

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.

ffreen

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





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		
A	Site Access & Circulation	 1 full access along Wellington Road 19 and 2 full accesses along 3 Line. An internal network of private roads with 12 metre right-of-ways. 		

Notes:

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



FIGURE 1 SITE LOCATION



FIGURE 2 SITE CONTEXT

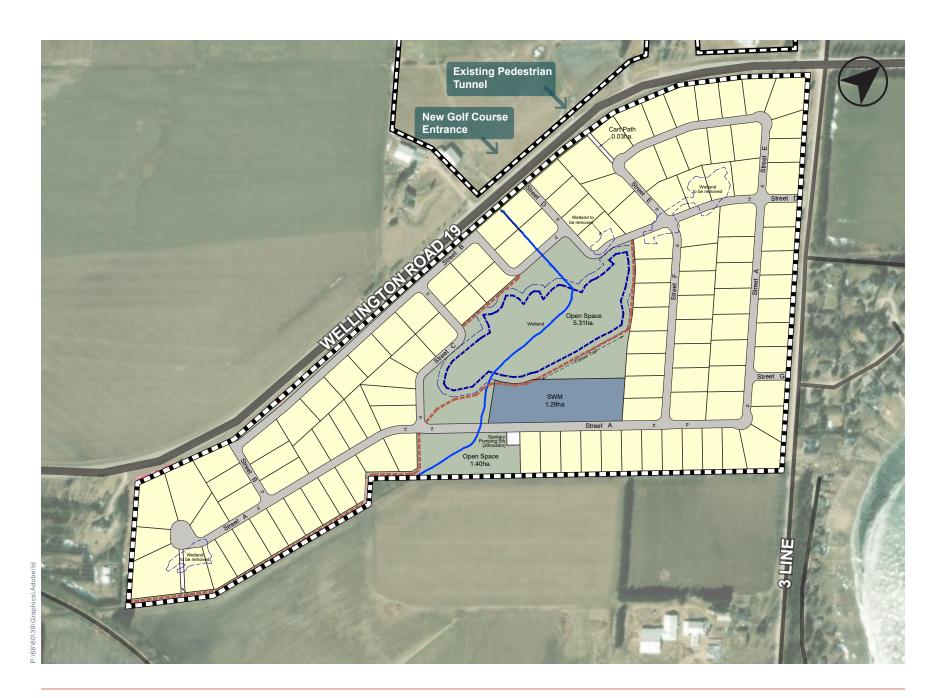


FIGURE 3 PROPOSED DEVELOPMENT

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

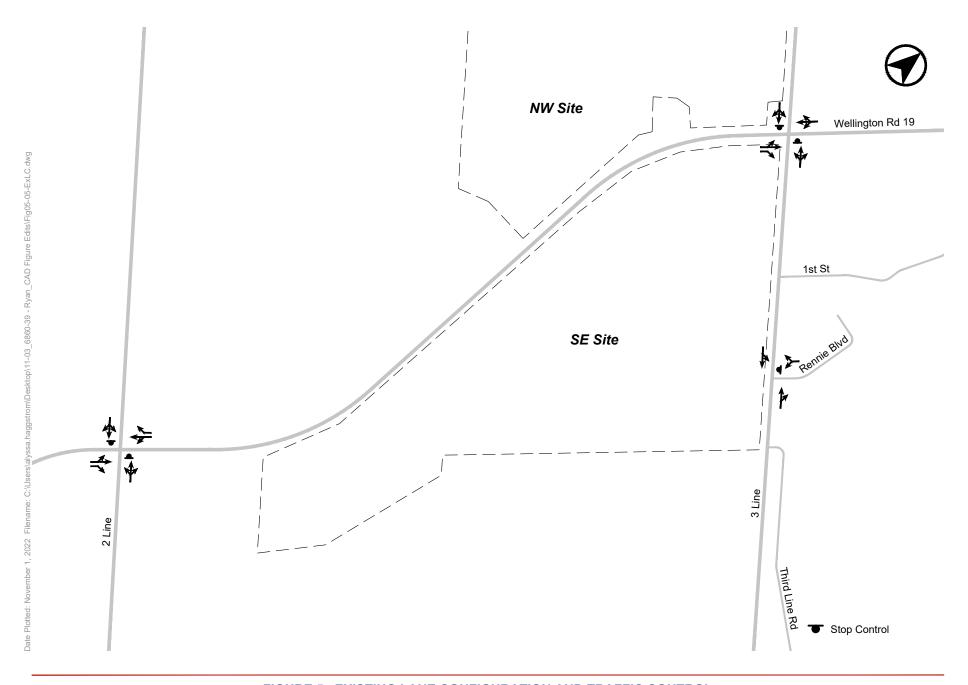


FIGURE 5 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

BA GROUP 6860-39 FERGUS GOLF CLUB

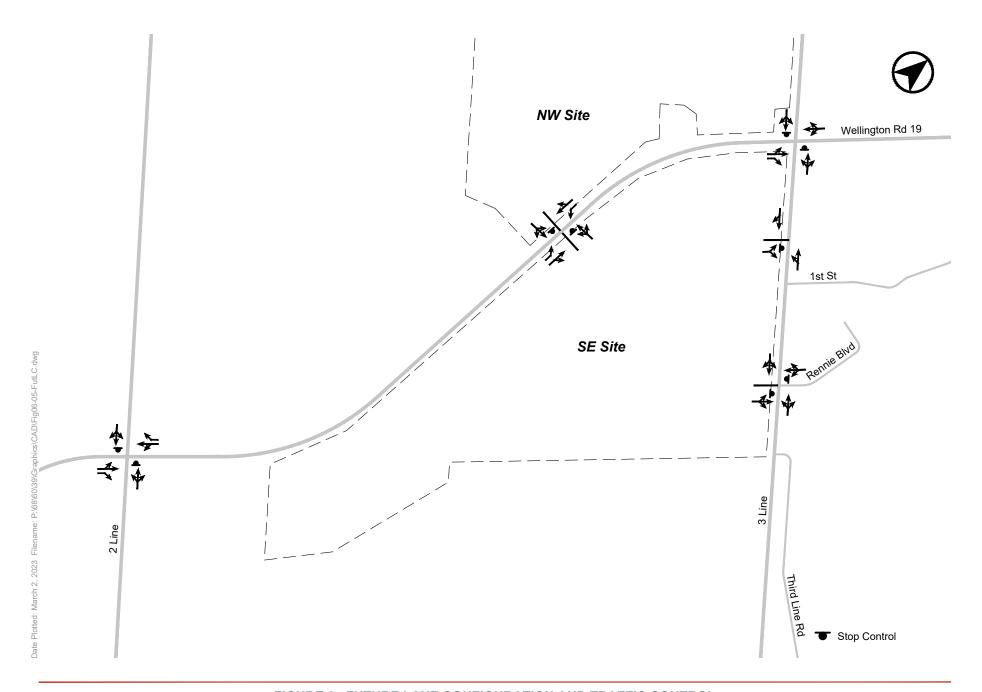


FIGURE 6 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

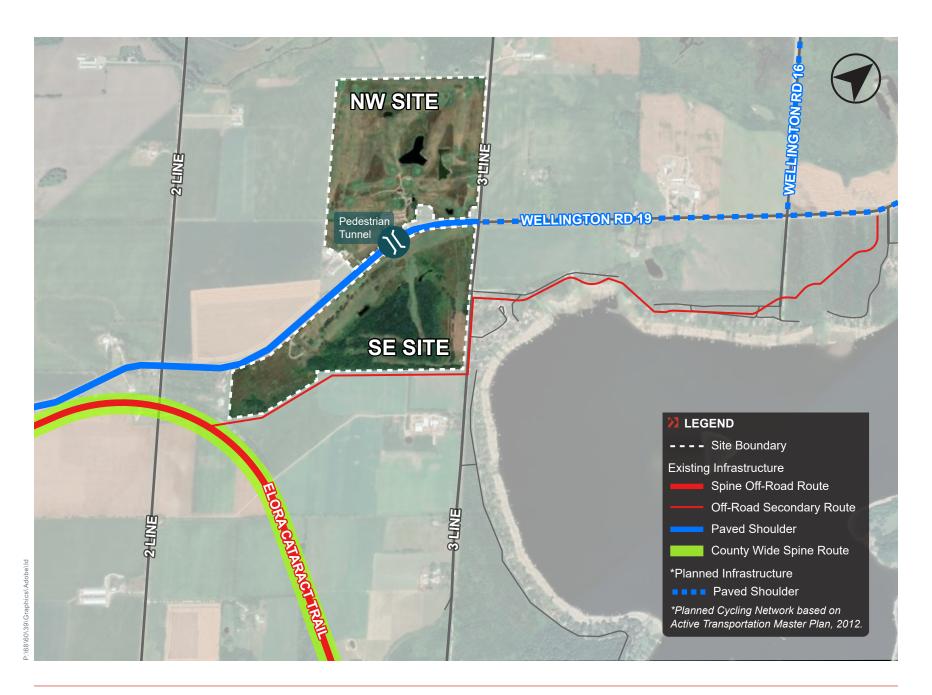


FIGURE 7 EXISTING & FUTURE AREA CYCLING AND PEDESTRIAN NETWORK

BA GROUP 6860-39 FERGUS GOLF CLUB

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	
Wellington Road 19 / 3 Line	Saturday, July 9 th , 2022 and Tuesday, July 12 th , 2022	Spectrum Traffic Inc.

Note:

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**.

^{1.} The Saturday, July 2 traffic counts were not used in the traffic analysis as the Saturday, July 9th traffic counts were higher.

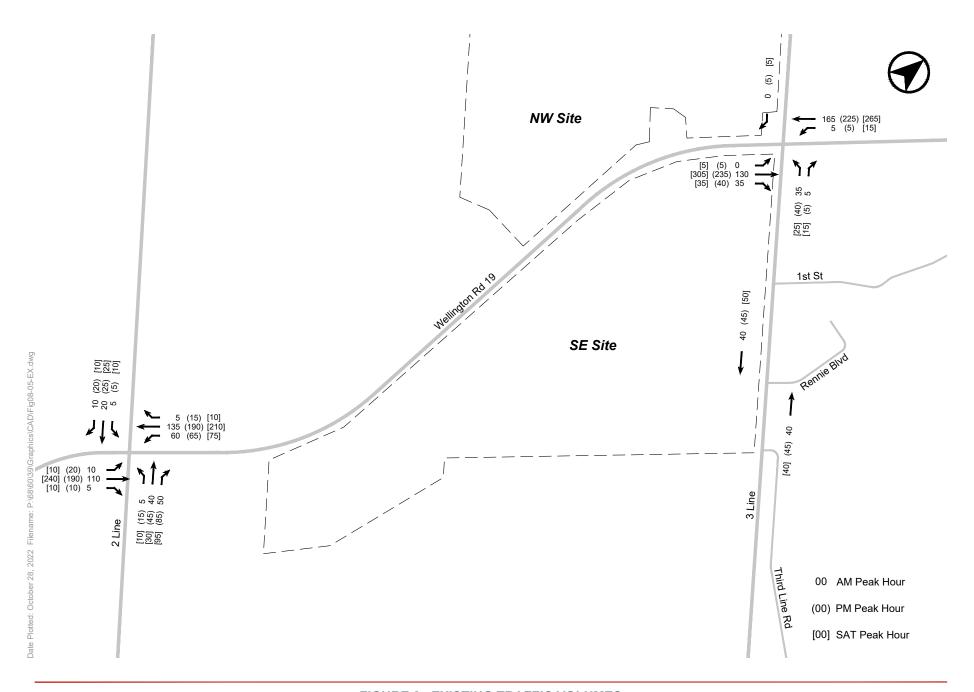


FIGURE 8 EXISTING TRAFFIC VOLUMES

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.

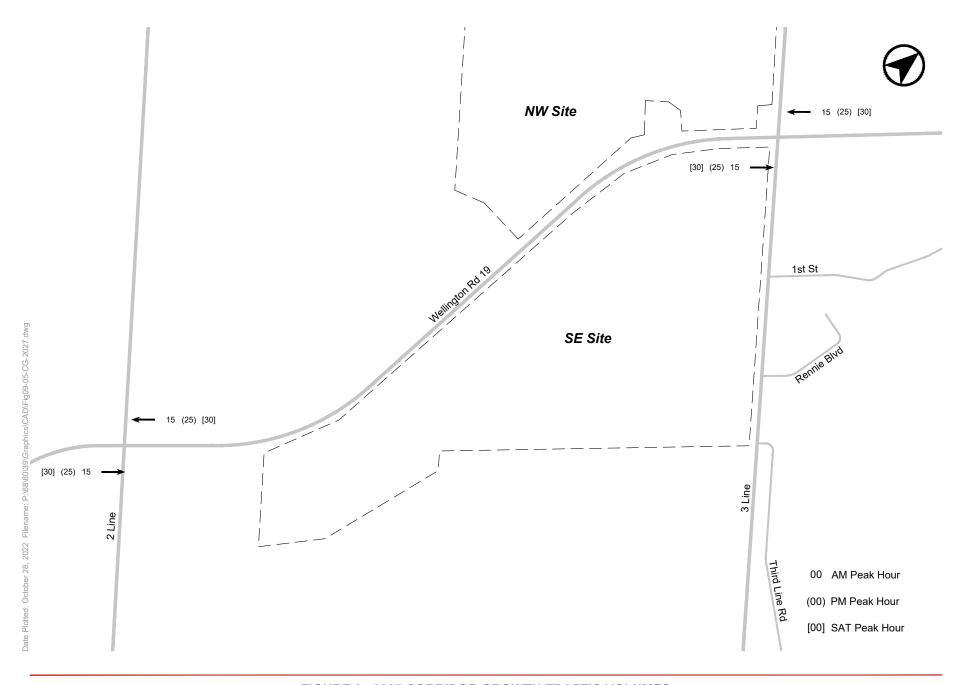


FIGURE 9 2027 CORRIDOR GROWTH TRAFFIC VOLUMES

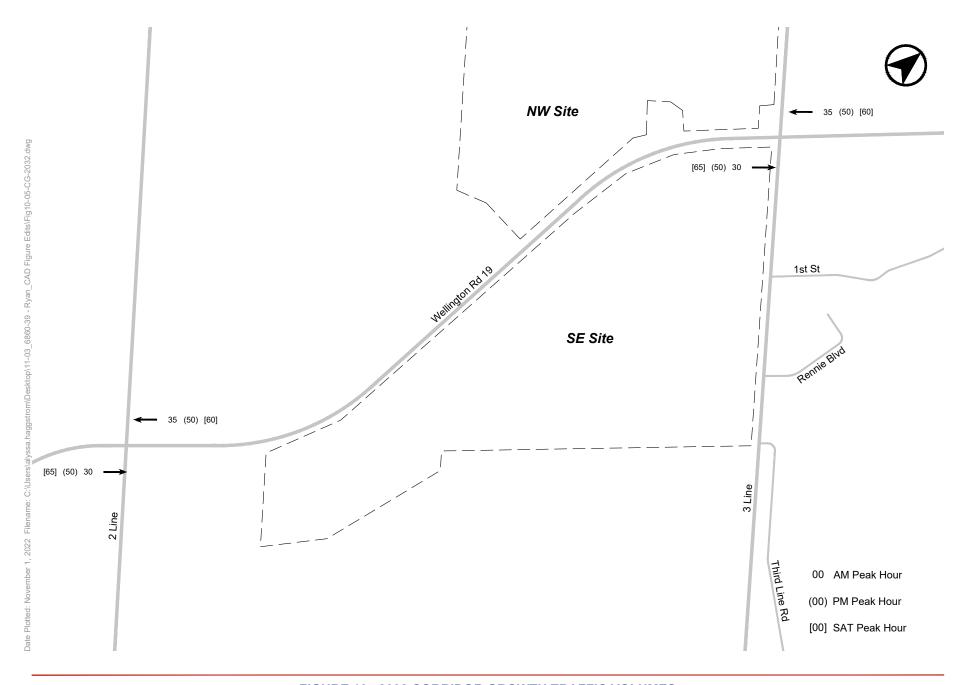


FIGURE 10 2032 CORRIDOR GROWTH TRAFFIC VOLUMES

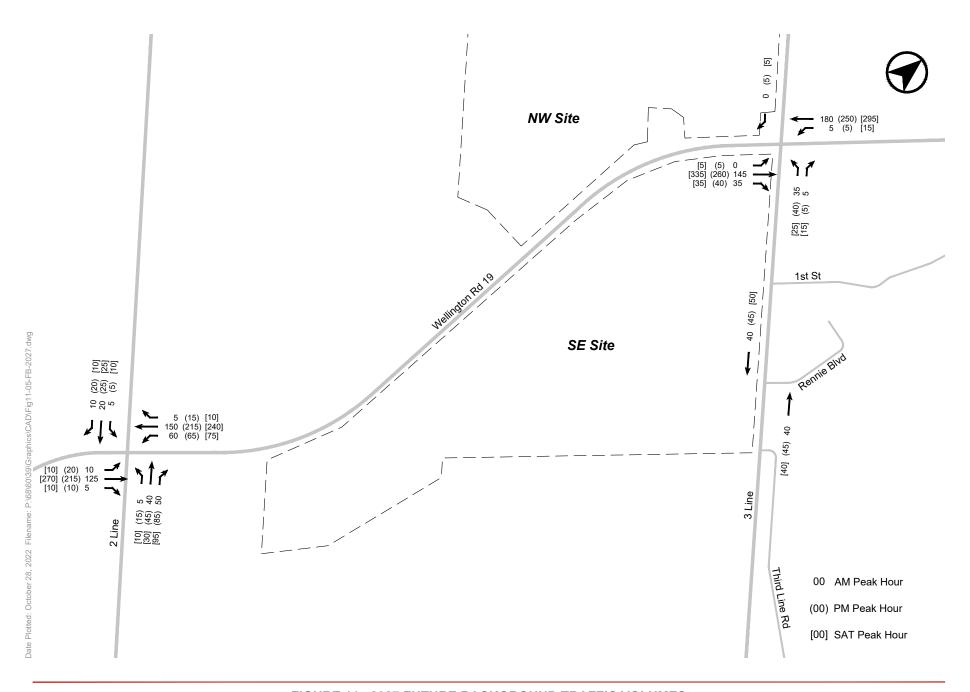


FIGURE 11 2027 FUTURE BACKGROUND TRAFFIC VOLUMES

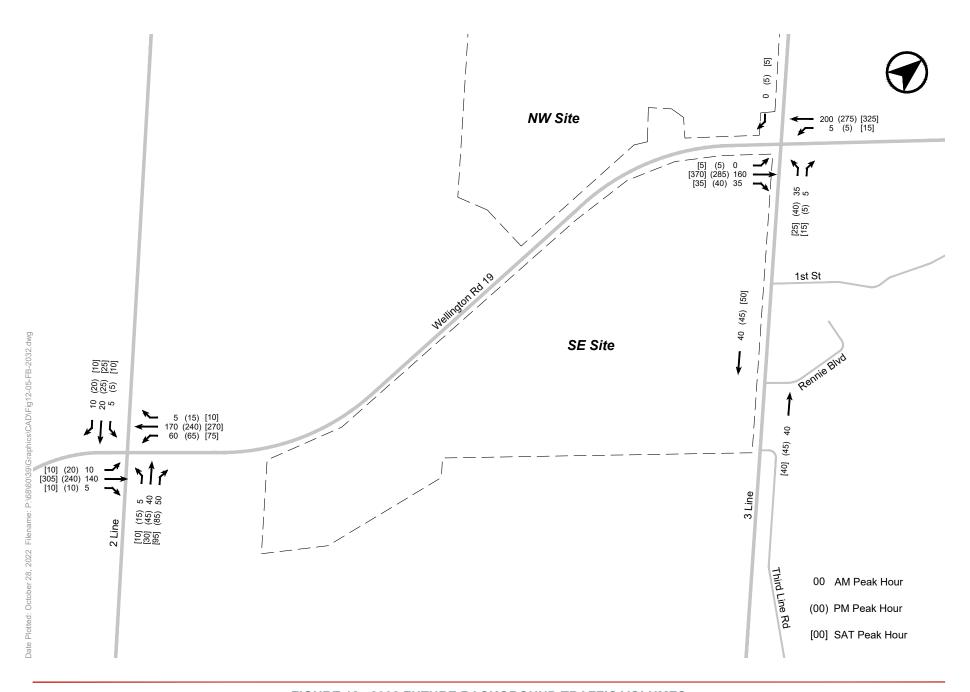


FIGURE 12 2032 FUTURE BACKGROUND TRAFFIC VOLUMES

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		
	ln	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:

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

	Al	M Peak Ho	our	PM Peak Hour			Saturday Peak Hour		
	ln	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:



Site trips are rounded to the nearest 5 vehicles.

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			
10 / From Site	Corridor	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.

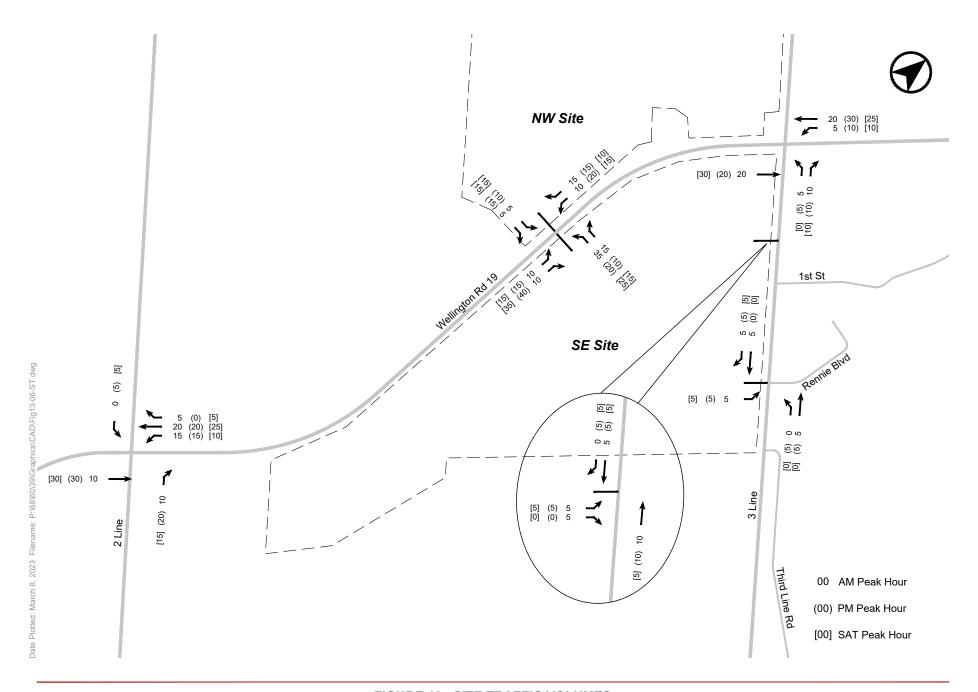


FIGURE 13 SITE TRAFFIC VOLUMES

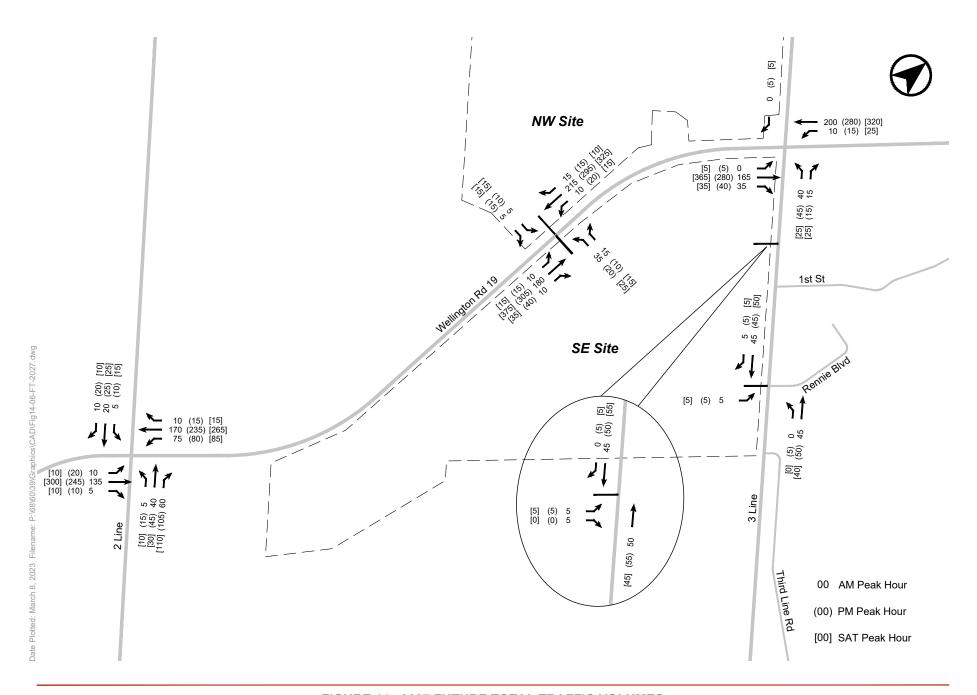


FIGURE 14 2027 FUTURE TOTAL TRAFFIC VOLUMES

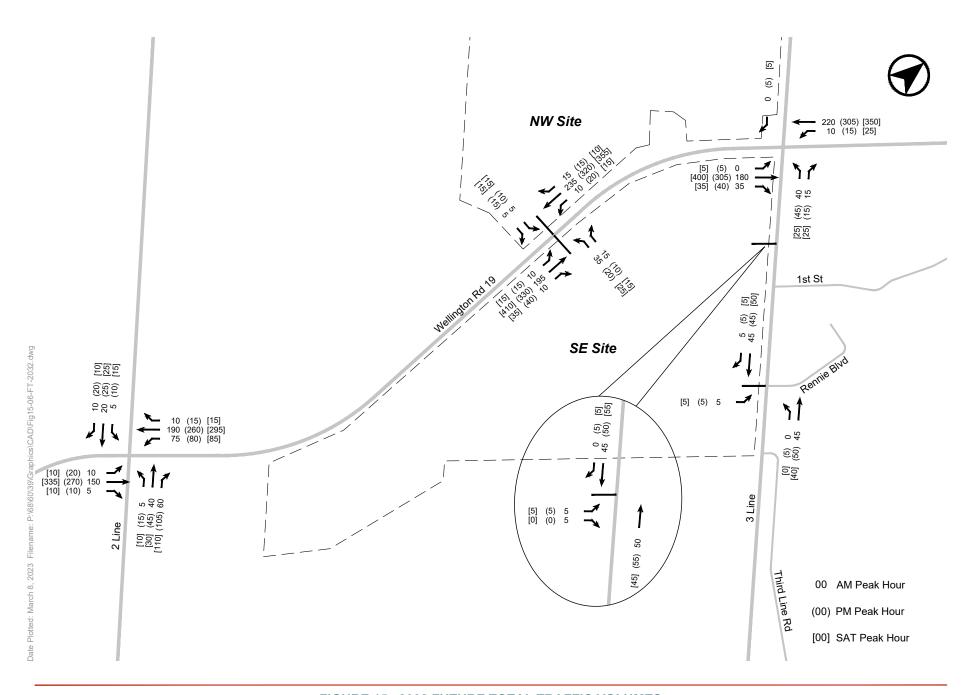


FIGURE 15 2032 FUTURE TOTAL TRAFFIC VOLUMES

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 stream¹. 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.**

Unsignalized Intersection Capacity Analysis Results TABLE 6

EBIT A (A) [A] [0.4] A (A) [A] [0.4] A (A) [A] [0.3] A (A) [A] [0.0] A (A) [A]					2027 Hor	izon Yea	r		2032 Hor	izon Yea	
EBTL		Ex	isting								
EBTL A (A) [A] [0,4] 0.7 (0.9) A (A) [A] 0.6 (0.8) A (A) [A] 0.6 (0.7) 0.3] A (A) [A] 0.6 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.6 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.6 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.6 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.5 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.5 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.5 (0.8) A (A) [A] 0.5 (0.7) 0.3] A (A) [A] 0.5 (0.8) A (A) [A] 0.5 (0.7) A (A) [A] 0.5 (0.8) A (A) [A] 0.5 (0.7)		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBR A (A) [A] [0.4] A (A) [A] [0.4] A (A) [A] [0.3] A (A) [A] [0.0] A (A) [A] [0.3] A (A) [A] [0.0] A (A) [A] [0.3]				,	Wellington	Road 19	/ 2 Line				
MBTL	EBTL	A (A) [A]		A (A) [A]	` '	A (A) [A]		A (A) [A]		A (A) [A]	0.5 (0.7) [0.3]
WBTL A(A) [A] [2.5] A(A) [A] [2.4] A(A) [A] [2.5] A	EBR	A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]	0.0 (0.0) [0.0]
NBTLR B (B) [B] 11.4 (14.2) B (C) [B] 11.7 (15.0) B (C) [C] 12.2 (16.5) B (C) [C] 12.0 (16.0) B (C) [C] 12.5 (17.2) B (C) [C] 12.5 (17.2) B (C) [C] 12.5 (18.3) B (C) [C] 12.6 (17.2) B (C) [C] 12.5 (18.3) B (C) [C] 12.5 (18.2) B (C) [C	WBTL	A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]	2.5 (2.4) [2.5]
SBTLR B (B) [C] 13.8 B (C) [B] 14.6 B (C) [C] 13.1 (17.5) 13.1 (17.5) 12.0 (13.8) 13.5 (18.3) 13.1 (17.5) 13.1 (17.5) 12.0 (13.8) 12.0 (13.8) 13.5 (18.8) 13.1 (17.5) 13.1 (17.5) 13.1 (17.5) 12.0 (13.8) 13.5 (18.8) 13.5 (18.8) 13.1 (18.3) 13.1 (17.5)	WBR	A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]	` '	A (A) [A]	0.0 (0.0) [0.0]
Select S	NBTLR	B (B) [B]		B (C) [B]		B (C) [C]		B (C) [C]		B (C) [C]	12.6 (17.2) [17.2]
EBLT	SBTLR	B (B) [C]		B (B) [C]		B (C) [C]		B (C) [C]	, ,	B (C) [C]	13.5 (18.8) [24.9]
EBR		•		'	Wellington	Road 19	/ 3 Line	,		,	
WBLTR	EBLT	A (A) [A]		A (A) [A]		A (A) [A]	` '	A (A) [A]		A (A) [A]	0.0 (0.2) [0.1]
NBLTR B (B) [B] 11.0 (13.4) B (B) [B] 11.3 (14.2) [14.9] B (C) [C] 11.6 (15.0) B (C) [C] 11.7 (15.0) B (C) [C] 11.6 (15.0) B (C) [C] 11.6 (15.0) B (C) [C] 11.7 (15.0) B (C) [C] 11.6 (15.0) B (C) [C] 11.7 (15.0) B (C) [C] 11.6 (15.0) B (C) [C] 11.7 (15.0) B (C) [C] 11.0 (10.4)	EBR	A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]	0.0 (0.0) [0.0]
SBLTR	WBLTR	A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]		A (A) [A]	0.4 (0.0) [0.0]
SELTR SELT	NBLTR	B (B) [B]		B (B) [B]		B (C) [C]		B (C) [C]		B (C) [C]	12.0 (16.0) [16.6]
BEL BETR A (A) [A] 7.8 (8.0) [8.1] A (A) [A] 7.7 (8.1) [8.1] A (A) [A] 7.7 (8.1) [8.3] A (A) [A] 7.7 (8.1) [8.3] A (A) [A] 7.7 (8.2) [9.2] A (A) [A] 7.7 (8.2) [9.2] A (A) [A] 7.7 (8.2) [9.3] A (A) [A] 9.0 (9.3) [9.3] A (A) [A] 9.0 (9.1)	SBLTR	A (A) [A]		A (A) [B]		A (A) [B]		A (A) [B]		A (B) [B]	0.0 (10.1) [10.4]
BET				We	llington Ro	ad 19 / S	ite Access				
MBL	EBL					A (A) [A]				A (A) [A]	7.8 (8.1) [8.1]
NBLTR Intersection does not exist. A (A) [A] [8.3]	EBTR					A (A) [A]				A (A) [A]	0.2 (0.2) [0.2]
WBTR A (A) [A] 0.2 (0.4) [0.3] not exist. 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 A (A) [A] 9.0 (9.1) [9.0] [9.0] Intersection does not exist. A (A) [A] 9.0 (9.1) [9.0] NBLT West Site Access / 3 Line EBLR A (A) [A] 8.8 (9.1) [9.1] Intersection does not exist. A (A) [A] 8.8 (9.1) [9.1] Intersection does not exist. A (A) [A] Intersection does not exist. A (A) [A] 8.8 (9.1) [9.1]	WBL	In	torsoction d	oos not a	viet	A (A) [A]		Interse	ction does	A (A) [A]	7.7 (8.2) [8.4]
SBLTR B (C) [C] [17.3] B (B) [C] [18.8] B (B) [C]	WBTR		itersection d	1062 1101 6	KISt.	A (A) [A]		not	exist.	A (A) [A]	0.2 (0.4) [0.3]
EBLR Intersection does not exist. A (A) [A] 9.0 (9.1) [9.0] A (A) [A] 9.0 (0.6) [0.0] A (A) [A] A	NBLTR					B (C) [C]				B (C) [C]	12.6 (16.5) [18.8]
EBLR A (A) [A] $9.0 (9.1) \\ [9.0]$ Intersection does not exist. A (A) [A] $9.0 (9.1) \\ [9.0]$ Intersection does not exist. A (A) [A] $9.0 (9.1) \\ [9.0]$ West Site Access / 3 Line EBLR A (A) [A] $8.8 (9.1) \\ [9.1]$ Intersection does A (A) [A] $8.8 (9.1) \\ [9.1]$	SBLTR					B (B) [C]				B (B) [C]	11.5 (13.7) [16.2]
NBLT Intersection does not exist. A (A) [A] [9.0] Intersection does not exist. A (A) [A] [9.0] Intersection does not exist. A (A) [A] [9.0] A (A) [A] A					East Site /	Access /	3 Line				
NBLT A (A) [A] 0.0 (0.6) not exist. A (A) [A] 0.0 (0.6) [0.0]	EBLR	l n	torocotion d	laga nat s	wist	A (A) [A]	9.0 (9.1) [9.0]	Interse	ction does	A (A) [A]	9.0 (9.1) [9.0]
EBLR A (A) [A] 8.8 (9.1) Intersection does A (A) [A] 8.8 (9.1) [9.1] Intersection does A (A) [A] 8.8 (9.1) [9.1]	NBLT	In		062 1101 6	FAISI.	A (A) [A]		not	exist.	A (A) [A]	0.0 (0.6) [0.0]
Intersection does not exist. A (A) [A] [9.1] Intersection does A (A) [A] [9.1]					West Site	Access /	3 Line				
Intersection does not exist.	EBLR	Lia	torooction d	ooo not s	viot	A (A) [A]		Interse	ction does	A (A) [A]	8.8 (9.1) [9.1]
NBTL A (A) [A] 0.0 (0.0) not exist. A (A) [A] 0.0 (0.0) [0.0]	NBTL	In	nersection d	oes not e	XISI.	A (A) [A]	0.0 (0.0) [0.0]	not	exist.	A (A) [A]	0.0 (0.0) [0.0]

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 I	Endinç	ļ				entage oliance
	Description	1 Lane [Free Flow]	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Average	Sectional
	A. Vehicle volume,	480	419	502	452	443	458	540	701	584		
1. Minimum	all approaches	100%	80%	100%	80%	80%	80%	100%	100%	100%	90%	400/
Vehicular Volume	B. Vehicle volume,	120	69	69	39	28	34	38	71	34		40%
	minor streets	100%	58%	58%	32%	23%	28%	32%	59%	28%	40%	
	A. Vehicle volume,	480	433	433	413	415	424	502	630	550		
2. Delay to	major street	100%	80%	80%	80%	80%	80%	100%	100%	100%	88%	
Cross Traffic	B. Combined vehicle/pedestrian	50	18	55	26	24	24	26	59	24		61%
	volume crossing artery from minor street	100%	37%	100%	52%	48%	49%	52%	100%	48%	61%	
		Ove	erall C	ompli	ance i	s 61%	2		•			

Notes:

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

		Required				Hour E	Ending					entage oliance
Justification	Description	1 Lane [Free Flow]	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00	Average	Sectional
	A. Vehicle volume,	480	862	832	481	486	534	635	886	909		
1. Minimum Vehicular	all approaches	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	92%
Verlicular Volume	B. Vehicle volume,	120	204	204	90	116	110	136	232	205		9270
	minor streets	100%	100%	100%	75%	80%	80%	100%	100%	100%	92%	
	A. Vehicle volume,	480	628	628	390	370	424	499	654	703		
2. Delay to	major street	100%	100%	100%	80%	77%	80%	100%	100%	100%	92%	400/
Cross Traffic	B. Combined vehicle/pedestrian	50	20	27	9	20	16	31	35	34		48%
	volume crossing artery from minor street	100%	40%	54%	18%	40%	33%	62%	70%	68%	48%	
		Ov	erall (Compl	iance	is 92%	2					

Notes:

Relevant OTM excerpts are provided in **Appendix E**.

