# 350 Wellington Road 7 Township of Wellington County of Centre Wellington

Traffic Impact Study for Elora 7 OP Inc.

> Type of Document: Final Report

> > Project Number: JDE – 22030

Date Submitted: November 2<sup>nd</sup>, 2022 Revised: April 27<sup>th</sup>, 2023

John Northcote, P.Eng. Professional License #: 100124071



# **Legal Notification**

This report was prepared by JD Northcote Engineering Inc. for the account of Elora 7 OP Inc.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **JD Northcote Engineering Inc.** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.



# **Executive Summary**

This report summarizes the traffic impact study for the proposed community, on a site municipally known as 350 Wellington Road 7, located on the south side of Wellington Road 7, midblock between David Street West and Wellington Road 18, in the Township of Centre Wellington [Township], County of Wellington [County]. The report assesses the impact of traffic related to the community on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed community will consist of 273 townhouse units.

The proposed community will have three access driveways onto Wellington Road 7 [North Access, Centre Access, South Access].

The scope of this analysis includes a review of the following intersections:

- Wellington Road 7 / Wellington Road 18;
- Wellington Road 7 / Middlebrook Road / David Street West;
- Wellington Road 7 / North Access
- Wellington Road 7 / Centre Access; and
- Wellington Road 7 / South Access.

### Conclusions

- 1. The proposed community is expected to generate a 110 AM and 140 PM peak hour trips.
- 2. Detailed intersection counts were conducted at the study intersection on Thursday August 4<sup>th</sup>, 2022.
- 3. An intersection operation analysis was completed at the study area intersections, using the existing (2022) and background (2027 & 2032) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed community. The following improvements are recommended to coincide with the increase in posted speed limit to 60 km/h on Wellington Road 7:

#### Background (2027) Traffic Volumes

- Wellington Road 7 / Middlebrook Road / David Street West
  - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 65 metre taper length.
  - Widen Wellington Road 7 to provide a southbound left turn lane with a 25 metre storage length, 50 metre parallel length and 80 metre taper length.
- 4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area street and intersections.
- 5. An intersection operation analysis was completed under total (2027 & 2032) traffic volumes with the proposed community operational at the study area intersections. The following improvements are recommended prior to occupancy of the proposed development:
  - Wellington Road 7 / North Access
    - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 15 metre parallel length and 65 metre taper length.



- Wellington Road 7 / Centre Access
  - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.
- Wellington Road 7 / South Access
  - Widen road to accommodate a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.
- Wellington Road 7 / South Street
  - Widen road to accommodate a southbound left turn lane with a 15 metre storage length, 15 metre parallel length and 65 metre taper length.
  - Wellington Road 7 / Middlebrook Road / David Street West
    - Advance northbound and southbound left turn lane construction to coincide with above-noted road improvements.
- 6. The proposed North Access, Centre Access and South Access will operate efficiently as fullmovement accesses, with one-way stop control for eastbound movements. A single ingress and egress lane at the North Access, Centre Access and South Access will provide the necessary capacity to service the proposed community.
- 7. It is recommended the Client install a Level 2 Type C pedestrian crossing at the north leg of the Wellington Road 7 / Middlebrook Road / David Street West intersection.
- 8. It is recommended the County maintain the posted 50km/h speed limit within the study area (between Middlebrook Road / David Street West and Wellington Road 18). The following traffic calming measures are recommended to support the posted 50km/h speed limit:
  - Construct a raised median island on Wellington Road 7, north of the subject site to provide a visual cue that will link the two adjacent low-speed sections on Wellington Road 7 (to be completed by the Client);
  - Provide enhanced street tree plantings on both sides of Wellington Road 7, between Middlebrook Road / David Street West and the bridge over the Grand River (to be completed by the Client); and
  - Extend the existing sidewalk from the bridge over the Grand River to Middlebrook Road, to activate the boulevard of Wellington Road 7 and also provide additional pedestrian access to the Elora Gorge Trail (to be completed by the Township).
- 9. The proposed parking supply meets the minimum requirements in the Township's Zoning Bylaw 2009-045.
- 10. In summary the proposed community will not cause any operational issues and will not add significant delay or congestion to the local roadway network.



# **Table of Contents**

1	Introduction	1
1.1	Background	1
1.2	Study Area	1
1.3	Study Scope and Objectives	3
1.4	Horizon Year and Analysis Periods	3
2	Information Gathering	3
2.1	Street and Intersection Characteristics	3
2.2	Local Transportation Infrastructure Improvements	5
2.3	Transit Access	5
2.4	Other Developments within the Study Area	5
2.5	Background Traffic Growth	5
2.6	Traffic Counts	6
2.7	Horizon Year Traffic Volumes	8
3	Intersection Operation without Proposed Community1	1
3.1	Intersection Capacity Analysis Criteria1	1
3.2	Existing (2022) Intersection Operation1	2
3.3	Background (2027) Intersection Operation1	3
3.4	Background (2032) Intersection Operation1	4
4	Proposed Community1	6
4.1	Traffic Generation1	6
4.2	Traffic Assignment1	6
4.3	Total Horizon Year Traffic Volumes with the Proposed Community1	9
5	Intersection Operation with Proposed Community2	2
5.1	Total (2027) Intersection Operation	2
5.2	Total (2032) Intersection Operation	4
5.3	Site Access	5
5.4	Pedestrian Connectivity Review2	5
5.5	Sight Distance Review2	6
5.6	Speed Management Review2	6
5.7	Parking Review2	7
6	Summary2	8



# **List of Tables**

Table 1 – Traffic Count Data	6
Table 2 – Level of Service Criteria for Intersections	. 12
Table 3 – Existing (2022) LOS	. 12
Table 4 – Background (2027) LOS	. 14
Table 5 – Background (2032) LOS	. 15
Table 6 – Estimated Traffic Generation for the Subject Site	. 16
Table 7 – Proposed Community Traffic Distribution	. 17
Table 8 – Total (2027) LOS	.23
Table 9 – Total (2032) LOS	.24
Table 10 - Zoning By-law Parking Requirements	. 27

