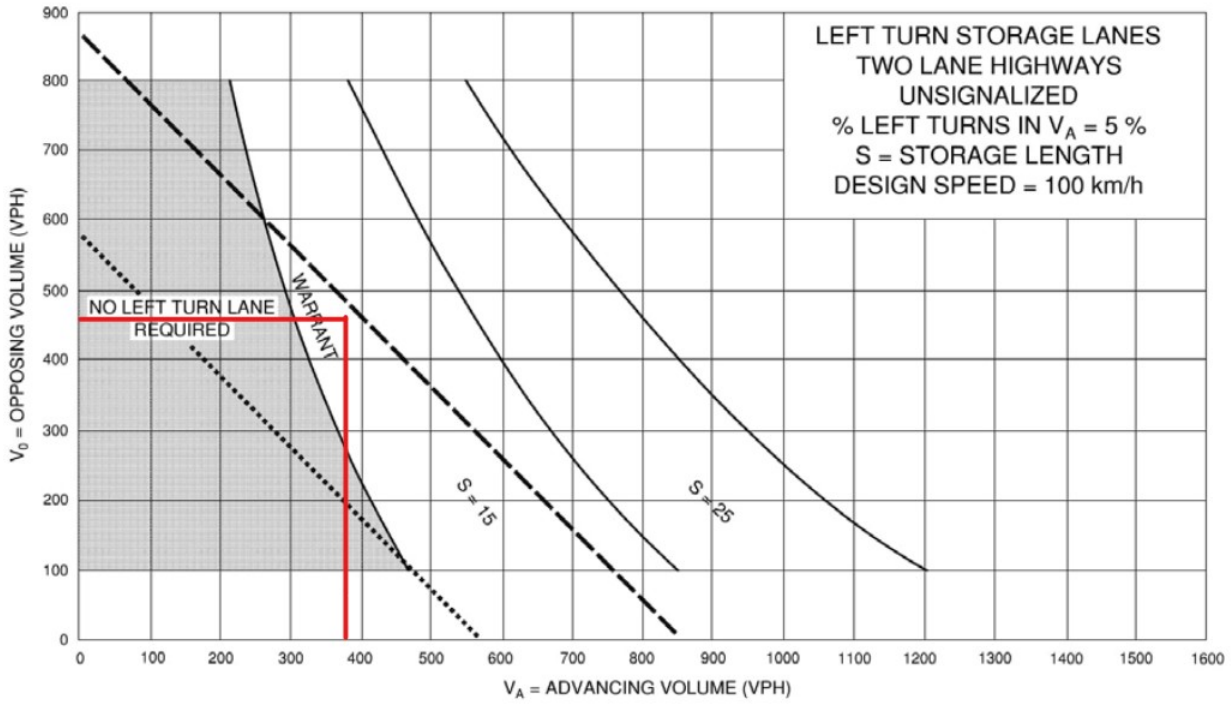
$$Advancing\ Traffic\ Volume\ V_A = 355 + 20$$

$$Advancing\ Traffic\ Volume\ V_A = 375$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{375} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.0\%$$



# Left-Turn Lane Warrant Analysis 2 Line (Existing Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

**AM Peak Period:**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 110$

Opposing Traffic Volume: $V_O = 200$

Left Turn Traffic Volume: $V_L = 10$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

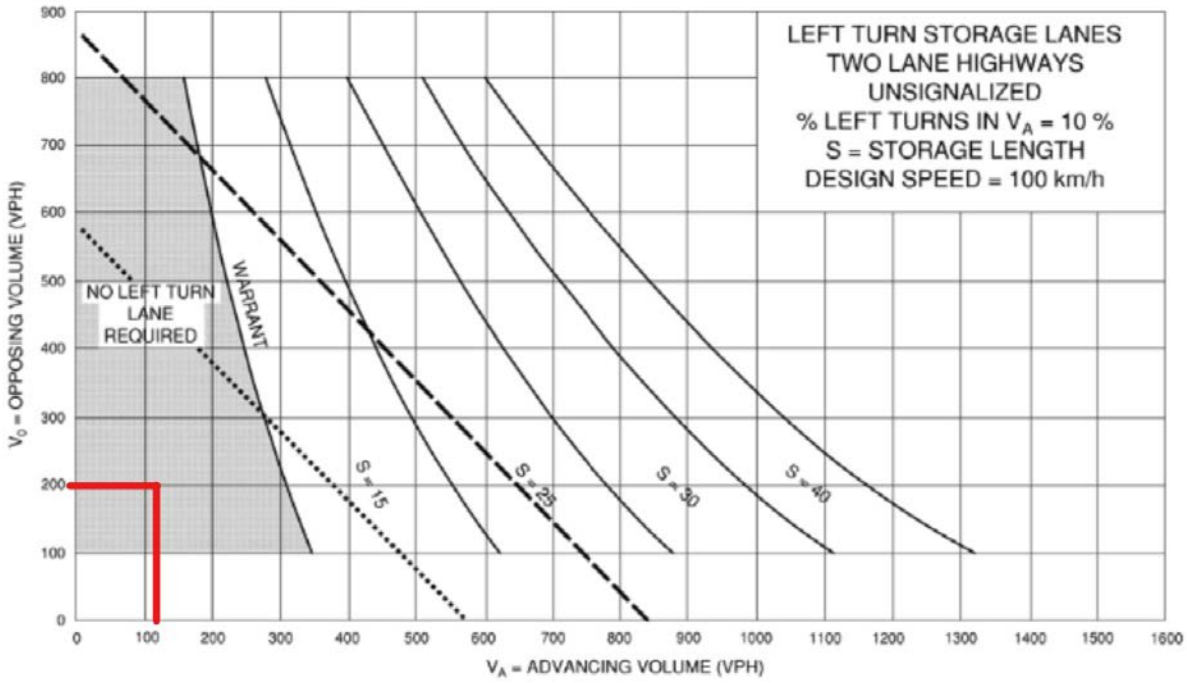
$$Advancing\ Traffic\ Volume\ V_A = 110 + 10$$

$$Advancing\ Traffic\ Volume\ V_A = 120$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{120} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 8.3\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 135$

Opposing Traffic Volume: $V_O = 125$

Left Turn Traffic Volume: $V_L = 60$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