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

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

Notes:

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.

^{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).

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**.

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 Sp	eed 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 Spe	eed 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 S	peed 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 Sp	eed 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

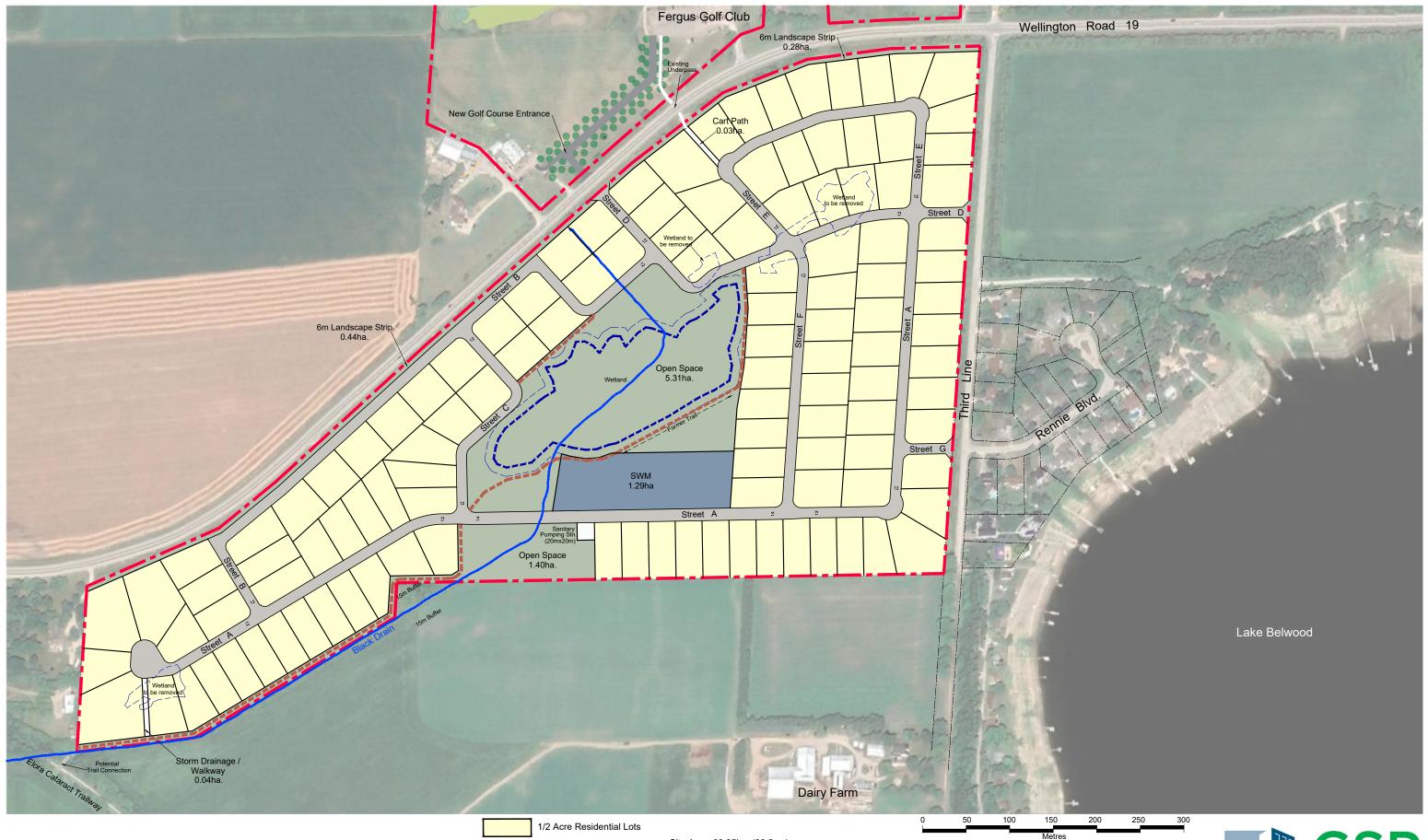
- Comprehensive sight distance reviews were completed along Wellington Road 19 at the proposed Site access/ golf club driveway intersection and along 3 Line at both proposed site access points, utilizing both the vertical and horizontal profile data obtained from surveys. All minimum required sight distances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

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.

GS group

Appendix B Internal Roads Cross-Section



FERGUS DEVELOPMENT INC.

THE VILLAGE AT FAIRVIEW GREENS

TYPICAL CROSS SECTION OF PROPOSED STREET 12.0m WIDTH

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

Appendix C Turning Movement Counts

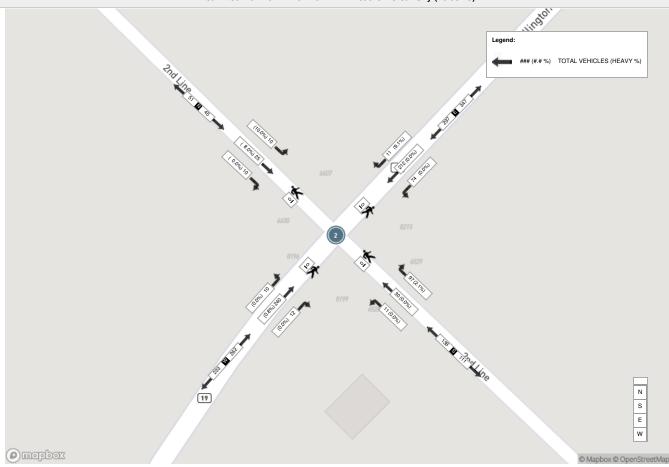
Turning Movement Count Location Name: WELLINGTON RD 19 & 2 LINE Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

										Turi	ning Mo	ovement Count	(2 . WEI	LINGT	ON RD	19 & 2	LINE)									
Start Time				N Approa	ch				WEI	E Approac	h RD 19					S Approac	h				w	W Approa	ich N RD 19		Int. Total (15 min)	Int. Total (1 hr)
Start Time	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%		-	-	-

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

								ı	Peak Ho	our: 01:	45 PM	- 02:45 PM W	eather:	Clear S	ky (20.	39 °C)									
Start Time				N Approac	h				WE	E Approac	h RD 19					S Approac 2 LINE	h				WE	W Approad	ch 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%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-

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





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

										Turr	ning Mo	ovement Count	(2 . WEL	LINGTO	ON RD	19 & 2 L	INE)									
Start Time				N Approac	h				WE	E Approac	ch RD 19					S Approac 2 LINE	h				WE	W Approa	ch I RD 19		Int. Total (15 min)	Int. Total (1 hr)
Start Time	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 %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-



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

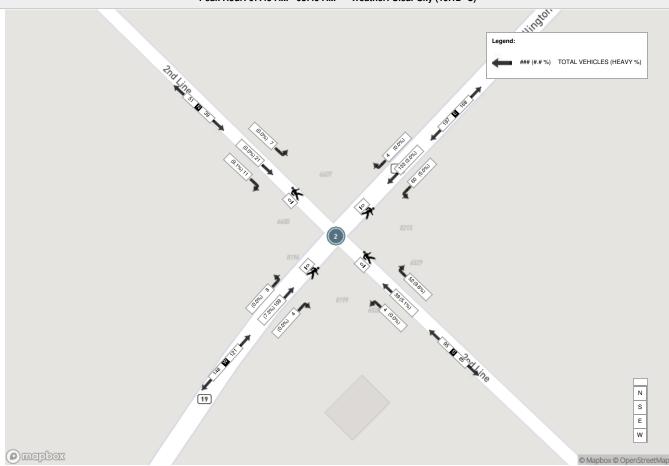
								ı	Peak Ho	ur: 07:4	15 AM -	08:45 AM W	eather:	Clear S	ky (19.	12 °C)									
Start Time				N Approac	:h				WE	E Approac LINGTON	h RD 19					S Approac 2 LINE	h				WE	W Approa	ch RD 19		Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	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%	-



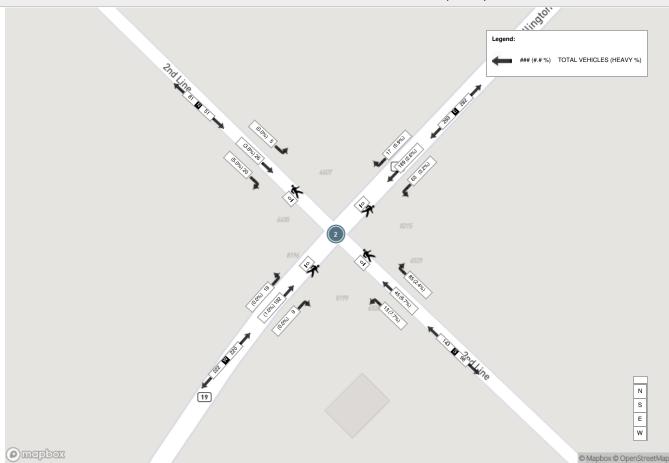
Turning Movement Count Location Name: WELLINGTON RD 19 & 2 LINE Date: Tue, Jul 12, 2022 Deployment Lead: Tasos Issaaakidis

								Pe	ak Hou	r: 04:15	PM - 0	05:15 PM Wea	ther: B	oken C	louds (2	24.71 °C)								
Start Time				N Approac	:h				WE	E Approac LLINGTON	h RD 19					S Approach 2 LINE	h				WE	W Approa	ch 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%	-

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)



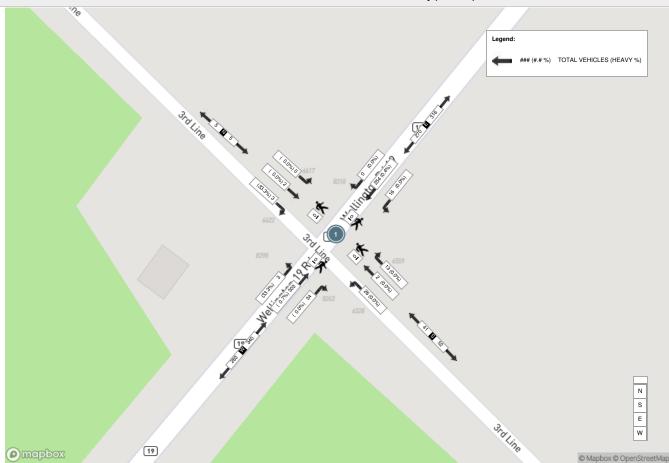
Turning Movement Count Location Name: WELLINGTON RD 19 & 3 LINE Date: Sat, Jul 09, 2022 Deployment Lead: Tasos Issaaakidis

										Tur	ning M	lovement Count	t (1 . WE	LLING	TON RE	19 & 3	LINE)									
Start Time				N Approac	:h IE				WELLIN	E Approa	ch JNTY RD 1	19				S Approac	ch NE				WELLIN	W Approad	ch INTY RD 19)	Int. Total (15 min)	Int. Total (1 hr)
Start Time	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%		-	-	-

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

									Peak	Hour: 0	1:30 P	M - 02:30 PM	Weathe	: Clear	Sky (20).39 °C)									
Start Time				N Approx	ach INE				WELLIN	E Approad	ch JNTY RD 1	9				S Approac	h IE				WELLIN	W Approac	h NTY RD 19	9	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)





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

										Tu	rning I	Movement Coun	t (1 . WE	ELLING	TON RI	D 19 & 3	LINE)									
Start Time				N Approa	ch NE				WELLIN	E Approa	ch JNTY RD	19				S Approac	h E				WELLIN	W Approac	ch NTY RD 19)	Int. Total (15 min)	Int. Total (1 hr)
Start Time	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 %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-



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

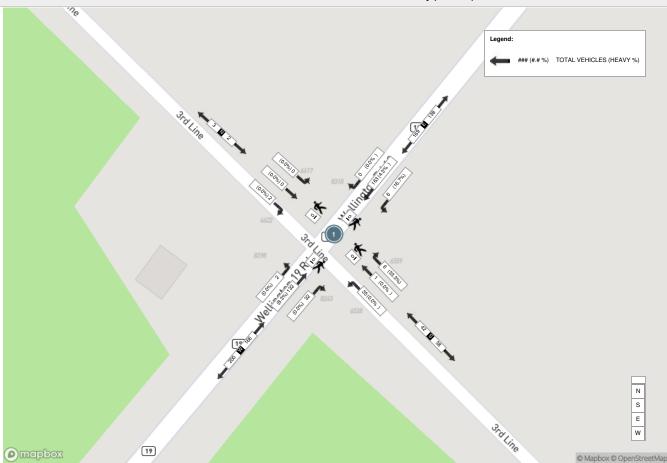
									Peak	Hour: 0	7:45 A	M - 08:45 AM	Weathe	er: Clea	r Sky (1	9.12 °C)								
Start Time				N Appro	oach LINE				WELLIN	E Approac		9				S Approac THIRD LIN	h E					W Approad			Int. Tota (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	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%	-



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

								Р	eak Ho	ur: 04:1	5 PM -	05:15 PM We	ather: B	roken	Clouds	(24.71	°C)								
Start Time				N Appro	ach INE				WELLIN	E Approa	ch JNTY RD 1	19				S Approa	ch NE				WELLIN	W Approac GTON COU	h NTY 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)



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)



Appendix D Synchro Worksheets

HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

Existing (AM)

EBL EBT EI 4		•	†	<i>></i>	>	ţ	4	•	←	•	۶	→	•
179 179 170	Tovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
0 130 35 5 165 0 35 0 Free 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	ane Configurations		₩	¥C.		4			4			4	
130 130 35 165 0 35 0 Free Free 500 0 0 0	affic Volume (veh/h)	0	130	32	2	165	0	32	0	2	0	0	0
Free Free Slop O% O% O% O% O% O% O% O	uture Volume (Veh/h)	0	130	32	2	165	0	32	0	2	0	0	0
179 179 179 170	gn Control		Free			Free			Stop			Stop	
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	rade		%0			%0			%0			%0	
None None None None 179 179 330 330 179 179 179 330 330 170 170 170 170 170 170 170 170 170 17	eak 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
179 179 330 330 330 179 179 330 330 330 179 179 330	ourly flow rate (vph)	0	141	38	2	179	0	38	0	2	0	0	0
None None None 179 330 330 179 179 330 330 179 179 179 179 170 170 170 170 170 170 170 170 170 170	edestrians												
None None None 179 330 330 41 179 179 330 330 41 179 179 330 330 41 170 170 170 170 170 170 170 170 170 17	ine Width (m)												
179 179 330 330 330 179 179 330 330 330 179 179 330 330 330 170 100 100 94 100 100 94 100 100 94 100 100 94 100 100 94 100 94 100 100 94 100 95 96 96 96 96 96 96 96	'alking Speed (m/s)												
None None None None 179 330	ercent Blockage												
None None None 179	ght turn flare (veh)												
179 179 330 330 330 330 330 330 330 330 4.1 4.1 7.1 6.5 4.0 100 94 100 95 96 96 96 96 96 96 96	edian type		None			None							
179 179 330 330 330 4.1 4.1 4.1 7.1 6.5 5.5 4.0 100 94 100 100 100 94 100 100 100 100 94 100 100 100 94 100 100 100 94 100 100 100 94 100 100 94 100 100 94 100 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 94 100 95 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 100 95 95 100 95	edian storage veh)												
179 179 330 330 330 4.1 1.179 3.30 3.30 3.30 4.1 1.17 1.10 6.5 4.0 1.00 9.4 100 9.4 9.	ostream signal (m)												
179 179 330 330 330 4.1 4.1 7.1 6.5 4.0 100 94 100 100 1397 622 587 622 587 622 587 622 622 622 623	(, platoon unblocked												
179 179 330 330 330 4.1 4.1 4.1 7.1 6.5 5.5 4.0 100 94 100 95 100	conflicting volume	179			179			330	330	141	335	368	179
179 179 330 330 330 341 4.1 4.1 7.1 6.5 5.5 4.0 100 100 94 100	71, stage 1 conf vol												
179 179 330	2, stage 2 conf vol												
4.1 4.1 7.1 6.5 2.2 2.2 3.5 4.0 100 100 94 100 1397 1397 6.22 587 6.2 141 38 184 43 0 0	u, unblocked vol	179			179			330	330	141	335	368	179
2.2 2.2 3.5 4.0 100 100 94 100 100 94 100 100 94 100 100 94 100 9	single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 3.5 4.0 100 100 94 100 137 1397 622 587 4 141 38 184 43 0 0 0 5 38 0 5 5 0 1397 1700 000 0.00 0.02 0.00 0.07 0.00 0.00 0.01 1.7 0.00 0.00 0.02 11.0 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.0 0.0 0.0 0.0 11.0 0.0 0.0 0.0 11.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	, 2 stage (s)												
100 100 94 100 130 1397 622 587 95 100 130 1307 622 587 95 100 100 100 100 100 100 100 100 100 10	(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1397 1397 622 587 EB	dnene tree %	100			100			94	100	66	100	100	100
EB1 EB2 WB1 NB1 SB1 141 38 184 43 0 0 0 5 38 0 1397 1700 1397 645 1700 0.00 0.02 0.07 0.00 0.00 0.01 11,0 0.0 0.00 0.0 0.1 11,0 0.0 0.00 0.0 0.1 11,0 0.0 0.00 0.1 11,0 0.0 0.00 0.2 11,0 0.0 0.00 0.00 0.00 0.00 0.00 0.00 0.0	1 capacity (veh/h)	1397			1397			622	287	406	614	226	864
141 38 184 43 0 0 0 5 38 0 0 3 0 5 0 1397 1700 1397 645 1700 0.00 0.02 0.00 0.07 0.00 0.00 0.0 1 17 0.0 0 0 0 1 17 0.0 A B A 0 0 0.2 110 0.0 B A A 1.3 ICU Level of Service	rection, Lane #	EB 1	EB2	WB1	NB 1	SB1							
0 0 5 38 0 0 1397 000 38 0 0 38 0 0 38 0 0 38 0 0 38 0 0 38 0 0 39 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ulume Total	141	88	184	43	0							
1397 1700 645 1700 000 000 000 000 000 001 177 000 000	olume Left	0	0	2	38	0							
1397 1700 1397 645 1700 0.00 0.02 0.00 0.07 0.00 0.0 0.0 0.1 1.7 0.0 0.0 0.0 0.2 11.0 0.0 A B A 0.0 0.2 11.0 0.0 B A II.3 ICU Level of Service	olume Right	0	38	0	2	0							
0.00 0.02 0.00 0.07 0.00 0.00 0.00 0.0 0.0 0.1 1.7 0.0 0.0 0.0 0.2 11.0 0.0 0.0 0.0 0.2 11.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		1397	1700	1397	645	1700							
00 00 01 17 00 00 00 02 110 00 A B A 00 02 110 00 B A Ilization 22.7% ICU Level of Service	olume to Capacity	0.00	0.05	0.00	0.07	0.00							
0.0 0.0 11.0 0.0 A B A 0.0 0.2 11.0 0.0 B A May 1.3 I CU Level of Service	nene Length 95th (m)	0.0	0.0	0.1	1.7	0.0							
0.0 0.2 11.0 0.0 1.0 0.0 1.0 0.0 1.3 1.3 ICU Level of Service	ontrol Delay (s)	0.0	0.0	0.2	11.0	0.0							
0.0 0.2 11.0 0.0 B A	ine LOS			A	В	⋖							
117) 1 1.3 1 1.3 1 1.3 1 1.7 1 1.5 1 1.7 1 1	oproach Delay (s)	0.0		0.2	11.0	0.0							
1.3 22.7% ICU Level of Service 1.5	oproach LOS				В	A							
1.3 22.7% ICU Level of Service 15	tersection Summary												
22. /% ICU Level of Service	rerage Delay			1.3	9								
	ersection Capacity Utilizatio	u.		22.7%	೨	U Level o	of Service			V			
	Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

Existing (AM)

	1	†	<i>></i>	>	ļ	4	•	←	•	۶	→	•
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		₩	¥		₩	W _		4			4	
Traffic Volume (veh/h)	10	110	2	09	135	2	2	40	20	2	20	10
Future Volume (Veh/h)	10	110	2	09	135	2	2	40	20	2	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	2	92	147	2	2	43	24	2	22	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	152			125			441	424	120	464	424	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	152			125			441	424	120	464	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
po dueue free %	66			96			66	91	94	66	%	66
cM capacity (veh/h)	1441			1474			486	498	937	413	498	902
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	131	2	212	2	102	38						
Volume Left	=	0	99	0	2	2						
Volume Right	0	2	0	2	54	7						
SSH	1441	1700	1474	1700	199	222						
Volume to Capacity	0.01	0.00	0.04	0.00	0.15	0.07						
Queue Length 95th (m)	0.7	0.0	1.1	0.0	4.3	1.8						
Control Delay (s)	0.7	0.0	5.6	0.0	11.4	12.0						
Lane LOS	V		V		В	В						
Approach Delay (s)	0.7		2.5		11.4	12.0						
Approach LOS					В	В						
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization	tion		29.8%	2	U Level o	ICU Level of Service			A			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

Existing (PM)

						į			į		
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	₩	¥		4			4			4	
2	235	40	2	225	0	40	0	2	0	0	5
2	235	40	2	225	0	40	0	2	0	0	2
	Free			Free			Stop			Stop	
	%0			%0			%0			%0	
0.92	0.95	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
2	255	43	2	245	0	43	0	2	0	0	2
	None			None							
245			298			525	520	255	525	263	245
245			298			525	250	255	525	263	245
4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
100			100			91	100	66	100	100	66
1321			1263			458	457	784	457	432	794
EB 1	EB2	WB1	NB 1	SB 1							
260	43	250	48	2							
2	0	2	43	0							
0	43	0	2	വ							
1321	1700	1263	478	794							
0.00	0.03	0.00	0.10	0.01							
0.1	0.0	0.1	2.7	0.2							
0.2	0.0	0.2	13.4	9.6							
V		V	В	V							
0.2		0.2	13.4	9.6							
			В	A							
		1.3									
ntersection Capacity Utilization		31.7%	⊇	ICU Level of Service	f Service			A			
		15									

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

Existing (PM)

Movement EBI EBI EBI Lane Configurations 4 7 Traffic Volume (vehrh) 20 190 10 Future Volume (vehrh) 20 190 10 Sgn Conflool 0% 0.92 0.92 0.92 Fore of the confloor 0% 0.92 0.92 0.92 0.92 Hourly flow rate (veh) 22 207 11 11 11 11 11 11 11 11 11 11 11 12 10 11 11 11 11 11 12 11 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 13 1	FBR WBL 10 65 10 65 10 65 11 71 11 71 218	WBT WBR 4	MBR NBL 15 15 15 15 15 0.92 0.92 0.92	NBT	NBR	SBL	SBT	SBR 20
20 190 64 60 60 60 60 60 60 60 60 60 60 60 60 60		O	0	4 24	ς π	יט ע	\$	7
20 190 20 190 692 092 0 22 207 223 223 4.1 2.2 98 1346 1346 1700 1 0.4 0.0 0.4 0.0 0.9 0.0 A 0.8		0	0	45	25	n n	22	20
22 207 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6% 6%		O O	0		2	Ľ		
Pree 0,92 0,05 0,05 0,05 0,05 0,05 0,05 0,05 0,0		O O	0	45	82	כ	22	20
22 207 22 207 22 207 22 207 223 223 4.1 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 11 1346 1700 1 0 0.02 0.00 0 0 0.4 0.0 0 0.4 0.0 0 0.9 0.0 0 A 0 8		0	0	Stop			Stop	
22 207 22 207 22 207 223 4.1 2.2 98 1346 1346 1700 1 1346 1700 0 0 0 0 0 4 0 0 0 0 0 0 0 0 0 0 0 0		0	0	%0			%0	
22 207 223 223 4.1 2.2 98 1346 EB1 EB2 W 22 0 11 22 0 1346 1346 0 11 0 0 11 0 0.4 0.0 0 0.9 0.0 0 8				0.92	0.92	0.92	0.92	0.92
223 223 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 0 0.9 0.0 0 A 0.8	218 218 4.1	None		46	92	2	27	22
223 223 4.1 2.2 98 1346 1346 1700 0.02 0.03 0.9 0.9 0.9 0.9	218 218 4.1	None						
223 223 4.1 2.2 98 1346 11346 1700 11 1346 1700 0,0 0,0 0,4 0,0 0,8	218 218 4.1	None						
223 223 4.1 2.2 98 1346 EB1 EB2 W 22 0 0 11 22 0 0 11 0,9 0,0 0,0 0,9 0,0 0,8	218 218 4.1	None						
223 223 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 11 22 0 0 11 0 0.4 0.0 0 0.4 0.0 0 A A 0.8	218 218 4.1	None						
223 4.1 2.2 98 1346 1346 1346 1700 0 0 0 0 0 0 4 0 0 0 0 0 0 0 0 0 0 0	218 218 4.1	None						
223 223 4.1 2.2 98 1346 EB1 EB2 W 22 0 0 11 22 0 0 11 1346 1700 1 0.02 0.01 0.04 0.0 0.9 0.0 0.8	218 218 4.1							
223 4.1 223 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 0 11 1346 1700 1 0.3 0.01 (0 0.4 0.0 0.9 0.0 A A 0.8	218 218 4.1							
223 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 11 1346 1700 1 0.02 0.01 0 0.4 0.0 A A 0.8	218 218 4.1							
223 223 4.1 2.2 98 1346 1346 1346 1700 0 0 0 0 0 0 A 0 A 0 0 0 0 0 0 0 0 0	218 218 4.1							
223 4.1 2.2 98 1346 EB1 EB2 W 229 01 0 22 0 0 11 1346 1700 1 0 0.4 0.0 0 0.4 0.0 0 0.9 0.0 0 8	218		989	919	207	716	611	207
223 4.1 2.2 98 1346 EB1 EB2 W 229 11 22 0 0 0 10 0.02 0.01 (0 0.02 0.01 (0 0.03 0.01 (0 0.04 0.00 (0 0.09 0.00 A	218							
223 4.1 4.1 2.2 98 1346 1346 22 0 0 11 1346 1700 1 1346 0.00 0.0 (m) 0.4 0.0 A 0.0 A 0.0	218							
4.1 2.2 98 1346 1346 11 22 0 0 11 1346 1700 11 0.00 0.01 0.01 0.0 0.01 0.0 0.01 0.0 0.01 0.0 0.01 0.0	4.1		989	919	207	716	611	207
2.2 98 1346 1346 229 11 229 11 0 0 11 002 001 0 0,9 0.0 A A 0.0			7.1	6.5	6.2	7.1	6.5	6.2
2.2 98 1346 1346 EB1 EB2 W 229 11 22 0 04 0.0 (m) 0.4 0.0 A 0.0 A 0.0 A 0.0								
1346 1346 EB1 EB2 W 222 0 11 22 0 11 1346 1700 1 0.02 0.01 0.03 0.01 A 0.00 A 0.00 A 0.00	2.2		3.5	4.0	3.3	3.5	4.0	3.3
1346 EB1 EB2 W 229 11 229 11 1346 1700 1 0.02 0.01 (0) 0.9 0.0 A A 0.8	95		95	87	86	86	93	97
EB1 EB2 W 229 11 22 0 0 11 1346 1700 1 (m) 0.02 0.01 (A A 0.0 0.8	1352		341	378	833	262	381	833
229 11 22 0 0 1 1346 1700 1 7 0.02 0.01 (m) 0.4 0.0 A A 0.8	31 WB2	NB 1 SB 1	11					
22 0 0 1 1346 1700 1 (m) 0.4 0.0 0.9 0.0 A A 0.8	278 16	157	54					
(m) 0.4 0.0 (m) 0.9 0.0 (m) 0.8 (m	71 0	16	2					
(m) 0.02 0.01 (m) 0.9 0.0	0 16		22					
(m) 0.02 0.01 (0.9 0.0 A 0.0 A 0.0 A 0.0 A A A 0.8	1352 1700		464					
(m) 0.4 0.0 0.9 0.0 A 0.8	U		0.12					
0.9 0.0 A 0.8	1.3 0.0		3.1					
A 0.8			13.8					
8.0	А	В	В					
Approach LOS	2.2		13.8					
		В	В					
Intersection Summary								
	5.1							
pacity Utilization 45.		ICU Level of Service	vice		⋖			
	15							

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

Existing (SAT)

Movement EBL Lane Configurations Traffic Volume (Vehin) Sign Control Grade Peak Hour Factor Olyzy Hourly Houry Hou	EBT 4305 305 305 Free 0% 332 332	35 35 35 35 0.92	WBL 15	WBT 265	WBR	NBL	NBT	NBR	SBL	SBT	SBR
onfigurations onfigurations ofolume (veh/h) 5 volume (veh/h) 5 antrol our Factor 0.92 flow rate (vph) 5 ians ians ians 1,5peed (ms) 1,5	4 305 305 305 Free 0% 332 332	35 35 0.92	15	265			4			ŀ	
Volume (veh/h) 5 Volume (veh/h) 5 nntrol our Factor 0.92 fians sians 1 Speed (m/s) 5 Blockage Im flare (veh) 7 Storage veh) 7 Nordage veh) 7 Storage veh)	305 305 Free 0.92 332	35 35 0.92	15	265						÷	
Volume (Veh/h) 5 Out Factor 0.92 Iow rate (vph) 5 Iow rate (vph) 5 Idh (m) 5 Ich (m) 7 Isbeed (m/s) Blockage Im flare (veh) 7 Isbeed (m/s) Rockage Newh) N	305 Free 0% 0.92 332	35		370	0	22	0	15	0	0	2
ontrol our Factor 10 over the coph 10 over th	9% 0% 0.92 332	0.92	15	007	0	22	0	15	0	0	2
our Factor 0.92 flow rate (vph) 5 fans fans fans fans fans fans fans fans	0.92	0.92		Free			Stop			Stop	
0.92	332	0.92		%0			%0			%0	
ιn	332		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
		89	16	288	0	27	0	16	0	0	2
Median storage veh)	None			None							
Upstream signal (m)											
pX, platoon unblocked											
vC, conflicting volume 288			370			199	662	332	879	700	288
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
ed vol			370			199	662	332	8/9	700	288
tC, single (s) 4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
stage (s)											
			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free % 100			66			93	100	86	100	100	66
cM capacity (veh/h) 1274			1189			365	375	710	353	357	751
Direction, Lane # EB 1	EB 2	WB1	NB 1	SB1							
Volume Total 337	38	304	43	2							
Volume Left 5	0	16	27	0							
Volume Right 0	38	0	16	2							
cSH 1274 1	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	8.6							
Lane LOS		A	В	V							
Approach Delay (s) 0.1		0.5	13.9	8.6							
Approach LOS			В	A							
Intersection Summary											
Average Delay	l	1.0	l	l							
Intersection Canacity Hilization		41 8%		ava	CILL aval of Service			٥			
mersecular capacity ouncation		20.0	2	C ECVCI C	2010100			ζ			

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

Existing (SAT)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	R.		4	¥.		÷			4	
Traffic Volume (veh/h)	10	240	10	75	210	10	10	30	96	10	25	10
Future Volume (Veh/h)	10	240	10	75	210	10	10	30	96	10	22	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	=	27	=
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	989	261	794	989	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	239			272			700	989	261	794	989	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
b0 dueue free %	66			94			96	06	87	95	92	66
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	1	310	1	147	49						
Volume Left	Ξ	0	82	0	=	=						
Volume Right	0	1	0	1	103	11						
cSH	1328	1700	1291	1700	222	352						
Volume to Capacity	0.01	0.01	90.0	0.01	0.26	0.14						
Queue Length 95th (m)	0.7	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		⋖		В	O						
Approach Delay (s)	0.4		2.5		13.8	16.9						
Approach LOS					В	ပ						
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization	ion		47.0%	2	U Level o	ICU Level of Service			⋖			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 2027 Future Background (AM) 4: 3 Line & Wellington Road 19

Movement EBL Lane Configurations Traffic Volume (Verbin) 0 Sign Confour Grade Peak Hour Factor 0,92 Pedestrians Pedestrians Walkin Cheef (mix) Walkin Cheef (mix)	L EBI	T EBR	WBL	WBT	WBD	IGIN	TOIN	NBR	Ido	CRT	SBR
onfigurations Volume (veh/h) onforce our Factor our Factor ions ale (yph) ians ridth (m)					\ <u>\</u>	NDL	NBI		שטכ	וחה	
Volume (veh/h) nour Factor our Factor flow rate (vph) flans flight (m) School (m/s)				€			4			4	
Volume (Veh/h) nntrol our Factor flow rate (vph) ians fieth (m) flow(s) for the flow(s)	-	5 35	2	180	0	32	0	2	0	0	0
our Factor flow rate (vph) flans fidth (m) Sneed (m/s)			2	180	0	32	0	2	0	0	0
our Factor flow rate (vph) ians idth (m)	Free	a		Free			Stop			Stop	
	%0			%0			%0			%0	
	2 0.92	2 0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pedestrians ane Width (m) Malking Speed (m/s)	0 15		2	196	0	38	0	2	0	0	0
-ane Width (m)											
Malking Speed (m/s)											
Walling open times											
Percent Blockage											
Right turn flare (veh)											
Median type	None	a		None							
Median storage veh)											
Upstream signal (m)											
pX, platoon unblocked											
vC, conflicting volume 196	2		196			364	364	158	369	402	196
vC1, stage 1 conf vol											
lo											
ed vol	2		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
stage (s)											
	2		2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free % 100	0		100			94	100	66	100	100	100
cM capacity (veh/h) 1377	7		1377			260	292	887	583	535	845
Direction, Lane # EB 1	1 EB2	2 WB1	NB 1	SB1							
Volume Total 158		38 201	43	0							
Volume Left 0	0	0 5	38	0							
Volume Right 0		38 0	2	0							
CSH 1377	7 1700	0 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 0.1	1.8	0.0							
Control Delay (s) 0.0	0.0	0 0.2	11.3	0.0							
Lane LOS		A	В	A							
Approach Delay (s) 0.0	0	0.2	11.3	0.0							
Approach LOS			В	A							
Intersection Summary											
Average Delay		12									
Intersection Capacity Utilization		23.5%	<u> </u>	I level c	ICLI Level of Service			⋖			
Analysis Period (min)		7									

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Background (AM)