# **List of Figures**

Figure 1 – Proposed Site Location and Study Area	2
Figure 2 – Existing (2022) Intersection Spacing and Lane Configuration within Study Area	4
Figure 3 – Existing (2022) Traffic Volumes	7
Figure 4 – Background (2027) Traffic Volumes	9
Figure 5 – Background (2032) Traffic Volumes	10
Figure 6 – Proposed Community Traffic Assignment	18
Figure 7 – Total (2027) Traffic Volumes	20
Figure 8 – Total (2032) Traffic Volumes	21

# **List of Appendices**

APPENDIX B – Traffic Count Data

APPENDIX C – Synchro Analysis Output – Existing Traffic Volumes

APPENDIX D – Synchro Analysis Output – Background Traffic Volumes

APPENDIX E – Synchro Analysis Output – Total Traffic Volumes

APPENDIX F – MTO Left Turn Analysis

APPENDIX G – OTM Signal Justification Sheets

APPENDIX H – Pedestrian Crossing Warrant

APPENDIX I – 2016 Transportation Tomorrow Survey Output



# 1 Introduction

### 1.1 Background

**Elora 7 OP Inc.** [The Client] is proposing a residential community located on a site municipally known as 350 Wellington Road 7, located on the south side of Wellington Road 7, midblock between David Street West and Wellington Road 18, in the Township of Centre Wellington [Township], County of Wellington [County].

The proposed community will consist of 273 townhouse units.

The proposed community will have three access driveways onto Wellington Road 7 [North Access, Centre Access, South Access].

The Client has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic impact study in support of the proposed community.

### 1.2 Study Area

**Figure 1** shows the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by MHBC is provided in **Appendix A**.

The subject site is bound by Wellington Road 7 to the northeast and undeveloped rural lands to the northwest, southwest and southeast.

Through consultation with the Township and County, the following intersections are included in this study:

- Wellington Road 7 / Wellington Road 18;
- Wellington Road 7 / Middlebrook Road / David Street West;
- Wellington Road 7 / North Access
- Wellington Road 7 / Centre Access; and
- Wellington Road 7 / South Access.





### Figure 1 – Proposed Site Location and Study Area



## 1.3 **Study Scope and Objectives**

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Consult with the Township and County to address any traffic-related issues or concerns they have with the proposed community;
- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed community was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed community) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed community and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed community) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;
- Review the suitability of the study area road network to accommodate future community growth;
- Complete a review of the proposed site accesses;
- Review the proposed parking supply and assess the suitability for the proposed community; and
- Document findings and recommendations in a final report.

## 1.4 Horizon Year and Analysis Periods

Traffic scenarios for the existing year (2022) and horizon years (2027 & 2032) were selected for analysis of traffic operations in the study area. The weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

# 2 Information Gathering

## 2.1 Street and Intersection Characteristics

**Wellington Road 7** is a two-lane arterial road with a posted speed limit of 50km/h in the study area. Wellington Road 7, south of David Street West has an urban cross-section with a sidewalk on the east side of the road. Wellington Road 7 north of David Street West has a rural cross-section with paved shoulders extending 268 metres, where it transitions with gravel shoulders for 781 metres and transitions north of this segment with paved shoulders in the study area. Wellington Road 7 is under jurisdiction of the County.

**Wellington Road 18 (Woolwich Street West)** is a two-lane arterial road with a posted speed limit of 50km/h in the study area. Wellington Road 18 east of Wellington Road 7 has an urban cross-section with a sidewalk on the north side of the road. Wellington Road 18 west of Wellington Road 7 has a rural cross-section with gravel shoulders. Wellington Road 18 is under jurisdiction of the County.

*Middlebrook Road* is a two-lane local road with a rural cross-section and gravel shoulders. Middlebrook Road has an unposted (assumed) speed limit of 60km/h within the study area and is under jurisdiction of the Township.

**David Street West** is a two-lane collector road with an urban cross-section and a sidewalk on both sides of the road in the study area. David Street West has an unposted (assumed) speed limit of 50km/h within the study area and is under jurisdiction of the Township.



The existing intersection spacing and lane configuration within the study area is illustrated in Figure 2.







## 2.2 Local Transportation Infrastructure Improvements

Based on a review of the County's Capital Budget (2022) and Township's Capital Budget (2022) there are no planned improvements that would impact traffic in the study area.

Based on a review of the County's Road Master Action Plan (December 2021) [RMAP] the following improvements were recommended in the plan:

Wellington Road 7 – from the Elora / Salem Community to the Highway 6 Junction (10 – 20 years)

• Widen the roadway and provide one additional lane per direction.

Wellington Road 7 – from Side Road 11 to First Line

- Increase speed limit from 50 km/h to 60 km/h; and
- Urbanization of the road segment.

Wellington Road 7 / Wellington Road 18 (2032)

- Install single lane roundabout; and
- Construct paved shoulders on Wellington Road 18.

Since the above noted improvements are not in the County's Capital Budget 10-year horizon (2022 - 2031) and the above noted improvements are generally planned in the long-term horizon, we have not assumed the above noted improvements in the analysis.

### 2.3 Transit Access

There is no transit service available in the Township. The County's RMAP identified a potential fixedroute transit service to operate in the County; however, there are no current plans to implement this transit system.

The RIDE WELL ride sharing service is provided by the County to provide on-demand shared rides. RIDE WELL provides connections within the County and City of Guelph as long as the origin or destination is within the County. RIDE WELL operates Monday to Friday from 06:00 – 19:00.

### 2.4 **Other Developments within the Study Area**

The Township is experiencing a growth in new urban development within the urban areas and in the rural areas adjacent to the boundaries of the Township. Based on correspondence with the Township, it was determined that utilization of conservative background growth factor would be sufficient in capturing the future development volumes in Section 2.5.

## 2.5 Background Traffic Growth

Based on the County's RMAP, a 0.4% nominal compound annual growth rate was applied to the County roads to account for background growth in the County.