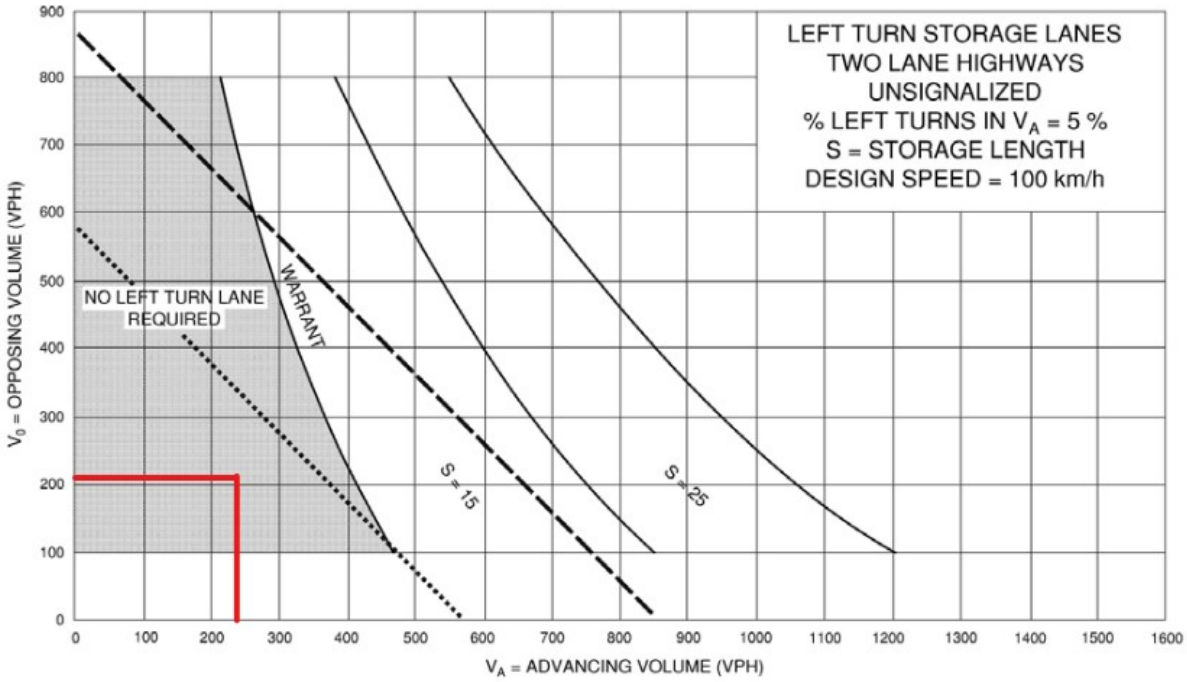
$$Advancing\ Traffic\ Volume\ V_A = 135 + 60$$

$$Advancing\ Traffic\ Volume\ V_A = 195$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{60}{195} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 30.8\%$$



**PM Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 190$

Opposing Traffic Volume: $V_O = 270$

Left Turn Traffic Volume: $V_L = 20$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

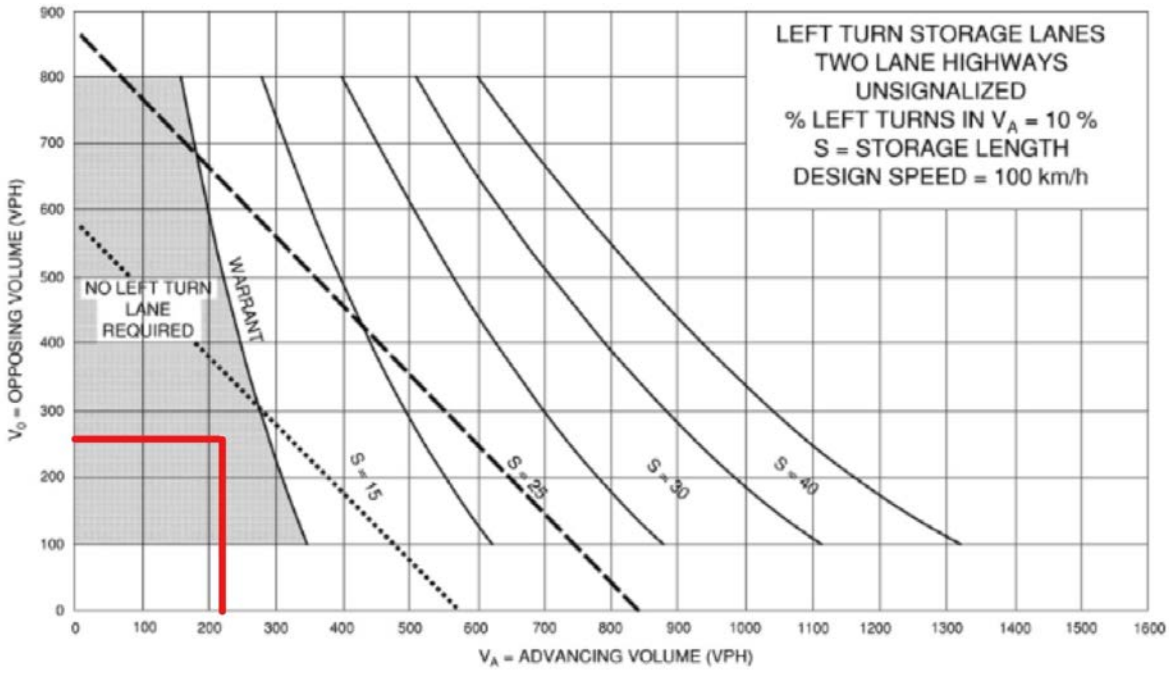
$$Advancing\ Traffic\ Volume\ V_A = 190 + 20$$

$$Advancing\ Traffic\ Volume\ V_A = 210$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{20}{210} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 9.5\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 190$

Opposing Traffic Volume: $V_O = 220$

Left Turn Traffic Volume: $V_L = 65$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

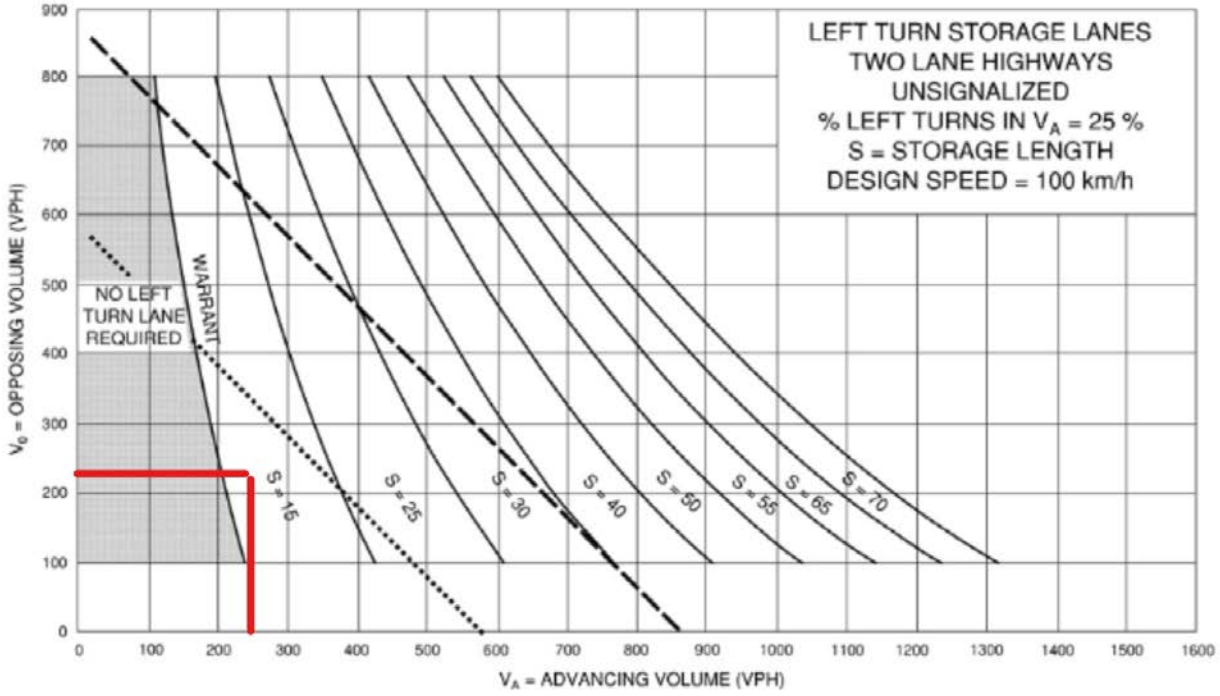
$$Advancing\ Traffic\ Volume\ V_A = 190 + 65$$

$$Advancing\ Traffic\ Volume\ V_A = 255$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{65}{255} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 25.5\%$$