	١	t	•	>		,	_	-		k.	•	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	*-		4	*		4			4	
Traffic Volume (veh/h)	10	125	വ	09	150	വ	2	40	20	2	50	_
Future Volume (Veh/h)	10	125	2	09	150	2	2	40	20	2	20	9
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	2	92	163	2	2	43	54	2	22	1
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
b0 queue free %	66			96			66	91	94	66	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	2	228	2	102	38						
Volume Left	1	0	99	0	2	2						
Volume Right	0	2	0	2	24	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		0.0	4.5	1.8						
Control Delay (s)	9.0	0.0	2.4	0.0	11.7	12.3						
Lane LOS	A		∢		В	В						
Approach Delay (s)	9.0		2.4		11.7	12.3						
Approach LOS					8	В						
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization	ation		34.4%	೨	U Level o	ICU Level of Service			⋖			

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HCM Unsignalized Intersection Capacity Analysis 2027 Future Background (PM) 4: 3 Line & Wellington Road 19

Movement Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h)	Ē	EBT	CDD	WBI	WRT				COLV	SBI	CRT	CDD
Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h)	EBL		LDK	10.5	-	WBR	NBL	NBT	NBK	טטר	וחה	SDF
Fraffic Volume (veh/h)		4	¥c.		÷			4			4	
-uture Volume (Veh/h)	2	260	40	2	250	0	40	0	2	0	0	5
()	2	260	40	2	250	0	40	0	2	0	0	2
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)	2	283	43	2	272	0	43	0	2	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	272			326			280	575	283	280	618	272
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			326			280	575	283	280	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			8	100	66	100	100	66
cM capacity (veh/h)	1291			1234			420	425	756	420	402	767
Direction, Lane #	EB 1	EB2	WB1	NB 1	SB 1							
Volume Total	288	43	277	48	2							
Volume Left	2	0	2	43	0							
Volume Right	0	43	0	2	D.							
CSH	1291	1700	1234	441	191							
Volume to Capacity	0.00	0.03	0.00	0.11	0.01							
Queue Length 95th (m)	0.1	0.0	0.1	5.9	0.2							
Control Delay (s)	0.2	0.0	0.2	14.2	6.7							
Lane LOS	V		V	В	V							
Approach Delay (s)	0.1		0.2	14.2	6.7							
Approach LOS				В	V							
Intersection Summary												
Average Delay			13									
Intersection Capacity Utilization			33 0%	2	l eve	ICIT Level of Service			A			
Analysis Doriod (min)			4	2					:			

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Background (PM)

Movement EBI EBI EBI WBI WBI WBI NBI NBI NBI SBI			ì	•	-			-	-	~			
1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
20 215 10 65 215 15 15 45 85 5 25	Lane Configurations		₩	¥L.		₩	¥L.		4			4	
10	Traffic Volume (veh/h)	20	215	10	99	215	15	15	45	82	2	52	7
Free Free Slop O'8	Future Volume (Veh/h)	70	215	10	99	215	15	15	45	82	2	22	7
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Sign Control		Free			Free			Stop			Stop	
None None None None None Section	Grade		%0			%0			%0			%0	
22 234 11 71 234 16 16 49 92 5 27 None None None None Separate Se	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	0.0
None None None None Section 245 690 670 234 770 665 3 250 245 690 670 234 770 665 3 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	Hourly flow rate (vph)	22	234	11	71	234	16	16	46	92	2	27	2
None	Pedestrians												
None None None None None S250 245 690 670 234 770 665 3 250 245 690 670 234 770 665 3 22 22 22 35 40 33 35 40 98 92 92 98 92 92 98 92 92 98 92 92 98 92 92 98 92 92 92 92 92 92 92 92 92 92 92 92 92	Lane Width (m)												
None	Walking Speed (m/s)												
None	Percent Blockage												
None None None None None State	Right turn flare (veh)												
250 245 690 670 234 770 665 2 250 245 690 670 234 770 665 2 22 2 2 35 40 33 35 40 98 92 95 95 86 89 98 92 1316 1321 381 381 35 40 33 35 40 22 0 11 0 16 92 22 22 0 11 0 16 92 22 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 11 0 16 92 22 0 0 10 030 0.012 0 08 0.0 2.2 0.0 150 145 0 08 2.1 150 145 0 08 2.1 150 145 0 08 2.1 150 145 0 08 2.1 150 145 0 08 2.1 150 145	Median type		None			None							
250 245 690 670 234 770 665 3 250 245 690 670 234 770 665 3 21 2.2 2.2 3.5 4.0 33 3.5 4.0 98 95 95 95 98 98 98 98 1316 1306 1321 1321 312 352 805 238 354 8 22 0 71 0 16 92 22 23 0.0 11 0 16 92 22 1316 1700 1321 1700 515 433 0.0 2.2 0.0 150 145 0.8 0.0 2.2 0.0 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145 0.8 2.1 150 145	Median storage veh)												
250 245 690 670 234 770 665 5 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 5 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 98 99 99 99 99 99 99 99 99 99 99 99 99	Upstream signal (m)												
250 245 690 670 234 770 665 3 250 245 690 670 234 770 665 3 21 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 22 2 2 35 40 33 3.5 40 24	pX, platoon unblocked												
250 245 690 670 234 770 665 3 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 98 95 95 95 95 86 89 98 92 1316 1321 MB 2 NB 1 SB 1 312 352 805 238 354 8 22 0 71 0 16 92 22 0 0 11 0 16 92 22 0.0 11 0 16 92 22 0.0 10 0.0 0.12 0.0 12.0 0.0 15.0 14.5 0.8 0.0 2.2 0.0 15.0 14.5 0.8 0.0 2.2 0.0 15.0 14.5 0.8 0.0 2.2 0.0 15.0 14.5 0.8 0.0 2.2 0.0 15.0 14.5 0.8 0.0 2.2 0.0 15.0 14.5 0.8 0.0 4.6 0.0 15.0 14.5 0.8 0.0 15.0 14.5 0.8 0.0 15.0 15.0 14.5 0.8 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 14.5 0.0 15.0 15.0 15.0 15.0 15.0 15.0 15.0 1	vC, conflicting volume	250			245			069	029	234	770	999	234
250 245 690 670 234 770 665 5 2 7.1 6.5 6.2 7.2 8.6 8.6 8.9 98 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8	vC1, stage 1 conf vol												
riblocked vol 260 245 690 670 234 770 665 33 41 65 62 71 65 65 71 65 65 71 65 65 71 65 65 71 65 65 71 65 85 71 65 71 65 71 65 71 65 71 65 71 65 71 65 71 65 71 65 71 65 86 89 98 92 80 89 89 80 <td>vC2, stage 2 conf vol</td> <td></td>	vC2, stage 2 conf vol												
lage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.1 30.5 1.6 1.5 5.4 stage (s) 1.3 1.2 3.5 2 80.5 2.3 3.5 4.0 stage (s) 1.3 1.2 3.5 2 80.5 2.3 3.5 4.0 stage (s) 1.3 1.2 3.5 3.5 3.5 3.5 4.0 stage (s) 1.3 1.2 3.5 3.5 3.5 3.5 4.0 stage (s) 1.3 1.2 3.5 3.5 3.5 3.5 4.0 stage (s) 1.3 1.3 1.2 3.5 3.5 3.5 3.5 4.0 stage (s) 1.3 1.3 1.2 3.5 3.5 3.5 3.5 4.0 stage (s) 1.3 1.3 1.2 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	vCu, unblocked vol	250			245			069	029	234	770	999	234
stage (s) 2.2 2.2 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 98 98 98 98 98 98 98 98 98 9	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 22 35 40 33 35 40 9e bed fee % 98 98 95 9e bed with the with 1316 bed	tC, 2 stage (s)												
98 99 99 1316 1316 1321 312 352 805 238 99 99 99 99 1316 1316 1317 1312 352 805 238 354	tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1316 1321 312 352 805 238 354 EB1 EB2 WB1 WB2 NB1 SB1 256 11 305 16 157 54 22	b0 queue free %	86			95			95	98	86	86	92	6
EB1 EB2 WB1 WB2 NB1 SB1 256 11 305 16 157 54 20 0 71 0 16 92 22 1316 1700 1321 1700 515 433 00.0 0.01 0.05 0.01 0.30 0.12 0) 0.4 0.0 1.4 0.0 1145 A A A A C B C B C B C B C B C C B C C B C C B C C B C C B C C B C C C B C C C B C C C C	cM capacity (veh/h)	1316			1321			312	352	802	238	354	806
256 11 305 16 157 54 22 0 71 0 16 5 0 11 0 16 16 5 0 0.11 0 16 16 5 0.02 0.01 0.05 0.01 0.30 0.12 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B 0.8 2.1 15.0 14.5 C B 5.0 10 Level of Service	Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
22 0 71 0 16 5 0 11 0 16 92 22 1316 1700 1321 1700 33 0.12 0.02 0.01 0.05 0.01 0.30 0.12 0) 0.4 0.0 1.4 0.0 10.2 3.4 A A A C B C B 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B 0.8 0.1 1.4 0.0 10.2 3.4 C B 0.8 0.1 1.4 0.0 10.2 3.4 C B 0.8 0.0 2.2 0.0 15.0 14.5 C B 0.8 0.0 2.4 0.0 14.5 C B 0.9 0.0 0.0 1.4 0.0 14.5 C B 0.0 0.0 0.0 1.4 0.0 14.5 C B 0.0 0.0 0.0 1.4 0.0 14.5 C B 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 14.5 C B 0.0 0.0 0.0 0.0 0.0 0.0 0.0 14.5 C B 0.0 0.0 0.0 0.0 0.0 0.0 0.0 14.5 C B 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume Total	256	11	302	16	157	54						
1316 1700 1321 1700 515 433 0.02 0.01 0.05 0.01 0.03 0.12 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B C B C B C B C B C B C B C B C B C B	Volume Left	22	0	71	0	16	2						
1316 1700 1321 1700 515 433 002 0.01 0.05 0.01 0.05 0.012 0 4 0.0 1.4 0.0 1.2 3.4 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B C B C B C B C B C C B C C B C C B C C C B C C C C	Volume Right	0	1	0	16	92	22						
0.02 0.01 0.05 0.01 0.30 0.12 0.4 0.0 1.4 0.0 10.2 3.4 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B C B 0.8 2.1 15.0 14.5 C B B 5.0 10.1 level of Service	cSH	1316	1700	1321	1700	515	433						
) 0.4 0.0 1.4 0.0 10.2 3.4 0.8 0.0 2.2 0.0 15.0 14.5 A A A C B B 0.8 2.1 15.0 14.5 C B B 5.0 C B C B	Volume to Capacity	0.02	0.01	0.02	0.01	0.30	0.12						
0.8 0.0 2.2 0.0 15.0 14.5 A A A C B C B C B 2.1 14.5 C B 5.0 ICU Level of Service	Queue Length 95th (m)	0.4	0.0	1.4	0.0	10.2	3.4						
A A C B 0.8 2.1 15.0 14.5 C B 5.0 5.0 ICU Level of Service	Control Delay (s)	0.8	0.0	2.2	0.0	15.0	14.5						
5.0 IS Service	Lane LOS	∢ 0		< ₹		ر د د	B 1,1						
C B 5.0 Utilization 48.6% ICU Level of Service	Approach Delay (s)	0.8		7.1		0.01	4.0						
5.0 5.0 Level of Service	Approach LOS					ပ	n						
5.0 48.6% ICU Level of Service	Intersection Summary												
46.0% ICU LEVELUI SELVICE	Average Delay	acit c		5.0	J	0 000	Coninco			<			
	Intersection Capacity Utiliza	ation		48.6%	ੂ	n Level C	or service			∢			

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HCM Unsignalized Intersection Capacity Analysis 2027 Future Background (SAT) 4: 3 Line & Wellington Road 19

HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Background (SAT)

Monement EBI EBI EBI WBI WBI WBI NBI NBI NBI NBI SBI		`	t	•	•		,	-	-			•	,
ordigurations of the fire ordinary (sethin) 10 270 110 75 240 110 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 0100 110 30 95 110 25 240 010 11 293 111 293	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Colume (verly) 10 270 10 75 240 10 10 30 95 10 25 Colume (verly) 10 270 10 75 240 10 10 30 95 10 25 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 33 103 11 27 Colume (verly) 11 293 11 82 261 11 11 27 Colume (verly) 120 22 22 32 40 32 32 Colume (verly) 120 120 120 11 147 49 40 40 40 40 40 Colume (verly) 120 126 11 11 11 40 40 40 40 40	Lane Configurations		₩	*		4	*		4			4	
Volume (Verlyt) 10 270 10 75 240 10 10 30 95 10 25 orthogonal Verlyt (Verlyt) 10 270 10 75 240 10 10 30 95 10 25 orthogonal Verlyt (Verlyt) 11 293 11 82 261 11 11 33 103 11 27 ratas (Verlyt) 11 293 11 82 261 11 11 33 103 11 27 ratas (Verlyt) 11 293 11 82 261 11 11 33 103 11 27 ratas (Verlyt) 11 293 11 82 261 11 11 33 103 11 27 ratas (Verlyt) 11 293 11 82 261 11 11 11 33 103 11 27 ratas (Verlyt) 11 200 1 2	Traffic Volume (veh/h)	10	270	10	75	240	10	10	30	96	10	25	_
Our Factor Free Free Stop Stop Stop Stop Stop O% O	Future Volume (Veh/h)	10	270	10	75	240	10	10	30	95	10	22	10
our Factor 0%	Sign Control		Free			Free			Stop			Stop	
Myther (my) Vigorale (phy) II 293 II 82 261 II 11 33 103 II 27 Statistics With (m) With (m)	Grade		%0			%0			%0			%0	
March (Ph)	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
Note (ms)	Hourly flow rate (vph)	11	293	11	82	261	11	1	33	103	11	27	11
Width (m) Width (m) Mydith (m) None None Lur flackage (ms) None None In storage veh) Annickage Annickage In storage veh) Annickage Annickage In storage veh) Annickage Annickage Annickage Annickage veh) Annickage Annicka	Pedestrians												
nu type m store (im.k) nu type m store (im.k) nu type m signal (im.) eam signal (Lane Width (m)												
rut Blockage turn flace (eth) None In storage veh) In storage veh	Walking Speed (m/s)												
Intrilate (veh) In type In type and signal (m) atom unblocked atom unblocked vol	Percent Blockage												
In Style but sty	Right turn flare (veh)												
na storage veh) eam storage veh) and storage veh) and stage (s) stage 2 conf vol stage 3 sora stage 3 sora stage 4 sora stage 6 sora stage 6 sora stage 6 sora stage 6 sora stage 7 sora stage 6 sora stage 6 sora stage 7 sora stage 6 sora stage 6 sora stage 7 sora stage 7 sora stage 8 sora stage 9 sora stage 8 sora stage 8 sora stage 9 sora stag	Median type		None			None							
same signal (m) aloon runbrocked aloon r	Median storage veh)												
ation unblocked ation unblocked ation Lane # EB1 EB2 WB1 WB2 01 ation Capacity ation Capac	Upstream signal (m)												
stage (conf vod meter) stage (conf vod meter) stage (conf vod meter) stage (conf vod meter) stage (s) 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.	pX, platoon unblocked												
stage 1 conf vol stage 1 conf vol stage 2 conf vol stage (s) 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 3.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 3.1 1.257 279 315 746 207 315 7100 Lane # EB 1 EB 2 WB 1 WB 2 NB 1 SB 1 746 207 315 7100 Lane # EB 1 1 17 1 17 1 17 1 17 1 17 1 17 1 17	vC, conflicting volume	272			304			764	751	293	860	751	261
stage 2 conf vol minocked vol 222 304 764 751 293 860 751 51 2000 Stage 2 conf vol minocked vol 222 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.6 3.5 4.0 stage (s) 2.2 3.5 4.0 3.6 3.5 4.0 stage (s) 2.2 3.5 4.0 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6	vC1, stage 1 conf vol												
anbjocked vol 272 304 764 751 293 860 751 31 31 31 31 31 31 31 31 31 31 31 31 31	vC2, stage 2 conf vol												
type (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 4.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 9.1 9.2 4.0 8.3 8.5 4.0 8.3 8.5 9.1 9.2 <t< td=""><td>vCu, unblocked vol</td><td>272</td><td></td><td></td><td>304</td><td></td><td></td><td>764</td><td>751</td><td>293</td><td>98</td><td>751</td><td>261</td></t<>	vCu, unblocked vol	272			304			764	751	293	98	751	261
stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 eue free % 99 93 96 96 96 96 97 315 1.0 packly (veh/h) 1291 1257 279 315 746 207 315 316 315 316 315 316 315 316 315 316	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
eue free % 99 92 22 35 40 33 35 40 eue free % 99 93 93 96 90 86 95 91 gold (vehh) 1291 1281 MB1 NB1 SB1 746 207 315 316 315 316 315 316 315 317 315 316 316 317 317 317 318 318 317 318	tC, 2 stage (s)												
99 99 93 94 1257 279 315 746 970 315 1291 1291 1291 1291 1291 1291 1291 12	F (S)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1291 1257 279 315 746 207 315 336 33	po queue free %	66			93			96	06	98	95	91	6
EB 1 EB 2 WB 1 SB 1	cM capacity (veh/h)	1291			1257			279	315	746	207	315	77
304 11 343 11 147 49 11 0 82 0 11 11 0 11 0 11 11 1291 1700 1257 1700 521 320 0.01 0.01 0.07 0.01 0.28 0.15 0.2 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 146 18.3 A A A B C 0.3 2.3 14.6 18.3 B C 4.6 ICU Level of Service	Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
11 0 82 0 11 11 1291 1700 1257 1700 23 11 1291 1700 1257 1700 28 0.15 0.2 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 146 18.3 A A A A B C 0.3 2.3 146 18.3 B C 46 102 202 102 102 102 102 102 102 102 102	Volume Total	304	1	343	1	147	49						
1291 1700 1257 1700 521 320 0.001 0.01 0.07 0.01 0.028 0.15 0.2 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 14.6 18.3 A A A A A B C 0.3 2.3 14.6 18.3 B C B C A A A A A A B C A A A A A B C A A A A A B C B C B C B C B C B C B C B C	Volume Left	=	0	82	0	=	=						
1291 1700 1257 1700 521 320 0.01 0.01 0.07 0.01 0.28 0.0 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 146 18.3 A A A B C B C B C B C B C B C B C B C B C B C	Volume Right	0	11	0	11	103	=						
001 0.01 0.07 0.01 0.28 0.15 0.2 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 146 18.3 A A A B C 0.3 2.3 146 18.3 B C 4.6 Idization 50.2% ICU Level of Service	CSH	1291	1700	1257	1700	521	320						
02 0.0 1.7 0.0 9.2 4.3 0.4 0.0 2.4 0.0 146 18.3 0.3 2.3 146 18.3 0.3 2.3 14.6 18.3 0.4 6 10.2 6.2 6.2 6.2 10.2 10.2 10.2 10.2 10.2 10.2 10.2 10	Volume to Capacity	0.01	0.01	0.07	0.01	0.28	0.15						
0.4 0.0 2.4 0.0 146 18.3 A A B C A B C B C C C C C C C C C C C C C C C C C	Queue Length 95th (m)	0.2	0.0	1.7	0.0	9.5	4.3						
A A B C 0.3 2.3 146 18.3 In the state of Service 15.2% ICU Level of Servic	Control Delay (s)	0.4	0.0	2.4	0.0	14.6	18.3						
0.3 2.3 14.6 18.3 1.9 C	Lane LOS	V		A		В	S						
B C mmary 4.6 10 Level of Service (min) 15	Approach Delay (s)	0.3		2.3		14.6	18.3						
4.6 50.2% ICU Level of Service 15	Approach LOS					В	O						
4.6 50.2% ICU Level of Service 15	Intersection Summary												
50.2% ICU Level of Service 15	Average Delay			4.6									
	Intersection Capacity Utiliza Analysis Period (min)	ıtion		50.2%	೨	U Level o	of Service			⋖			

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HCM Unsignalized Intersection Capacity Analysis 2027 Future Total (AM) 3: North Site Access/Golf Course Access & Wellington Road 19

*	SBR		5	5		0	0.92	ည										242			242	6.2		3.3	66	797															
→	SBT	4	0	0	Stop	%0	0.92	0										493			493	6.5		4.0	100	469															
۶	SBL		2	2		0	0.92	2										498			498	7.1		3.5	66	468															
4	NBR		15	15		0	0.92	16										202			202	6.2		3.3	86	839														⋖	
←	NBT	4	0	0	Stop	%0	0.92	0										496			496	6.5		4.0	100	468															
•	NBL		32	32		0	0.92	88										484			484	7.1		3.5	35	484															
4	WBR		15	15		0	0.92	16																			SB 1	10	2	2	589	0.02	0.4	11.2	В	11.2	В			Service	
Ļ	WBT	4	215	215	Free	%0	0.92	234						None													NB 1	72	88	16	553	0.10	5.6	12.2	Ф	12.2	В			ICU Level of Service	
-	WBL	je-	9	9		0	0.92	Ξ										207			207	4.1		2.2	66	1364	WB2	254	4	16	1364	0.01	0.2	0.2	4					ਹ	
-	EBR		10	10		0	0.92	£																			WB 1	7	7	0	1364	0.01	0.2	7.7	∢	0.4			1.8	21.0%	15
†	EBT	4	180	180	Free	%0	0.92	196						None													EB 2	211	4	=	1316	0.01	0.2	0.2	∢						
4	EBL	F	10	10		0	0.92	=										250			250	4.1		2.2	66	1316	EB 1	7	7	0	1316	0.01	0.2	7.8	∢	0.5				_	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Total (AM)

Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR SBL SBT SBR SBL SBT SBR SBL SBL SBT SBR SBL SBT SBL		1	1	-	-	ļ	1	•	—	*	۶	→	*
10 10 135 5 75 170 10 5 40 60 5 20 11 10 135 5 75 170 10 5 40 60 5 20 12 0 0 20 0 92 0 92 0 92 0 92 0 92 0 92	Movement	EB	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10 135 5 75 170 10 5 40 60 5 20 10 145 5 75 170 10 5 40 60 5 20 10 15 15 170 10 5 40 60 5 20 11 147 5 82 185 11 5 43 65 5 22 11 147 5 82 185 11 5 43 65 5 22 12 136 152 540 529 147 604 523 136 152 540 529 147 604 523 138 141 142 181 181 141 428 905 337 432 138 140 140 140 140 140 140 139 1700 141 100 142 131 140 150 144 100 145 131 150 150 144 100 145 131 150 150 144 100 145 131 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 101 145 140 150 150 144 150 145 140 150 150 144 150 145 140 150 150 144 150 145 140 150 150 144 150 145 140 150 150 144 150 145 140 150 150 140 140 140 140 150 140	Lane Configurations		÷	R_		t	R_		4			4	
10 135 5 75 170 10 5 40 60 5 20 Free Free Slop	Traffic Volume (veh/h)	9	135	2	75	170	9	2	40	09	2	50	10
Free Free Free Ship	Future Volume (Veh/h)	9	135	2	75	170	10	2	40	09	2	20	9
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Sign Control		Free			Free			Stop			Stop	
None None None None None 116 4.1 4.1 4.2 82 185 11 5 43 65 5 22 None 196 152 540 529 147 604 523 4.1 6.5 6.2 7.1 6.5 6.2 14.1 6.5 6.2 7.1 6.5 6.2 14.1 6.5 6.2 7.1 6.5 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.2 7.	Grade		%0			%0			%0			%0	
None None None None 156 11 5 43 65 5 22 Mone 156 152 540 529 147 604 523 147 614 523 141 614 523 141 614 523 141 614 523 141 615 612 7.1 6.5 62 7.1 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	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
None None None None 152 540 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 615 615 615 615 615 615 615 615 615 615	Hourly flow rate (vph)	£	147	22	85	185	Ξ	2	43	92	22	22	7
None None None None 152 540 529 147 604 523 146 152 540 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 605 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 605 604 604 604 604 604 604 604 604 604 604	Pedestrians												
None None None None None 152 540 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 605 604 605	Lane Width (m)												
None None None None None 152 540 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 605	Walking Speed (m/s)												
None None None None None 152 540 529 147 604 523 146 156 158 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 615 62 7.1 615 7.1 615 62 7.1	Percent Blockage												
None	Right turn flare (veh)												
196 152 540 529 147 604 523 198 152 540 529 147 604 523 4.1 4.1 4.1 6.5 6.2 7.1 6.5 99 99 99 90 93 99 96 138 5 267 11 13 38 118 5 267 11 13 38 118 5 267 11 13 38 119 0 5 0 11 65 11 1389 1700 1441 1700 613 484 0.01 0.02 0.01 14 0.0 54 2.0 0.0 27 0.0 122 13.1 A A A B B B B A A A A A A A A A A A A A A A A A A A	Median type		None			None							
196 152 540 529 147 604 523 147 614 523 147 614 523 147 614 523 147 614 523 147 614 523 147 614 523 147 615 623 147 615 623 147 615 623 147 615 623 147 615 623 147 615 623 147 615 615 147 615 615 147 615 615 147 615 615 147 615 615 147 615 615 147 147 615 147 147 147 147 147 147 147 147 147	Median storage veh)												
196 152 540 529 147 604 523 147 614 523 147 614 523 147 614 523 147 614 523 147 614 614 625 615	Upstream signal (m)												
196 152 540 529 147 604 523 147 604 523 147 604 523 147 604 523 147 604 523 147 604	pX, platoon unblocked												
196 152 540 529 147 604 523 4.1 4.1 4.1 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 7.1 7.1 7.1 7.1 7.1 7.1 7.1 7.1 7.1 7.1	vC, conflicting volume	196			152			240	529	147	604	523	185
196 152 540 529 147 604 523 147 615 623 147 615 623 147 615	vC1, stage 1 conf vol												
196	vC2, stage 2 conf vol												
4.1	vCu, unblocked vol	196			152			240	529	147	604	523	185
2.2 2.2 3.5 4.0 3.3 3.5 4.0 99 99 95 94 94 99 96 93 99 95 94 94 99 96 93 99 95 94 94 99 96 93 99 95 95 94 94 99 96 93 99 95 95 95 95 95 95 95 95 95 95 95 95	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 22 35 40 33 35 40 138 138 141 428 905 337 432 14 158 5 267 11 113 38 11 11 0 82 0 11 4 1 113 38 11 11 0 82 0 11 11 0 82 0 11 11 0 82 0 11 11 0 82 0 11 11 0 82 0 11 11 0 82 0 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18 0 88 11 0 18	tC, 2 stage (s)												
99 94 95 95 95 95 95 95 95 95 95 95 95 95 95	fF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1389	p0 queue free %	8			8			66	90	93	66	92	66
EB1 EB2 WB1 WB2 NB1 SB1 158 5 267 11 113 38 11 0 82 0 5 5 5 0 1 6 11 6 11 1389 1700 1441 1700 613 484 (m) 0.2 0.0 1.4 0.0 54 2.0 0.6 0.0 2.7 0.0 12 13.1 A A A B B B 0.6 2.6 122 13.1 B B B 0.7	cM capacity (veh/h)	1389			1441			411	428	902	337	432	862
158 5 267 11 113 38 0 82 0 5 5 5 0 1 82 0 5 5 5 11 0 82 0 5 5 5 11 10 0 82 0 5 5 11 10 0 82 0 11 1389 1700 1441 1700 613 484 0.01 0.00 0.06 0.01 0.18 0.08 0.6 0.0 2,7 0.0 12 13.1 A A A B B B B 0.6 2.6 122 13.1 B B B 0.7 122 13.1 A A A A A A A A B B 0.8 4.5 122 13.1 14 0.0 54 2.0 15 4.5 12.2 13.1 16 12 13.1 17 13 14.5 18 18 18 18 18 18 19 Utilization 37.4% ICU Level of Service	Direction, Lane #	EB 1	EB2	WB 1	WB2	NB 1	SB 1						
(m) 0.00 0.00 0.01 0.18 0.00 0.00 0.00 0.00	Volume Total	158	2	267	11	113	38						
(m) 0.2 0.0 1.4 1.00 613 484 (m) 0.2 0.0 0.06 0.01 0.00 6.4 2.0 A A A A B B 0.6 2.6 2.6 12.2 13.1 A A A A B B 0.6 2.7 0.0 12.2 13.1 A A A A B B 0.6 4.5 12.0 12.2 13.1 A A A A B B B B ny 4.5 12.2 13.1 A A A A B B B A B B A B B B I CU Level of Service n) 15	Volume Left	=	0	82	0	2	2						
(m) 0.2 0.01 0.06 0.01 0.18 0.08 (m) 0.2 0.0 0.06 0.01 0.18 0.08 0.00 0.06 0.01 0.18 0.08 0.00 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.2 0.0 0.0	Volume Right	0	2	0	7	65	1						
(m) 0.2 0.0 0.06 0.01 0.18 0.08 (m) 0.2 0.0 1.4 0.0 5.4 2.0 (n. 6. 0.0 2.7 0.0 122 13.1 A A B B B B B B B B B B B B B B B B B	cSH	1389	1700	1441	1700	613	484						
(m) 02 00 14 00 54 20 06 0.0 2.7 0.0 122 13.1 A A A B B B 0.6 2.6 12.2 13.1 B B B any Utilization 37.4% ICU Level of Service	Volume to Capacity	0.01	0.00	90.0	0.01	0.18	0.08						
0.6 0.0 2.7 0.0 122 13.1 A A B B B B B B B B B B B B B B B B B B	Queue Length 95th (m)	0.2	0.0	1.4	0.0	5.4	2.0						
A A B B B B C C C C C C C C C C C C C C	Control Delay (s)	9.0	0.0	2.7	0.0	12.2	13.1						
0.6 2.6 12.2 13.1 B B Bny 4.5 ty Utilization 37.4% ICU Level of Service	Lane LOS	∢		∢		ω	В						
B B 1.00	Approach Delay (s)	9.0		5.6		12.2	13.1						
4.5 37.4% IOU Level of Service 15	Approach LOS					В	Ф						
4.5 37.4% ICU Level of Service 15	Intersection Summary												
37.4% ICU Level of Service 15	Average Delay			4.5									
15	Intersection Capacity Utilization	6		37.4%	⊇	U Level o	f Service			⋖			
	Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 5: 3 Line & West Site Access

																																								A	
•	SBR		0	0			0.92	0																																ICU Level of Service	
→	NBT SBT		50 45	50 45	Free Free		0.92 0.92							None None																										ICU Level	
•	R NBL		5 0				2 0.92	5 0										49 49				6.2 4.1				0 1558	1 SB1	54 49	0 0			٥	0.0 0			0.0 0.0			0.8	13.3%	15
1	EBL EBR	>	22	2	Stop		0.92 0.92	2										103 4				6.4 6.				895 1020	EB 1 NB 1		2		953 1558		0.3 0.0			8.8	V			uc	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2027 Future Total (AM)

	1	†	1	-	Ļ	1	1	—	4	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	W_		÷			÷			÷	
Traffic Volume (veh/h)	0	165	32	9	200	0	40	0	15	0	0	0
Future Volume (Veh/h)	0	165	32	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	88	#	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)												
fF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			66			92	100	86	100	100	100
cM capacity (veh/h)	1353			1353			245	522	864	519	496	823
Direction, Lane #	EB 1	EB2	WB1	NB 1	SB 1							
Volume Total	179	38	228	29	0							
Volume Left	0	0	=	43	0							
Volume Right	0	88	0	16	0							
SH	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	5.6	0.0							
Control Delay (s)	0.0	0.0	0.4	11.6	0.0							
Lane LOS			∢	ш	⋖							
Approach Delay (s)	0.0		0.4	11.6	0.0							
Approach LOS				മ	⋖							

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ICU Level of Service

1.6 28.7% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Total (PM)

Future Volume (Vehrly)	2 6	a	225	k t	Ť.	4	105	40	♣ ∺	NOS OC
		8 8	235 235 Free	5 5	र्घ र	45 Stop	50 20	2 2 2 2	25 25 Stop	2 8
	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
	£	87	255	9	91	49	114	£	27	22
None			None							
271		277			774	755	266	878	750	255
27.1		277			774	755	266	878	750	255
4.1		4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2		2.2			3.5	4.0	3.3	3.5	4.0	3.3
86		83			8	8	82	짫	91	97
1292		1286			268	310	773	189	312	784
EB 1 EB 2	WB 1	WB2	NB 1	SB 1						
	342	16	179	09						
22 0	87	0	16	=						
	0	16	114	22						
	1286	1700	490	347						
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						
	2.5	0.0	16.5	17.5						
A	⋖		ပ	ပ						
0.7	2.4		16.5	17.5						
			O	O						
	5.7									
average Deray	51 0%		٥	CLLI evel of Service			٥			
	0.0	2	בממם	200			c			

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HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