The Township's Transportation Master Plan (2019) [TMP] generated traffic projections model based on a Emme traffic modelling software for the existing (2019) and future (2041) horizon years. Using on the Emme traffic model data, comparing the existing (2019) and future (2041) for the preferred alternative improvements in the Township scenarios, a background traffic growth rate was calculated. The background traffic growth rate calculated on Wellington Road 7, Wellington Road 18 and Middlebrook Road were 2.8%, 3.3% and 1.7% respectively. Based on direction provided by the Township, a conservative growth rate of 4.5% has been utilized on Wellington Road 7, Wellington Road 18,



Middlebrook Road and David Street West to ensure a conservative approach and account for the impact by the planned local development.

## 2.6 **Traffic Counts**

Detailed turning movement traffic and pedestrian counts were commissioned at the study area intersections. **Table 1** summarizes the traffic count data.

Intersection (N-S Street / E-W Street)	Count Date	AM Peak Hour	PM Peak Hour	Source
Wellington Road 7 / Wellington Road 18	Thursday August 4 <sup>th</sup> , 2022	07:45 – 08:45	16:00 – 17:00	JD Eng.*
Wellington Road 7 / South Street	Thursday August 4 <sup>th</sup> , 2022	08:00 - 09:00	16:00 – 17:00	JD Eng.*
Wellington Road 7 / Middlebrook Road / David Street West	Thursday August 4 <sup>th</sup> , 2022	08:00 - 09:00	16:00 – 17:00	JD Eng.*

#### Table 1 – Traffic Count Data

\*Counts were completed by Accu Traffic Inc. on behalf of JD Engineering.

Detailed traffic count data can be found in **Appendix B**. The peak hours of traffic generation for the study area intersections generally aligned with the anticipated peak hour of traffic generation by the proposed community.

The through traffic volumes at the site access driveways have been estimated based on the north and south leg traffic at the Wellington Road 7 / South Street intersection.

Heavy vehicle percentages from the traffic count data have also been included in the Synchro analysis.

The existing (2022) AM and PM peak hour traffic volumes through the study are illustrated in Figure 3.





### Figure 3 – Existing (2022) Traffic Volumes



## 2.7 Horizon Year Traffic Volumes

The background (2027 & 2032) horizon year traffic volumes without the proposed community were estimated using the background growth rate discussed in Section 2.4.

The background (2027 & 2032) horizon year traffic volumes are illustrated in **Figures 4** and **5** respectively.











### Figure 5 – Background (2032) Traffic Volumes



# 3 Intersection Operation without Proposed Community

## 3.1 Intersection Capacity Analysis Criteria

Existing and background horizon operational conditions were established to determine how the street network within the study area is currently functioning without the proposed community. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the existing and future background traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 11, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 11 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign-controlled intersections are shown in **Table 2.** A description of traffic performance characteristics is included for each LOS.

For County intersections, for signalized intersections V/C ratio greater than 0.85 for intersection operation, through or shared through / turning movements and greater than 0.95 for exclusive turning movements have been highlighted in the LOS tables. For unsignalized intersections LOS E or worse are considered to be critical movements and have been highlighted in the LOS tables.

The peak hour factor applied at the study area intersections in the analysis, are based on the traffic counts completed for the study area intersections, noted in Section 2.6, Table 1. For the driveways / intersections that did not have traffic counts completed, a general peak hour factor of 0.92 was applied.



		Control Delay (seconds per vehicle)				
LOS	LOS Description	Signalized Intersections	Stop Controlled Intersections			
А	Very low delay; most vehicles do not stop (Excellent)	less than 10.0	less than 10.0			
В	Higher delay; more vehicles stop (Very Good)	between 10.0 and 20.0	between 10.0 and 15.0			
с	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping <b>(Good</b> )	between 20.0 and 35.0	between 15.0 and 25.0			
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop ( <b>Satisfactory</b> )	between 35.0 and 55.0	between 25.0 and 35.0			
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of <b>acceptable</b> delay	between 55.0 and 80.0	between 35.0 and 50.0			
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection ( <b>Unacceptable</b> )	greater than 80.0	greater than 50.0			

#### Table 2 – Level of Service Criteria for Intersections

## 3.2 Existing (2022) Intersection Operation

The results of the LOS analysis under existing (2022) traffic volumes during the AM and PM peak hour can be found below in **Table 3**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix C**.

	Weekday AM Peak Hour						Weekday PM Peak Hour				
Location (N-S Street / E-W Street)			1.00	95% Queue (m)			Dalars (a)		95% Queue (m)		
(	v/C	Delay (S)	LUS	Model	Storage	V/C	Delay (s)	LUS	Model	Storage	
Wellington Road 7 / Wellington Road 18 (signalized)	0.29	13.4	В	-	-	0.45	15.2	В	-	-	
EB	0.55	25.6	С	32	-	0.70	28.4	С	55	-	
WB	0.48	24.2	С	30	-	0.44	22.0	С	37	-	
NB	0.18	4.5	Α	18	-	0.35	7.6	Α	45	-	
SB	0.22	4.7	Α	22	-	0.31	7.2	Α	38	-	
Wellington Road 7 / Middlebrook Road / David Street West (unsignalized)	-	2.3	А	-	-	-	2.5	А	-	-	
EB	0.05	11.5	В	2	-	0.09	13.4	В	3	-	
WB	0.11	12.9	В	3	-	0.19	16.6	С	6	-	

#### Table 3 – Existing (2022) LOS

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for northbound and westbound movements at the Wellington Road 7 / Wellington Road 18 intersection extends past existing driveways to the gas station at the southeast corner of the intersection; however, the anticipated queue for each movement will be experienced for a short period of time at the end of each phase and is anticipated to clear after each cycle.



There are no other issues with the anticipated queuing in the study area.

An analysis was completed for left turn movements at the Wellington Road 7 / Middlebrook Road / David Street West intersection, based on the criteria outlined in Appendix 9A of the Ontario Ministry of Transportation Design Supplement for TAC Geometric Design Guide for Canadian Roads (dated June 2017) [MTO DS] (results are provided in **Appendix F**). For the purposes of this report, in the left turn analysis a design speed of 60 km/h (for a posted speed of 50 km/h) and 80 km/h (for a posted speed of 60 km/h) were reviewed to account for the planned increase in speed limit as noted in Section 2.2. Based on the above noted criteria, a left turn lane is not warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection.