## Left-Turn Lane Warrant Analysis 3 Line (Existing Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

**AM Peak Period:**

**Westbound Left**

Existing Thru Traffic Volume: $V_T = 165$

Opposing Traffic Volume: $V_O = 160$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

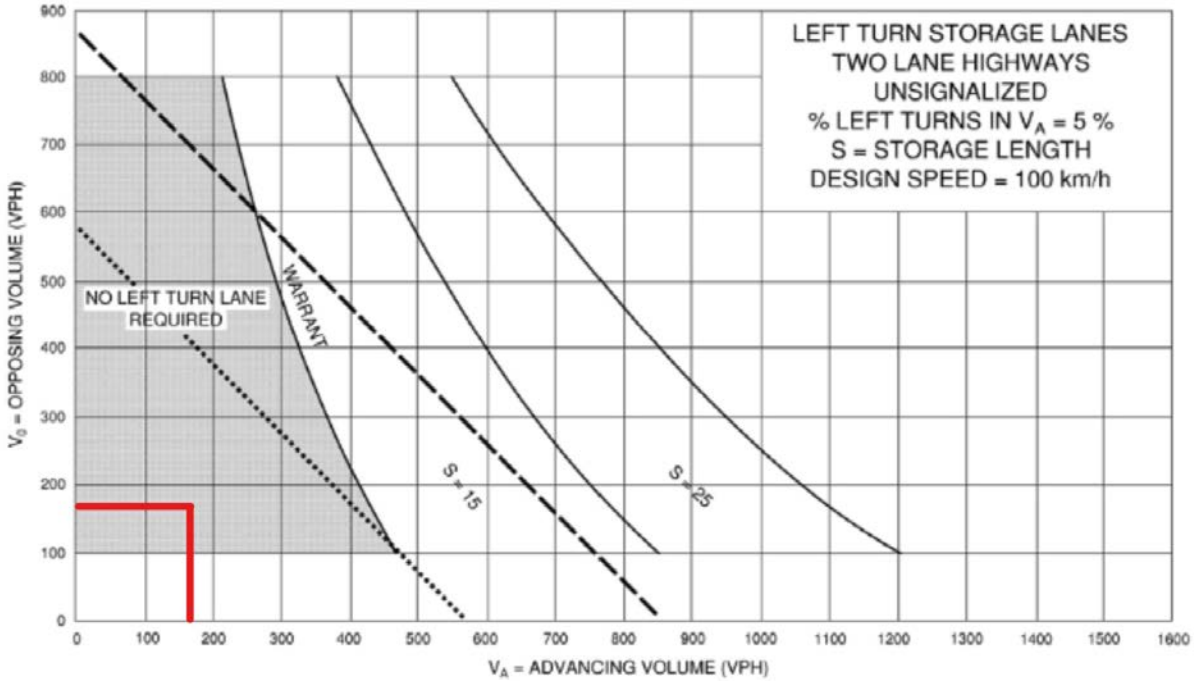
$$Advancing\ Traffic\ Volume\ V_A = 165 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 170$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{170} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.9\%$$



**PM Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 220$

Opposing Traffic Volume: $V_O = 265$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

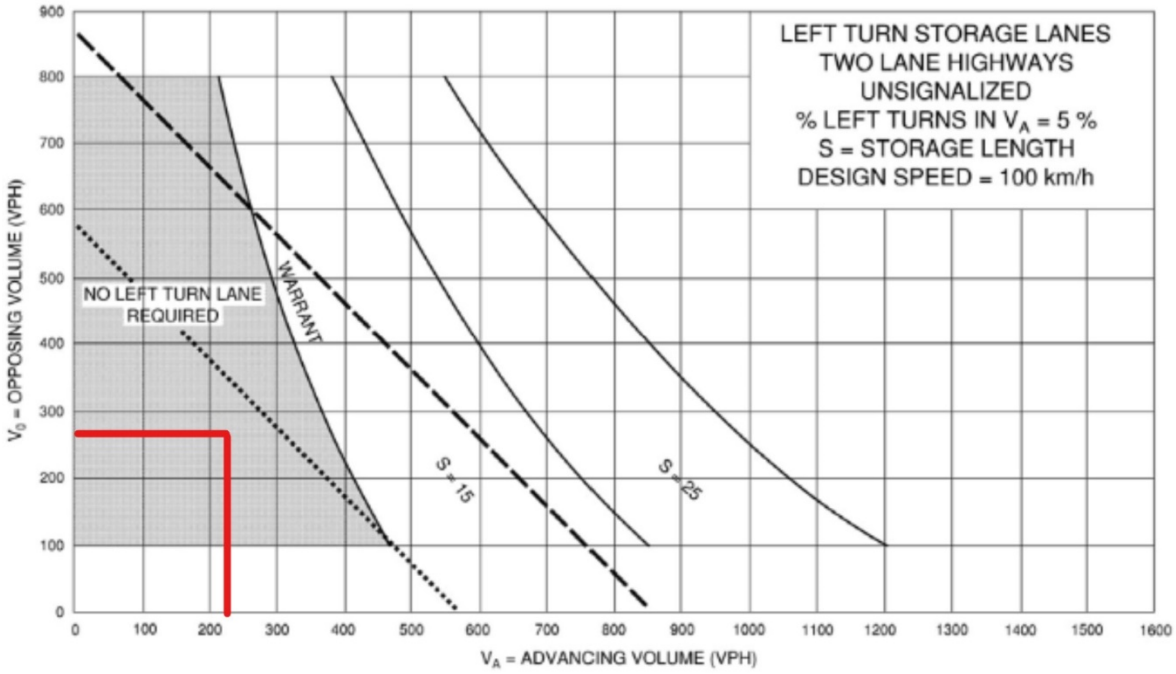
$$Advancing\ Traffic\ Volume\ V_A = 220 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 225$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{225} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.2\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 215$

Opposing Traffic Volume: $V_O = 265$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