2027 Future Total (AM)

Movement EBL NBT NBT SBR NBT SBR		1	1	•	←	→	*	
And the (vehly) 5 0 0 45 45 5 5 5 6 10 0 45 45 5 5 5 6 10 0 45 45 5 5 5 6 10 0 45 45 5 5 5 6 10 0 45 45 5 5 5 6 10 0 45 45 5 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 49 49 5 5 6 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Movement	EB	EBR	NBL	NBT	SBT	SBR	
Volume (vehln) 5 0 45 45 5 Volume (vehln) 5 0 0 45 45 5 Andread (vehln) 5 0 0 45 45 5 Own rate (vph) 5 0 0 49 49 5 Inverse (vph) 5 0 0 49 49 5 Steped (m/s) 5 0 0 49 49 5 Steped (m/s) 6 0 49 49 5 6 Steped (m/s) 6 0 49 49 5 6 Steped (m/s) 6 4 100 6 4 6 6 Steped (m/s) 6 4 2 4 4 6 6 4 6 6 6 4 6 6 6 4 6 6 6 6 6 6 6 6 6 6 6 <td>Lane Configurations</td> <td>></td> <td></td> <td></td> <td>¢¥</td> <td>2</td> <td></td> <td></td>	Lane Configurations	>			¢¥	2		
Olume (Vehn) 5 0 0 45 45 5	Traffic Volume (veh/h)	2	0	0	45	45	2	
nitrol Stop Free Free our Factor 0% 0% 0% ow rate (vph) 5 0 49 49 5 iains 0 49 49 5 0 iains (veh) 8 49 5 0 0 49 5 0 m Speed (m/s) 8 8 8 8 8 8 6 6 49 49 5 6 6 49 6 6 49 6 6 6 49 6 6 6 6 6 49 6 4 6 6 4 6 6 4 6 6 4 6 6 6 6 4 6	Future Volume (Veh/h)	2	0	0	45	42	2	
our Factor 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Sign Control	Stop			Free	Free		
Hour Fedor (ng) 5 0.92 0.92 0.92 0.92 0.92 (ng) 6.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0	Grade	%0			%0	%0		
How rate (riph) 5 0 0 49 49 5	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
width (m) Width (m) width (m) Width (m) width (m) None None art Blockage None None and storage veh) SE 54 and storage veh) SE 54 attorn unblocked 100 52 54 milled you've 100 52 54 milled you've 64 62 4.1 stage Loon'r vol 35 33 22 are free (s) 64 62 4.1 64 stage Conf vol 64 62 4.1 64 stage Conf vol 64 62 4.1 62 stage	Hourly flow rate (vph)	2	0	0	49	49	2	
Width (m) Width (m) ing Speed (mis) None None hum flare (reh) 100 52 54 annicity oulme 100 52 54 hum flare (sonf vol 100 52 54 hum flare (sonf vol 6.4 6.2 4.1 stage 2 conf vol 100 52 54 habital (sol) 6.4 6.2 4.1 stage 2 conf vol 6.4 6.2 4.1 stage 3 conf vol 6.4 6.2 4.1 stage 5 conf vol 100 100 5.4 stage 6 conf vol 5.0 0 0 stage 1 conf vol 0.0 0.0	Pedestrians							
in Bookage In Bookage in the (vek) None None in type None None ean signal (m) 52 54 stage to onf vol 52 54 stage 2 conf vol 100 52 54 stage 2 conf vol 100 52 54 inpacity (velrh) 64 62 4.1 stage 2 conf vol 100 52 54 inpacity (velrh) 89 100 100 pacity (velrh) 898 100 100 pacity (velrh) 898 1551 1700 in Lane # EB 1 NB 1 SB 1 in Lane # EB 1 NB 1 SB 1 in Capacity (velrh) 898 1551 1700 in E Left 5 0 0 0 in Capacity (velrh) 99 0.0 0.0 0 ce Right 5 4 54 54 ce Left 5 0	Lane Width (m)							
nt Blockage tun flare (veh) nu flare (veh) ann storage veh) sam signal (m) ann si	Walking Speed (m/s)							
burn flare (veh) None None n type None None n type None None n to strage veh) Sen 54 Sen 54 amblocked 100 52 54 amblocked vol 100 52 54 instocked vol 100 52 54 instocked vol 100 52 54 instocked vol 100 52 54 stage (s) 64 62 4.1 66 stage (s) 64 62 4.1	Percent Blockage							
n styce with a sear size of the style of the	Right turn flare (veh)							
ana signal (m) ana sin signal (m) ana signal (m) a	Median type				None	None		
sem signal (m) stage I conf vol stage I con stage I conf vol stage I conf vol stage I conf vol stage I conf	Median storage veh)							
attorn unblocked milliciting volume 100 52 54 milliciting conf vol 64 62 4.1 stage (\$)	Upstream signal (m)							
rigiding volume 100 52 54 rigge 1 conf vol rigge (s) 5 54 rigge 2 conf vol riblocked vol 0 52 54 rigge (s) 6 4 6 2 4.1 rigge 2 conf vol rigge (s) 6 4 6 2 4.1 rigge 2 conf vol rigge (s) 6 6 6 2 4.1 rigge (s) 3.5 3.3 2.2 rigge (s) 6 6 7 6 6 rigge (s) 6 7 6 6 rigge (s) 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	pX, platoon unblocked							
tage 1 conf vol tage 2 conf vol tage 2 conf vol tage 5 54 tage 6 6 6 2 4.1 tage 6 9 6.4 6 2 4.1 tage (s) 3.5 3.3 2.2 sue free % 99 100 100 pacify (velvfn) 898 1016 1551 to Lane # EB 1 NB 1 SB 1 te Left 5 0 0 0 te Right 0 0.1 0.0 0.0 te Right 0 0.1 0.0 0.0 te Left 0 0 0 0.0 ach Loelay (s) 9.0 0.0 0.0 ach Loelay (s) 9.0 0.0 0.0 ach Los A A O 0.0 0.0 ach Los A O 0.	vC, conflicting volume	100	25	72				
lago 2 conf vol motoked vol 100 52 54 11 11 11 11 11 11 11 11 11 11 11 11 11	vC1, stage 1 conf vol							
rade (s) 6.4 6.2 4.1 stage (s) 6.4 6.2 4.1 stage (s) 8.4 6.2 4.1 stage (s) 8.4 6.2 4.1 stage (s) 9.4 6.2 4.1 stage (s) 3.5 3.3 2.2 stage (s) 100 100 stage (s) 49 5.4 stage (s) 6.0 0.0 stage (s) 9.0 0.0 stage (s)	vC2, stage 2 conf vol							
gge (s) 6.4 6.2 4.1 stage (s) 3.5 3.3 2.2 aue free % 99 100 100 pacity (veh/h) 898 1016 1551 for Lane # EB 1 NB 1 SB 1 et caft 5 0 0 5 et caft 6 1551 for Lane # EB 1 NB 1 SB 1 et caft 6 0 0 5 et caft 700 et caft 6 1551 for 100 0.00 0.00 stage 1 caft 700 0.00 0.00 0.00 0.00 0.00 0.00 0.00	vCu, unblocked vol	100	25	Ŗ				
stage (s) 3.5 3.3 2.2 sue free % 99 100 100 pacity (velvin) 898 1016 1551 pacity (velvin) 898 1016 1551 in Chall 5 49 54 in Earth 5 0 0 in Earth 5 0 0 in Earth 6 0 0 in Earth 898 1551 1700 in Earth 0 0 0 in Earth 0 <td>tC, single (s)</td> <td>6.4</td> <td>6.2</td> <td>4.1</td> <td></td> <td></td> <td></td> <td></td>	tC, single (s)	6.4	6.2	4.1				
3.5 3.3 2.2 pacify (vehfn) 99 100 100 pacify (vehfn) 89 1016 1551 ne Left 5 49 54 ie Left 5 0 0 ie Right 6 5 0 ie Right 60 0 5 ie Right 89 1551 1700 ie Right 0 0 0 ie Right 0 0 0 ie Length Sght (m) 0.1 0.0 0.0 Jack (mill) 0 0 0 A ach Loslay (s) 9 0 0 0 ach Los A ach Loslay (s) A ach Loslay (s) 0 0 ach Los A ach Loslay (s) A ach Loslay (s) 0 0 ach Los A ach Loslay (s) 0 0 0 ach Los A ach Loslay (s) 0 0 0 ach Los A ach Loslay (s) 0	tC, 2 stage (s)							
99 100 100 898 1016 1551 EB1 NB1 SB1 5 0 0 0 0 5 898 1551 1700 0.01 0.00 0.03 (m) 0.1 0.0 0.00 A 0.0 0.0 A 0.0 0.0 A 0.0 0.0 A 0.0 0.0 A 133% ICU Level of Service 15 3% 15 100	F(s)	3.5	3.3	2.2				
EB 1 NB 1 SB 1 EB 1 NB 1 SB 1 5 49 54 5 0 0 0 6 0 5 898 1551 1705 0.01 0.00 0.03 (m) 9.0 0.0 0.0 A 9.0 0.0 0.0 A 9.0 0.0 0.0 A 9.0 0.0 0.0 A 9.0 0.0 0.0 13.3% ICU Level of Service 15 1 10 1 13.3% ICU Level of Service 15 1 10 1 10 1 10 10 10 10 10 10 10 10 10	p0 queue free %	66	100	100				
EB1 NB1 SB1 5 49 54 6 0 0 0 0 5 898 1551 1700 ith (m) 0.11 0.0 0.0 (s) 9.0 0.0 0.0 A (s) 9.0 0.0 0.0 A mary city Utilization 13.3% ICU Level of Service min) 15	cM capacity (veh/h)	888	1016	1551				
5 49 54 0 0 0 0 0 5 0 0 5 0 0 5 0 0 0 6 ity 0.01 0.00 0.03 ith (m) 0.1 0.0 0.0 (s) 9.0 0.0 0.0 A A mary city Utilization 13.3% ICU Level of Service min) 15	Direction, Lane #	EB 1	NB 1	SB 1				
ity 0.01 0.0 5 898 1561 1700 ith (m) 0.01 0.00 0.03 ith (m) 0.1 0.0 0.0 (s) 9.0 0.0 0.0 A A A A A A A A A A A A A A A A A A A	Volume Total	2	49	25				
10 0 5 5 6 9 1561 7700 10 0 10 0 10 0 10 0 10 0 10 0 10	Volume Left	5	0	0				
ity 0.01 0.00 0.03 Ith (m) 0.1 0.0 0.03 Ith (m) 9.0 0.0 0.0 Is) 9.0 0.0 0.0	Volume Right	0	0	2				
ity 0.01 0.00 0.03 iff (m) 0.1 0.0 0.0 A A (s) 9.0 0.0 0.0 A A many Ody Utilization 13.3% ICU Level of Service min) 15	SH	868	1551	1700				
ith (m) 0.1 0.0 0.0 9.0 0.0 0.0 (s) A A O.0 0.0 A mary 0.4 Illization 13.3% ICU Level of Service	Volume to Capacity	0.01	0.00	0.03				
9.0 0.0 0.0 A 0.0 Mary 0.4 ICU Level of Service min)	Queue Length 95th (m)	0.1	0.0	0.0				
9.0 0.0 0.0 A 0.4 13.3% ICU Level of Service 15	Control Delay (s)	0.6	0.0	0.0				
9.0 0.0 0.0 A 0.4 13.3% ICU Level of Service 15	Lane LOS	∢						
0.4 ICU Level of Service 15	Approach Delay (s)	0.6	0.0	0.0				
0.4 13.3% ICU Level of Service 15	Approach LOS	∢						
0.4 13.3% ICU Level of Service 15	Intersection Summary							
13.3% ICU Level of Service 15	Average Delay			0.4				
15	Intersection Capacity Utilizati	ioi		13.3%	2	U Level o	fService	∢
	Analysis Period (min)			15				

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2027 Future Total (PM) HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

> → / < ←	NBT NBR SBL SBT SBR	4	0 15 0 0 5	15 0	0,	%0	0.92 0.92 0.92 0.92 0.92											650 304 666 693 304			304 666	7.1 6.5		3.3 3.5 4.0	100 98 100 100 99	736 360 360													
•	NBL		45		0,			49										655			655	7.1	ı	ა ი. ნ	/8/	372													
1	WBR		0	0				0																															
Ļ	WBT	4	280	280	Free	%0	0.92	304						None													SB 1	2	0	2	736	0.01	0.2	6.6	⋖	6.6	V		
-	WBL		15	15			0.92	16										347			347	4.1	d	7.7	55	1212	NB 1	92	49	16	423	0.15	4.3	15.0	ပ	15.0	O		
~	EBR	R_	9	40			0.92	43																			WB 1	320	16	0	1212	0.01	0.3	0.5	⋖	0.5			
†	EBT	4	280	280	Free	%0	0.92	304						None													EB 2	43	0	43	1700	0.03	0.0	0.0					
4	EBL		2	2			0.92	2										304			304	4.1	0	7.7	100	1257	EB 1	309	2	0	1257	0.00	0.1	0.2	∢	0.1			
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	C, single (s)	IC, 2 stage (s)	r (s)	on dueue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	

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2027 Future Total (PM) HCM Unsignalized Intersection Capacity Analysis 3: North Site Access/Golf Course Access & Wellington Road 19

Feb. EBT EBR WBL WBT WBR NBL NBT NBR SBT	Movement Lane Configurations Traffic Volume (veh/h) Future (veh/h)	ě											
March Marc	Lane Configurations Traffic Volume (veh/h) Future Volume (Veh/h)	H	EBT	EB	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
15 305 40 20 295 15 20 0 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Volume (veh/h) Future Volume (Veh/h)	*	4		K	4			4			4	
15 305 40 20 295 15 20 0 10 10 0 0 0 0 0 0	Future Volume (Veh/h)	15	305	4	20	295	15	20	0	10	10	0	15
None Free Free Stop O% O% O% O% O% O% O% O	Sign Control	15	305	4	20	295	15	20	0	10	10	0	15
None			Free			Free			Stop			Stop	
h) 16 332 43 22 321 16 22 0 11 11 0 0 1 1	Grade		%0			%0			%0			%0	
b) None None None 337 None 338 None 4.1 338 341 352 352 356 366 367 376 376 376 376 376	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
None	Hourly flow rate (vph)	16	332	43	22	321	16	22	0	7	11	0	16
None	Pedestrians												
None None None None None None 337 375 766 766 354 748 780	Lane Width (m)												
None	Walking Speed (m/s)												
None	Percent Blockage												
None None None None None None None None	Right turn flare (veh)												
337 375 766 766 354 748 780 337 375 766 766 354 748 780 337 375 766 766 354 748 780 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 99	Median type		None			None							
1 22 22 22 35 478 780 31 22 22 22 35 478 780 31 22 22 32 40 32 32 40 32 32 40 32 32 40 32 32 40 32 32 40 32 32 40 32 32 32 32 32 32 33 33 40 33 32 40 33 4	Median storage veh)												
ed a 337 375 766 766 354 748 780 a 10 a	Upstream signal (m)												
National Property Nati	pX, platoon unblocked												
337 375 766 766 354 748 780 341 7.1 6.5 6.2 7.1 6.5 7.1 6.5 7.1	vC, conflicting volume	337			375			99/	99/	354	748	780	329
337 375 766 766 354 748 780 744 741	vC1, stage 1 conf vol												
337 375 766 766 354 748 780 4.1 4.1 7.1 6.5 6.2 7.1 6.5 2.2 2.2 3.5 4.0 33 3.5 4.0 2.2 1183 89 99 100 98 97 100 2.2 183 183 374 471 0 43 0.1 0.02 0.02 0.09 0.06 0.01 0.01 0.02 0.02 0.09 0.06 0.01 0.01 0.02 0.02 0.00 0.06 0.01 0.01 0.02 0.02 0.00 0.06 0.01 0.02 8.1 0.4 15.5 13.1 A A A A C B A A A A C B A A C B A A A C B A A C B A A A C B A A C B A A A C B A A C B A A C B A A C B A A C B A A C B A A C B A A C B A A A C B A A C B A A C B A A C B A A C B A A C B A A C B A A C B A A C C B A C C B A C C C B A C C C C B A C C C C C C C C C C C C C C C C C C C	vC2, stage 2 conf vol												
2.2 2.2 3.5 4.0 3.3 3.5 4.0 99 99 98 97 100 98	vCu, unblocked vol	337			375			99/	99/	354	748	780	329
2.2 2.2 3.5 4.0 3.3 3.5 4.0 1/22 1183 1183 3.7 471 1183 1183 1183 1183 1183 1183 1183 11	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 22 35 4.0 33 35 4.0 122 122 35 4.0 34 35 4.0 122 122 183 100 98 97 100 98	tC, 2 stage (s)												
99 98 97 100 1222	作(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1222 1183 305 322 690 316 31	p0 queue free %	66			86			93	100	86	97	100	86
EB1 EB2 WB1 WB2 NB1 SB1 11 380 15 344 33 27 11 5 15 7 22 11 0 43 0 16 12 11 16 1222 1222 1183 1183 374 471 001 001 002 002 009 0.06 m) 0.3 0.3 0.5 0.5 0.5 1.5 8.0 0.2 8.1 0.4 15.5 13.1 A A A A A C B V A A A C B Utilization 16.5 (CU Level of Service)	cM capacity (veh/h)	1222			1183			305	322	069	316	316	712
11 380 15 344 33 27 11 5 15 7 22 11 0 4 3 0 16 11 16 1222 1222 1183 1183 374 471 001 001 002 002 009 006 10) 0.3 0.3 0.5 0.5 0.5 2.3 1.5 0.5 A A A A C B 0.5 0.7 155 13.1 0.5 0.7 155 13.1 0.5 16 0.7 155 13.1 0.5 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 0.9 0.7 156 0.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Direction, Lane #	EB 1	EB2	WB1	WB2	NB 1	SB 1						
11 5 15 2 11 0 43 0 16 11 16 1222 1222 183 1183 374 471 0.01 0.02 0.02 0.09 0.06 10) 0.3 0.3 0.5 0.5 2.3 1.5 8.0 0.2 8.1 0.4 15.5 13.1 A A A A C B A A A C B V 16 B Utilization 26.5% ICU Level of Service	Volume Total	11	380	15	344	33	27						
122 122 148 1183 374 471 0.01 0.02 0.02 0.06 0.03 0.3 0.5 0.5 2.3 1.5 8.0 0.2 8.1 0.4 15.5 13.1 8.0 0.2 8.1 0.4 15.5 13.1 8.0 0.2 8.1 0.4 15.5 13.1 8.0 0.2 8.1 0.4 15.5 13.1 9.5 0.7 15.5 13.1 Utilization 26.5% ICU Level of Service	Volume Left	7	2	15	7	22	7						
1222 1222 1183 1183 374 471 0.001 0.01 0.02 0.02 0.09 0.06 0.002 8.1 0.4 15.5 13.1 A A A A C B 0.5 0.7 15.5 13.1 C B V Utilization 2.6.5% ICU Level of Service	Volume Right	0	43	0	16	=	16						
m) 0.01 0.01 0.02 0.02 0.09 0.06 m) 0.3 0.3 0.5 0.5 2.3 1.5 A A A A C B 0.5 0.7 155 13.1 C B V Utilization 26.5% ICU Level of Service	SH	1222	1222	1183	1183	374	471						
m) 0.3 0.3 0.5 0.5 2.3 1.5 8.0 0.2 8.1 0.4 15.5 13.1 A A A A A 15.5 13.1 C B V 1.6 Utilization 2.6.5% ICU Level of Service	Volume to Capacity	0.01	0.01	0.02	0.02	0.09	90.0						
8.0 0.2 8.1 0.4 15.5 13.1 A A A A C B C B C B V Utilization 2.6.5% ICU Level of Service	Queue Length 95th (m)	0.3	0.3	0.5	0.5	2.3	1.5						
A A A A C B 0.5 0.7 15.5 13.1 C B V Utilization 26.5% ICU Level of Service	Control Delay (s)	8.0	0.2	8.1	0.4	15.5	13.1						
U.5 U.7 15.5 13.1 V 1.6 1.6 ICU Level of Service	Lane LOS	∢ ,	∢	۷ !	∢	O	m :						
C B 1.6 Utilization 26.5% ICU Level of Service	Approach Delay (s)	0.5		0.7		15.5	13.1						
y 1.6 Utilization 26.5% ICU Level of Service	Approach LOS					O	മ						
1.6 Utilization 26.5% ICU Level of Service	Intersection Summary												
Utilization 26.5% ICU Level of Service	Average Delay			1.6	3								
	Intersection Capacity Utilizati	uoi		26.5%	٥	U Level c	of Service			∢			

HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

2027 Future Total (PM)

	1	>	•	—	→	*
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	>			4	£	
Traffic Volume (veh/h)	2	0	2	20	42	ಬ
Future Volume (Veh/h)	2	0	2	20	42	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)	2	0	2	72	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	25	\$			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	25	\$			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	100	100			
cM capacity (veh/h)	878	1016	1551			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2	29	72			
Volume Left	2	2	0			
Volume Right	0	0	2			
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	9.0	0:0			
Lane LOS	∢	∢				
Approach Delay (s)	9.1	9.0	0:0			
Approach LOS	∢					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			16.8%	<u></u>	ICU Level of Service	Service
Analysis Period (min)			15			

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HCM Unsignalized Intersection Capacity Analysis 5: 3 Line & West Site Access

2027 Future Total (PM)

Movement EB EBR NB NBT SBR SBR Lane Configurations Y		1	1	•	←	→	`	
Sonifigurations ₩ A № Volume (veh(h)) 5 0 55 50 5 Volume (veh(h)) 5 0 0 55 50 5 Control 0%	Movement	EBF	EBR	NBL	NBT	SBT	SBR	
Volume (veh/h) 5 0 0 55 50 5 5 5 5 5 5 5 5 5 5 5 5 5	Lane Configurations	>			4	2,		
Noturne (Vehrh) 5 0 0 55 50 5 5 5 5 5 5 5 5 5 5 5 5 5	Traffic Volume (veh/h)	2	0	0	22	20	2	
Shop Free Free Free Free Free Free Free Fr	Future Volume (Veh/h)	2	0	0	22	20	5	
10% 0% 0% 0% 0% 0% 0% 0%	Sign Control	Stop			Free	Free		
How Teachor (1992 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0	Grade	%0			%0	%0		
Hour rate (rph) 5 0 0 65 4 5 Hour rate (rph) 5 0 0 65 4 5 Hour rate (rph) 5 0 0 65 4 5 Hour rate (rph) H	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
ritrians (with) Vidth (mi) Vidth (mi) It Blockage It blockage It blockage veh) Is san signal (m) Is san signal (m) Is san out blocked It san out blocked It san out locked It	Hourly flow rate (vph)	2	0	0	09	72	2	
Width (m) ig Seed (mis) None None In Straeg veh) None None In straeg veh) None None atom unblocked 116 \$6 \$9 inflicing volume 116 \$6 \$9 ingle (s) 6.4 6.2 4.1 itage 2 cont vol 116 \$6 \$9 inhocked vol 116 \$6 \$9 gle (s) 6.4 6.2 4.1 itage 2 cont vol 116 \$6 \$9 inhocked vol 116 \$6 \$9 gle (s) 6.4 6.2 4.1 itage 2 cont vol 116 \$6 4.1 itage 5 0 100 100 inch 6(s) 3.5 3.3 2.2 itage (s) 6.0 5 6 inch 1 5 0 0 inch 6(s) 3.1 0.0 0.0 or 1 0.0 0.0	Pedestrians							
in Speed (m/s) in Bockage in Bockage in type near signal (m) netrege (s) sige (s) 6.4 sige (s) <td>Lane Width (m)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Lane Width (m)							
nt Blockage un flare (veh) san signal (m) san signa	Walking Speed (m/s)							
burn flare (veh) None None n type None None n type None None sem signal (m) sem signal (m) None sem signal (m) 116 56 59 afficing volume 116 56 59 afficing volume 116 56 59 niblocked vol 116 56 59 ingle (s) 6.4 6.2 4.1 ingle (s) 6.4 6.2 4.1 ingle (s) 6.4 6.2 4.1 ingle (s) 3.5 3.3 2.2 step (s) 6.4 6.2 4.1 pacity (verkr) 88 100 100 pacity (verkr) 88 1545 7700 e Left 5 0 0 5 e Left 5 0 0 0 e Right 88 1545 7700 ach Capacity (m) 0 0 0	Percent Blockage							
n type n stategaveh) n stategaveh) attent unblocked inflicting volume inflicting inflicti	Right turn flare (veh)							
In storage veh) sam signal (m) sam s	Median type				None	None		
sem signal (m) store signal (m) store signal (m) store of control or control stage 1 control stage 2 control stage 2 control stage 2 control stage 3 control stage 6) substitute 4 6 2 4.1 stage 6) substitute 5 3 3 2.2 substitute 6 4 6 2 4.1 stage 6) substitute 6 6 7 6 2 4.1 stage 6) substitute 7 80 100 100 substitute 8 80 1010 1545 substitute 8 80 1010 1545 substitute 8 80 1545 1700 substitute 9 1 0 0 0 0 0 substitute 9 1 0 0 0 0 0 substitute 9 1 0 0 0 0 0 0 substitute 9 1 0 0 0 0 0 0 0 0 substitute 9 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Median storage veh)							
and the control of the second	Upstream signal (m)							
Inflicting volume 116 56 59 Ingel Confucing volume 116 56 59 Ingel Confucing 116 116 116 116 116 116 116 116 116 11	pX, platoon unblocked							
lage 1 conf vol lage 1 conf vol lage 1 conf vol lage 2 conf vol lage 2 conf vol lage 2 conf vol lage 3 conf vol lage 4 conf vol lage 5 conf vol lage 6 conf vo	vC, conflicting volume	116	20	29				
tage 2 conf vol mitocked vol 116 56 59 69 69 69 69 69 69 69 60 59 64 11 66 62 4.1 fage (s) 6.4 6.2 4.1 fage (s) 6.4 6.2 4.1 fage (s) 3.5 3.3 2.2 fage (s) 99 100 100 100 fage (s) 99 100 100 1545 fage (s) 99 100 100 1545 fage (s) 90 0 5 60 59 60 60 60 60 60 60 60 60 60 60 60 60 60	vC1, stage 1 conf vol							
gle (s) 6.4 6.2 4.1 gle (s) 6.4 6.2 4.1 stage (s) 3.3 2.2 sue free % 99 100 100 pacity (velvh) 880 1010 1545 fort, Lane # EB 1 NB 1 SB 1 e Left 5 0 0 e Right 80 154 1700 e Right 80 154 1700 e Lord belay (s) 9.1 0.0 0.0 ach Delay (s) 9.1 0.0 0.0 ach Delay (s) A section Summary ga Delay section Summary 13.3% ICU Level of Service	vC2, stage 2 conf vol							
gge (s) 6.4 6.2 4.1 https://dx.com/dx	vCu, unblocked vol	116	26	29				
tage (s) 3.5 3.2 3.8 99 100 100 pacity (veh/h) 890 1010 1545 pacity (veh/h) 890 1010 1545 pacity (veh/h) 890 1010 1545 pacity (seh/h) 890 1545 pacity (s) 91 100 000 ach LOS (s) 91 100 100 100 ach LOS (s) 91 100 100 100 100 100 100 100 100 100	tC, single (s)	6.4	6.2	4.1				
3.5 3.3 2.2 pacity (vehrh) 89 100 100 pacity (vehrh) 80 101 1545 pacity (vehrh) 80 101 1545 pacity (sehrh) 80 101 1545 pacity (sehrh) 80 100 30 e Total 5 60 39 e Left 5 0 0 e Right 80 1545 1700 e Right 80 1545 1700 o Capacity 0.01 0.00 3 a Local Left 5 0 0 0 a Local Left 80 1545 1700 0 a Local Left 80 1545 1700 0 a Capacity (s) 9.1 0.0 0 0 a chick 3 1 0 0 a chick 3 1 0 0 a chick 3 1 0 0 </td <td>tC, 2 stage (s)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	tC, 2 stage (s)							
99 100 100 880 1010 1545 EB1 NB1 SB1 5 0 0 0 0 0 5 9 880 1545 10 0 0 0 5 890 1545 10 0 0 0 5 10 0 0 0 0 5 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	作(s)	3.5	3.3	2.2				
EB 1 NB 1 SB 1 EB 1 NB 1 SB 1 5 60 59 6 0 0 6 0 0 6 0 0 6 0 1545 7 0 0 0 9.1 0.0 0.0 1.1 0.0 0.0 1.2 0.0 1.3 0.4 1.3 % ICU Level of Service 1.3 % ICU Level of Service	p0 queue free %	8	100	100				
# EB1 NB1 SB1 5 60 59 5 0 0 6 0 0 7 0 0 0 880 1545 1700 city 0.01 0.00 0.03 85th (m) 0.1 0.0 0.0 7 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A 7 A	cM capacity (veh/h)	880	1010	1545				
5 60 59 5 0 0 0 0 0 0 0 5 880 1545 1700 sight (m) 0.01 0.00 0.03 880 1500 0.03 880 1545 1700 880 1545 1700 880 1545 1700 890 100 0.00 891 0.0 0.0 A A A A A A A A A A A A A A A A A A	Direction, Lane #	EB 1	NB 1	SB 1				
city 0.01 0.00 5 880 1545 1700 sith (m) 0.11 0.00 0.03 55th (m) 0.1 0.0 0.0 75th (m) 0.1 0.0 0.0 80 9.1 0.0 0.0 0.0 80 9.1 0.0 0.0 0.0 80 9.1 0.0 0.0 0.0 0.0 80 9.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Volume Total	2	09	29				
city 880 1545 1700 city 0.01 0.00 0.03 55th (m) 0.1 0.0 0.03 7 A 0.0 0.0 A mmary 0.4 13.3% ICU Level of Service (min) 153 15 150	Volume Left	2	0	0				
bicity 0.01 0.00 0.03 0.03 0.01 0.00 0.03 0.03	Volume Right	0	0	2				
city 0.01 0.00 0.03 55h (m) 0.1 0.0 0.0 75 A A O 0.0 75 A A O 0.0 76 A A O 0.0 77 A A O 0.0 78 A O 0.0 79 A O 0.0 70 A O 0.0 70 A O 0.0 71 CU Level of Service (min) 15.3%	SH	880	1545	1700				
55th (m) 0.1 0.0 0.0 5)	Volume to Capacity	0.01	0.00	0.03				
(s) 9.1 0.0 0.0 (s) A 0.0 A mmary 0.4 (min) 13.3% ICU Level of Service (min) 15	Queue Length 95th (m)	0.1	0.0	0.0				
(s) 9.1 0.0 0.0 A mmary 0.4 (min) 13.3% ICU Level of Service	Control Delay (s)	9.1	0.0	0.0				
(s) 9.1 0.0 0.0 A mmary 0.4 (min) 13.3% ICU Level of Service (min) 15	Lane LOS	∢						
A 0.4 0.4 13.3% (CU Level of Service (min) 15.3% (CU)	Approach Delay (s)	9.1	0.0	0.0				
nmary 0.4 0.4 ICU Level of Service (min) 15 15 15	Approach LOS	V						
0.4 0.0 Level of Service 15.3% ICU Level of Service 15.0 15.0 (min)	Intersection Summary							
aacity Utilization 13.3% ICU Level of Service (min) 15	Average Delay			0.4				
15	Intersection Capacity Utilizati	ioi		13.3%	2	U Level o	Service	∢
	Analysis Period (min)			15				

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HCM Unsignalized Intersection Capacity Analysis 2027 Future Total (SAT) 3: North Site Access/Golf Course Access & Wellington Road 19

	→ ⊞	† a	₩	₩BL	₩BT	₩	√ NBL	◆ NBT	♦ NBR	≯ ∃	SBT	SBR
je-		4		K	4			4			4	
12		375	35	15	325	10	25	0	15	15	0	15
र्ट		375 Free	33	5	325 Free	9	22	O Stop	5	5	Stop	12
		%0			%0			%0			%0	
0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
16		408	88	16	353	7	27	0	16	16	0	16
Ż	Ž	None			None							
364				446			860	822	427	846	898	358
100				746			050	0.00	407	210	000	010
504				440			000	000	174	040	000	200
4.				4.			-	0.0	7.0	-	0.0	7.0
2.2				2.2			3.5	4.0	3.3	3,5	4.0	3.3
66				66			6	100	26	ᆶ	100	86
1195				1114			264	287	628	269	282	989
EB 1 E	ш	EB 2	WB 1	WB2	NB 1	SB 1						
11		451	1	369	43	32						
=		2	7	2	27	16						
		æ	0	=	16	16						
	`	1195	1114	1114	337	386						
		0.01	0.01	0.01	0.13	0.08						
0.3		0.3	0.3	0.3	3.5	2.2						
8.1		0.2	8.3	0.3	17.3	15.2						
∢		∢	∢	∢	O	O						
0.4			0.5		17.3	15.2						
					O	ပ						
			18									
ntersection Capacity Utilization			27.1%	ੂ	U Level o	ICU Level of Service			∢			
			15									

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2027 Future Total (SAT)

	1	Ť	1	-	Ļ	4	1	—	•	۶	→	*
Movement	EB	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		₹	R.		4	R.		4			4	
Traffic Volume (veh/h)	10	300	9	82	265	15	10	30	110	15	25	10
Future Volume (Veh/h)	10	300	10	82	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)	7	326	#	35	288	16	#	33	120	16	27	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right tum flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304			337			844	836	326	926	831	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			337			844	836	326	926	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 %	66			92			92	88	83	91	8	66
cM capacity (veh/h)	1257			1222			242	278	715	168	280	751
Direction, Lane #	EB 1	EB2	WB1	WB2	NB 1	SB 1						
Volume Total	337	11	380	16	164	54						
Volume Left	7	0	92	0	7	16						
Volume Right	0	7	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	∢		∢		ပ	ပ						
Approach Delay (s)	0.3		2.4		15.9	22.3						
Approach LOS					O	O						
Intersection Summary												
Average Delay			5.1	-								
Intersection Capacity Utilization	E		54.3%	<u></u>	ICU Level of Service	Service			∢			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 5: 3 Line & West Site Access

																																								A	
*	SBR		2	co			0.92	2																																ICU Level of Service	
→	SBT	2	22	22										None																										CU Level	
—	NBT	4	45	45	Free	%0	0.92	49						None																										_	
1	NBL		0	0			0.92	0										92			92	4.1	00	7.7	100	133	SB 1	92	0	2	1700	0.0	0.0	0:0		0.0			0.4	13.3%	15
1	EBR		0	0			0.92	0										62			62	6.2	2 2	5.5	3 5	7001	NB 1	49	0	0	1537	0.00	0.0	0.0		0.0					
1	EBL	>	2	2	Stop	%0	0.92	2										112			112	6.4	2	2. 6	50 00	000	EB 1	2	2	0	882	0.01	0.1	9.1	∢	9.1	∢			nc	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	(C, 2 staye (s)	(8)	pu queue rree %	civi capacity (ven/n)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2027 Future Total (SAT)

	1	†	-	-	Ļ	4	•	←	•	۶	-	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	R_		4			4			4	
Traffic Volume (veh/h)	2	365	32	52	320	0	25	0	25	0	0	5
Future Volume (Veh/h)	2	365	32	52	320	0	22	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)	2	397	æ	27	348	0	27	0	27	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	348			435			814	808	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)												
fF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
% do	100			88			91	100	96	100	100	66
cM capacity (veh/h)	1211			1125			788	306	652	269	290	695
Direction, Lane #	EB 1	EB2	WB1	NB 1	SB 1							
Volume Total	402	88	375	25	2							
Volume Left	2	0	27	27	0							
Volume Right	0	88	0	27	2							
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	9.0	3.7	0.2							
Control Delay (s)	0.1	0.0	0.8	15.4	10.2							
Lane LOS	∢		⋖	O	ω							
Approach Delay (s)	0.1		8.0	15.4	10.2							
Approach LOS				O	В							
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization	tion		53.7%	2	U Level o	ICU Level of Service			⋖			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 2032 Future Background (AM) 1: 2 Line & Wellington Road 19

Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL Lane Control Urable (self) 140		4	†	<i>></i>	>	Ļ	4	•	←	•	۶	→	•
ondigurations ordigurations ordigurations ordigurations ordigurations ordigurations ordigurations ordigurations ordigurations (velvin) 10 140 5 60 170 5 5 40 50 ordinate (velvin) 10 140 5 60 170 5 5 40 50 ordinate (velvin) 11 152 5 65 185 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 5 43 54 isans ordinate (velvin) 11 152 5 65 185 5 5 18 isans ordinate (velvin) 11 152 5 22 2 2 2 2 2 2 35 40 33 and ordinate (velvin) 11 150 5 12 2 2 3 35 4.0 33 and ordinate (velvin) 11 150 5 150 5 5 5 5 5 5 5 5 5 5 5 5 5	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (verlyn) 10 140 5 60 170 5 5 40 50 Volume (verlyn) 10 140 5 60 170 5 5 40 50 Ontrol Free Free Free C% 0 0	Lane Configurations		₩	*		4	*-		4			4	
Volume (Verhit) 10 140 5 60 170 5 40 500 Owlume (Verhit) 11 Free Free 60 70 500 500 70	raffic Volume (veh/h)	10	140	വ	09	170	വ	2	40	20	2	70	10
Free Free Free Stop Stop	uture Volume (Veh/h)	10	140	2	09	170	2	2	40	20	2	20	10
our Factor 0,92 0,92 0,92 0,92 0,92 0,92 0,92 0,92	Sign Control		Free			Free			Stop			Stop	
Hour Factor 0 92 0 92 0 92 0 92 0 92 0 92 0 92 0 9	Grade		%0			%0			%0			%0	
Marians Mari	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
width (m) and Speed (ms) and Speed (ms) and Speed (ms) an Storage veh) at stor	Hourly flow rate (vph)	=	152	2	99	185	2	2	43	24	2	22	1
Width (m) Width (m) width (m) Width (m) wild blockage None None un flage (web) None None an type 190 157 511 494 152 eam signal (m) datoon unblocked 190 157 511 494 152 stage 1 conf vol 190 157 511 494 152 stage 2 conf vol 4.1 4.1 4.1 4.1 4.9 152 stage 2 conf vol 190 4.1 4.1 4.1 4.1 4.2	Pedestrians												
ng Speed (m/s) Ium flate (veh) Ium storage veh) I	Lane Width (m)												
Hander (veh) In Brockage In In Brockage In In Brockage In In Brockage In I	Walking Speed (m/s)												
Lum flane (veh) None None an storage evel) 180 157 511 494 152 aam signal (m) 190 157 511 494 152 aam signal (m) 190 157 511 494 152 stage 1 conf vol 190 157 511 494 152 stage 2 conf vol 4.1 4.1 4.1 6.5 6.2 stage 2 conf vol 4.1 4.1 4.1 6.5 6.2 stage 2 conf vol 4.1 4.1 4.1 6.5 6.2 stage 2 conf vol 4.1 4.1 7.1 6.5 6.2 stage 2 conf vol 4.1 4.1 7.1 6.5 6.2 stage 5 conf vol 4.1 4.1 7.1 6.5 6.2 stage 6 (s) 2.2 2.2 3.5 4.5 4.0 3.3 stage 6 (s) 2.2 2.5 3.6 4.1 6.1 6.0 6.0 6	Percent Blockage												
None	Right turn flare (veh)												
an storage veh) an storage veh) along uniformed (veh) along Lord (veh) along Lord (veh) bit Lots cell on Sameth (veh) and the storage of the storage (veh) and the storage (veh	Median type		None			None							
eam signal (m) ataoon unblocked normalized youldness 190 stage I conf vol stage 2 conf vol stage 6 (s) 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.	Median storage veh)												
Authoroun wholecked and a mining volume 190 157 511 494 152 stage 1 cont vol stage 2 cont vol stage 3 cont vol stage 4 cont vol stage 5 cont v	Upstream signal (m)												
157 151 494 152 152 152 153	pX, platoon unblocked												
Right Confl vol 157 511 494 152 unblocked vol 190 157 511 494 152 unblocked vol 4.1 4.1 7.1 6.5 6.2 unblocked vol 4.1 4.1 7.1 6.5 6.2 stage (s) 2.2 2.2 3.5 4.0 3.3 stage (s) 2.2 2.2 3.5 4.0 3.3 eue free % 99 95 99 91 94 ppacity (verkh) 1396 NB1 NB1 SB1 4.0 3.3 eue free % 99 95 95 99 91 94 ppacity (verkh) 1396 NB1 NB1 SB1 45 45 90 lond Lale 16 6.5 5.0 5 5 5 45 40 90 lond Lale 1.1 0.0 6.5 5 5 5 7 1.1 1.1 <	vC, conflicting volume	190			157			211	464	152	564	464	185
stage 2 conf vol 150 157 41 494 152 rige (s) 4.1 4.1 7.1 6.5 6.2 rige (s) 2.2 2.2 3.5 4.0 3.3 stage (s) 2.2 3.5 4.0 3.3 pacify (verly) 139 99 99 91 94 pacify (verly) 136 5 250 8 435 454 90 pacify (verly) 136 5 250 5 102 38 90 91 94 pacify (verly) 136 5 250 5 102 38 454 90 ne Total 16 5 5 10 38 454 90 ne Lot 1 0 5 5 5 5 5 11 90 11 90 11 90 11 90 12.7 10 12.7 3 12.0 12.7 3 <td< td=""><td>vC1, stage 1 conf vol</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	vC1, stage 1 conf vol												
Indicated void 190 157 511 494 152 Autholocked void 4.1 4.1 6.5 6.2 2.2 4.1 6.5 6.2 3.3 stage (s) 2.2 2.2 3.5 4.0 3.3 tenefree % 99 99 99 94 94 ppacity (verly) 1396 WB1 WB2 NB1 SB1 4.0 3.3 pacity (verly) 1396 WB1 WB2 NB1 SB1 4.0 3.3 ne Total 163 5 250 8 5 4.0 3.3 ne Edit 11 0 65 0 5 4 1.0 9	vC2, stage 2 conf vol												
type (s) 4.1 4.1 7.1 6.5 6.2 stage (s) 2.2 2.2 3.5 4.0 3.3 eue free % 99 95 99 91 94 ppacity (ver/h) 1396 1435 NB1 NB1 SB1 4.1 94 postly (ver/h) 1396 NB1 NB2 NB1 SB1 4.1 94 postly (ver/h) 1396 NB1 NB2 NB1 SB1 4.3 4.0 90 pion, Lane # EB1 EB2 WB2 NB2 NB3 4.3 4.3 4.3 4.3 4.3 9.0<	vCu, unblocked vol	190			157			511	464	152	564	464	185
stage (s) 2.2 2.2 3.5 4.0 3.3 eue free % 99 99 99 91 94 </td <td>IC, single (s)</td> <td>4.1</td> <td></td> <td></td> <td>4.1</td> <td></td> <td></td> <td>7.1</td> <td>6.5</td> <td>6.2</td> <td>7.1</td> <td>6.5</td> <td>6.2</td>	IC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
Lete free % 22 22 3.5 4.0 3.3 pacify (verhh) 139 99 91 94 <th< td=""><td>IC, 2 stage (s)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	IC, 2 stage (s)												
apacity (ve/hr) 99 99 91 94 apacity (ve/hr) 1396 481 881 435 454 90 apacity (ve/hr) 1396 WB1 NB1 SB1 435 454 90 ne Total EB1 EB2 WB1 WB1 SB1 435 454 90 ne Total EB2 VB1 WB1 SB1 AB1 AB2	F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
apacity (veh/h) 1396 1435 454 900 1400 Lane # EB 1 EB 2 WB1 WB2 NB1 SB1 45 459 900 1400 Lane # EB 1 EB 2 WB1 WB2 NB1 SB1 45 459 900 1400 Lane Helf 163 5 250 5 102 38 102 38 102 1400 Lane Left 1 0 6 6 5 5 4 11 1 0 6 5 5 4 11 1 1 0 0 1 1 1 1 0 0 1 1 1 1 1 1 1	oo dnene tree %	66			95			66	91	94	66	95	66
we feet EB 1 EB 2 WB 1 NB 1 SB 1 ne Total 163 5 250 5 102 38 ne Left 11 0 65 0 5 5 5 5 ne Legacity 07 1700 1435 1700 614 508 9 7 11 007 11 007 11 007 127 127 127 127 127 127 127 127 127 127 22 120 127 22 120 127 22 120 127 22 22 120 127 22	cM capacity (veh/h)	1396			1435			435	454	006	368	454	862
ne Total 163 5 250 5 102 38 ne Left 1 0 65 0 5 5 5 ne Right 0 5 0 5 5 5 ne Right 1396 1700 1435 1700 614 508 ne to Capacity 0.01 0.00 0.05 0.00 0.17 0.07 ne Length 95th (m) 0.2 0.0 1.1 0.0 4.7 1.9 nort Delay (s) 0.6 0.0 2.3 0.0 12.7 nort Delay (s) 0.6 0.2 12.0 12.7 and Delay (s) 0.6 2.2 12.0 12.7 section Summary section Summary 42 CU Level of Service section Capacity Wilitation 15 15 16 17 18 18 18 18 18 18 18 18 18	Direction, Lane #	EB 1	EB2	WB1	WB 2	NB 1	SB 1						
ne Left 11 0 65 0 5 5 5 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Volume Total	163	2	250	2	102	38						
ne Right 0 5 6 4 11 1396 1700 1435 1700 614 508 ne lo Capacity 0 0.01 0.00 0.05 0.07 0.07 or Le Length 95th (m) 0.2 0.0 1.1 0.0 4.7 1.9 or Delay (s) 0.6 0.0 2.3 0.0 12.0 12.7 or LO Delay (s) 0.6 2.2 12.0 12.7 or LO Delay (s) 0.0 2.3 0.0 12.7 or LO Delay (s) 0.0 1.1 0.0 12.7 or LO Delay (s) 0.0 12	Volume Left	=	0	99	0	2	2						
1396 1700 1435 1700 644 508 me to Capacity 0.01 0.00 0.05 0.00 0.17 0.07 ab Leughth 95th (m) 0.2 0.0 1.1 0.0 4.7 1.9 north Delay (s) 0.6 0.0 2.3 0.0 12.0 12.7 and Delay (s) 0.6 2.2 12.0 12.7 and Delay (s) 0.6 2.2 12.0 12.7 section Summary B B B A 2 120 12.7 section Summary 4.2 section Capacity Utilization 36.2% ICU Level of Service	Volume Right	0	2	0	2	24	11						
0.01 0.00 0.05 0.00 0.17 0.07 0.02 0.0 1.1 0.0 4.7 1.9 0.6 0.0 2.3 0.0 12.0 12.7 1.0 0.6 2.2 12.0 12.7 B B B A 2.2 12.0 12.7 B B B A 2.2 12.0 12.7 1.0 12.7	cSH	1396	1700	1435	1700	614	208						
0.2 0.0 1.1 0.0 4.7 1.9 0.6 0.0 2.3 0.0 12.0 12.7 A A A 12.0 12.7 0.6 2.2 12.0 12.7 B B B 4.2 ICU Level of Service 15.2% ICU Level of Service	Volume to Capacity	0.01	0.00	0.02	0.00	0.17	0.07						
0.6 0.0 2.3 0.0 12.0 12.7 A A B B B 0.6 2.2 12.0 12.7 B B B 4.2 ICU Level of Service 15	Queue Length 95th (m)	0.7	0.0	1.1	0.0	4.7	1.9						
A A B B B 0.6 2.2 12.0 12.7 B B B A A A B B B B B B B B B B B B B	Control Delay (s)	9.0	0.0	2.3	0.0	12.0	12.7						
0.6 2.2 12.0 12.7 B B B A A 2 CU Level of Service 15.2%	Lane LOS	⋖		V		В	В						
8 B 4.2 36.2% ICU Level of Service 15	Approach Delay (s)	9.0		2.2		12.0	12.7						
4.2 36.2% ICU Level of Service 15	Approach LOS					В	В						
4.2 36.2% ICU Level of Service 15	Intersection Summary												
36.2% ICU Level of Service 15	Average Delay			4.2									
15	Intersection Capacity Utilizati	lo		36.2%	2	U Level o	f Service			⋖			
	Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

2027 Future Total (SAT)

																																								*	A
•	SBR		2	2			0.92	2																																f O-miles	1 Service
→	SBT	2	20	20	Free	%0	0.92	72						None																										0 0 0	ICU Level of Service
←	NBT	4	40	40	Free	%0	0.92	43						None																										2	2
•	NBL		0	0			0.92	0										29			29	4.1		2.2	100	1545	SB 1	29	0	വ	1700	0.03	0.0	0.0		0.0			0.4	10000	13.3%
-	EBR		0	0			0.92	0										20			26	6.2		3.3	100	1010	NB 1	43	0	0	1545	0.00	0.0	0.0		0.0					
1	EBL	>	2	2	Stop	%0	0.92	2										100			100	6.4		3.5	66	833	EB 1	2	2	0	836	0.01	0.1	9.0	∢	9.0	A			I,	Ľ
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	(€ (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Avelage Delay	Intersection Capacity Utilization

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HCM Unsignalized Intersection Capacity Analysis 2032 Future Background (PM) 1: 2 Line & Wellington Road 19

•	SBR		20	70		0.00	27.5	77									261			261	6.2		3.3	4	778															
→	SBT	4	25	25	Stop 200	0.60	27.0	17									719			719	6.5		4.0	92	329															
۶	SBL		2	2		0.92	, , , ,	2									824			824	7.1		3.5	86	216															
•	NBR		82	82		0.00	0.72	7/									261			261	6.2		3.3	88	778														⋖	
←	NBT	4	45	45	Stop 00/2	0.60	40	÷									724			724	6.5		4.0	82	327															
•	NBL		15	15		0 00	1,7	2									744			744	7.1		3.5	94	285															
4	WBR	R.	15	15		0 00	1,7	2																		SB 1	54	2	22	404	0.13	3.7	15.3	O	15.3	ပ			f Service	
ļ	WBT	₩	240	240	PT 66	0 0%	26.72	707					None													NB 1	157	16	92	484	0.32	11.1	16.0	O	16.0	O			ICU Level of Service	
>	WBL		92	65		0 0	71.7	=									272			272	4.1		2.2	95	1291	WB 2	16	0	16	1700	0.01	0.0	0.0						ਹ	
*	EBR	ĸ	10	9		0 0	11	=																		WB1	332	71	0	1291	0.02	1.4	2.1	V	2.0			5.0	51.2%	15
†	EBT	₩	240	240	2 3	0 60	24.72	707					None													EB2	11	0	=	1700	0.01	0.0	0.0							
•	EBL		70	20		0 0	27.7	7									277			277	4.1		2.2	86	1286	EB 1	283	22	0	1286	0.05	0.4	8.0	⋖	0.7				Ę	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Deak Hour Factor	Hourty flow rate (vnh)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	CSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2032 Future Background (AM)

Movement EBI EBI WBI		4	†	*	>	Ļ	1	•	←	•	۶	→	*
1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
0 166 35 5 200 0 35 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations		4	*		4			4			4	
1	Traffic Volume (veh/h)	0	160	35	2	200	0	35	0	വ	0	0	0
Free Free Stop Stop O	Future Volume (Veh/h)	0	160	32	2	200	0	32	0	2	0	0	0
0,92 0,92 0,92 0,92 0,92 0,92 0,92 0,92	Sign Control		Free			Free			Stop			Stop	
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Grade		%0			%0			%0			%0	
None None None S 217 0 38 0 5 0 0 0 217 212 401 401 174 406 439 3 218 4.1 4.1 4.1 6.5 6.2 7.1 6.5 6.1 100 100 100 100 138 22 2.2 3.5 4.0 33 3.5 4.0 100 138 22 38 0 0 0 0 0 0 0 0 0 0 0 0 0 0 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
None None None None	Hourly flow rate (vph)	0	174	38	2	217	0	38	0	2	0	0	0
None None None None None	Pedestrians												
None None None 217 212 401 401 174 406 439 3 31 4.1 4.1 5.1 6.5 6.2 7.1 6.5 5.1 6.5 100 93 100 99 100 100 100 1353 135 4.0 100 1358 22.2 4.3 1358 5.8 5.8 5.8 5.8 5.8 5.9 5.1 5.1 6.5 10.4 1353 135 4.0 100 1358 135 100 99 100 100 100 100 100 1358 135 100 99 100 100 100 100 100 1358 135 100 99 100 100 100 100 100 1358 135 100 99 100 100 100 100 1358 135 100 99 100 100 100 1358 135 100 99 100 100 100 100 1358 135 100 99 100 100 100 100 100 100 100 100	Lane Width (m)												
None None None None None	Walking Speed (m/s)												
None None None None None	Percent Blockage												
None None None None	Right turn flare (veh)												
217 212 401 401 174 406 439 3 217 212 401 401 174 406 439 3 4.1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 5 100 93 100 99 100 100 100 100 100 100 100 100	Median type		None			None							
217 212 401 401 174 406 439 : 217 4.1 4.1 4.1 4.0 4.39 : 217 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1	Median storage veh)												
217 212 401 401 174 406 439 121 41 11 11 11 11 11 11 11 11 11 11 11 11	Upstream signal (m)												
217 212 401 401 174 406 439 32 41 4.1 4.1 4.1 4.06 439 32 4.1 4.1 7.1 6.5 6.2 7.1 6.2 6.2 7.1 6.2 7.1 6.2 6.2 7.1 6.2 6.2 7.1 6.2 7.1 6.2 6.2 7.1	pX, platoon unblocked												
217 212 401 401 1774 406 439 : 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 100 1100 93 100 99 100 100 100 133 2.2 43 0 9 100 99 100 100 100 174 38 222 43 0 0 0 0 5 38 0 5 5 1 510 14 174 38 222 43 0 0 0 0 0 0 0 1 1.9 0.0 0 0 0 0 0 0 1 1.9 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	vC, conflicting volume	217			212			401	401	174	406	439	217
217 212 401 401 174 406 439 1.2 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 100 1.00 1.00 1.00 1.00 1.00 1.00 1	vC1, stage 1 conf vol												
riblocked vol 217 212 401 401 174 406 439 3 step (s) 4.1 1.1 1.2 6.5 6.2 7.1 6.5 step (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 100 length (welch) 1353 100 99 100 100 length (welch) 1353 100 9.5 100 length (welch) 1353 100 9.5 100 length (welch) 1353 100 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	vC2, stage 2 conf vol												
lage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 4.3 0 stage (s) 2.2 4.3	vCu, unblocked vol	217			212			401	401	174	406	439	217
stage (s) 2.2 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 93 100 93 93 94 94 94 94 94 94 94 94	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
aue free % 100 100 93 135 4,0 33 35 4,0 100 100 100 100 100 100 100 100 100 1	tC, 2 stage (s)												
1353 100 99 100 100 1353 136 869 551 510 EB1 EB2 WB1 NB1 SB1 558 536 869 551 510 174 38 222 43 0 0 0 5 5 38 0 0 0 0 5 5 30 0 0 0 0 0 0 1 1.9 0.0 0 0 0 0 0 1.1 0 0 0 0 0 0 0 0 1.1 0 0 0 0 0 0 0 1.1 0	tF(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1353 1358 558 550 869 551 510 EB1 EB2 WB1 NB1 SB1 SB2	b0 dueue free %	100			100			93	100	66	100	100	100
EB 1 EB 2 WB 1 NB 1 SB 1 174 38 222 43 0 0 0 5 38 0 0 0 8 5 38 0 1353 1700 1358 582 1700 0.00 0.02 0.00 0.07 0.00 0.0 0.0 0.1 1.9 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0	cM capacity (veh/h)	1353			1358			228	536	698	551	510	823
174 38 222 43 0 0 0 5 38 0 0 0 8 5 38 0 0 0 8 5 38 0 0 0 1353 1700 1358 582 1700 0.00 0.02 0.00 0.07 0.00 0.0 0.0 0.1 1.9 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.2 11.7 0.0 0.3 11.1 0.0 0.4 12.45% ICU Level of Service	Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
0 0 5 38 0 0 1353 1700 1354 1700 0.00 0.02 0.00 0.07 0.00 0.00 0.01 1.9 0.0 0.0 0.0 0.0 11.7 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 11.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Volume Total	174	38	222	43	0							
138 0 5 0 1383 1700 1358 582 1700 0.00 0.02 0.00 0.07 0.0 0.0 0.1 1.9 0.0 0.0 0.2 11.7 0.0 A B A 0.0 0.2 11.7 0.0 B A 1.1 CU Level of Service	Volume Left	0	0	2	38	0							
1353 1700 1358 582 1700 0.00 0.02 0.00 0.07 0.00 0.0 0.0 0.1 1.9 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 1.1 0.0 0.2 11.7 0.0 0.2 11.7 0.0 0.3 1.1 0.0 0.4 5.8 1.1 0.0 0.5 11.7 0.0 0.5 11.7 0.0 0.6 11.7 0.0 0.7 11.7 0	Volume Right	0	38	0	2	0							
0.00 0.02 0.00 0.07 0.00 0.00 0.0 0.0 0.0 0.1 1.9 0.0 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.2 11.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	cSH	1353	1700	1358	582	1700							
0.0 0.0 0.1 1.9 0.0 0.0 0.0 0.2 11.7 0.0 A B A A 0.0 0.2 11.7 0.0 B A Ilization 24.5% ICU Level of Service	Volume to Capacity	0.00	0.02	0.00	0.07	0.00							
0.0 0.0 0.2 11.7 0.0 A B A 0.0 0.2 11.7 0.0 B A any 1.1 1.1 ILEVEL OF SERVICE 1)	Queue Length 95th (m)	0.0	0.0	0.1	1.9	0.0							
0.0 0.2 11.7 0.0 B A any 1.1 1.1 It Utilization 24.5% ICU Level of Service 1)	Control Delay (s)	0.0	0.0	0.2	11.7	0.0							
90 0.2 11.7 0.0 B A any 1.1	Lane LOS			V	В	V							
B A mmary 1.1 pacity Utilization 24.5% ICU Level of Service (min) 15	Approach Delay (s)	0.0		0.2	11.7	0.0							
1.1 24.5% ICU Level of Service 15	Approach LOS				В	A							
1.1 24.5% ICU Level of Service 15	Intersection Summary												
24.5% ICU Level of Service 15	Average Delay			1.1									
	Intersection Capacity Utilizati	on		24.5%	2	U Level o	f Service			A			
	Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 2032 Future Background (SAT) 1: 2 Line & Wellington Road 19

Movement		TOT	רחח		F							
MOVOING	EBL	EBI	EBK	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	¥C.		4	¥C.		4			4	
Traffic Volume (veh/h)	10	302	10	75	270	10	10	9	96	10	25	10
Future Volume (Veh/h)	10	305	10	72	270	10	10	30	95	10	22	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)	1	332	11	82	293	11	11	33	103	1	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 %	66			93			%	88	82	94	91	66
cM capacity (veh/h)	1257			1216			247	286	710	182	286	746
Direction, Lane #	EB 1	EB2	WB1	WB 2	NB 1	SB 1						
Volume Total	343	11	375	11	147	46						
Volume Left	=	0	82	0	Ξ	=						
Volume Right	0	11	0	11	103	11						
SSH	1257	1700	1216	1700	482	588						
Volume to Capacity	0.01	0.01	0.07	0.01	0.31	0.17						
Queue Length 95th (m)	0.7	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	⋖		V		O	ပ						
Approach Delay (s)	0.3		2.2		15.7	20.0						
Approach LOS					O	O						
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization	tion		53.6%	0	U Level o	ICU Level of Service			V			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2032 Future Background (PM)

FBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT													
Configurations	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (verht) 5 285 40 5 275 0 40 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations		4	*		4			4			4	
Solution (Verlyth) 5 285 40 5 775 0 40 0 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Volume (veh/h)	വ	285	40	2	275	0	40	0	2	0	0	L
Part	Future Volume (Veh/h)	2	285	40	2	275	0	40	0	2	0	0	2
Part Federar 1,00,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,	Sign Control		Free			Free			Stop			Stop	
Hour Factor 092 092 092 092 092 092 092 092 092 092	Grade		%0			%0			%0			%0	
March (Ph) 5 310	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
width (m) None None turn flare (ver) None None turn flare (ver) None None turn flare (ver) None Acron (ver) sam signal (m) sam signal (m) Acron (ver) sam signal (m) sam signal (m) Acron (ver) stage 1 conf vol 299 353 634 629 310 634 672 310 634 672 310 642 672 32 40 22 40 33 35 40 34 672 33 40 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71 65 62 71<	Hourly flow rate (vph)	2	310	43	2	299	0	43	0	2	0	0	2
Witch (m) Witch (m) ng Speed (ms) None None turn flackage turn flackage veh) 353 634 629 310 634 672 334 asm storage veh) asm storage veh) 353 634 629 310 634 672 334 <	Pedestrians												
In Blockage In Blockage In Blockage In Blockage In Intrinder (veh) In Vipe In Storage veh) In Storage veh In St	Lane Width (m)												
In Brockage tun flaer (veh) None In storage veh) and son function and son funcion and	Walking Speed (m/s)												
Lun flare (veh) None None nn type nn type nn type eam signal (m) eam signal (m) eam signal (m) eam signal (m) eam signal (m) eam signal (m) eam signal (m) eam signal (m) east ear	Percent Blockage												
In type In stage veth) about unblocked about unblocked vol about unbl	Right turn flare (veh)												
na storage veh) am signal (in) an signal (in) an signal (in) an signal (in) as a signa	Median type		None			None							
sam signal (m) agon riboded agon riboded agon conflod ago	Median storage veh)												
alton unblocked above unblocked alton	Upstream signal (m)												
stage conf vol stage 299 353 634 629 310 634 672 318 634	pX, platoon unblocked												
stage 1 conf vol stage 1 conf vol stage 2 conf vol stage	vC, conflicting volume	299			353			634	629	310	634	672	299
Itage 2 conf vol Sasa 654 629 310 634 672 7.1 6.5 6.2 7.1 6.5	vC1, stage 1 conf vol												
stage (s) 4.1 4.1 6.5 310 634 672 310 634 672 310 634 672 310 634 672 310 634 672 310 634 672 311 65 62 7.1 65 62 7.1 65 310 67 7.1 65 62 7.1 65 40 33 35 40 33 35 40 33 35 40 90	vC2, stage 2 conf vol												
lyge (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 100 100 100 100 stage (s) 2.2 100 100 100 100 100 stage (s) 2.2 100 100 100 100 100 100 100 100 100 10	vCu, unblocked vol	566			353			634	679	310	634	672	299
stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 eue free % 100 100 99 100 <	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
ceue free % 100 122 3.5 4.0 3.3 3.5 4.0 ppackly (verhr) 1262 WB 1 NB 1 SB 1 9 100 100 100 ppackly (verhr) 1262 WB 1 NB 1 SB 1 38 37 <td>tC, 2 stage (s)</td> <td></td>	tC, 2 stage (s)												
100 100 100 89 100 99 100 100 100 1262 1206 387 374 7 1262 1206 387 374 7 1262 1206 1206 407 741 000 0.03 0.00 0.12 0.00 0.12 0.00 0.02 15.0 9.9 100 1206 40.1 3.2 0.2 0.0 0.2 15.0 9.9 10.1 0.2 0.0 0.2 15.0 9.9 10.1 0.2 0.3 4.3% 1CU Level of Service A	tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1262 1206 387 396 730 387 374 EB 1 EB 2 WB1 NB1 SB1 387 396 730 387 374 315 43 304 48 5 5 0 5 43 0 6 43 0 5 5 1262 1700 1206 407 741 0.00 0.01 32 0.02 0.1 0.0 0.1 32 0.02 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9 0.1 0.0 0.2 15.0 9.9	b0 dueue free %	100			100			88	100	66	100	100	66
EB 1 EB 2 WB 1 NB 1 SB 1 315 43 304 48 5 5 0 5 43 0 1262 1700 1206 407 741 0.00 0.03 0.00 0.12 0.01 0.1 0.0 0.1 3.2 0.2 A A A C A A 0.1 0.0 0.2 15.0 9.9 A A A C A 0.1 0.0 0.2 15.0 9.9 A A C A 1.2 C A 1.2 C A 1.2 C A 1.2 C A 1.3 C A 1.4 C A 1.5 C A 1.7 C A 1.7 C A 1.8 C A 1.8 C A 1.9 C A 1.1 C A 1.2 C A	cM capacity (veh/h)	1262			1206			387	396	730	387	374	741
315 43 304 48 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
5 0 5 43 0 0 43 0 5 5 5 1262 1700 1206 407 741 0.00 0.03 0.00 0.12 0.01 0.1 0.0 0.1 3.2 0.2 0.2 0.0 0.2 15.0 9.9 A A C A 0.1 0.2 15.0 9.9 1.2 A 1.2 A 1.2 A 1.2 A 1.2 A	Volume Total	315	43	304	48	2							
1262 1700 1206 407 741 0.00 0.03 0.00 0.12 0.01 0.1 0.0 0.1 3.2 0.2 0.2 0.0 0.2 15.0 9.9 0.1 0.2 15.0 9.9 0.1 1.2 0.2 A 0.1 1.2 0.3 34,3% ICU Level of Service	Volume Left	വ	0	2	43	0							
1262 1700 1206 407 741 0.00 0.03 0.00 0.12 0.01 0.2 0.0 0.2 15.0 9.9 A A C A A 0.1 0.2 15.0 9.9 C A 1.2 C A 1.2 C DLevel of Service	Volume Right	0	43	0	2	2							
0.00 0.03 0.00 0.12 0.01 0.1 0.0 0.1 3.2 0.2 0.2 0.0 0.2 15.0 9.9 A A C A 0.1 0.2 15.0 9.9 C A 1.2 C Level of Service	cSH	1262	1700	1206	407	741							
0.1 0.0 0.1 3.2 0.2 0.2 0.0 0.2 15.0 9.9 A A C A A 0.1 0.2 15.0 9.9 C A 1.2 CU Level of Service	Volume to Capacity	0.00	0.03	0.00	0.12	0.01							
0.2 0.0 0.2 15.0 9.9 A C A 0.1 0.2 15.0 9.9 C A 1.2 CU Level of Service	Queue Length 95th (m)	0.1	0.0	0.1	3.2	0.2							
A A C A 0.1 0.2 15.0 9.9 C A 1.2 1.2 1.3% ICU Level of Service	Control Delay (s)	0.2	0.0	0.2	15.0	6.6							
0.1 0.2 15.0 9.9 C A 1.2 1.2 1.2 1.2 1.3% ICU Level of Service 1.4.3%	Lane LOS	A		A	ပ	V							
C A 1.2 34.3% ICULevel of Service	Approach Delay (s)	0.1		0.2	15.0	6.6							
1,2 34,3% ICU Level of Service	Approach LOS				ပ	A							
1.2 34.3% ICU Level of Service	Intersection Summary												
34.3% ICU Level UI Service	Average Delay	a of		1.2	2	0100	9			<			
	Intersection Capacity Utiliza	IIION		34.3%	2	n Level o	1 Service			⋖			

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

→ <i>→ →</i>	IR SBL SBT SBR	ı	5 20	60 5 20 10	Stop	%0	0.92	5 22										163 642 561 207		647 561	62 71 65 62	2	3.5 4.0		316 411												
\ +	- NBT NBR	4	40		Stop	%0	0.92		!									267		567	5 2	5	4.0	88	407												
1	WBR NBL	¥c_	10				0.92 0.92											218		87.5	7.1		3.5	36	387	SB1	38	5	=	460	0.08	7.7	13.3 B	13.5	<u>a</u>		
\	WBL WBT	4	75 190		Free	%0	0.92 0.92							None				168		168	2 7	÷	2.2	8	1422	WB2 NB1	ľ	0 5		1700 589		0.0		12.6	e e		
<i>≯</i> ↑	EBT EBR		150 5	150 5	Free	%0	0.92	163 5						None												EB 2 WB 1		0 82		1700 1422		0.0		24	i	7.7	77 77
4	EBL			10	_		0.92							z				218		218	1 4 4	ř	2.2	66	1364	EB 1 E	174	1				0.2	c. <	7 2	2		
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	VCz, stage z corii voi	C cindle (c)	tC, single (s)	tF (s)	% and the most of	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Annroach Delay (s)	Approach LOS	 Arieraccion Communiary	Wildragon Dough

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2032 Future Background (SAT)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	*		4			4			4	
Traffic Volume (veh/h)	2	370	32	15	325	0	25	0	15	0	0	5
Future Volume (Veh/h)	22	370	32	15	325	0	22	0	15	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)	വ	402	38	16	353	0	27	0	16	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	353			440			802	797	402	813	832	353
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			440			802	797	402	813	832	353
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
fF (S)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
bo dnene tree %	100			66			91	100	86	100	100	66
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	2							
Volume Left	2	0	16	27	0							
Volume Right	0	38	0	16	2							
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	ပ	В							
Approach Delay (s)	0.1		0.5	16.0	10.3							
Approach LOS				ပ	В							
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization	ation		44.9%	⊇	U Level o	ICU Level of Service			A			
Analysis Dariod (min)												

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2032 Future Total (AM) HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

	4	†	-	-	Ļ	1	•	←	•	۶	→	*
Movement	EBE	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	¥L.		4			4			4	
Traffic Volume (veh/h)	0	180	32	9	220	0	4	0	15	0	0	0
Future Volume (Veh/h)	0	180	32	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	Ħ	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			66			35	100	86	100	100	100
cM capacity (veh/h)	1328			1333			511	496	842	489	472	800
Direction, Lane #	HB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total	196	38	250	29	0							
Volume Left	0	0	=	43	0							
Volume Right	0	88	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			∢	ω	⋖							
Approach Delay (s)	0.0		0.4	12.0	0.0							
Approach LOS				В	∢							
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			29.7%	0	U Level o	ICU Level of Service			<			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 3: North Site Access/Golf Course Access & Wellington Road 19

2032 Future Total (AM)

	1	†	1	1	Į.	4	•	←	•	۶	→	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	4		F	4			4			4	
Traffic Volume (veh/h)	9	195	9	9	235	15	32	0	15	2	0	5
Future Volume (Veh/h)	10	195	10	10	235	15	35	0	15	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		%			%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)	=	212	=	=	255	16	89	0	16	2	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	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)												
IF(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	66			66			92	100	86	66	100	66
cM capacity (veh/h)	1292			1346			457	446	822	442	447	776
Direction, Lane #	EB 1	EB2	WB 1	WB2	NB 1	SB 1						
Volume Total	7	227	7	275	54	10						
Volume Left	7	4	7	4	38	2						
Volume Right	0	7	0	16	16	2						
cSH	1292	1292	1346	1346	256	563						
Volume to Capacity	0.01	0.01	0.01	0.01	0.10	0.05						
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	⋖	∢	⋖	⋖	ш	ш						
Approach Delay (s)	0.4		0.4		12.6	11.5						
Approach LOS					Ф	В						
Intersection Summary												
April operation			17									
Average Delay	ion		24 50%	2	Ol I I out of Coning	00000			<			
Iller section Capacity Curicat	101		21.070	5	ח רפגפו ח	OGIVIOG			<			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

																																								A	
`	SBR		5	2			0.92	2																																Service	
→	SBT	4	45	42	Free	%0	0.92	49						None																										ICU Level of Service	
←	NBT	4	45	45	Free		0.92							None																											
•	NBL		0	0			0.92	0										72			\$	4.1		2.2	100	1551	SB 1	72	0	2	1700	0.03	0.0	0.0		0.0			0.4	13.3%	15
1	EBR		0	0			0.92	0										25			52	6.2		3.3	100	1016	NB 1	49	0	0	1551	0.00	0.0	0.0		0.0					
1	EBL	>	2	2	Stop	%0	0.92	2										100			100	6.4		3.5	66	868	EB 1	2	2	0	838	0.01	0.1	9.0	∢	9.0	V			uc	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 5: 3 Line & West Site Access

2032 Future Total (AM)

																																								4	
•	SBR		0	0			0.92	0																																ICIT Level of Service	3
→	SBT	2,	45	45	Free	%0	0.92	49						None																										o laya I	
←	NBT	4	20	20	Free	%0	0.92	75						None																										2	2
1	NBL		0	0			0.92	0									:	49			49	4.1		2.2	100	1558	SB 1	49	0	0	1700	0.03	0.0	0.0		0.0			80	13.3%	15
~	EBR		2	2			0.92	2										46			49	6.2		3.3	100	1020	NB 1	75	0	0	1558	0.00	0.0	0.0		0.0					
1	盟	>	2	2	Stop	%0	0.92	2										103			103	6.4		3.5	66	895	EB 1	10	2	2	953	0.01	0.3	8.8	⋖	8.8	∢				
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF(s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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2032 Future Total (PM) HCM Unsignalized Intersection Capacity Analysis 3: North Site Access/Golf Course Access & Wellington Road 19

Free O'82 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.9	EBT EBR →
820 820 380 802 834 3 820 820 380 802 834 3 7.1 6.5 6.2 7.1 6.5 3.5 4.0 33 3.5 4.0 92 100 98 96 100 280 300 667 290 294 4	40
820 820 380 802 834 3 820 820 380 802 834 3 7.1 6.5 6.2 7.1 6.5 3.5 4.0 3.3 3.5 4.0 92 100 98 96 100 280 300 667 290 294	359 43 22
820 820 834 834 820 820 834 820 820 836 802 834 87.1 6.5 6.2 7.1 6.5 82 100 92 100 98 96 100 280 300 667 290 294 8	None
820 820 834 371 6.5 6.2 7.1 6.5 834 35 4.0 92 100 98 96 100 280 300 667 290 294 89 98 98 98 98 98 98 98 98 98 98 98 98	402
35 40 33 35 40 92 100 98 96 100 280 300 667 290 294 6	402
	2.2 98 1157
	8
Ш	0.02
Ш	0.7
	1.6 27.1% ICU 15