A review of the need for additional auxiliary right turn lanes at the Wellington Road 7 / Middlebrook Road / David Street West intersection was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, additional auxiliary right turn lanes are not recommended in the study area.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection (results are provided in **Appendix G**).

No infrastructure improvements are required for the existing (2022) scenario.

## 3.3 Background (2027) Intersection Operation

The results of the LOS analysis under background (2027) traffic volumes during the AM and PM peak hour can be found below in **Table 4**. Existing traffic control has been utilized for this scenario.

An analysis was completed for left turn movements at the Wellington Road 7 / Middlebrook Road / David Street West intersection, based on the criteria outlined in Appendix 9A of the MTO DS (results are provided in **Appendix F**). For the purposes of this report, in the left turn analysis a design speed of 60 km/h (for a posted speed of 50 km/h) and 80 km/h (for a posted speed of 60 km/h) were reviewed to account for the planned increase in speed limit as noted in Section 2.2. Based on the above noted criteria, a southbound left turn lane for a 60 km/h design speed and a northbound and southbound left turn lane for an 80 km/h design speed is warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection. It is recommended northbound and southbound left turn lanes are constructed on Wellington Road 7 at Middlebrook Road / David Street West, to coincide with the increase in posted speed limit to 60 km/h on Wellington Road 7. The recommended configuration for the left turn lanes is provided below:

#### Wellington Road 7 / Middlebrook Road / David Street West

- Northbound left turn lane: 15 metre storage length, 50 metre parallel length and 65 metre taper length
- Southbound left turn lane: 25 metre storage length, 50 metre parallel length and 80 metre taper length

Detailed output of the Synchro analysis can be found in **Appendix D**.



	Weekday AM Peak Hour						Weekday PM Peak Hour			
Location (N-S Street / E-W Street)				95% Q	95% Queue (m)		Dalars (a)	1.00	95% Queue (m)	
	V/C	Delay (S)	103	Model	Storage	V/C	Delay (s)	LUS	Model	Storage
Wellington Road 7 / Wellington Road 18 (signalized)	0.37	14.4	В	-	-	0.58	17.7	В	-	-
EB	0.63	27.2	С	40	-	0.78	32.2	С	71	-
WB	0.54	24.2	С	38	-	0.49	21.7	С	46	-
NB	0.24	5.6	Α	25	-	0.48	10.6	В	72	-
SB	0.29	5.9	Α	31	-	0.41	9.8	Α	59	-
Wellington Road 7 / Middlebrook Road / David Street West (unsignalized)	-	2.6	А	-	-	-	3.1	А	-	-
EB	0.08	12.7	В	2	-	0.14	16.0	С	4	-
WB	0.16	14.9	В	5	-	0.30	22.6	С	10	-

#### Table 4 – Background (2027) LOS

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for northbound and westbound movements at the Wellington Road 7 / Wellington Road 18 intersection extends past existing driveways to the gas station at the southeast corner of the intersection; however, the anticipated queue for each movement will be experienced for a short period of time at the end of each phase and is anticipated to clear after each cycle.

There are no other issues with the anticipated queuing in the study area.

A review of the need for additional auxiliary right turn lanes at the Wellington Road 7 / Middlebrook Road / David Street West intersection was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, additional auxiliary right turn lanes are not recommended in the study area.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection (results are provided in **Appendix G**).

No infrastructure improvements are required for the background (2027) scenario.

### 3.4 Background (2032) Intersection Operation

The results of the LOS analysis under background (2032) traffic volumes during the AM and PM peak hour can be found below in **Table 5**. It is recommended the signal timing split at the Wellington Road 7 / Wellington Road 18 intersection is adjusted to optimize the use of the existing infrastructure.

Detailed output of the Synchro analysis can be found in **Appendix D**.



	Weekday AM Peak Hour						Weekday PM Peak Hour			
Location (N-S Street / E-W Street)	NUC			95% Q	95% Queue (m)		Dalars (a)	1.00	95% Queue (m)	
(	v/C	Delay (S)	105	Model	Storage	V/C	Delay (S)	105	Model	Storage
Wellington Road 7 / Wellington Road 18 (signalized)	0.48	16.2	В	-	-	0.74	20.4	С	-	-
EB	0.72	30.3	С	51	-	0.83	31.1	С	83	-
WB	0.59	24.7	С	46	-	0.51	18.4	В	50	-
NB	0.32	7.2	Α	37	-	0.69	17.5	В	130	-
SB	0.38	7.7	Α	47	-	0.60	15.3	В	94	-
Wellington Road 7 / Middlebrook Road / David Street West (unsignalized)	-	3.1	А	-	-	-	5.1	А	-	-
EB	0.12	14.6	В	4	-	0.22	20.8	С	7	-
WB	0.25	19.0	С	8	-	0.55	42.4	E	24	-

#### Table 5 – Background (2032) LOS

The results of the LOS analysis indicate that the delay for the westbound direction at the Wellington Road 7 / Middlebrook Road / David Street West intersection is operating marginally outside the typical design limits noted in Section 3.1; however, there are no issues regarding the anticipated queuing for westbound movements and the delay marginally exceeds the design limits. Consequently, no further improvements are recommended. As noted in Section 2.2, the County RMAP identified a future widening of Wellington Road 7. Although no improvements are recommended based on this analysis, it is recommended that the County continue to monitor this area as development occurs to confirm the traffic growth assumptions applied in this report.

The results of the LOS analysis indicate that all other movements / intersections in the study area are operating within the typical design limits noted in Section 3.1.

The anticipated queue for northbound and westbound movements at the Wellington Road 7 / Wellington Road 18 intersection extends past existing driveways to the gas station at the southeast corner of the intersection; however, the anticipated queue for each movement will be experienced for a short period of time at the end of each phase and is anticipated to clear after each cycle.

There are no other issues with the anticipated queuing in the study area.

A review of the need for additional auxiliary right turn lanes at the Wellington Road 7 / Middlebrook Road / David Street West intersection was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, additional auxiliary right turn lanes are not recommended in the study area.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection (results are provided in **Appendix G**).