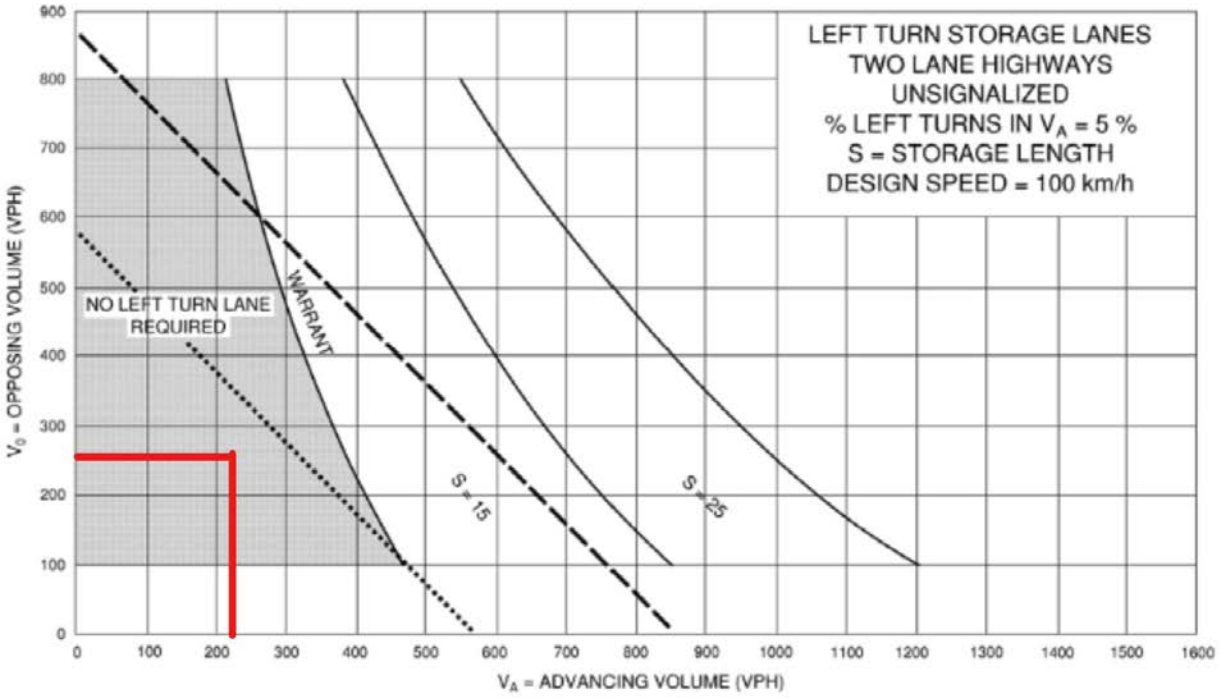
$$Advancing\ Traffic\ Volume\ V_A = 215 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 220$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{220} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.3\%$$



## Left-Turn Lane Warrant Analysis 3 Line (Future Background Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

**AM Peak Period:**

**Westbound Left**

Existing Thru Traffic Volume: $V_T = 180$

Opposing Traffic Volume: $V_O = 180$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

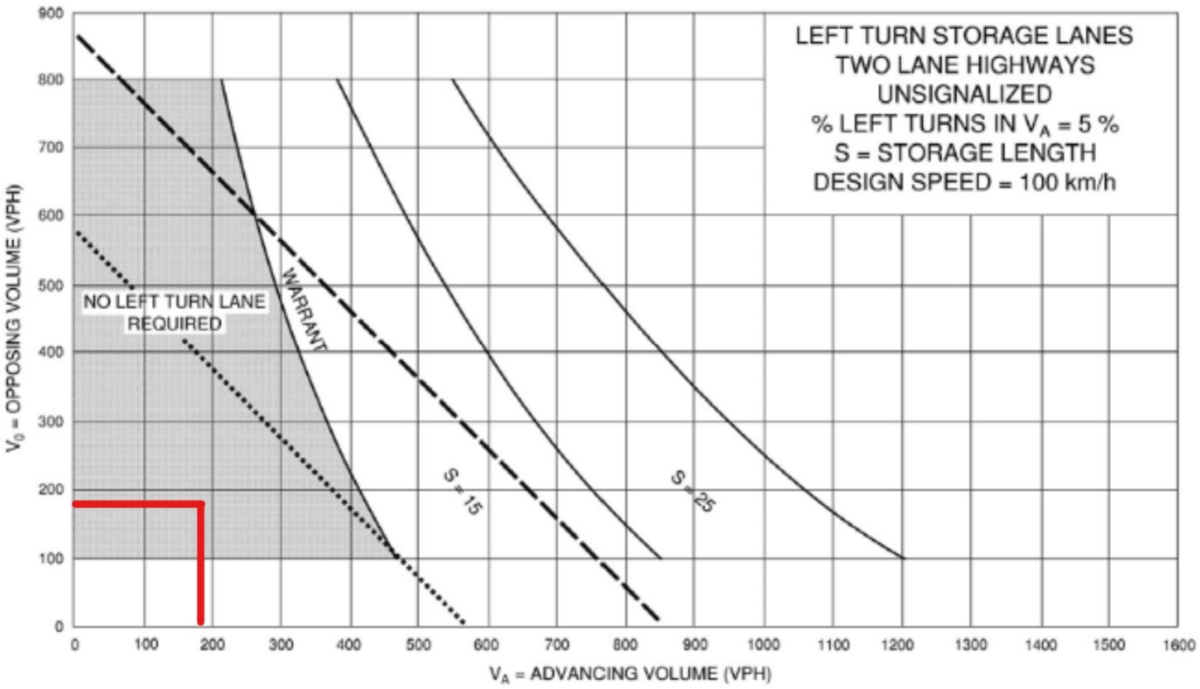
$$Advancing\ Traffic\ Volume\ V_A = 180 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 185$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{185} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.7\%$$



**PM Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 260$

Opposing Traffic Volume: $V_O = 255$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

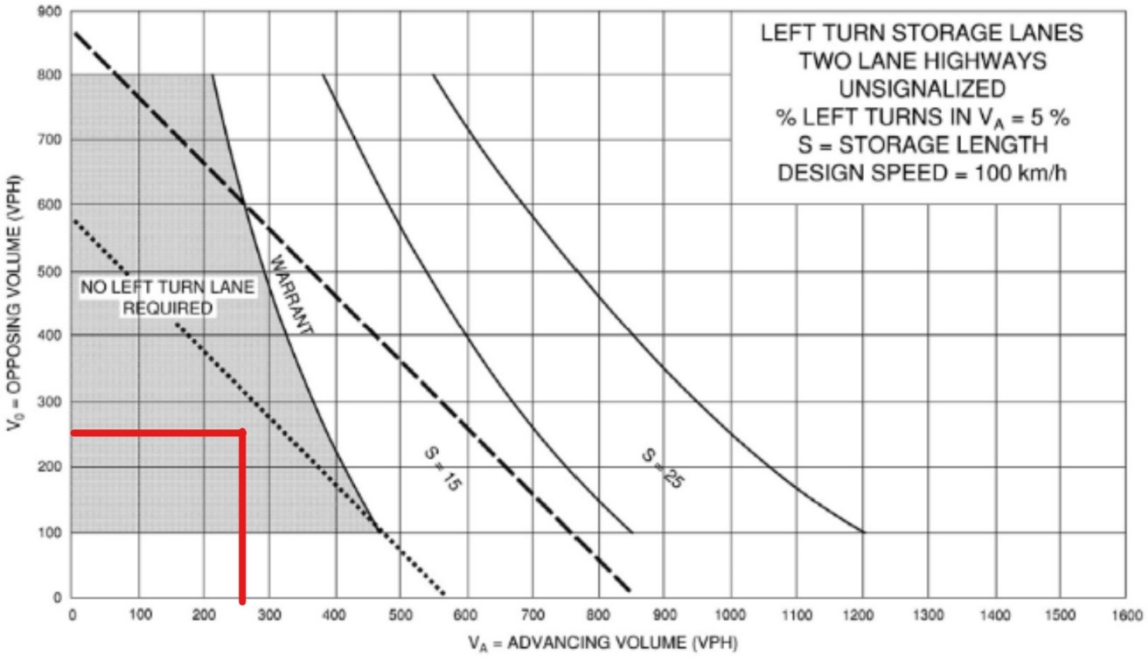
$$Advancing\ Traffic\ Volume\ V_A = 260 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 265$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{265} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.9\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 250$