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

2032 Future Total (PM)

Movement EBI EBT EBR WBI WBT WBB NBI NBT NBB SBI		1	†	1	1	ļ	1	•	—	•	۶	→	*
Configurations 4 7 4 7 4 7 4 4 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 45 105 10 25 25 20 25 20 25 20 25 20 25 10 25 20 25 20 25 0.92	Movement	EBF	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
s Volume (verhit) 20 270 10 80 280 15 15 45 105 10 25 20 20 20 10 80 280 15 15 45 105 10 25 20 20 20 10 80 280 15 15 15 45 105 10 25 20 20 20 0 10 2 25 20 11 87 283 16 16 49 114 11 27 3 4 3 4 10 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Lane Configurations		4	N.		t	R.		÷			÷	
Procurred (Vehich) 20 270 10 80 280 15 15 15 10 25 20 and to 10 20 20 0% 20 0% 20 0% 20 20 20 20 20 20 20 20 20 20 20 20 20	Traffic Volume (veh/h)	20	270	9	8	260	15	15	45	105	10	25	20
Control Free Ree Shp Skp Skp Skp Skp Skp O%	Future Volume (Veh/h)	20	270	10	8	260	15	15	45	105	10	25	20
Hour Factor 0,92 0,92 0,92 0,92 0,92 0,92 0,92 0,92	Sign Control		Free			Free			Stop			Stop	
Hour Feactor 0.92	Grade		%0			%0			%0			%0	
March Marc	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
Note (ms) Note (ms) It Blockage Lun flater (veit) It Stockage Lun flater (veit) None In type In type In type In type In type In the flett In th	Hourly flow rate (vph)	22	293	7	87	283	16	16	49	114	=	27	22
Width (m) Width (m) Width (m) None None Lum flace (we) None None In types None None In types (we) None None In storage vel) 304 830 810 293 805 am storage vel) 304 830 810 293 805 am storage vel) 304 830 810 293 805 stage 2 conf vol 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage 2 conf vol 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage 1 conf vol 4.1 4.1 4.1 6.5 6.2 7.1 6.5 stage 2 conf vol 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 stage (s) 2.2 2.2 3.5 4.1 2.2 <td>Pedestrians</td> <td></td>	Pedestrians												
in Speed (m/s) In Blockage In Blockage In Blockage In Blockage In Blockage In storkage veh) Sam signal (m)	Lane Width (m)												
to the Bockage tun flace (veh) None In storage veh) aem signal (in) a	Walking Speed (m/s)												
burn flare (veh) None None na type None None na type gae (wh) 830 810 293 832 805 aem signal (m) 304 830 810 293 832 805 attiget Loont vol nulciocked vol stage 2 cont vol stage 8 cont vol stage 9 cont vol stage 9 cont vol stage 9 cont vol vol stage 9 cont vol stag	Percent Blockage												
In type In stage veth) attoan witholded attoan witholded attoan witholded attoan witholded volume 299 304 304 304 305 304 307 304 307 304 307 307 307 307 307 307 307 307 307 307	Right tum flare (veh)												
aem signate veh) aem signate (m) aem size (m)	Median type		None			None							
am signal (m) attached value become signal (m) attached value become signal (m) attached value become value v	Median storage veh)												
atoon unblocked atomic value	Upstream signal (m)												
State Control Contro	pX, platoon unblocked												
stage 1 cont vol stage 1 cont vol stage 2 cont vol stage (s)	vC, conflicting volume	299			304			830	810	293	932	802	283
stage 2 conf vol lange 4 and stage 2 soft vol lange 8 and stage 8 and subtooked vol 2 99 and subtooked vol 2 99 and stage 8 and subtooked vol 4 and 4	vC1, stage 1 conf vol												
ribidocked vol 299 304 830 810 293 932 805 sige (s) 4.1 4.1 6.5 6.2 7.1 6.5 80	vC2, stage 2 conf vol												
type (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 5.3 4.0 5.2 4.0 5.2 4.0 3.3 3.5 4.0 5.2 4.0 5.2 4.0 3.3 3.5 4.0 3.3 3.5 4.0 5.2 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 4.0 3.3 3.5 4.0 3.3 3.5 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.3 4.0 3.0 4.0 3.0 4.0 4.0 4.0 4.0 4.0 4.0 <t< td=""><td>vCu, unblocked vol</td><td>299</td><td></td><td></td><td>304</td><td></td><td></td><td>830</td><td>810</td><td>293</td><td>932</td><td>802</td><td>283</td></t<>	vCu, unblocked vol	299			304			830	810	293	932	802	283
stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 eue free % 98 93 93 83 85 94 91 pacify (ve/h) 1262 1257 244 287 746 170 289 pacify (ve/h) 1262 170 16 179 60 170 289 94 91 98 94 91 91 91 91 91 91 91 91 92 94 91 91 92 94 91 93 94 91 93 94 91 94 91 94 91 94 91 96 94 91 94	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
eue free % 22 22 35 4,0 33 35 4,0 pacity (veh/h) 1262 1257 244 287 746 170 289 pacity (veh/h) 1262 18 WB1 WB1 NB1 SB1 746 770 289 91	tC, 2 stage (s)												
98 93 83 85 94 91 1262 1257 244 287 746 170 289 128 1 818 1 818 1 818 1 818 1315 11 370 16 10 11 11 22 128 0 87 0 16 11 22 128 0 170 1257 170 490 320 100.2 0.01 0.07 0.01 0.39 0.19 10.07 0.01 0.03 0.14.5 5.4 10.07 0.01 0.03 0.14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 1.8 0.0 14.5 5.4 10.07 0.01 0.39 0.19 10.07 0.01 0.39 0.19 10.08 0.30 0.30 0.30 10.08 0.30 0.30 0.30 10.08 0.30 0.30 0.30 10.08 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 0.30 0.30 0.30 10.08 0.30 0.30 0.30 0.30 0.30 0.30 0.30	(s) ₄	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1262 1257 124 281 746 770 289 EB1 EB2 WB1 WB2 NB1 SB1	p0 queue free %	88			83			93	83	82	94	91	97
# EB1 EB2 WB1 WB2 NB1 SB1 315 11 370 16 179 60 2 0 87 0 16 111 0 11 0 16 114 22 1262 1700 1257 1700 460 320 city 0.02 0.01 0.07 0.01 0.39 0.19 Sign (m) 0.4 0.0 1.8 0.0 14.5 5.4 s) A A A A C C (s) 0.7 2.3 17.7 18.8 C C C C Immary # EB1 EB2 WB1 WB2 NB1 17.7 18.8 C C C C C C C C C C C C C	cM capacity (veh/h)	1262			1257			244	287	746	170	289	756
315 11 370 16 179 60 22 0 87 0 16 119 60 0 1 1 0 16 11 22 1262 1700 1257 1700 460 320 scity 0.02 0.01 0.07 0.01 0.39 0.19 85th (m) 0.4 0.0 1.8 0.0 14.5 5.4 5) A A 0.0 17.7 18.8 7 (s) 0.7 2.3 17.7 18.8 7 A A C C 7 mmary 6.7 1CU Level of Service (min) 15	Direction, Lane #	EB 1	EB2	WB1	WB2	NB 1	SB 1						
22 0 87 0 16 11 0 17 0 16 114 22 1262 1700 1257 1700 460 320 coty 0.02 0.01 0.07 0.01 0.39 0.19 55 0.7 0.0 2.4 0.0 14.5 5.4 57 0.0 2.4 0.0 17.7 18.8 A A C C C C Inmary 5.7 1CU Level of Service (min) 15	Volume Total	315	11	370	16	179	09						
1262 1700 1257 1700 460 320 city 0.02 0.01 0.07 0.01 0.39 0.19 Seth (m) 0.4 0.0 1.8 0.0 14.5 5.4 S) A A A C C (s) A A A C C Tunnary 5.7 0.0 2.4 0.0 17.7 18.8 C C Tunnary 5.7 0.0 5.4 (in) 0.7 2.3 17.7 18.8 (in) 0.7 2.4 0.0 17.7 18.8 (in) 0.7 2.4 0.0 17.7 18.8 (in) 0.7 2.4 0.0 17.7 18.8 (in) 0.7 5.4 0.0 17.7 18.8 (in) 0.7 5.4 0.0 17.7 18.8 (in) 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	Volume Left	22	0	87	0	16	7						
1262 1700 1257 1700 460 320 coly 0.02 0.01 0.07 0.01 0.39 0.19 55th (m) 0.4 0.0 1.8 0.0 14.7 18.8 (s) 0.7 0.2 4 0.0 17.7 18.8 (s) 0.7 2.3 17.7 18.8 mmary 5.7 C C mmary 5.7 ICU Level of Service (min) 15	Volume Right	0	7	0	16	114	22						
beth 0.02 0.01 0.07 0.01 0.39 0.19 Seth (m) 0.4 0.0 1.18 0.0 14.5 5.4 s) 0.7 0.0 2.4 0.0 17.7 18.8 (s) 0.7 2.3 17.7 18.8 C C mmary S.7 ICU Level of Service (min) 15	SH	1262	1700	1257	1700	460	320						
Sign (m)	Volume to Capacity	0.05	0.01	0.07	0.01	0.39	0.19						
s) 0.7 0.0 2.4 0.0 17.7 18.8 (c) A A C C C C C C C C C C C C C C C C C	Queue Length 95th (m)	0.4	0.0	 8:	0.0	14.5	5.4						
(s) 0.7 2.3 17.7 18.8 mmary 5.7 CU Level of Service (min) 15	Control Delay (s)	0.7	0.0	2.4	0.0	17.7	18.8						
/ (s) 0.7 2.3 17.7 18.8 C C C C C C C C C C C C C C C C C C	Lane LOS	⋖		⋖		ပ	ပ						
C C C pacty Utilization 54.5% ICU Level of Service (min) 15	Approach Delay (s)	0.7		2.3		17.7	18.8						
innary 5.7 5.7 iCU Level of Service (min) 15	Approach LOS					O	O						
5.7 5.7 Pacity Utilization 54.5% ICU Level of Service (min) 15	Intersection Summary												
54.5% ICU Level of Service 15	Average Delay			5.7									
15	Intersection Capacity Utiliza	ıtion		54.5%	⊇	U Level o	f Service			⋖			
	Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 5: 3 Line & West Site Access

2032 Future Total (PM)

																																								A	
*	SBR		2				0.6	2																																ICU Level of Service	
→	SBT	4	20	20	Free	%0	0.92	72						None																										CU Level	
←	NBT	4	22	22	Free	%0	0.92	09						None																										\subseteq	
•	NBL		0	0			0.92	0										20			29	4.1	c	7.7	100	1545	SB 1	29	0	2	1700	0.03	0.0	0:0		0.0			0.4	13.3%	15
-	EBR		0	0			0.92	0										26			26	6.2	c	o. o	100	1010	NB 1	9	0	0	1545	0.00	0.0	0.0		0.0					
1	EBF	*	2	2	Stop	%0	0.92	2										116			116	6.4	C	c.5	66	880	EB 1	2	5	0	880	0.01	0.1	9.1	⋖	9.1	∢			tion	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	(C, 2 stage (s)	(F (S)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	SSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

2032 Future Total (PM)

	1	†	1	1	ļ	1	•	—	•	۶	→	*
Movement	EB	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	W.		4			4			4	
Traffic Volume (veh/h)	2	305	9	15	305	0	45	0	15	0	0	5
Future Volume (Veh/h)	2	305	4	15	302	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)	2	332	43	16	332	0	49	0	16	0	0	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	332			375			711	90/	332	722	749	332
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	332			375			71	902	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
po dueue free %	100			66			98	100	86	100	100	66
cM capacity (veh/h)	1227			1183			341	354	710	330	335	710
Direction, Lane #	EB 1	EB2	WB1	NB 1	SB 1							
Volume Total	337	43	348	92	2							
Volume Left	2	0	16	49	0							
Volume Right	0	43	0	16	2							
SSH	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	∢		∢	O	ш							
Approach Delay (s)	0.1		0.5	16.0	10.1							
Approach LOS				O	Ф							
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization	loi		45.0%	2	U Level c	ICU Level of Service			∢			
Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 1: 2 Line & Wellington Road 19

EBL EBT EI 4 1 4 4 1 10 335 10 335 10 335 11 364		1	†	1	-	ļ	4	•	—	4	۶	→	•
origiurations of the first originations of the first originations of the first original (m) originations original (m) orig	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (verlyh) 10 335 10 85 295 15 10 30 110 Volume (verlyh) 10 335 10 85 295 15 10 30 110 Ontroll Free Free 70% 0 0 <td>ane Configurations</td> <td></td> <td>4</td> <td>¥.</td> <td></td> <td>4</td> <td>R_</td> <td></td> <td>4</td> <td></td> <td></td> <td>4</td> <td></td>	ane Configurations		4	¥.		4	R_		4			4	
Notime (Vehith) 10 335 10 85 295 15 10 30 110 and total control (Vehith) 10 335 10 85 295 15 10 30 110 and total control (Vehith) 11 364 11 92 321 16 11 33 120 and total control (Vehith) 11 364 11 92 321 16 11 33 120 and total control (Vehith) 122 32 32 32 32 32 32 32 32 32 32 32 32 3	Fraffic Volume (veh/h)	10	335	19	82	295	15	10	9	110	15	25	10
Prece Prece Prece Stop Prece Prece Stop Prece Prece Stop Prece Prece Stop Prece Prece Prece Stop Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece Prece P	-uture Volume (Veh/h)	10	335	10	82	295	15	10	8	110	15	22	10
four Factor 0% 0 0% 0% 0% 0	Sign Control		Free			Free			Stop			Stop	
None None None None None 337 375 375 916 907 364 4.1 4.1 4.1 6.5 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	Grade		%0			%0			%0			%0	
None None None None None None None None	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
337 375 916 907 384 11 337 4.1 4.1 4.1 7.1 6.5 6.2 2.2 2.2 3.5 4.0 3.3 99 92 95 87 82 1222 1183 16 164 54 1.1 0 92 0 11 16 0 11 0 02 0 01 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A A C C C C C C C C C C C C C C	Hourly flow rate (vph)	11	364	11	92	321	16	11	33	120	16	27	11
None None None None 337 375 916 907 364 11 4.1 4.1 7.1 6.5 6.2 4.1 7.1 6.5 6.2 681 7.1 6.2 681 7.1 6.5 6.2 681 7.1 6.5 6.2 681 7.1 6.5 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 681 7.1 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2	Pedestrians												
None None None None Say	Lane Width (m)												
None	Walking Speed (m/s)												
None None None None None	Percent Blockage												
None None None 337 375 916 907 364 11 337 375 916 907 364 11 2.2 2.2 3.5 4.0 3.3 99 92 95 87 82 122 118 118 118 118 118 122 1700 118 1700 457 249 0.1 0.0 0.0 0.26 0.28 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.7 8 17.0 8 0.3 2.4 17.2 24.9 0.3 2.5 0.0 12.9 6.9 0.3 2.7 2.7 2.4 0.3 2.7 2.7 2.4 0.3 2.7 2.7 2.7 0.3 2.7 0.3 2.7 2.7 0.3 2.8 0.3 2	Right turn flare (veh)												
337 375 916 907 364 11 337 4.1 4.1 4.1 7.1 6.5 6.2 122 2.2 3.5 4.0 3.3 99 92 95 87 82 122 2.2 3.5 4.0 3.3 375 11 4.3 16 164 5.4 1 10 16 120 11 16 0 11 0 16 120 11 1222 1700 1183 1700 457 234 0.01 0.01 0.08 0.01 0.36 0.23 0.3 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A C C C C C C C C C C C C C C C C	Median type		None			None							
337 375 916 907 364 11 337 4.1 4.1 4.1 7.1 6.5 6.2 2.2 2 2 3.5 4.0 3.3 99 92 92 95 87 82 1222 1183 24 244 252 681 7 11 0 92 0 11 16 0 11 0 92 0 11 16 1222 1700 1183 1700 457 234 0.01 0.01 0.08 0.01 0.38 0.03 0.03 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A C C C C C C C C C C C C C C C	Median storage veh)												
337 375 916 907 364 10 4.1 4.1 4.1 7.1 6.5 6.2 2.2 2.2 3.5 4.0 3.3 99 99 82 95 87 82 1422 1183 NB1 SB1 244 252 681 122 1700 1183 1700 457 249 0.0 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A A C C C C C C C C C C C C C C	Jpstream signal (m)												
337 375 916 907 364 11 337 4.1 4.1 4.1 7.1 6.5 6.2 22 22 22 35 4.0 3.3 99 92 95 87 82 1222 148 NB1 NB1 SB1 EB1 EB2 NB1 NB2 NB1 SB1 11 0 92 0 11 16 54 0 11 0 16 120 11 1222 1700 1183 1700 457 234 0.01 0.08 0.01 0.36 0.23 0.2 0.0 2.0 0.012.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 1.5 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 0.3 0.0 2.5 0.0 12.9 6.9 1.5 0.0 2.5 0.0 12.9 6.9 1.5 0.0 2.5 0.0 17.2 24.9 1.5 0.0 2.5 0.0 17.2 24.9 1.5 0.0 2.5 0.0 17.2 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9 1.5 0.0 2.5 0.0 17.5 24.9	X, platoon unblocked												
337 375 916 907 364 11 4.1 4.1 7.1 6.5 6.2 2.2 2.2 3.5 4.0 3.3 99 92 92 95 87 82 1222 1183 16 164 54 1 1 413 16 164 54 1 1 0 92 0 11 16 1 1222 1700 1183 1700 457 234 0.01 0.01 0.08 0.01 0.29 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A C C C C C C C C C C C C C C C C	C, conflicting volume	337			375			916	206	364	1028	905	321
337 375 916 907 384 11 4.1 4.1 7.1 6.5 6.2 2.2 2.2 3.5 4.0 3.3 99 92 95 87 82 1222 1183 NB 1 8B 7 82 1222 1183 NB 1 8B 1 82 17 0 92 0 11 16 54 17 0 92 0 11 16 54 1722 170 183 170 457 234 0.01 0.01 0.08 0.01 0.36 0.23 0.2 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C	C1, stage 1 conf vol												
337 375 916 907 364 14 4.1 4.1 7.1 6.5 6.2	C2. stage 2 conf vol												
4.1 4.1 7.1 6.5 6.2 2.2 2.2 3.5 4.0 3.3 9.9 9.2 9.5 87 82 1222 1183 81 81 214 252 681 375 11 413 16 164 54 175 14 413 16 164 54 175 17 18 1700 457 234 0.01 0.06 0.01 0.36 0.23 0.2 0.0 0.2 0.0 0.2 0.3 0.0 2.0 0.12 9.6 0.3 0.0 2.5 0.0 17.2 24.9 A A A A C C C C C C C C C C C C C C C	'Cu, unblocked vol	337			375			916	206	364	1028	905	321
2.2 2.2 3.5 4.0 3.3 99 92 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 82 95 87 92 95 87 92 92 92 92 92 92 92 92 92 92 92 92 92	C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 3.5 4.0 3.3 122 3.5 4.0 3.3 122 3.5 4.0 3.3 122 3.5 4.0 3.3 122 3.5 4.0 3.3 122 122 3.5 4.0 3.3 122 122 144 252 6.81 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.	C, 2 stage (s)												
99 99 87 82 122 188 WB1 WB2 NB1 SB1 1975 11 413 16 164 54 11 0 92 0 11 16 102 1700 1183 1700 457 234 10.1 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A C C C C C C C C C C C C C C C C	F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1222 1183 214 252 681 184 18	00 queue free %	66			35			92	87	85	8	8	86
EB 1 EB 2 WB 1 WB 2 NB 1 SB 1 375	:M capacity (veh/h)	1222			1183			214	252	681	147	254	720
375 11 413 16 164 54 11 0 92 0 11 16 0 11 16 0 11 16 0 11 16 0 11 16 0 11 18 0 10 1 18 0 10 1 0.01 0.08 0.01 0.36 0.23 0 2 0 0 12 9 69 0 3 0.0 2.5 0.0 17.2 24.9 0 A A A C C 0 0 12 0.0 17.2 24.9 0 A A C C C 0 12 17.2 24.9 0 51 17.2 24.9 0 63 0.0 5.5 0.0 17.2 24.9 0 63 0.0 5.5 0.0 17.2 24.9 0 64 0.0 5.7 0.0 17.2 24.9 0 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Direction, Lane #	EB 1	EB 2	WB 1	WB2	NB 1	SB 1						
11 0 92 0 11 16 122 1700 1183 1700 457 234 0.01 0.01 0.08 0.01 0.23 0.2 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 A A A A C C 0.3 2.4 17.2 24.9 C C 1.3 2.4 17.2 24.9 C C 5.1 1.2 2.4 17.2 24.9 C C 6.3 2.4 17.2 24.9 C C 6.3 2.4 17.2 24.9 C C 7 1.2 24.9 C C 7	/olume Total	375	11	413	16	164	72						
1222 1700 118 1700 457 234 001 0.01 0.08 0.01 0.05 0.02 0.3 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 2.4 17.2 24.9 0.5 5.1 0.1 column 57.7% Idication 57.7% ICU Level of Service	/olume Left	=	0	92	0	=	16						
122 1700 1183 1700 457 234 0.01 0.01 0.08 0.01 0.38 0.23 0.2 0.0 2.0 0.0 12.9 6.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 2.4 17.2 24.9 0.5 5.1 6.1 CU Level of Service	/olume Right	0	7	0	16	120	7						
0.01 0.01 0.08 0.01 0.36 0.23 0.23 0.2 0.0 2.0 0.0 12.9 6.9 0.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 2.4 17.2 24.9 0.3 2.4 17.2 24.9 0.3 5.1 0.0 Level of Service	SH	1222	1700	1183	1700	457	234						
02 00 20 00 129 6.9 0.3 0.0 2.5 0.0 17.2 24.9 0.3 2.4 17.2 24.9 0.5 5.1 6.1 CU Level of Service	/olume to Capacity	0.01	0.01	0.08	0.01	0.36	0.23						
0.3 0.0 2.5 0.0 17.2 24.9 A A A C C C C C C C C C C C C C C C C C C	Jueue Length 95th (m)	0.2	0.0	2.0	0.0	12.9	6.9						
A A C C 0.3 2.4 17.2 24.9 C C C // // 5.1 Utilization 57.7% ICU Level of Service	Control Delay (s)	0.3	0.0	2.5	0.0	17.2	24.9						
0.3 2.4 17.2 24.9 C C /	ane LOS	∢		∢		ပ	ပ						
C C 6.1 Utilization 57.7% ICU Level of Service	Approach Delay (s)	0.3		2.4		17.2	24.9						
5.1 Evel of Service Utilization 57.7% ICU Level of Service	Approach LOS					O	ပ						
5.1 CU Level of Service 7.7% ICU Level of Service	ntersection Summary												
Utilization 57.7% ICU Level of Service	Average Delay			5.1									
	ntersection Capacity Utilization	_		27.7%	೦	U Level o	f Service			ш			
	Analysis Period (min)			15									

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HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

2032 Future Total (PM)

ICU Level of Service 0.92 45 45 45 0% 0.92 49 None None 0.7 16.8% 15 0.92 2.2 100 1551 54 0 0 0.03 0.03 0.00 攻 0.0 0.92 3.3 100 1016 59 50 0 0.00 0.10 0.6 A A A O.6 25 3.5 99 878 5 0 0.01 0.01 878 9.1 9.1 Stop 0% 0.92 5 116 116 Average Delay Intersection Capacity Utilization Analysis Period (min) Lane Configurations
Traffic Volume (vehin)
Sign Control
Grade
Peak Hour Factor
Hourly flow rate (vph)
Pedestrians
Lane Width (m)
Walking Speed (mis)
Percent Blockage
Right tum flare (veh)
Median type
Median storage veh)
Wedian storage veh
Wort un brocked vol
Conflicting volume
VC, stage 1 conf vol
C, stage 2 conf vol
C, stage 2 conf vol
C, singe (s)
C, singe (s)
F (s) cSH CSH Volume to Capacity Queue Length 95th (m) Control Delay (s) Lane LOS Approach Delay (s) Approach LOS Direction, Lane #
Volume Total
Volume Left
Volume Right

HCM Unsignalized Intersection Capacity Analysis 4: 3 Line & Wellington Road 19

Traffic Volume (vehih) 5 400 35 25 10 count of volume (vehih) 5 400 35 25 25 25 25 25 25 25 25 25 25 25 25 25	None None Section 1999	0 25 0 25 0 25 0 27 884		25 25 25 27 27 435	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stop 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 5 5
(s) (r) (m) (s) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d				0. 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stop 0 0% 0.92 0	5 5 0.92
(s) (s) (h) 5 400 35 (h/h) 5 400 35 (h/h) 5 400 35 (h/h) 6 400 35 (h/h) 8 (h/h) 9 (h/h				0 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stop 0 0% 0.92 0	5 0.92 5
(s) Free 1766 (h) 5 400 35 1766 (h) 5 435 38 38 (s) 6 400 35 (s) 6 435 38 (s) 6 400 6 400 6 400 6 6 6 6 6 6 6 6 6 6 6				0 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stop 0% 0.92 0	0.92
Free (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)					0.90	0.92 0.92	0.92
0% 0.92 0.92 435 38 435 38 407 0.02 0.02 0.02 0.02 0.00 0.08 0.00 0.08 0.00 0.08 0.00 0.08 0.00 0.08 0.00 0.08 0.00 0.00 0.08 0.00				0.92 27 435	0.92	0.92	0.92
(s) (s) (h) (h) (h) (h) (h) (h) (h) (h) (h) (h				27 27 435	0 0 806	0.92	0.92
(s) (h) (h) (n) (n) (n) (n) (n) (n) (n) (n) (n) (n				435	0 906	0	2
(s) (h) None		88 88		435	906		
(a) (b) (c) (c) (d) (d) (d) (d) (d) (e) (e) (e		88		435	906		
(s) (h) (n) (n) (n) (n) (n) (n) (n) (n) (n) (n		88 88		435	906		
(m) None (m)		88 88		435	906		
(ed		884		435	906		
380 380 4.1 2.2 100 1178 EB1 EB2 WB1 I 40 38 407 5 0 27 5 0 27 6 178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A A A A A A A A A A A A A A A A A		88		435	906		
380 380 4.1 2.2 100 1178 EB1 EB2 WB1 I 440 38 407 5 0 38 0 0.27 0.38 0 0.17 0.02 0.02 0.11 0.0 0.6 0.11 0.0 0.6 0.11 0.0 0.6 0.11 0.0 0.6 0.11 0.0 0.6 0.11 0.0 0.6		88		435	906		
380 380 4.1 2.2 100 1178 EB1 EB2 WB1 1 170 170 0.27 0.00 0.17 0.02 0.11 0.02 0.11 0.03 0.11 0.04 0.05 0.11 0.05 0.11 0.06 0.11 0.08 0.11 0.00 0.00 0.01 0.00		88		435	906		
380 4.1 2.2 100 1178 EB1 EB2 WB1 1 440 38 407 5 0 27 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.08 A A A A A A A A A A A A A A A A A A A		884		435	906		
380 4.1 4.1 2.2 100 1178 EB1 EB2 WB1 I 40 27 6 0 38 0 27 6 0 38 0 0 1778 1700 1089 0.00 0.02 0.02 0.11 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6	_	88		435	906		
380 4.1 2.2 100 1178 EB1 EB2 WB1 1 178 440 38 407 5 0 38 0 1778 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6		888		435		917	380
380 4.1 2.2 100 1178 EB1 EB2 WB1 1 440 38 407 5 0 27 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A 0.1 0.0 0.8		884		435			
380 4.1 2.2 100 1178 EB 1 EB 2 WB1 1 40 38 407 5 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 A A A 0.1 0.0 0.8		887		435			
2.2 100 1178 EB1 EB2 WB1 I 440 38 407 5 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.11 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6 0.1 0.0 0.6)	6/8		906	917	380
2.2 100 1178 EB1 EB2 WB1 1 440 38 407 5 0 27 0 178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A		7.1	6.5	6.2	7.1	6.5	6.2
22 100 1178 EB1 EB2 WB1 1 440 38 407 5 0 27 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A							
1178 EB1 EB2 WB1 1 440 38 407 5 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A 0.1 0.0 0.8		3.5		3.3	3.5	4.0	3.3
H178 HB1 HB2 WB1 I I I I I I I I I I I I I I I I I I I		06	100	96	100	100	8
EB1 EB2 WB1 1 440 38 407 5 0 27 0 38 0 1178 1700 1089 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A	_	256		621	240	264	299
440 38 407 5 0 27 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.8 A A A A	SB 1						
5 0 27 0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.8 A A A 0.1 0.8							
0 38 0 1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 A A A 0.1 0.8	0						
1178 1700 1089 0.00 0.02 0.02 0.1 0.0 0.6 0.1 0.0 0.8 A A A A A A 0.1							
0.00 0.02 0.02 0.02 0.03 0.04 0.06 0.06 0.08 0.08 0.08 0.09 0.09 0.09 0.09 0.09							
0.1 0.0 0.6 0.1 0.0 0.8 A A A A A A A A A A A A A A A A A A A							
0.1 0.0 0.8 A A A 0.1 0.8	0.2						
A A A O.1 0.8							
0.1 0.8	ω						
mmary	10.4						
mmary	В						
Average Delay 1.4							
ntersection Capacity Utilization 55.2%	ICU Level of Service	Service		æ			

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HCM Unsignalized Intersection Capacity Analysis 3: North Site Access/Golf Course Access & Wellington Road 19

2032 Future Total (SAT)

Movement EBL EBL EBL WBI WBI WBI NBI NBI NBI NBI NBI NBI NBI SBI SBI SBI SBI Lane Confliction		1	Ť	1	1	Ļ	1	•	—	•	۶	→	*
Configurations 1	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (verh) 15	Lane Configurations	je.	4		F	4			4			4	
Notice (Vehich) 15 410 38 15 385 10 25 0 15 15 0 15 or	Traffic Volume (veh/h)	15	410	32	15	355	9	22	0	15	15	0	15
Promotion of the point of the poin	Future Volume (Veh/h)	15	410	32	15	322	10	22	0	15	15	0	15
1	Sign Control		Free			Free			Stop			Stop	
Hour Factor 099 092 092 092 092 092 092 092 092 092	Grade		%0			%0			%0			%0	
March Marc	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
width (m) None None nt Blockage weh) None None nat Storage weh) None None aem signal (m) 397 484 931 926 465 918 940 aem signal (m) 397 484 931 926 465 918 940 attoger cont vol nublocked vol 397 4.1 4.1 7.1 6.5 6.2 7.1 6.5 940 stage 1 cont vol nublocked vol 397 4.1 4.1 7.1 6.5 6.2 7.1 6.5 940 stage 2 cont vol 1 4.1 4.1 7.1 6.5 6.2 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6	Hourly flow rate (vph)	16	446	88	16	386	1	27	0	16	16	0	16
Width (m) Width (m) No of Section (ms) None None None Ag4 931 926 465 918 940 Lum flace (sep) Am storage veh) Ag4 931 926 465 918 940 and spot cont vol microked A1 A2 A2 A2	Pedestrians												
9g Speed (m/s) In Blockage In Blockage In thype In thype In storkage well) In thype In storkage well) In thype In th	Lane Width (m)												
Int Blocklege Lun filtere (veh) Sam signal (m) Sam signal (Walking Speed (m/s)												
In the face (veh) In type In type In the material (m) In the materia	Percent Blockage												
n trype n storage veh) attoan withorded attoan storage veh) attoan withorded attoan withorded attoan withorded voi attoan without attoan with	Right turn flare (veh)												
ne storage veh) aem signale (iii) aem storage veh) aem storage veh) aem storage veh) aem storage veh aem storage vori vol attage 1 2,2 2,2 3,5 4,0 3,3 3,5 4,0 aem storage (s) aem s	Median type		None			None							
Para signal (m) and signal (m) and signal (m) as a signal (m)	Median storage veh)												
atron unblocked milliotyced a 397 484 931 926 465 918 940 milliotyced volue stage 2 cord vol stage 2 cord vol stage 2 cord vol stage 2 cord vol stage 3 cord vol 444 41 71 6.5 6.2 7.1 6.5 35 4.0 33 35 4.0 39 99 89 100 97 93 100 39 100 97 99 100 39 11 402 43 32 30 100 97 91 100 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 009 30 100 001 001 001 001 001 001 001 001 0	Upstream signal (m)												
rigidicting volume 397 484 931 926 465 918 940 stage to ordinal stage of confrol stage to ordinal stage to o	pX, platoon unblocked												
itage 1 cont vol latge 1 cont vol latge 2 cont vol latge 3 cont vol latge 2 cont vol latge 3 cont vol latge	vC, conflicting volume	397			484			931	926	465	918	940	392
Lage 2 cont vol 397 484 991 926 465 918 940 niblocked vol 37 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 3.5 4.0 3.3 3.5 4.0 stage free % 99 99 89 89 89 100 act free % 99 89 89 100 97 33 100 act free % 99 89 89 89 100 97 39 100 act free % 99 11 402 43 32 24 31 100 inc. Land 1162 1162 1079 1079 304 35 24 30 34 34 34 34 34 34 34 34 34 34 34 34 34 34	vC1, stage 1 conf vol												
rublocked vol 397 484 931 926 465 918 940 sige (s) 4.1 4.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 sue free % 99 89 89 100 97 93 100 pacity (velvh) 1162 WB1 WB1 NB1 SB1 4.0 3.3 3.5 4.0 scint, Lane # EB1 EB2 WB1 MB2 NB1 SB1 4.0 3.3 3.5 4.0 scint, Lane # EB1 EB2 WB1 MB1 SB1 4.2 2.2 3.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 2.5 4.0 <td>vC2, stage 2 conf vol</td> <td></td>	vC2, stage 2 conf vol												
gge (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 pacify (veh/h) 1162 WB 1 WB 2 NB 1 SB 1 2.2 7.1 6.5 6.2 7.1 6.5 pacify (veh/h) 1162 WB 1 WB 2 NB 1 SB 1 2.2 2.0 3.2 4.0 3.3 4.0 pacify (veh/h) 1162 WB 1 WB 2 NB 1 SB 1 2.2 2.0 2.0 3.0 4.0 2.0 <th< td=""><td>vCu, unblocked vol</td><td>397</td><td></td><td></td><td>484</td><td></td><td></td><td>931</td><td>926</td><td>465</td><td>918</td><td>940</td><td>392</td></th<>	vCu, unblocked vol	397			484			931	926	465	918	940	392
stage (s) 2.2 3.5 4.0 3.3 3.5 4.0 sue free % 99 99 89 100 97 93 100 pacify (velr/h) 1162 1079 236 261 597 240 256 4 pacify (velr/h) 1162 11 489 11 402 43 32 240 256 6 in Cralal 11 489 11 402 43 32 24 256 6 in Capacity 0 3 0 11 6 6 8 1 26 8 in Capacity 0.01 0.01 0.01 0.01 0.01 0.03 34 32 4 in Engith 95th (m) 0.3 0.4 3.82 2.4 2.4 2.4 2.4 co Capacity 0.01 0.01 0.01 0.01 0.01 0.01 0.03 0.04 3.82 2.4 2.4 2.4 <td>tC, single (s)</td> <td>4.1</td> <td></td> <td></td> <td>4.1</td> <td></td> <td></td> <td>7.1</td> <td>6.5</td> <td>6.2</td> <td>7.1</td> <td>6.5</td> <td>6.2</td>	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 22 35 4.0 34 4.0 34 5.0 4.0 34 5.4 4.0 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 4.0 34 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4	tC, 2 stage (s)												
152 1079 1	⊕ (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1162 WB1 WB2 NB1 SB1 SB1 SB2 SB2 SB3	p0 queue free %	66			66			83	100	97	93	100	88
EB1 EB2 WB1 WB2 NB1 SB1 11 489 11 402 43 32 11 5 11 5 71 16 0 8 0 11 16 16 1162 1162 1079 1079 304 352 0.01 0.01 0.01 0.01 0.14 0.09 m) 0.3 0.3 0.4 0.4 3.9 24 M A A A C C O A A A A C C C O A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A A C C C O A A A A A C C C O A A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C O A A A A A C C C C C C C C C C C C C C	cM capacity (veh/h)	1162			1079			236	261	262	240	256	657
11 489 11 402 43 32 0 8 11 5 17 16 0 8 0 1 16 16 1162 1162 1079 1079 304 352 0.01 0.01 0.01 0.01 0.14 0.09 10) 0.3 0.3 0.4 0.4 3.9 2.4 8 1 0.2 84 0.3 18 16.2 A A A A A C C 0.4 0.5 188 16.2 C C V 1.8 16.2 C C 1.8 16.2 C C 1.8 16.2 C C 1.8 16.2 1.8 16.2	Direction, Lane #	EB 1	EB2	WB1	WB2	NB 1	SB 1						
11 5 11 5 27 16 0 8 8 0 11 16 16 1162 1182 1079 1079 394 352 0 0 1 0 0 1 0 0 1 0 14 0 0 9 1 0 3 0 3 0 4 0 4 3 9 2.4 1 0 2 8.4 0 3 18 16.2 A A A A C C 0 A A A A C C 1 18 16.2 C C Utilization 28.0% ICU Level of Service	Volume Total	7	489	1	402	43	32						
(1462 1462 1079 1079 304 352 (170 107 001 001 001 000 009 (170 107 001 001 001 009 (170 107 001 001 001 009 (170 107 001 001 009 (170 108 109 109 (170 108 109 109 (170 108 109 109 (170 108 109 109 (170 108 109 109 109 109 109 109 109 109 109 109	Volume Left	=	2	7	2	27	16						
1162 1162 1079 1079 394 352 m) 0.01 0.01 0.01 0.01 0.04 0.09 m) 0.3 0.4 0.4 0.3 188 16.2 A A A A C C C C V 1.8 162 C C C V 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162 1.8 162	Volume Right	0	89	0	=	16	16						
m) 0.3 0.3 0.4 0.0 0.14 0.09 m) 0.3 0.3 0.4 0.4 3.9 2.4 8.1 0.2 8.4 0.3 18.8 16.2 A A A C C 0.4 0.5 18.8 16.2 C C V 1.8 16.2 Utilization 28.0% ICU Level of Service	cSH	1162	1162	1079	1079	304	352						
m) 0.3 0.3 0.4 0.4 3.9 2.4 8.1 0.2 8.4 0.3 18.8 16.2 0.4 0.5 18.8 16.2 C C 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.	Volume to Capacity	0.01	0.01	0.01	0.01	0.14	0.09						
8.1 0.2 8.4 0.3 18.8 16.2 A A A A C C C C C C C L C C C C C C C C L C C C C	Queue Length 95th (m)	0.3	0.3	0.4	0.4	3.9	2.4						
A A A C C 0.4 0.5 188 16.2 C C V 18 18 16.2 C C V 18 18 16.2 I C C 18 18 16.2	Control Delay (s)	8.1	0.2	8.4	0.3	18.8	16.2						
0.4 0.5 18.8 16.2 C C V 1.8 Utilization 28.0% ICU Level of Service	Lane LOS	∢	∢	∢	∢	O	O						
C C 18 18 Utilization 28.0% ICU Level of Service 15	Approach Delay (s)	0.4		0.5		18.8	16.2						
1.8 1.0 Level of Service 15 15 15 15 15 15 15 15 15 15 15 15 15	Approach LOS					O	ပ						
1.8 Utilization 28.0% ICU Level of Service 15	Intersection Summary												
Utilization 28.0% ICU Level of Service	Average Delay			1.8	2					4			
	Intersection Capacity Utilizar	tion		28.0%	0	U Level o	Service			⋖			
	Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 6: 3 Line & East Site Access