No infrastructure improvements are required for the background (2032) scenario.



# 4 **Proposed Community**

## 4.1 **Traffic Generation**

The traffic generation for the subject site has been based on the Institute of Transportation Engineers [ITE] Trip generation Manual (11<sup>th</sup> Edition) [ITE Trip Generation Manual]. The following ITE land use has been applied to estimate the traffic from the proposed community:

• ITE land use 220 (Multifamily Housing (Low-Rise)) – General Urban/Suburban Setting

The AM and PM peak hour traffic generation for the proposed community do not exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual. The estimated trip generation of the proposed community is illustrated below in **Table 6**.

		A	/ Peak Ho	ur	PM Peak Hour			
Land Use	Size	IN	OUT	TOTAL	IN	OUT	TOTAL	
Multifamily Housing (Low-Rise) ITE Lane Use: 220	273 units	26	84	110	88	52	140	

## 4.2 **Traffic Assignment**

For the purposes of this study, it has been assumed that all traffic generated by the proposed community will be new traffic and would not be in the study area if the community was not constructed.

The ITE data provides the anticipated percentage of new traffic entering and exiting during the peak hour. The distribution of traffic for the proposed community has been calculated based on the 2016 TTS data for traffic zone 8344, retrieved using the TTS IDRS (output attached as **Appendix I**). TTS data provides historical origin and destination work trip percentages for specific areas within the Township and southern Ontario.

Traffic distribution for the trips generated by the proposed community during the AM and PM peak hour is expected to generally follow commuter travel patterns. Our analysis is based on egress traffic during the AM peak hour. Logically, the distribution of ingress traffic will follow the inverse of the exiting traffic distribution. For each of the individual areas identified in the TTS data, we have selected the probable route of travel, assuming people will select their route primarily based on travel time.

The residential distribution of trips is illustrated in **Table 7** using the methodology outlined above.



Travel Direction (to / from)	Percentage of Total Traffic Generation
North via Wellington Road 7	6%
South via Wellington Road 7	63%
West via Wellington Road 18	13%
East via Wellington Road 18	9%
East via David Street East	9%
TOTAL	100%

### Table 7 – Proposed Community Traffic Distribution

Figures 6 illustrate the site traffic assignment for the proposed community, during the AM and PM peak hour.





### Figure 6 – Proposed Community Traffic Assignment



# 4.3 Total Horizon Year Traffic Volumes with the Proposed Community

For the total (2027 & 2032) horizon year traffic volumes, the proposed community traffic was added to the background (2027 & 2032) traffic volumes. The resulting total (2027 & 2032) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figures 7** and **8** respectively.





#### Figure 7 – Total (2027) Traffic Volumes





#### Figure 8 – Total (2032) Traffic Volumes



# 5 Intersection Operation with Proposed Community

## 5.1 **Total (2027) Intersection Operation**

The results of the LOS analysis under total (2027) traffic volumes during the AM and PM peak hour can be found below in **Table 8**. The intersection improvements recommended in Section 3.3 have been utilized for this scenario.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS (results are provided in **Appendix F**). For the purposes of this report, in the left turn analysis, a design speed of 60 km/h (for a posted speed of 50 km/h) and 80 km/h (for a posted speed of 60 km/h) on Wellington Road 7 were reviewed to account for the planned increase in speed limit as noted in Section 2.2.

Based on the above noted criteria, a northbound left turn lane is marginally warranted on Wellington Road 7 at the North Access, Centre Access and South Access for the 80 km/h design speed. In order to maintain the travel capacity for northbound traffic on Wellington Road 7, the following improvements are recommended:

Wellington Road 7 / North Access

- Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 15 metre parallel length and 65 metre taper length.
- Wellington Road 7 / Centre Access
  - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.

Wellington Road 7 / South Access

• Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.

In order to maintain the travel capacity for southbound traffic on Wellington Road 7, the following improvements are also recommended:

Wellington Road 7 / South Street

• Widen Wellington Road 7 to provide a southbound left turn lane with a 15 metre storage, 15 metre parallel length and 65 metre taper length.

In order to mitigate the impact of construction on Wellington Road 7, it is recommended that the abovenoted improvements are completed along with the planned northbound and southbound left turn lane improvements at the Wellington Road 7 / Middlebrook Road / David Street West intersection (noted in Section 3.3). It is recommended that all road improvements are completed prior to occupancy of the proposed development.

Detailed output of the Synchro analysis can be found in Appendix E.



	Weekday AM Peak Hour					Weekday PM Peak Hour				
Location (N-S Street / E-W Street)	V/C	Delay (s)	LOS	95% Queue (m)			Delaw (a)	1.00	95% Queue (m)	
(				Model	Storage	V/C	Delay (s)	LUS	Model	Storage
Wellington Road 7 / Wellington Road 18 (signalized)	0.38	14.3	В	-	-	0.60	18.4	В	-	-
EB	0.63	27.2	С	41	-	0.81	33.8	С	74	-
WB	0.55	24.2	С	38	-	0.52	22.0	С	48	-
NB	0.27	5.8	Α	28	-	0.50	11.0	В	76	-
SB	0.29	5.9	Α	32	-	0.42	10.0	Α	60	-
Wellington Road 7 / Middlebrook Road / David Street West (unsignalized)	-	2.6	А	-	-	-	3.4	А	-	-
EB	0.09	13.7	В	3	-	0.16	17.8	С	5	-
WB	0.18	16.5	С	6	-	0.37	26.6	D	14	-
Wellington Road 7 / North Access (unsignalized)	-	0.6	А	-	-	-	0.4	А	-	-
EB	0.04	11.3	В	2	-	0.04	13.2	В	1	-
NBL	0.00	7.9	Α	1	-	0.01	8.1	Α	1	-
Wellington Road 7 / Centre Access (unsignalized)	-	0.7	А	-	-	-	0.5	А	-	-
EB	0.05	11.0	В	2	-	0.04	12.5	В	1	-
NBL	0.01	7.9	Α	1	-	0.02	8.1	Α	1	-
Wellington Road 7 / South Access (unsignalized)	-	0.7	А	-	-	-	0.5	А	-	-
EB	0.05	11.0	В	2	-	0.04	11.9	В	1	-
NBL	0.01	7.9	A	1	-	0.02	8.2	A	1	-

#### Table 8 – Total (2027) LOS

The results of the LOS analysis indicate that all study area intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for northbound and westbound movements at the Wellington Road 7 / Wellington Road 18 intersection extends past existing driveways to the gas station at the southeast corner of the intersection; however, the anticipated queue for each movement will be experienced for a short period of time at the end of each phase and is anticipated to clear after each cycle.