Opposing Traffic Volume: $V_O = 305$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

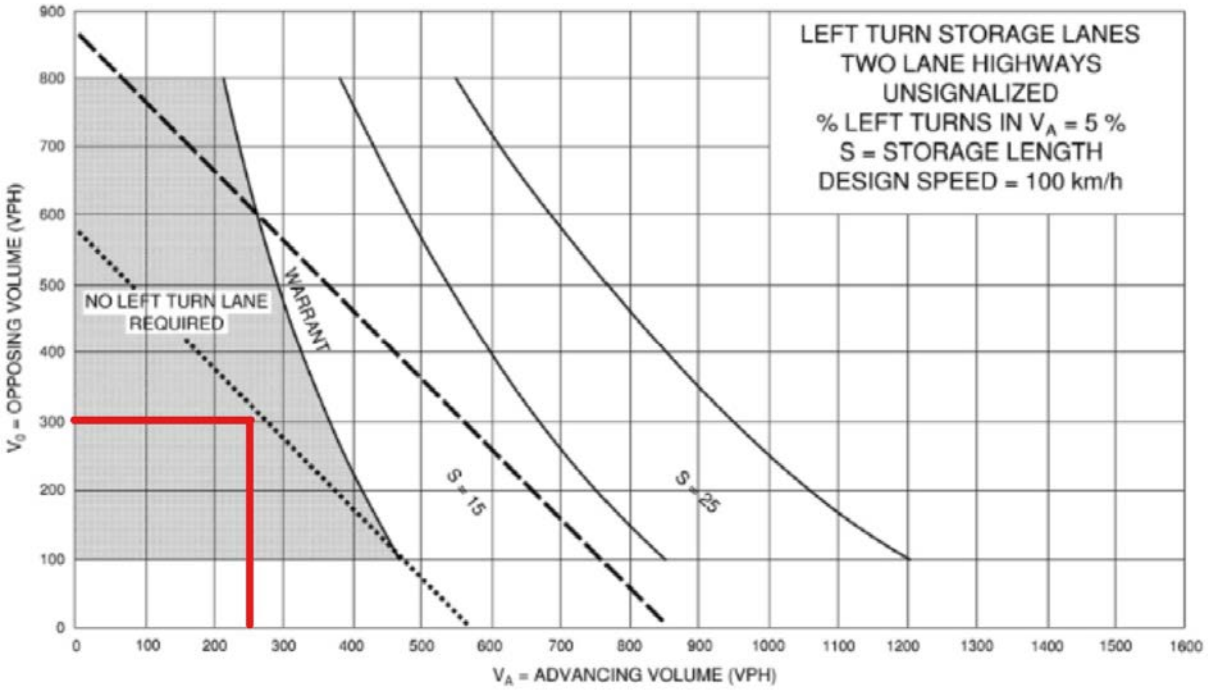
$$Advancing\ Traffic\ Volume\ V_A = 250 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 255$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{255} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 2.0\%$$



**SAT Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 335$

Opposing Traffic Volume: $V_O = 310$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

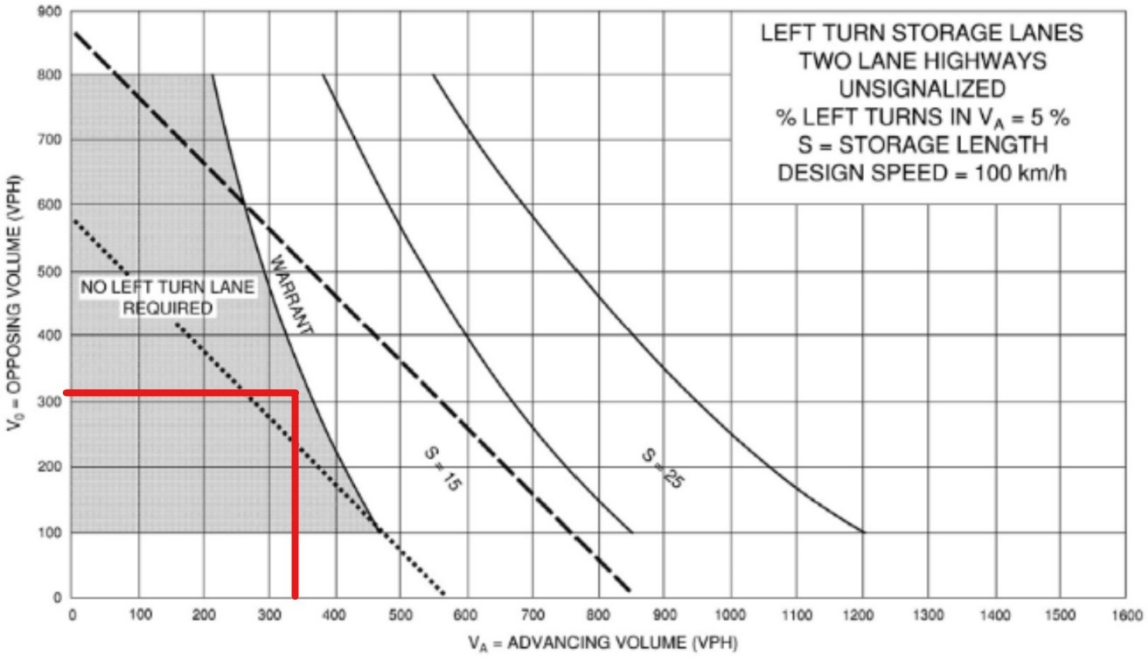
$$Advancing\ Traffic\ Volume\ V_A = 335 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 340$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{340} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.5\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 295$

Opposing Traffic Volume: $V_O = 375$

Left Turn Traffic Volume: $V_L = 15$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