																																								A	
*	SBR		2	2			0.92	2																																ICU Level of Service	
→	SBT	42	20	20	Free	%0	0.92	72						None																										U Level o	
←	NBT	4	4	40	Free	%0	0.92	43						None																										ੁ	
•	NBL		0	0			0.92	0										29			20	4.1		2.2	100	1545	SB 1	29	0	2	1200	0.03	0.0	0.0		0.0			0.4	13.3%	12
-	EBR		0	0			0.92	0										26			26	6.2		3.3	100	1010	NB 1	43	0	0	1545	0.00	0.0	0.0		0.0					
1	EBL	>	2	2	Stop	%0	0.92	2										100			100	6.4		3.5	66	888	EB 1	2	2	0	836	0.01	0.1	9.0	∢	9.0	∢			_	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (m)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction, Lane #	Volume Total	Volume Left	Volume Right	cSH	Volume to Capacity	Queue Length 95th (m)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

Synchro 11 Report 02-27-2023 BA Group

2032 Future Total (SAT)		
HCM Unsignalized Intersection Capacity Analysis	5: 3 Line & West Site Access	

→ ← ✓ /*	EBR NBL NBT SBT		45	0 45	Free Free		0					adoN adoN				62 65			62 65	6.2 4.1			1002 1537	NB1 SB1	w.	0 0	į		0.0		00				0.4	13.3% ICU Level of Service	15
•	Movement EBL	Lane Configurations	Traffic Volume (veh/h) 5	ne (Veh/h)	Sign Control Stop	our Factor (Hourly flow rate (vph) 5	Pedestrians	Lane Width (m)	Walking Speed (m/s)	Percent Blockage	Right With flate (Veri) Median type	Median type Median storage veh)	Unstream signal (m)	pX, platoon unblocked	vC, conflicting volume 112	vC1, stage 1 conf vol	vC2, stage 2 conf vol	lov be:	tC, single (s) 6.4	stage (s)		cM capacity (veh/h) 885	Direction, Lane # EB 1		Volume Left 5	ne Right		Queue Lerigin 35m (m) 0.1	Control Delay (s) 9.1		Apploacii Delay (s)	Approach LOS A	Intersection Summary	Average Delay	Intersection Capacity Utilization	Analysis Period (min)

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 \square
80% SATISFIED -	YES 🗖	NO 🗆

			JIREMENT BRACKE	S)		F	PERCENTAC		NT				
APPROACH LANES	1	1	2 or N	IORE			HOUR	ENDING					
FLOW CONDITION	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW								TOTAL ACROSS	
A. ALL APPROACH	480 (385)	720 (575)	600 (480)	900 (720)									
LANES		100% FU	ILFILLED										SECTIONAL
LANES			ILFILLED										PERCENT
	ACTUA	AL % IF BE	LOW 80%	VALUE									-
											Т	OTAL DOW	V / 8 =
B. MINOR STREET	120* (95)*	170* (135)*	120* (95)*	170* (135)*								TOTAL ACROSS	
BOTH APPROACHES		100% FU	LFILLED	•									SECTIONAL
BOTTAFFROACTIES	80% FULFILLED						PERCENT						
	ACTUA	AL % IF BE	LOW 80%	VALUE									PERCENT
						•		•		•	1 т	OTAL DOW	1/8=

^{*} 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

										SFIED – SFIED –		YES YES	
			IREMENT BRACKE			ı	PERCENTA	GE WARRA	NT				
APPROACH LANES	1		2 or I	MORE			HOUF	RENDING					
FLOW CONDITION		RESTR. FLOW	FREE FLOW	RESTR. FLOW								TOTAL ACROSS	
A. MAJOR STREET	480 (385)	720 (575)	600 (480)	900 (720)									
BOTH APPROACHES		100% FULFILLED 80% FULFILLED											SECTIONAL PERCENT
	ACTUAL	ACTUAL % IF BELOW 80% VALUE									Т	OTAL DOW	N / 8 =
										L		O I AL DOWN	170
B. TRAFFIC	50 (40)											TOTAL ACROSS	
CROSSING MAJOR	1	100% FULFILLED											SECTIONAL
STREET			LFILLED										PERCENT
	ACTUAL	. % IF BE	LOW 80%	VALUE								OTAL DOW!	
												OTAL DOW	N / δ =

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:

- 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 eighthour 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

		Minimum	Requirement	Minimum E	Requirement 2		Compliance	
Justification	Description	1	Highways	1	ore lanes	Sect	ional	Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
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			
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:

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

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

Deadurer Condition	Full Eight-hour Count	Estimate Available	AHV Only Available
Roadway Condition	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%

	6860-39 Wellington Road 19 / 2 L	.ine	Base S	cenario											
ITE 210 - Single-Family Deta	ched Housing Tempora	al Variation													
Time Ending	% of daily total		neak hour												
8:00	6.7	100	n/												
9:00	6.2	939													
12:00	5.2	789	%												
13:00	5.5	619	%												
14:00	6	679													
16:00	7.2	809													
17:00	9	100													
18:00	8.8	989	%												
Temporal Variation															
Time Ending	NBL	NBT NB	R SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR				
8:00		100% 100			100%	100%	100%	100%	100%	100%	100%	AM Peak			
												AIVI Peak			
9:00		93% 939		93%	93%	93%	93%	93%	93%	93%	93%				
12:00	78%	78% 789	% 78%	78%	78%	78%	78%	78%	78%	78%	78%				
13:00	61%	61% 619	% 61%	61%	61%	61%	61%	61%	61%	61%	61%				
14:00		67% 679		67%	67%	67%	67%	67%	67%	67%	67%				
16:00		80% 809		80%	80%	80%	80%	80%	80%	80%	80%				
17:00		100% 100			100%	100%	100%	100%	100%	100%	100%	PM Peak			
18:00	98%	98% 989	% 98%	98%	98%	98%	98%	98%	98%	98%	98%				
Existing Volumes															
Time Ending	NBL	NBT NB	R SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR				
8:00	11	44 10		25	14	12	196	5	60	238	12				
9:00	11	23 10		31	16	16	201	9	57	217	13	AM Peak			
12:00	3	11 52		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		10	14	10	161	11	59	123	3				
17:00	14	31 11		29	12	9	202	12	52	200	14	PM Peak			
												PM Peak			
18:00	13	27 94	11	27	9	10	237	9	69	206	11				
2032 Corridor Growth Volun	nes														
Time Ending	NBL	NBT NB	R 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												444 D I			
	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				
			0	0	0	0	50		0	50	0	PM Peak			
17:00 18:00	0	0 0	0	0	0	0	49	0	0	49	0	PIVI Peak			
	•			·	ŭ	Ü	-10	·	Ü		Ü				
Site Traffic															
Time Ending 8:00	NBL 0	NBT NB 0 11		SBT 0	SBR 0	EBL 0	EBT 11	EBR 0	WBL 16	WBT 22	WBR 5				
												444 D I			
9:00	0	0 10		0	0	0	10	0	15	20	5	AM Peak			
12:00	0	0 8		0	0	0	8	0	13	17	4				
13:00	0	0 12		0	0	0	18	0	9	12	0				
14:00	0	0 13	3	0	0	0	20	0	10	13	0				
16:00	Ö	0 16		ō	ō	ō	24	ō	12	16	ō				
17:00	0	0 20		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												All	Minor	Major	Min Vel
Time Ending	NBL	NBT NB	R SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	7 44		major	• • •
							239			297		000	00:	000	
8:00	11	44 11		25	14	12		5	76		17	862	204	628	
9:00	11	23 11:	2 11	31	16	16	241	9	72	272	18	832	204	628	
12:00	3	11 60	1	5	10	7	135	6	71	168	4	481	90	390	
13:00	10	8 77		13	3	7	148	9	58	146	2	486	116	370	
14:00	5	7 74		13	4	6	179	14	70	153	2	534	110	424	
16:00	18			10	14	10	225	11	71	179	3	635		499	
17:00	14	31 13		29	12	9	282	12	67	270	14	886	232	654	
18:00	13	27 11	4 16	27	9	10	315	9	84	274	11	909	205	703	
0.11															
8-Hour Volume															

Future Total (20	31)	
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

Justification	Requirement					FUTU					
	1 lane Free Flow										
	FIEE FIOW	8:00	9:00	12:00	13:00	Ending	16:00	17:00	10.00		onal Percen
Min Vehicle Volumes		0.00	9.00	12:00	13.00	14.00	16:00	17:00	10.00		
A. Vehicle volumes all approaches	480	862	832	481	486	534	635	886	909		
**	Score	####	####	####	####	####	####	####	####		
		100%	100%	100%	100%	100%	100%	100%	100%	100%	
Vehicle volumes, minor streets Delay to Cross Traffic	120	204	204	90	116	110	136	232	205		92%
	Score	####	####	75%	97%	91%	####	####	####		
		100%	100%	75%	80%	80%	100%	100%	100%	92%	
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%	

Minor Major Veh+ped

Project No.	6860-39												
ntersection	Wellington Road 19	/ 3 Line		Base Scer	nario								
TE 210 - Single-Family D	etached Housing Tem	noral Variatio	on										
Time Ending	% of daily		f 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%										
emporal 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%	
ulatina Valumaa													
xisting 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
													Ам Реак
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	
032 Corridor Growth Vo	lumes												
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	AWITGAN
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	РМ Реак
10.00	U	U	U	U	U	U	U	49	U	U	43	U	
ite 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	
32 Future Total	NBL	MOT	NDD	051	0.0.7	000	EBL			wo	WOT	WDD	All
Time Ending		NBT	NBR	SBL	SBT	SBR		EBT	EBR	WBL	WBT	WBR	
8:00	13	0	16	0	0	0	1	176	12	6	194	0	419
9:00	50	1	16	0	0	2	2	167	33	10	221	0	502
12:00	19	0	13	2	0	4	1	193	10	8	201	0	452
13:00	19	0	9	0	0	0	4	195	22	11	181	2	443
14:00	19	0	13	0	0	2	2	203	17	9	192	1	458
16:00	20	0	15	1	0	2	3	247	16	17	219	0	540
17:00	53	0	14	1	0	3	5	282	48	13	282	0	701
18:00	19	0	13	0	0	2	3	262	21	11	253	0	584

8-Hour	Volum

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		

			IVIIIIOI												
nor	M	lajor	Veh+ped	TRAFFIC SIGNAL WARRANTS - OTM	Book 12, Justifi	cations	s 1 & 2			FUTUI					
	69 69	433 433		Justification	Requirement 1 lane					FUIU	ΧE.				
	39	413	26		Free Flow				Hour	Ending				Averaço	nal Percent
	28	415	24			8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
	34	424	24	Min Vehicle Volumes											
	38	502	26	A. Vehicle volumes all approaches	480	419	502	452	443	458	540	701	584		
	71	630			Score	87%	####	94%	92%	95%	####	####	####		
	34	550			00016	80%	100%	80%	80%	80%	100%	100%	100%	90%	
	34	550	24			00%	100%	00%	00%	00%	100%	100%	100%	90%	
															40%
				 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%		
					30016	37%	100%	52%	48%	49%	52%	100%	48%	61%	
						0.76	10076	5276	-13 /6	-370	UL /0	10076	3 / 6	0170	

OVERALL WARRANT FOR TRAFFIC SIGNAL IS 61%

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

STEP 1

AHV

Combined Vehicle and Pedestrian All Approaches Minor Streets Major Street Crossing Artery from Minor Streets

amPHV Lefts + peds pmPHV Lefts + peds (30+5)333 304 20 AHV = (amPHV+pmPHV)/4 2B

STEP 2

JUSTIFICATION 7 Compliance Minimum Requirement 1 Lane Justification Description Highways Sectional ENTIRE Free Flow Restr. Flow Restr. Flow Numerical A. Vehicle volume, all approaches (average 480 333 69% I. Minimum hour) 24% Vehicular Volume B. Vehicle volume, along minor streets (average 120 24% 29 hour) Does not apply. A. Vehicle volume, major street (average hour) 480 304 63% 2. Delay to cross 40% B. Combined vehicle and pedestrian volume traffic crossing artery from minor streets (average 50 20 40% hour)

*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:

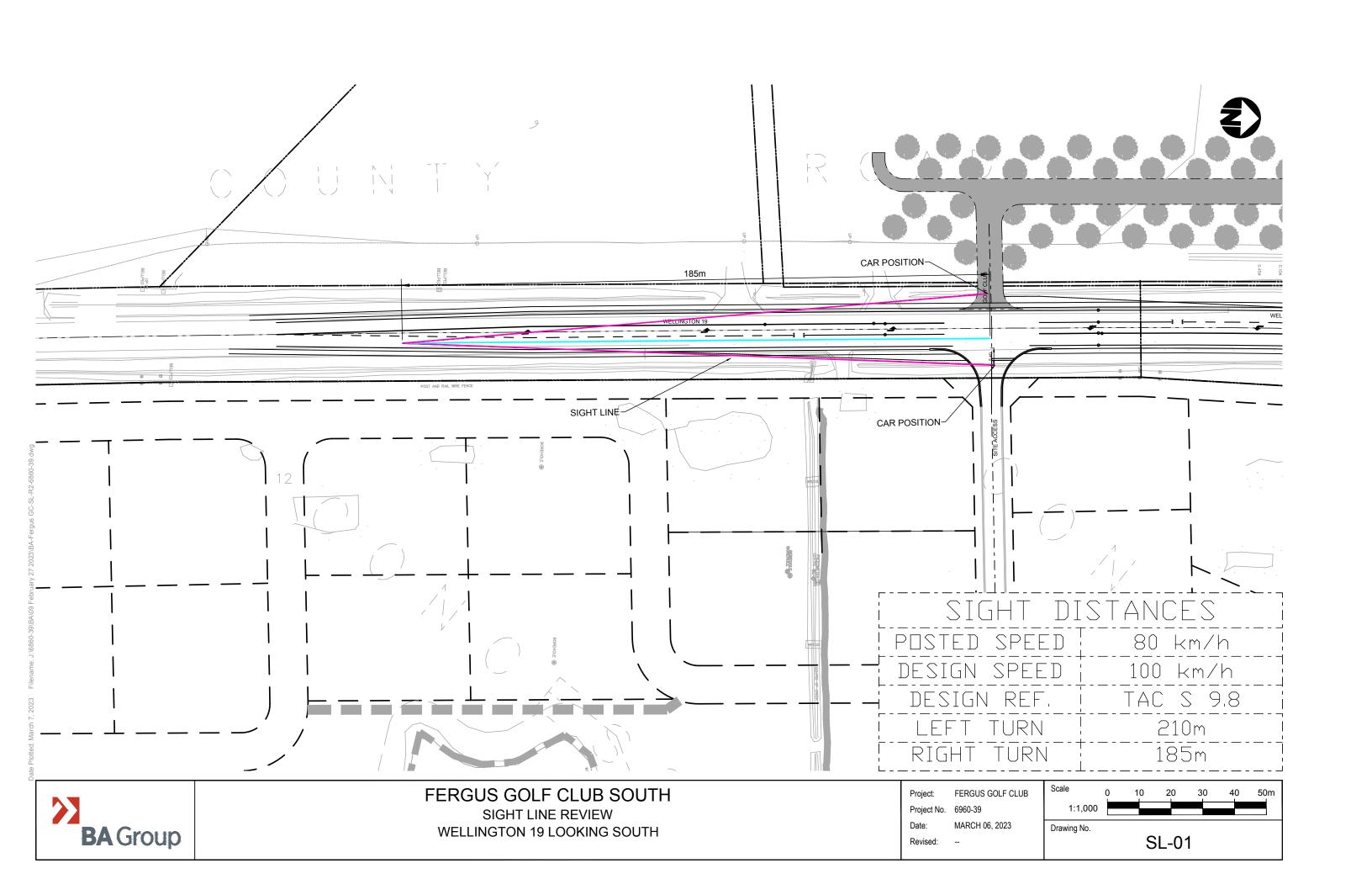
Analysis Using Average Hour Volume

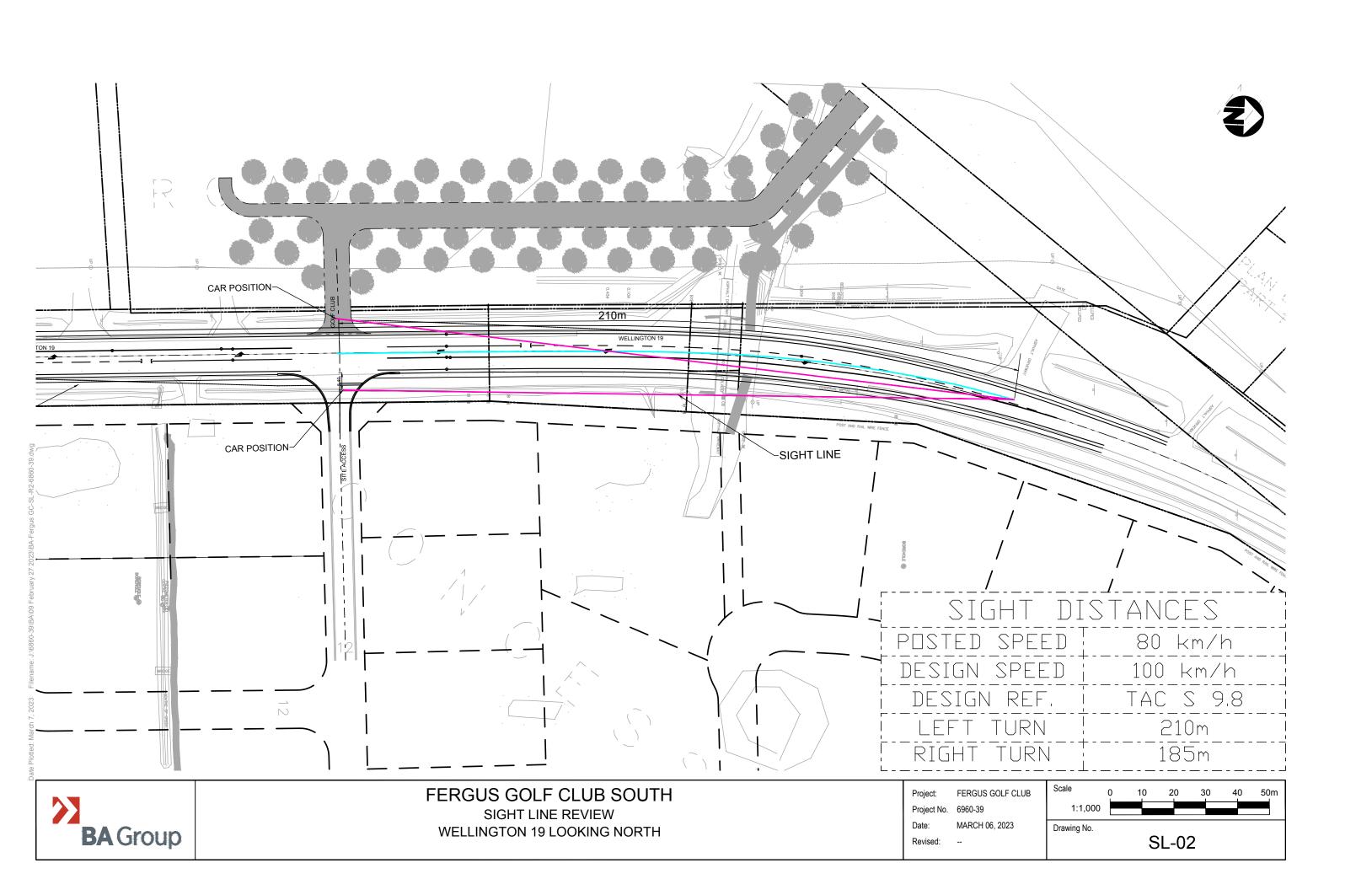
For traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a 50% increase for a future intersection or roadway.

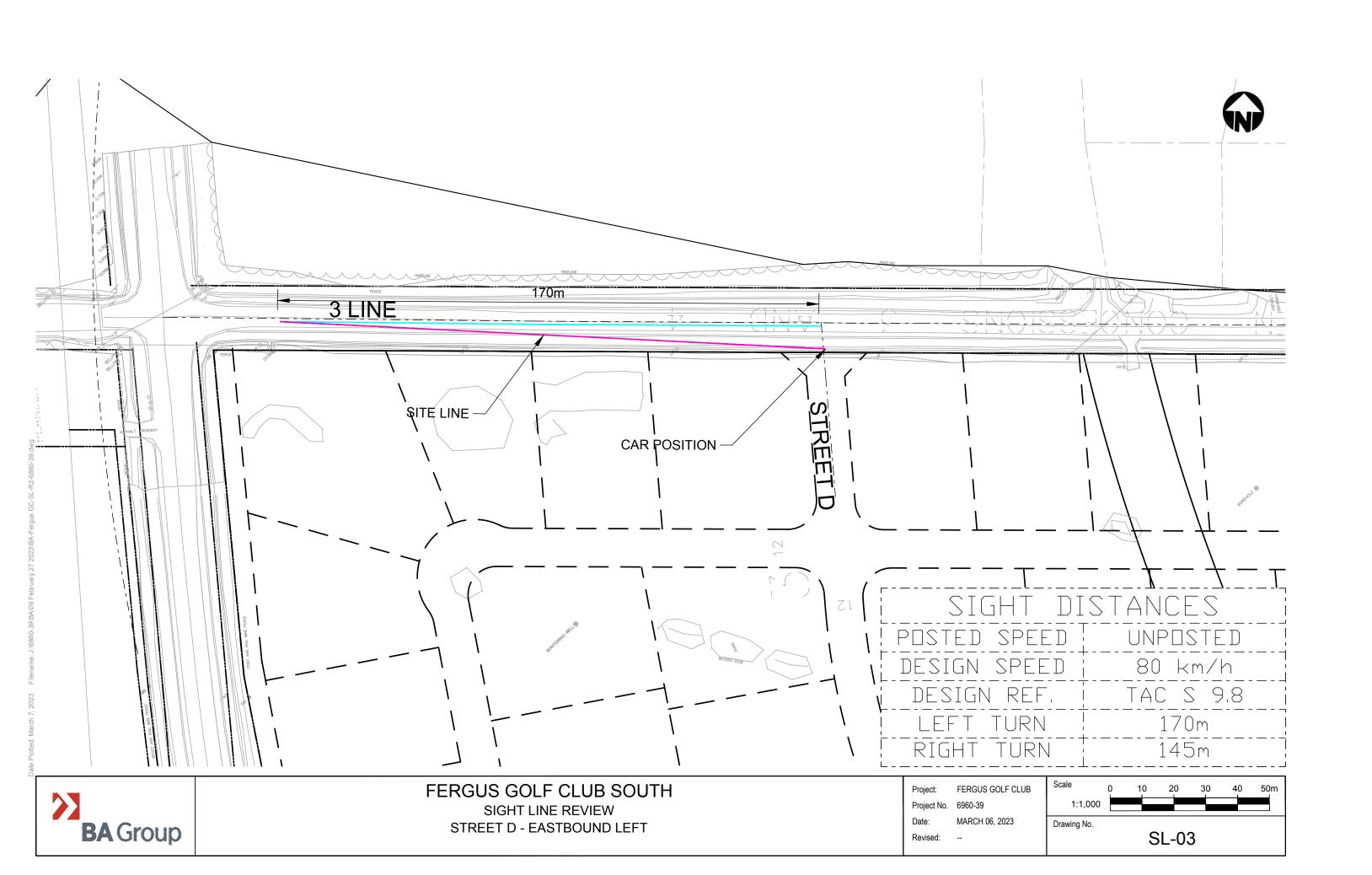
40% 150% NOT WARRANTED

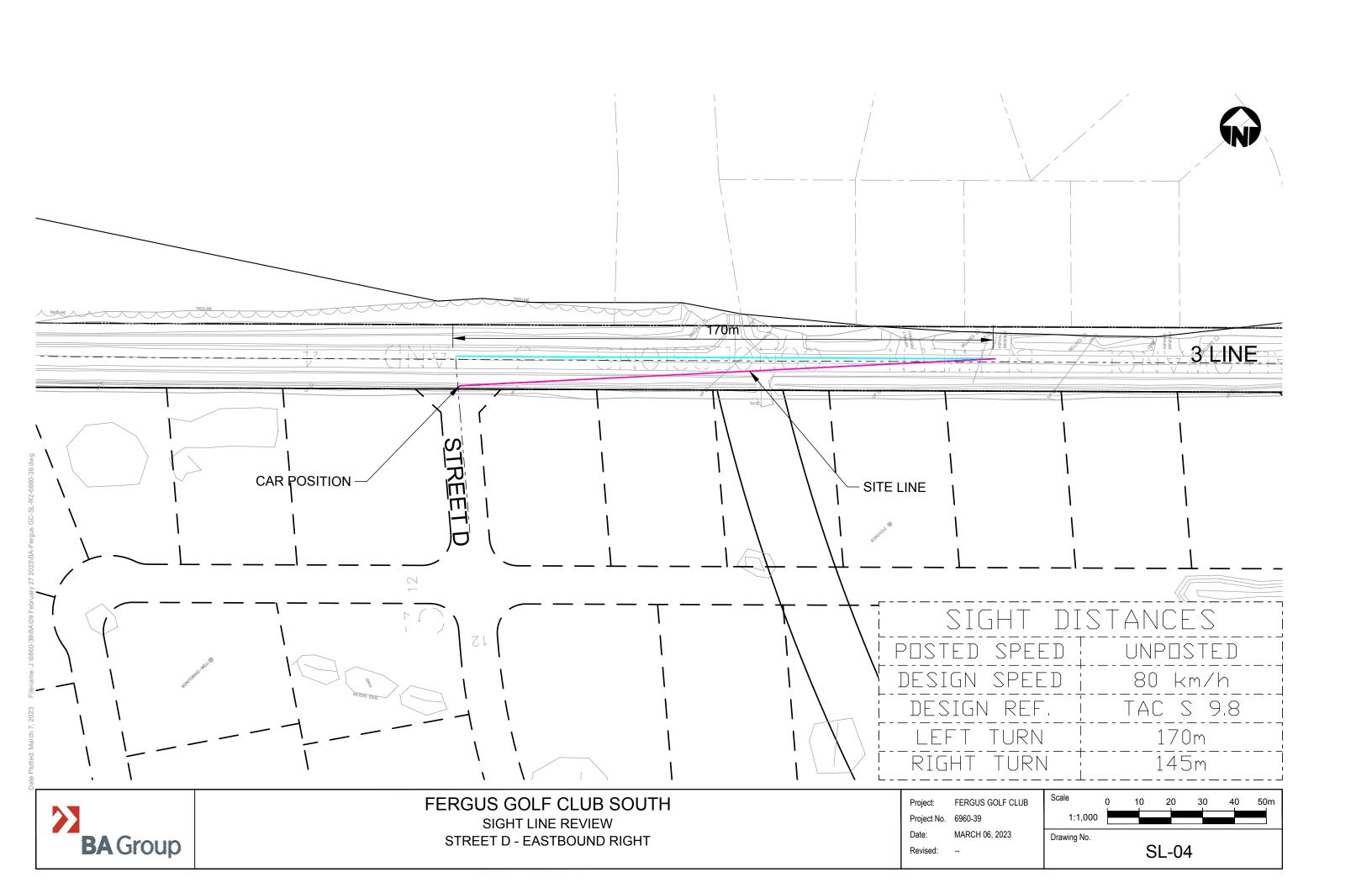
Required:

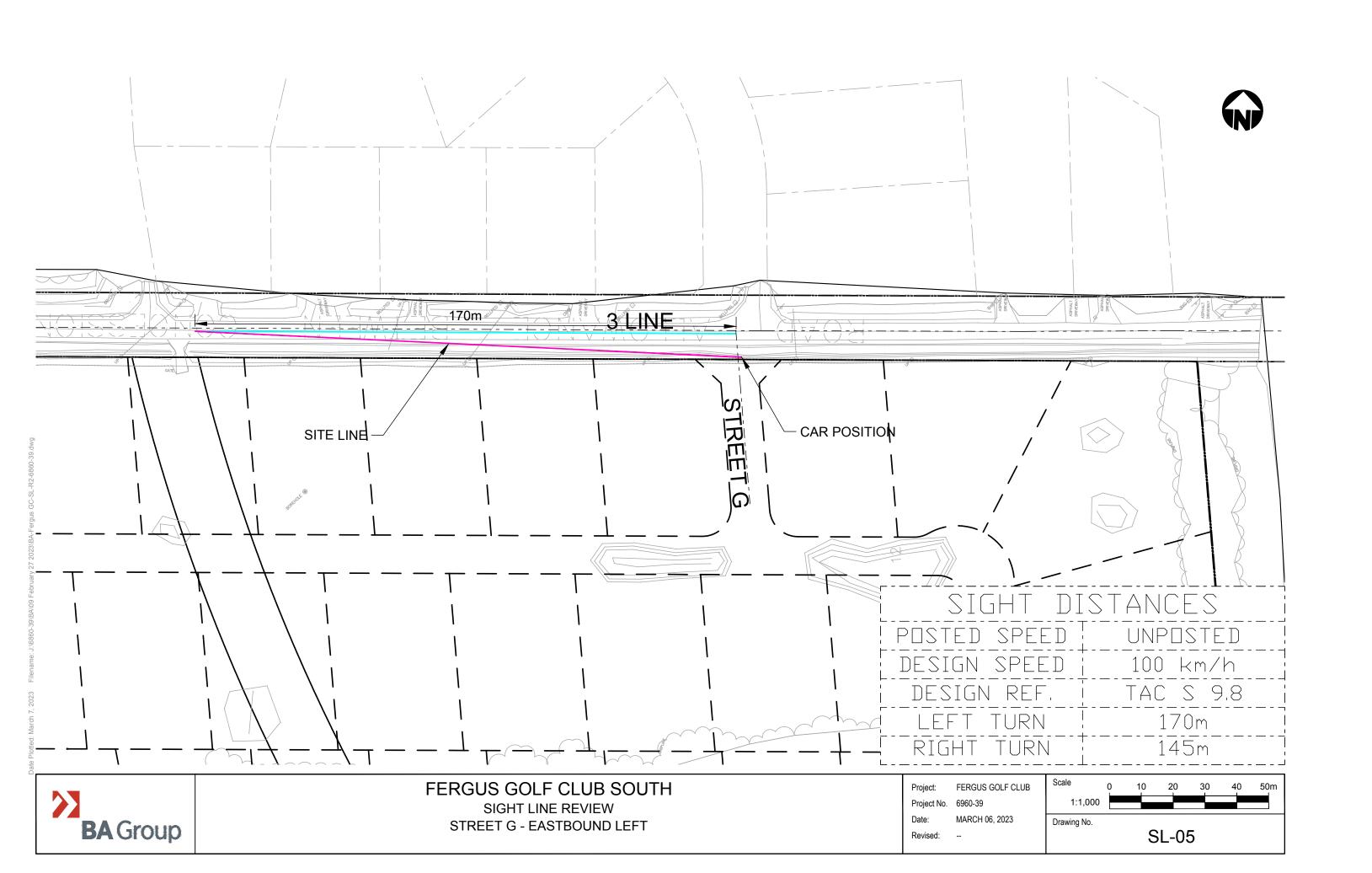
Appendix F Sight Distance Assessments

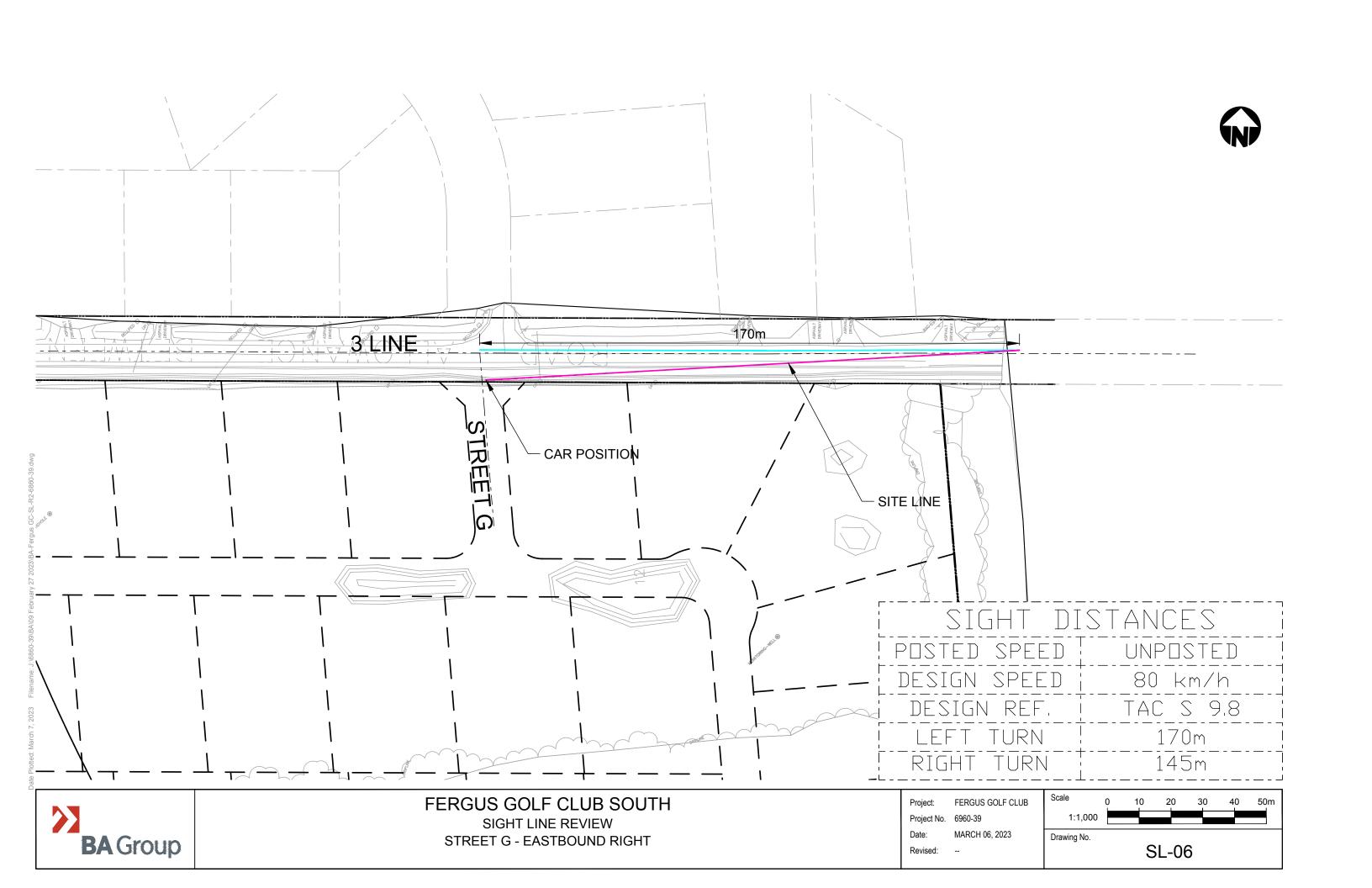


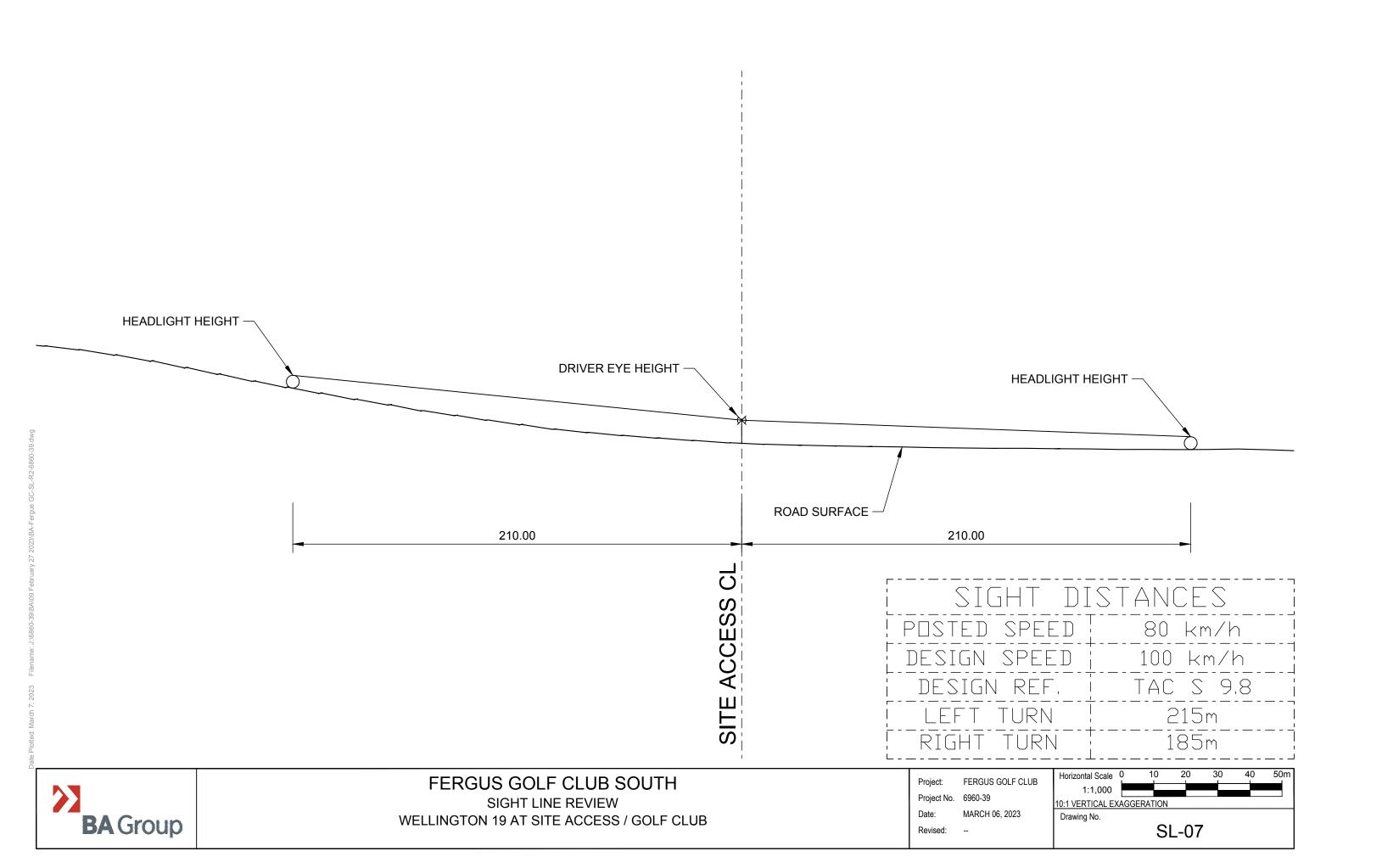


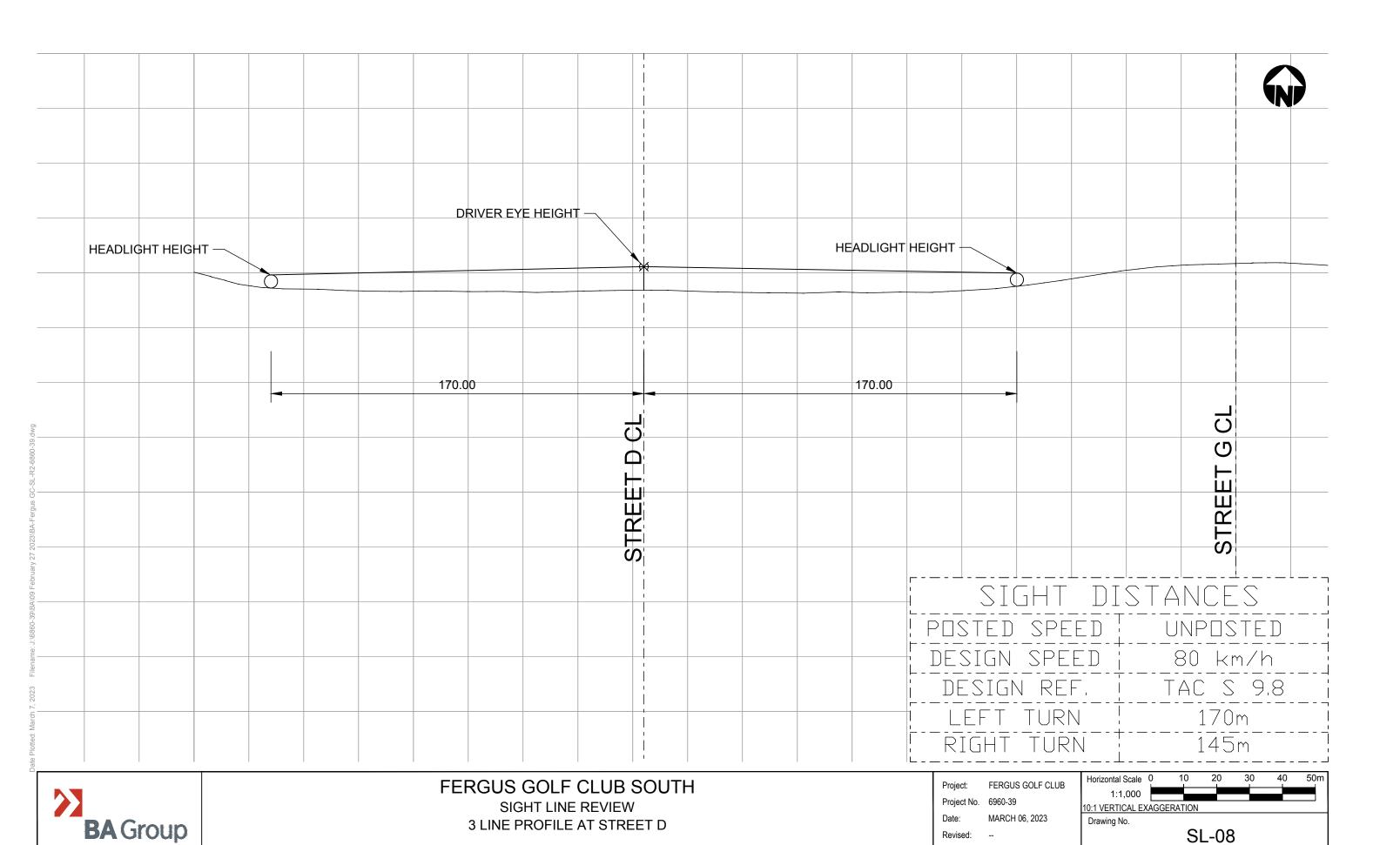




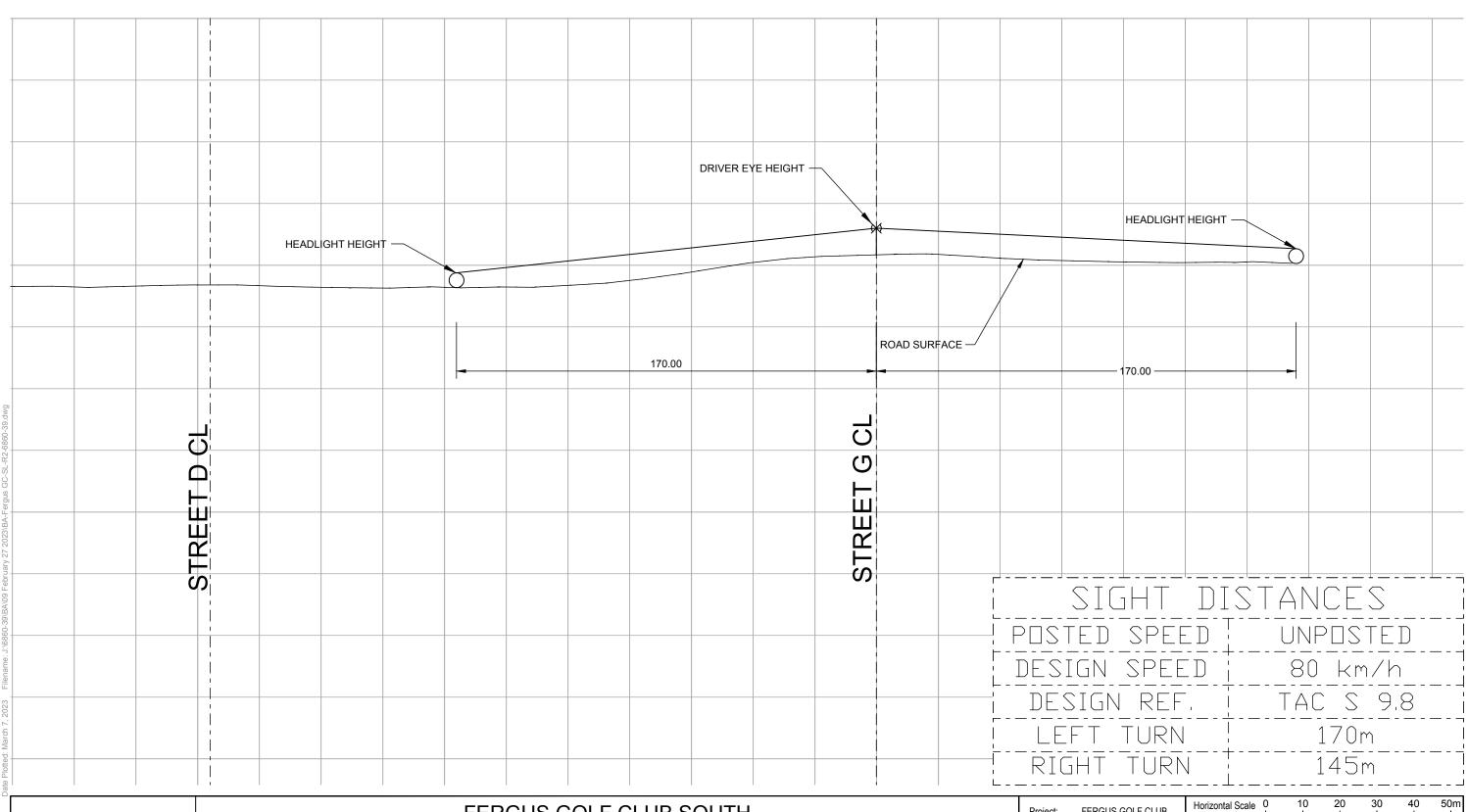








Revised:



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 0 10 20 30 40 50m 1:1,000 10:1 VERTICAL EXAGGERATION Drawing No.

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: <u>image001.jpg</u>

image004.jpg 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



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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 $V_A = V_T + V_L$

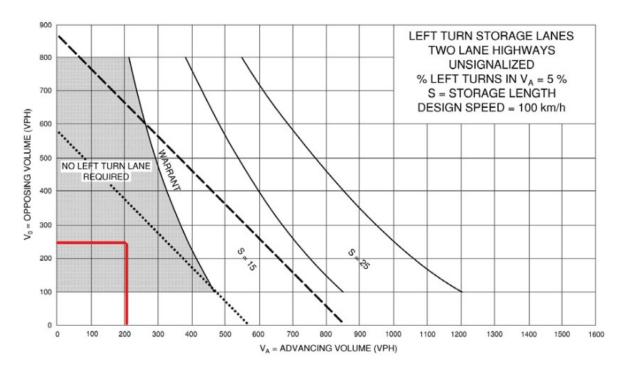
Advancing Traffic Volume $V_A = 195 + 10$

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%



Existing Thru Traffic Volume: $V_T = 235$

Opposing Traffic Volume: $V_O = 205$

Left Turn Traffic Volume: $V_L = 10$

Advancing Traffic Volume $V_A = V_T + V_L$

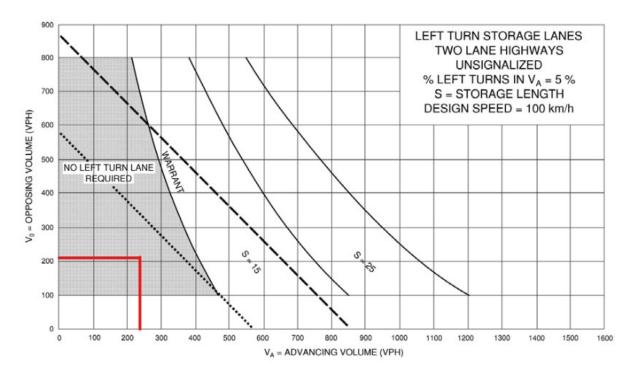
 $Advancing\ Traffic\ Volume\ V_A = 235 + 10$

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 $V_A = V_T + V_L$

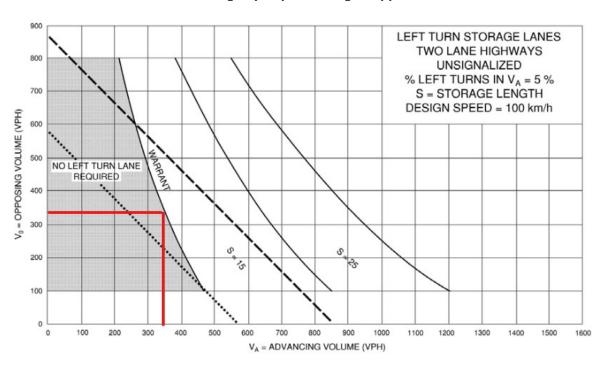
Advancing Traffic Volume $V_A = 330 + 15$

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%



Existing Thru Traffic Volume: $V_T = 320$

Opposing Traffic Volume: $V_O = 370$

Left Turn Traffic Volume: $V_L = 20$

Advancing Traffic Volume $V_A = V_T + V_L$

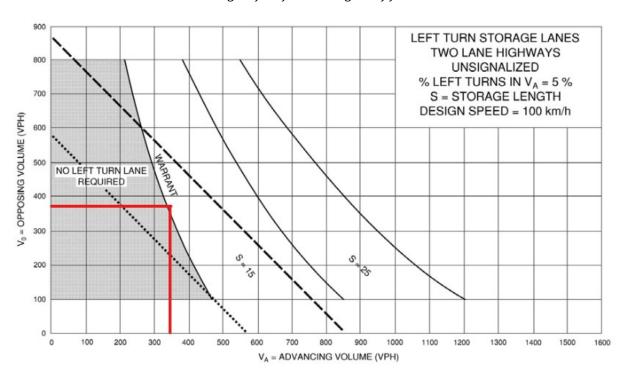
Advancing Traffic Volume $V_A = 320 + 20$

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 $V_A = V_T + V_L$

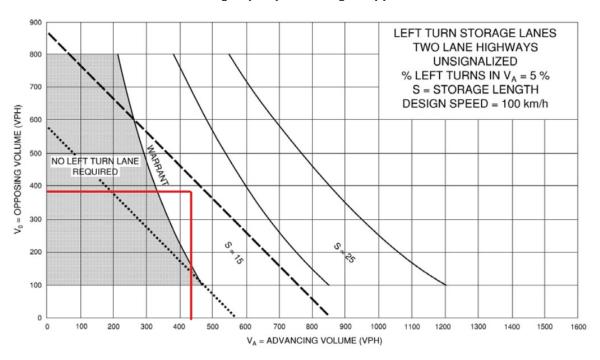
Advancing Traffic Volume $V_A = 410 + 15$

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%



Existing Thru Traffic Volume: $V_T = 355$

Opposing Traffic Volume: $V_O = 460$

Left Turn Traffic Volume: $V_L = 15$

Advancing Traffic Volume $V_A = V_T + V_L$

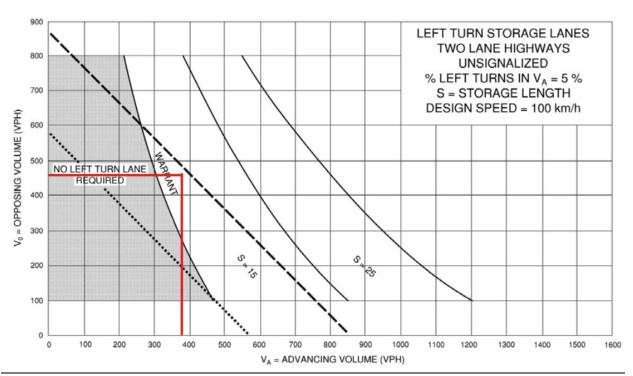
 $Advancing\ Traffic\ Volume\ V_A = 355 + 20$

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 $V_A = V_T + V_L$

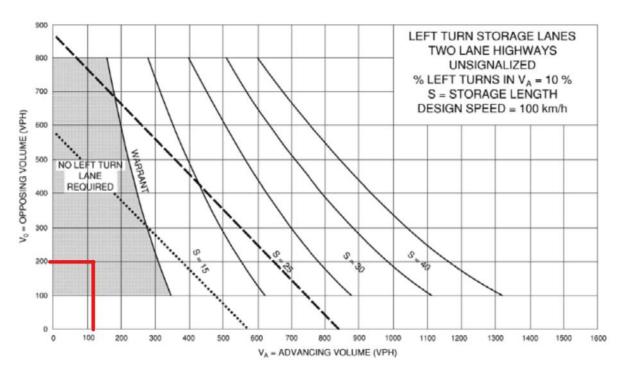
 $Advancing\ Traffic\ Volume\ V_A=110+10$

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%



Existing Thru Traffic Volume: $V_T = 135$

Opposing Traffic Volume: $V_O = 125$

Left Turn Traffic Volume: $V_L = 60$

Advancing Traffic Volume $V_A = V_T + V_L$

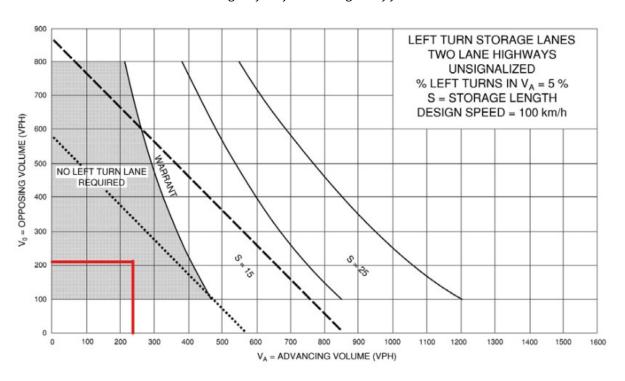
Advancing Traffic Volume $V_A = 135 + 60$

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 $V_A = V_T + V_L$

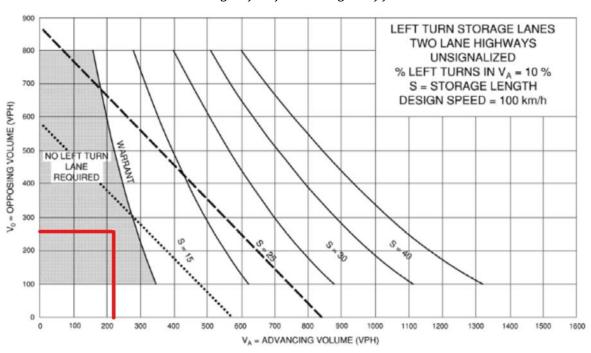
Advancing Traffic Volume $V_A = 190 + 20$

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%



Existing Thru Traffic Volume: $V_T = 190$

Opposing Traffic Volume: $V_O = 220$

Left Turn Traffic Volume: $V_L = 65$

Advancing Traffic Volume $V_A = V_T + V_L$

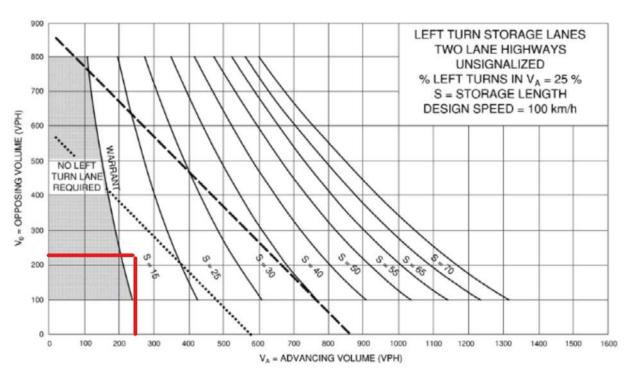
Advancing Traffic Volume $V_A = 190 + 65$

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 $V_A = V_T + V_L$

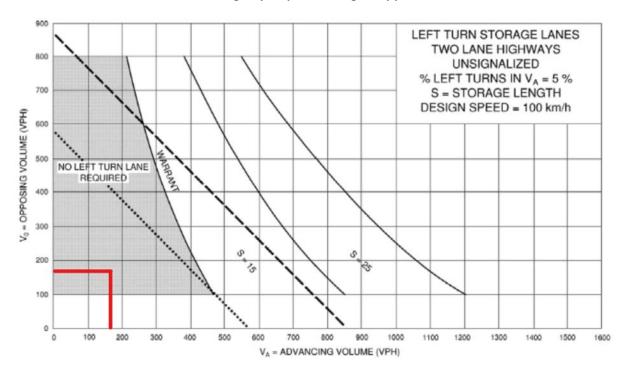
Advancing Traffic Volume $V_A = 165 + 5$

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 $V_A = V_T + V_L$

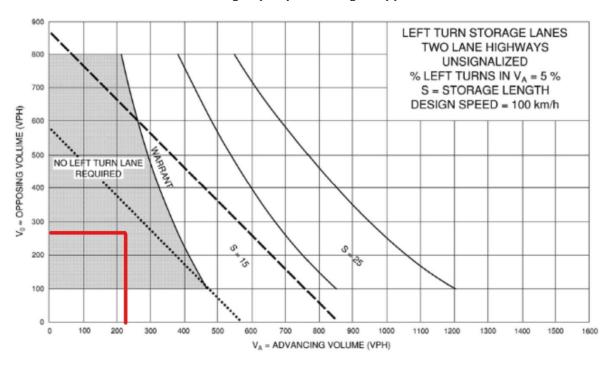
Advancing Traffic Volume $V_A = 220 + 5$

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%



Existing Thru Traffic Volume: $V_T = 215$

Opposing Traffic Volume: $V_O = 265$

Left Turn Traffic Volume: $V_L = 5$

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

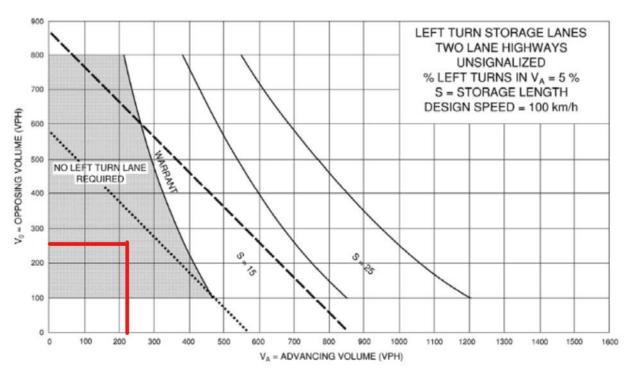
Advancing Traffic Volume $V_A = 215 + 5$

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 $V_A = V_T + V_L$

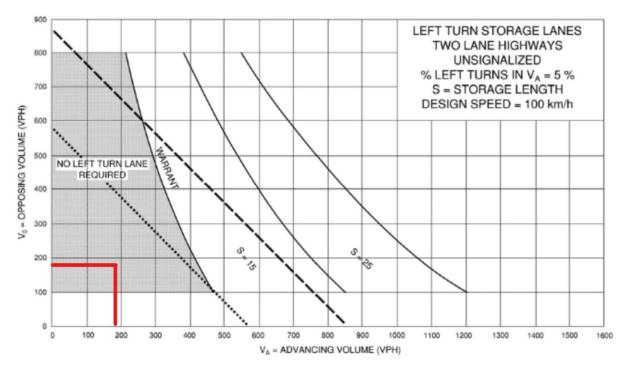
Advancing Traffic Volume $V_A = 180 + 5$

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 $V_A = V_T + V_L$

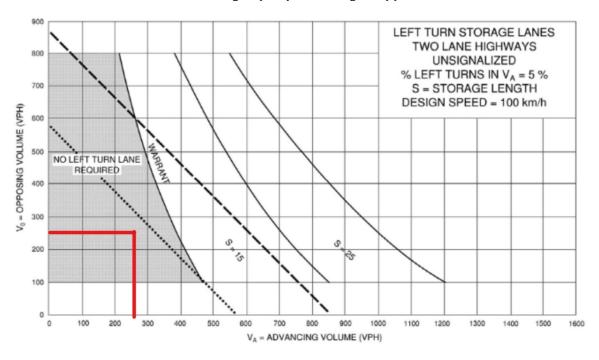
Advancing Traffic Volume $V_A = 260 + 5$

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%



Existing Thru Traffic Volume: $V_T = 250$

Opposing Traffic Volume: $V_O = 305$

Left Turn Traffic Volume: $V_L = 5$

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

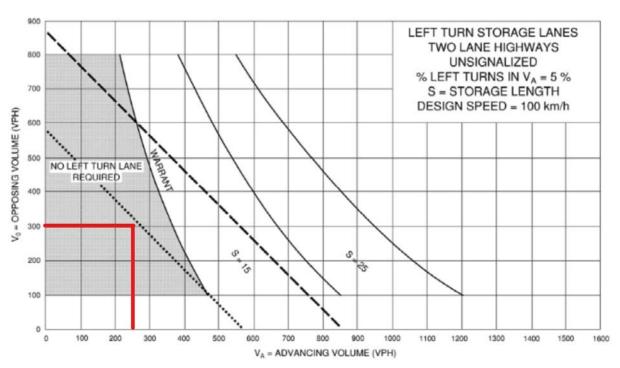
Advancing Traffic Volume $V_A = 250 + 5$

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 $V_A = V_T + V_L$

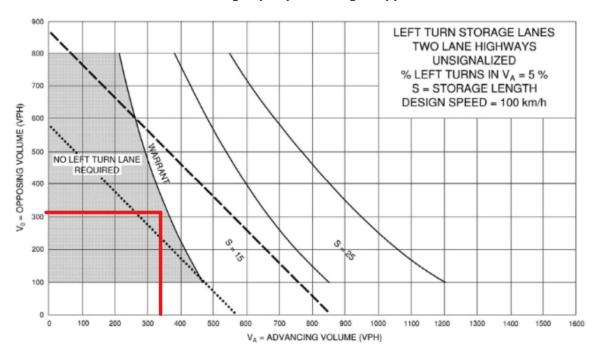
Advancing Traffic Volume $V_A = 335 + 5$

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%



Existing Thru Traffic Volume: $V_T = 295$

Opposing Traffic Volume: $V_0 = 375$

Left Turn Traffic Volume: $V_L = 15$

Advancing Traffic Volume $V_A = V_T + V_L$

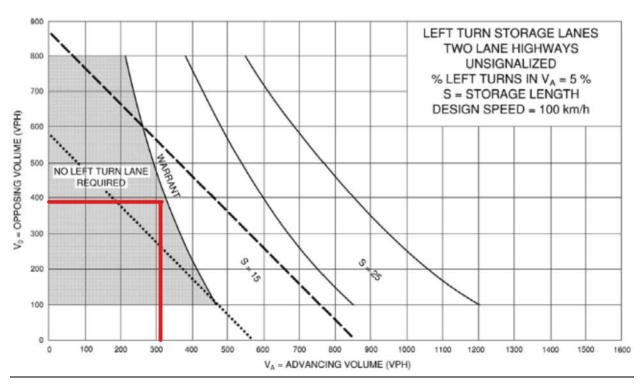
 $Advancing\ Traffic\ Volume\ V_A = 295 + 15$

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 $V_A = V_T + V_L$

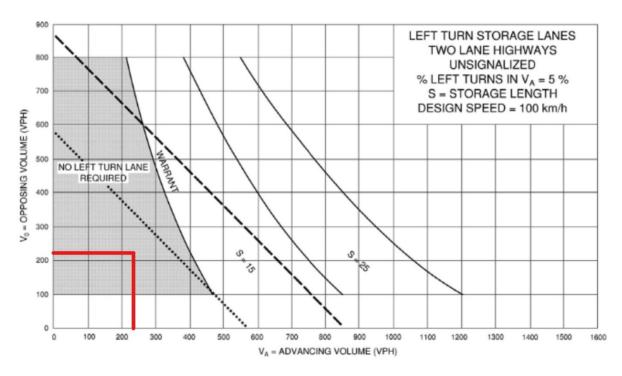
 $Advancing\ Traffic\ Volume\ V_A = 220 + 10$

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 $V_A = V_T + V_L$

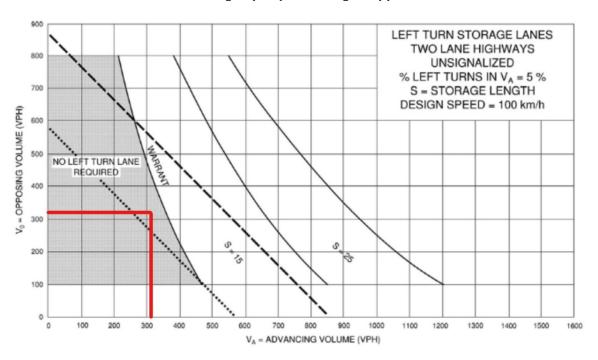
Advancing Traffic Volume $V_A = 305 + 5$

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%



Existing Thru Traffic Volume: $V_T = 305$

Opposing Traffic Volume: $V_O = 350$

Left Turn Traffic Volume: $V_L = 15$

Advancing Traffic Volume $V_A = V_T + V_L$

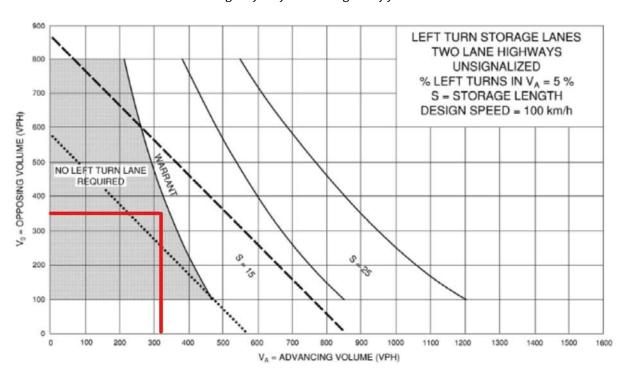
Advancing Traffic Volume $V_A = 305 + 15$

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: $V_0 = 375$

Left Turn Traffic Volume: $V_L = 5$

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

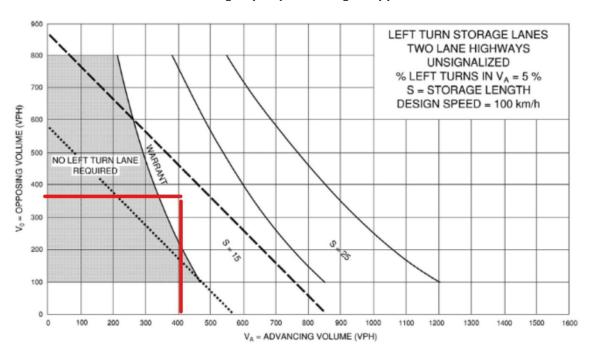
Advancing Traffic Volume $V_A = 400 + 5$

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%



Existing Thru Traffic Volume: $V_T = 350$

Opposing Traffic Volume: $V_O = 440$

Left Turn Traffic Volume: $V_L = 25$

Advancing Traffic Volume $V_A = V_T + V_L$

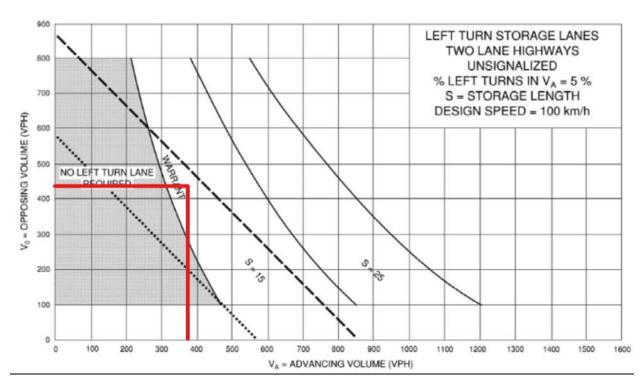
Advancing Traffic Volume $V_A = 350 + 25$

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