There are no other issues with the anticipated queuing in the study area.

A review of the need for additional auxiliary right turn lanes at the study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, additional auxiliary right turn lanes are not recommended in the study area.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area intersections (results are provided in **Appendix G**).

No infrastructure improvements are required for the total (2027) scenario.



# 5.2 Total (2032) Intersection Operation

The results of the LOS analysis under total (2032) traffic volumes during the AM and PM peak hour can be found below in **Table 9**. The intersection improvements recommended in Section 3.3 and 5.1 have been utilized in this scenario. Detailed output of the Synchro analysis can be found in **Appendix E**.

	Weekday AM Peak Hour					Weekday PM Peak Hour				
Location (N-S Street / E-W Street)	V/C	Delay (s)	LOS	95% Queue (m)			Delaw (a)		95% Queue (m)	
				Model	Storage	V/C	Delay (s)	LUS	Model	Storage
Wellington Road 7 / Wellington Road 18 (signalized)	0.48	16.2	В	-	-	0.76	21.1	С	-	-
EB	0.72	30.2	С	52	-	0.83	31.4	С	85	-
WB	0.60	24.7	С	47	-	0.53	18.6	В	52	-
NB	0.36	7.7	Α	42	-	0.71	18.8	В	138	-
SB	0.39	7.9	Α	48	-	0.61	15.8	В	97	-
Wellington Road 7 / Middlebrook Road / David Street West (unsignalized)	-	3.2	А	-	-	-	6.5	В	-	-
EB	0.13	16.0	С	4	-	0.25	23.9	С	8	-
WB	0.29	21.7	С	10	-	0.67	58.0	F	32	-
Wellington Road 7 / North Access (unsignalized)	-	0.5	А	-	-	-	0.4	A	-	-
EB	0.05	12.3	В	2	-	0.05	15.3	С	2	-
NBL	0.00	8.0	Α	1	-	0.02	8.4	Α	1	-
Wellington Road 7 / Centre Access (unsignalized)	-	0.6	А	-	-	-	0.4	А	-	-
EB	0.06	11.9	В	2	-	0.05	14.2	В	2	-
NBL	0.01	8.1	Α	1	-	0.02	8.4	Α	1	-
Wellington Road 7 / South Access (unsignalized)	-	0.6	А	-	-	-	0.4	А	-	-
EB	0.06	11.8	В	2	-	0.04	13.2	В	1	-
NBL	0.01	8.1	A	1	-	0.03	8.4	A	1	-

#### Table 9 – Total (2032) LOS

The results of the LOS analysis indicate that the delay for the westbound direction at the Wellington Road 7 / Middlebrook Road / David Street West intersection is operating marginally outside the typical design limits noted in Section 3.1; however, there are no issues regarding the anticipated queuing for westbound movements and the delay marginally exceeds the design limits. Consequently, no further improvements are recommended. As noted in Section 2.2, the County RMAP identified a future widening of Wellington Road 7. Although no improvements are recommended based on this analysis, it is recommended that the County continue to monitor this area as development occurs to confirm the traffic growth assumptions applied in this report.

The results of the LOS analysis indicate that all other intersections in the study area are operating within the typical design limits noted in Section 3.1.

The anticipated queue for northbound and westbound movements at the Wellington Road 7 / Wellington Road 18 intersection extends past existing driveways to the gas station at the southeast corner of the intersection; however, the anticipated queue for each movement will be experienced for a short period of time at the end of each phase and is anticipated to clear after each cycle.



There are no other issues with the anticipated queuing in the study area.

A review of the need for additional auxiliary right turn lanes at the study area intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, additional auxiliary right turn lanes are not recommended in the study area.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area intersections (results are provided in **Appendix G**).

No infrastructure improvements are required for the total (2032) scenario.

### 5.3 Site Access

The North Access, Centre Access and South Access will operate efficiently as full-movement accesses, with one-way stop control for eastbound movements. A single ingress and egress lane at the North Access, Centre Access and South Access will provide the necessary capacity to service the proposed community. As noted in Section 5.1, it is recommended Wellington Road 7 is widened to accommodate a northbound left turn lane at the North Access, Centre Access and South Access, Centre Access, Cent

The proposed spacing between the North Access and South Street (139 metres– measured edge of driveway to edge of road), Centre Access and South Street (62 metres– measured edge of driveway to edge of road) and the South Access and Middlebrook Road (273 metres– measured edge of driveway to edge of road) exceeds the minimum driveway spacing requirements identified in the Transportation Association of Canada *Design Guide for Canadian Roads* (2017) [TAC Guidelines], Figure 8.8.2 – 35 metres for an arterial road at an unsignalized intersection.

The proposed spacing between the Centre Access and South Access (207 metres – measured edge to edge of driveway) are greater than the minimum driveway spacing requirements as per the TAC Guidelines – Figure 8.9.2 (Driveway Spacing Guidelines – Locals and Collectors).

Based on the Synchro analysis, there are no issues regarding the anticipated queuing on Wellington Road 7 at the site access driveways, as noted in Section 5.2.

Where feasible, driveways and roadways on opposite sides of an arterial road should be aligned. In this case, based on the preferred internal layout of the subject site, the location of the Centre Access does not align with South Street. South Street is a local road that provides access to single-family detached residential units at the south end and the existing Elora Municipal Cemetery at the north end. Based on our review of the existing and future development potential along South Street and the existing road network, there will be negligible traffic interaction between the Centre Access and South Street. Consequently, the proposed configuration of the North Access, Centre Access and South Access will not cause any operational or traffic safety issues.