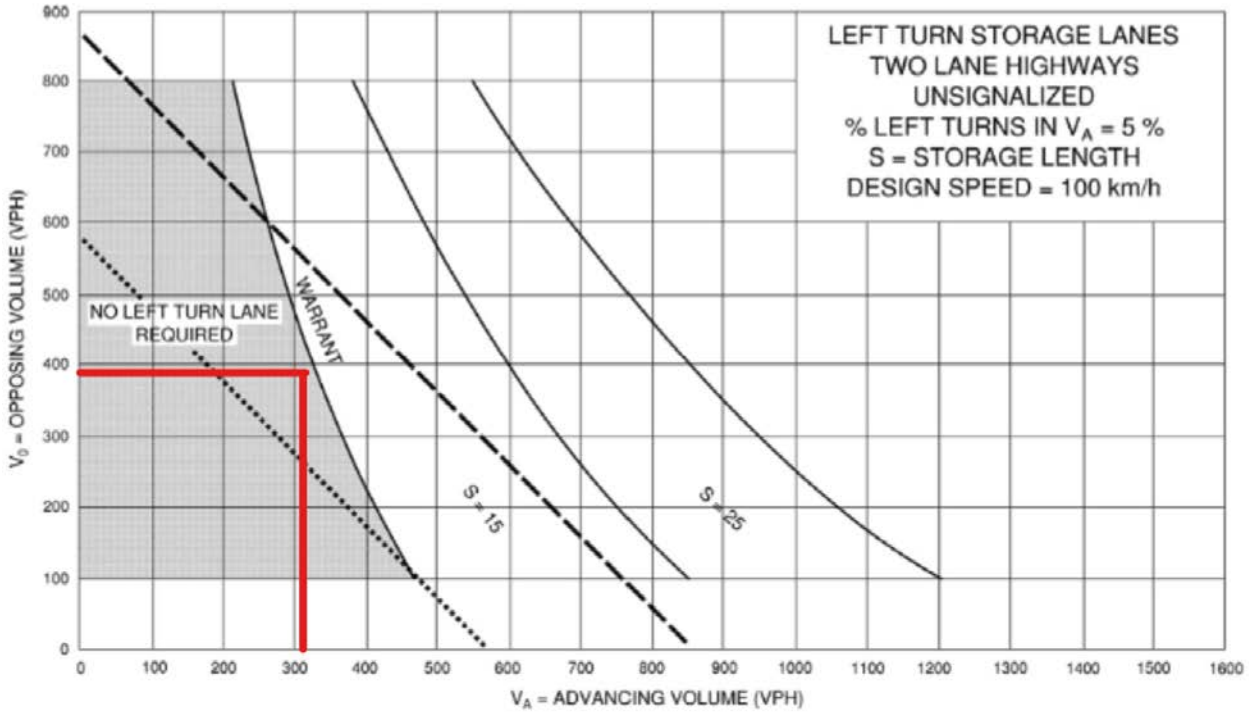
$$Advancing\ Traffic\ Volume\ V_A = 295 + 15$$

$$Advancing\ Traffic\ Volume\ V_A = 310$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{310} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.8\%$$



## Left-Turn Lane Warrant Analysis 3 Line (Future Total Conditions)

Speed Limit (unposted) = 80 km/h

Design Speed = 100 km/h

**AM Peak Period:**

**Westbound Left**

Existing Thru Traffic Volume: $V_T = 220$

Opposing Traffic Volume: $V_O = 215$

Left Turn Traffic Volume: $V_L = 10$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

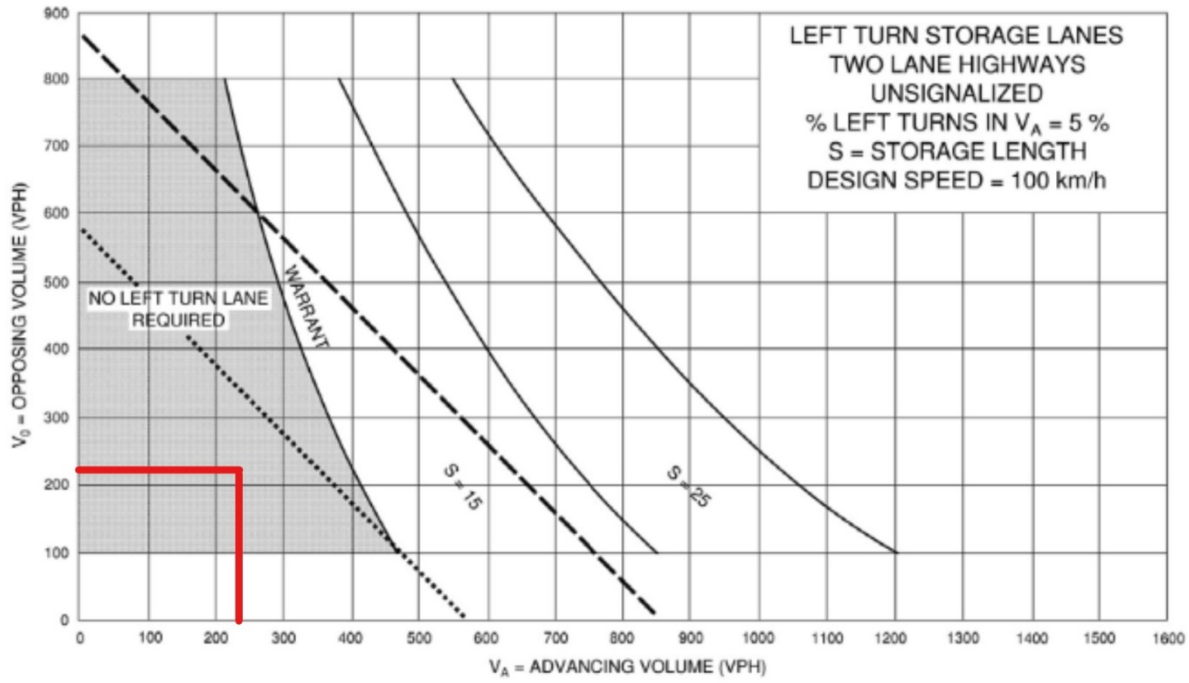
$$Advancing\ Traffic\ Volume\ V_A = 220 + 10$$

$$Advancing\ Traffic\ Volume\ V_A = 230$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{10}{230} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.3\%$$



**PM Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 305$

Opposing Traffic Volume: $V_O = 320$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

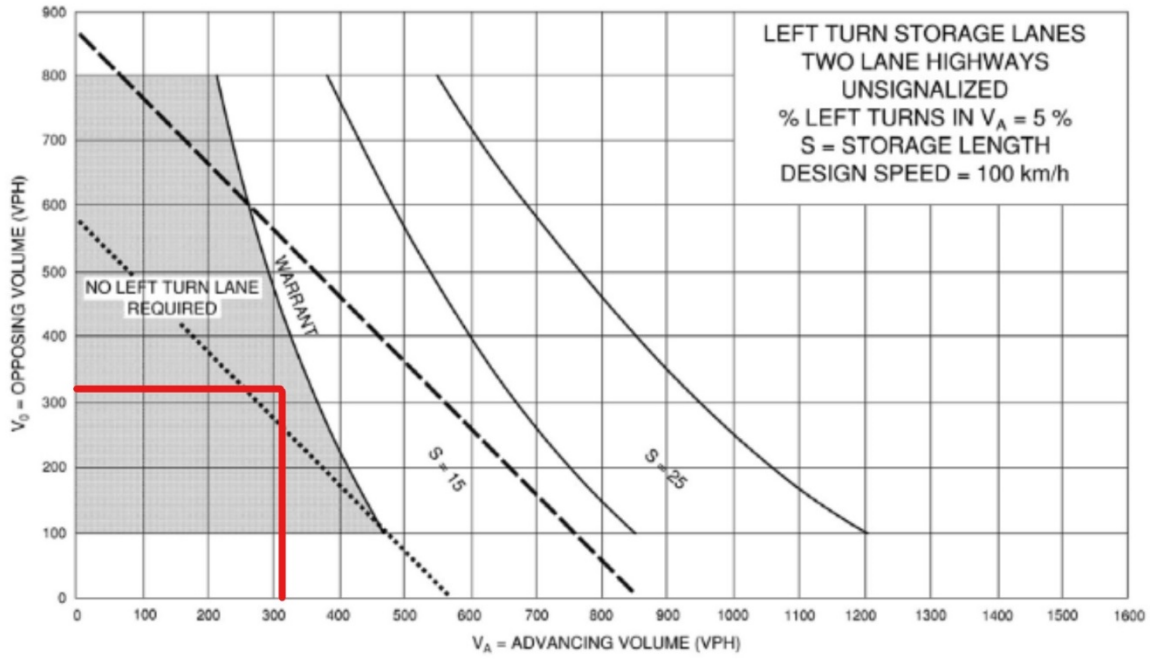
$$Advancing\ Traffic\ Volume\ V_A = 305 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 310$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{310} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.6\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 305$