### 5.4 **Pedestrian Connectivity Review**

In order to provide high-quality pedestrian access for the proposed community, it is recommended a sidewalk is constructed on the west side of Wellington Road 7 from the North Access to Middlebrook Road / David Street West.

As noted in Section 5.3, signalization is not warranted at the Wellington Road 7 / Middlebrook Road / David Street West intersection and the vehicular and pedestrian volume at this intersection do not warrant pedestrian crossing infrastructure. In the existing condition, pedestrians are required to cross



Wellington Road 7 via the unmarked crosswalk at the Wellington Road 7 / Middlebrook Road / David Street West intersection.

A review for the warrant for a pedestrian crossing infrastructure was completed at the north leg of the Wellington Road 7 / Middlebrook Road / David Street West intersection, based on Ontario Traffic Manual Book 15 Pedestrian Crossing Facilities. The total (2032) traffic volumes were used in the pedestrian crossing warrant<sup>3</sup>. Based on the OTM Book 15 criteria, a pedestrian crossing is not warranted at the north leg of the Wellington Road 7 / Middlebrook Road / David Street West intersection (warrant provided in **Appendix H**).

Notwithstanding, based on our review of the pedestrian network, and the need for a high-quality pedestrian crossing for pedestrian connectivity, it is recommended the Client install a Level 2 Type C pedestrian crossing at the north leg of the Wellington Road 7 / Middlebrook Road / David Street West intersection.

## 5.5 Sight Distance Review

A review of the available sight distance for the proposed site access driveways was completed as part of this analysis. The minimum sight distance requirements for a 60 km/h posted speed limit on Wellington Road 7 was reviewed to identify potential issues associated with the increased speed limit proposed as noted in Section 2.2.

The sight distance north of the North Access, south of the Centre Access and north of the South Access are greater than 200 metres and meet the minimum sight distance requirements as identified in the County's Entrance Permit Policy (2022) – 135 metres and 165 metres for a 50 km/h and 60 km/h posted speed, respectively.

The sight distance south of the North Access is 175 metres<sup>4</sup>, north of the Centre Access is 185 metres<sup>2</sup> and south of the South Access is 167 metres<sup>5</sup> which all meet the minimum sight distance requirements as identified in the County's Entrance Permit Policy – 135 metres and 165 metres for a 50 km/h and 60 km/h posted speed, respectively.

## 5.6 **Speed Management Review**

As noted in Section 2.2, the RMAP recommended an increase in the posted speed limit (from 50km/h to 60km/h) on Wellington Road 7 between Sideroad 11 and First Line. In order to assess the impact of that recommended change in the posted speed limit, our analysis has included a review of the posted 50km/h scenario and the posted 60km/h scenario. It is acknowledged that an increase in the posted speed may be appropriate at the north and south end of the noted corridor; however, it is our recommendation to maintain the posted 50km/h speed limit within the study area included in our analysis (between Middlebrook Road / David Street West and Wellington Road 18).

It is acknowledged that the existing configuration of Wellington Road 7, in the study area, may warrant an increase in the posted speed limit; however, the following proposed changes to the study area will have a traffic calming effect:

1) The proposed community will add an urban edge to the west side of Wellington Road 7. The proposed community includes closely spaced street trees, sidewalk and the townhouse building face, all located within 15 metres of the edge of the existing road. The proposed

<sup>&</sup>lt;sup>5</sup> Limited by the vertical curve and slight horizontal curve on Wellington Road 7.



<sup>&</sup>lt;sup>3</sup> 8-hour and 4-hour pedestrian crossing warrants were reviewed.

<sup>&</sup>lt;sup>4</sup> Limited by the vertical curve on Wellington Road 7.

community also includes building entrances and private walkways along the frontage of the subject site, which will activate the corridor.

- 2) The proposed community will include the reconstruction of the west side of Wellington Road 7 from a rural cross-section to an urban cross-section, along the frontage of the subject site and also south of the subject site to Middlebrook Road / David Street West.
- 3) The proposed community will include the construction of the North Access, Centre Access and South Access on Wellington Road 7, which will demand additional driver attention.
- 4) The construction of the proposed pedestrian crossing on Wellington Road 7, north of Middlebrook Road / David Street West (as outlined in Section 5.4), will demand additional driver attention and periodically stop traffic on Wellington Road 7.

The existing Elora Lions Park and Elora & District Community Centre at the southwest and southeast corner of the Wellington Road 7 / Middlebrook Road / David Street West intersection, also supports the need to control the speed of traffic in the study area. The Township could facilitate this by permitting the Client to provide enhanced street tree plantings on both sides of the road through this area and extending the existing sidewalk from the bridge over the Grand River to Middlebrook Road. This missing pedestrian link would activate the boulevard of Wellington Road 7, which would have a traffic calming effect and also provide additional pedestrian access to the Elora Gorge Trail, facilitated by the proposed pedestrian crossing of Wellington Road 7 at Middlebrook Road / David Street West.

South of Wellington Road 18, the existing residential development on both sides of Wellington Road 7 will have a traffic calming effect and the existing 50km/h posted speed limit is appropriate for this section.

There is a section of Wellington Road 7, just north of the subject site and south of the above-noted existing residential area, where the existing vertical / horizontal road profile and the roadside characteristics are consistent with higher-speed roads (the section is approximately 250 metres in length). In order to influence driver behavior through this short section, it is recommended that a 15-metre-long, 1.5 - 2.5-metre-wide raised median is installed. It is recommended that the raised median include hardy landscaping (trees or shrubs), which would require minimal maintenance, but would provide a visual cue that will link the two adjacent low-speed sections on Wellington Road 7. The exact configuration and location will be confirmed through detailed design; however, based on our preliminary assessment, there is sufficient space to install the raised median without impacting existing driveways in the area.

## 5.7 **Parking Review**

The parking supply for the proposed community meets the minimum parking requirements specified in the Township's Zoning By-law 2009-045 [ZBL]. Each townhouse unit is proposed with two tandem parking spaces (surface driveway parking plus garage parking). The proposed parking breakdown for the proposed community is provided in **Table 12**.