Opposing Traffic Volume: $V_O = 350$

Left Turn Traffic Volume: $V_L = 15$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

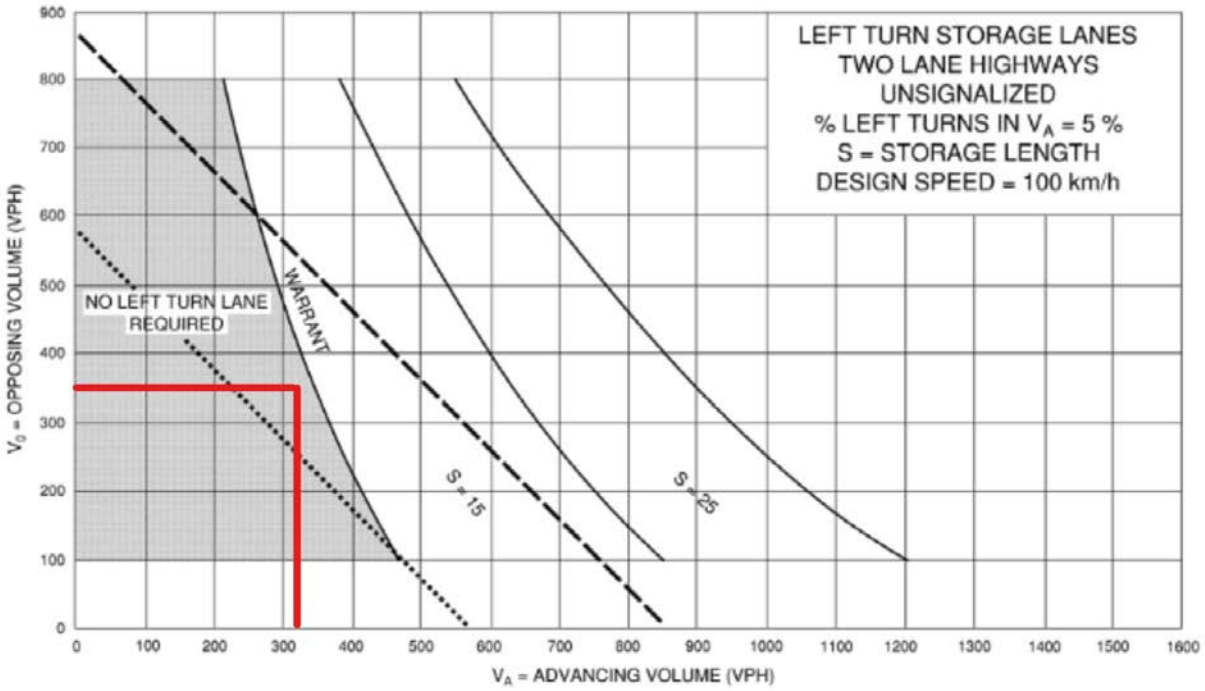
$$Advancing\ Traffic\ Volume\ V_A = 305 + 15$$

$$Advancing\ Traffic\ Volume\ V_A = 320$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{15}{320} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 4.7\%$$



**SAT Peak Period**

**Eastbound Left**

Existing Thru Traffic Volume: $V_T = 400$

Opposing Traffic Volume: $V_O = 375$

Left Turn Traffic Volume: $V_L = 5$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

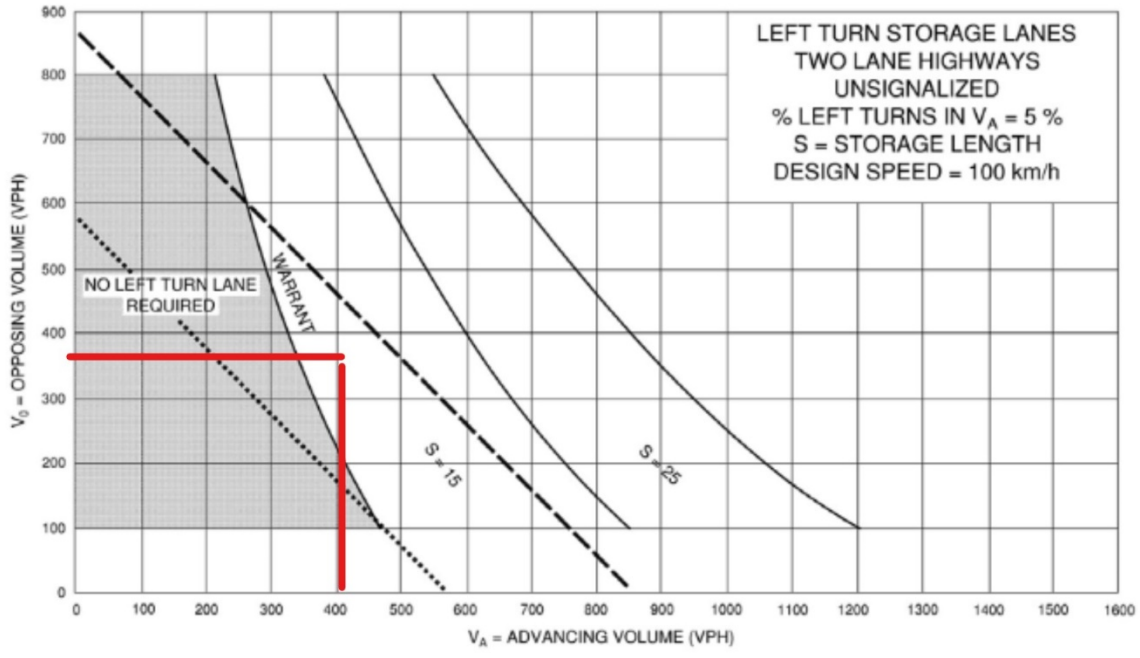
$$Advancing\ Traffic\ Volume\ V_A = 400 + 5$$

$$Advancing\ Traffic\ Volume\ V_A = 405$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{5}{405} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 1.2\%$$



**Westbound Left**

Existing Thru Traffic Volume: $V_T = 350$

Opposing Traffic Volume: $V_O = 440$

Left Turn Traffic Volume: $V_L = 25$

$$Advancing\ Traffic\ Volume\ V_A = V_T + V_L$$

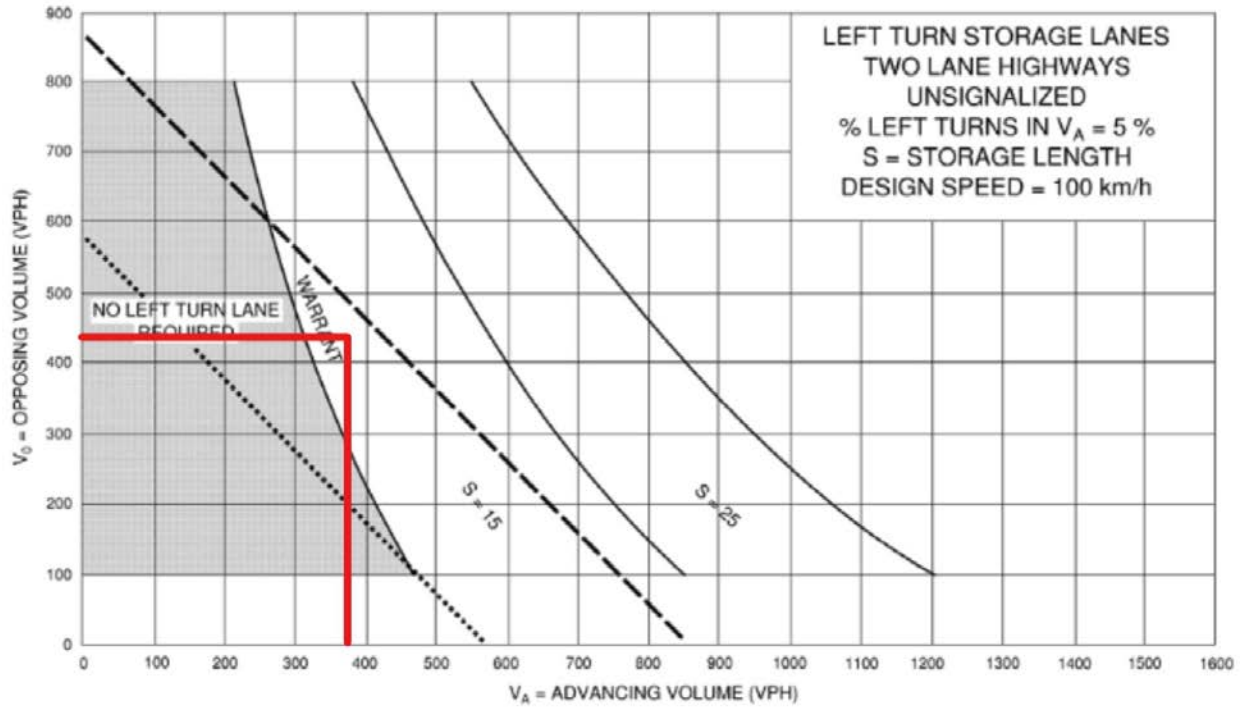
$$Advancing\ Traffic\ Volume\ V_A = 350 + 25$$

$$Advancing\ Traffic\ Volume\ V_A = 375$$

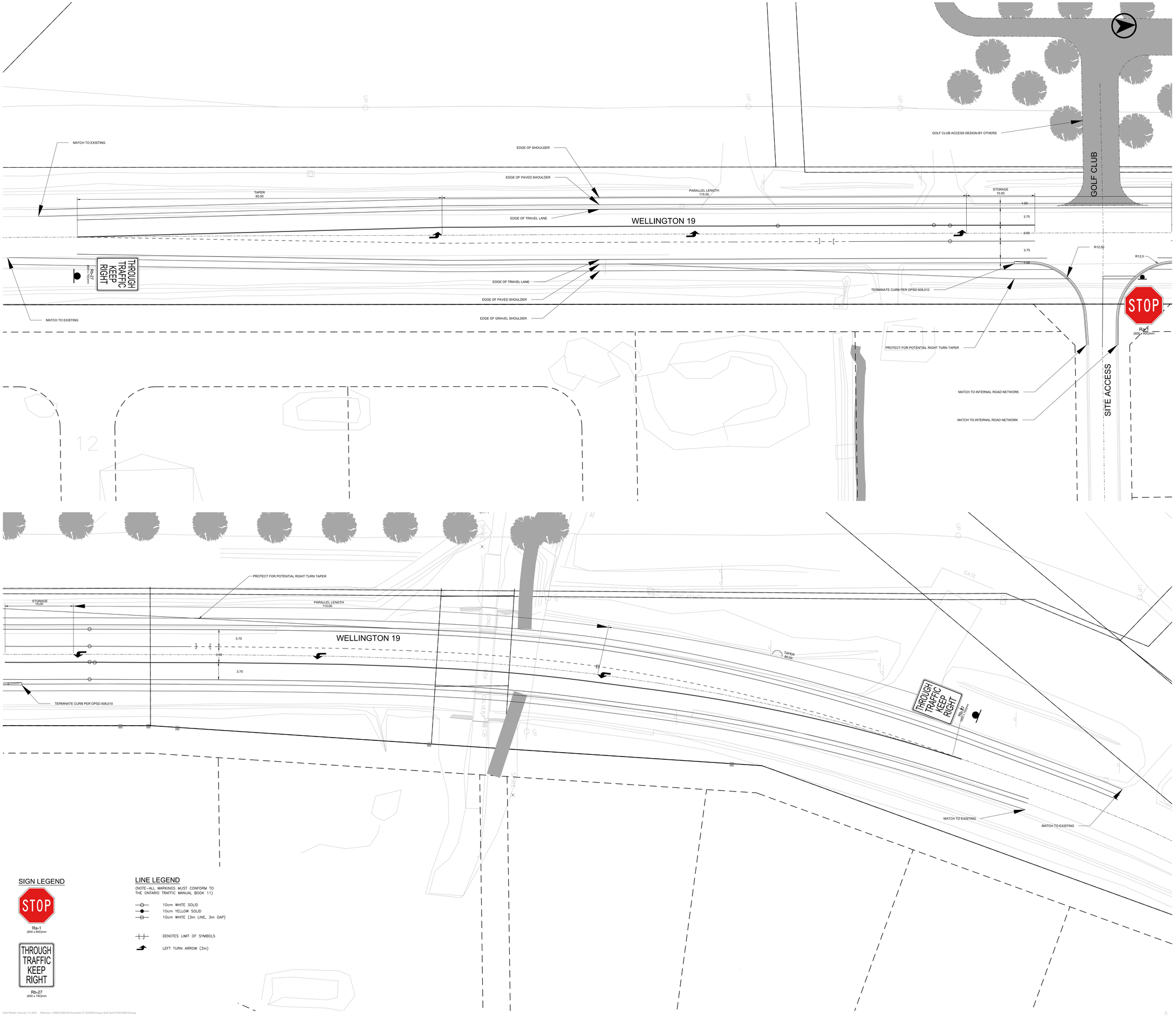
$$Percentage\ of\ Left\ Turning\ Traffic = \frac{V_L}{V_A} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = \frac{25}{375} \times 100$$

$$Percentage\ of\ Left\ Turning\ Traffic = 6.7\%$$



# Appendix I
# Functional Plan for Left-Turn Lanes




## SIGN LEGEND

STOP

Ra-1
(600 x 600)mm

THROUGH TRAFFIC KEEP RIGHT

Rb-27
(600 x 750)mm

## LINE LEGEND

(NOTE--ALL MARKINGS MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL BOOK 11)

- 10cm WHITE SOLID
- 10cm YELLOW SOLID
- 10cm WHITE (3m LINE, 3m GAP)
- DENOTES LIMIT OF SYMBOLS
- LEFT TURN ARROW (3m)

Date Plotted: February 15, 2023 Filename: J:\6860-39\BA\08 November 27 2022\BA-Fergus Golf Club-FD-R0-6860-39.dwg

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# FERGUS GOLF CLUB DEVELOPMENT

## SITE ACCESS LEFT TURN LANES FUNCTIONAL DESIGN

Date: FEBRUARY 15, 2023

Project No.: 6860-39

Scale: 1:250 0 5 10m

FD-01