Category	Zoning	Parking Standard	<u>a</u> :	Parking (Spaces)			
	Section	Farking Standard	Size	Required	Provided		
Residential (Cluster Townhouse)	5.5.1	Resident: 1 space per unit plus 0.5 spaces per unit for the first 20 units and 0.25 spaces per unit for each additional unit Visitor Parking: 50% of additional parking	273 units	310 resident spaces <u>37 visitor spaces</u> 347 spaces total	546 resident spaces <u>56 visitor spaces</u> 602 spaces total		
Barrier-Free Parking	6.4.3	15 spaces for required parking between 301 – 400 spaces	-	15 spaces	15 spaces		

### Table 10 - Zoning By-law Parking Requirements



Although tandem parking spaces are not defined in the ZBL, the tandem parking spaces are provided in addition to the minimum visitor parking supply and supplement the minimum provision of one parking space per unit for residential parking, as identified in the zoning by-law. Consequently, the proposed tandem parking is acceptable for the proposed application and the overall parking supply is sufficient for the intended use.

# 6 Summary

**Elora 7 OP Inc.** retained **JD Engineering** to prepare this traffic impact study in support of the proposed community on a site municipally known as 350 Wellington Road 7, located on the south side of Wellington Road 7, midblock between David Street West and Wellington Road 18 in the Township of Centre Wellington County of Wellington. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed community is anticipated to consist of 273 townhouse units.

- 1. The proposed community is expected to generate a 110 AM and 140 PM peak hour trips.
- 2. Detailed intersection counts were conducted at the study intersection on Thursday August 4<sup>th</sup>, 2022.
- 3. An intersection operation analysis was completed at the study area intersections, using the existing (2022) and background (2027 & 2032) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed community. The following improvements are recommended to coincide with the increase in posted speed limit to 60 km/h on Wellington Road 7:

#### Background (2027) Traffic Volumes

- Wellington Road 7 / Middlebrook Road / David Street West
  - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 65 metre taper length.
  - Widen Wellington Road 7 to provide a southbound left turn lane with a 25 metre storage length, 50 metre parallel length and 80 metre taper length.
- 4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area street and intersections.
- 5. An intersection operation analysis was completed under total (2027 & 2032) traffic volumes with the proposed community operational at the study area intersections. The following improvements are recommended prior to occupancy of the proposed development:
  - Wellington Road 7 / North Access
    - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 15 metre parallel length and 65 metre taper length.
  - Wellington Road 7 / Centre Access
    - Widen Wellington Road 7 to provide a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.
  - Wellington Road 7 / South Access
    - Widen road to accommodate a northbound left turn lane with a 15 metre storage length, 50 metre parallel length and 80 metre taper length.
  - Wellington Road 7 / South Street
    - Widen road to accommodate a southbound left turn lane with a 15 metre storage length, 15 metre parallel length and 65 metre taper length.



#### • Wellington Road 7 / Middlebrook Road / David Street West

- Advance northbound and southbound left turn lane construction to coincide with above-noted road improvements.
- 6. The proposed North Access, Centre Access and South Access will operate efficiently as fullmovement accesses, with one-way stop control for eastbound movements. A single ingress and egress lane at the North Access, Centre Access and South Access will provide the necessary capacity to service the proposed community.
- 7. It is recommended the Client install a Level 2 Type C pedestrian crossing at the north leg of the Wellington Road 7 / Middlebrook Road / David Street West intersection.
- 8. It is recommended the County maintain the posted 50km/h speed limit within the study area (between Middlebrook Road / David Street West and Wellington Road 18). The following traffic calming measures are recommended to support the posted 50km/h speed limit:
  - Construct a raised median island on Wellington Road 7, north of the subject site to
    provide a visual cue that will link the two adjacent low-speed sections on Wellington
    Road 7 (to be completed by the Client);
  - Provide enhanced street tree plantings on both sides of Wellington Road 7, between Middlebrook Road / David Street West and the bridge over the Grand River (to be completed by the Client); and
  - Extend the existing sidewalk from the bridge over the Grand River to Middlebrook Road, to activate the boulevard of Wellington Road 7 and also provide additional pedestrian access to the Elora Gorge Trail (to be completed by the Township).
- 9. The proposed parking supply meets the minimum requirements in the Township's Zoning Bylaw 2009-045.
- 10. In summary the proposed community will not cause any operational issues and will not add significant delay or congestion to the local roadway network.



350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

# Appendix A – Site Plan




243.84 ( 800.00' )

N 44º 38' 05" W

243.84 ( 800.00' )

PROPOSED	HIGWAY COMMERCIAL Z	ONE (C2)	
CATEGORY	ZONING REGULATION	PROPOSED	COMPLIANCE
MINIMUM LOT AREA	700.0 m <sup>2</sup> (7,535 ft <sup>2</sup> )	44,588.50m <sup>2</sup> ( 11.02Ac )	YES
MINIMUM LOT FRONTAGE	20 m (65.6 ft)	487.68m (1,600 ft)	YES
MINIMUM FRONT YARD	3 m (9.8 ft) FOR A BUILDING CONTAINING DWELLING UNITS ADJACENT TO THE STREET LINE, THE BUILDING FACE SHALL BE STEEPED BACK 2m FOR EACH STOREY ABOVE THE THIRD STOREY	3.0m (9.8 ft) 3 STOREY	YES
MINIMUM LANDSCAPE BUFFER ABUTTING STREET LINE	3 m (9.8 ft)	3.0m WITH EXCEPTION OF WALKWAYS TO LIVE / WORK UNITS	YES
RESIDENTIAL USES ON GROUND FLOOR	NOT [PERMITTED WITHIN 9m OF A STREET LINE. SHALL NOT OCCUPY MORE THAN 50% OF TOTAL GROUND FLOOR AREA OF A BUILDING WITHIN 30m OF A STREET LINE.	LIVE / WORK UNITS FRONTING ONTO WELLINGTON ROAD 7 CONTAIN LIVING AREA, WORKSPACE, WASHROOM AND GARAGE USES. TOWNHOUSE UNITS FLAKING WELLINGTON ROAD 7 (4.0m)	NO
MINIMUM REAR YARD	7.5m (24.6 ft)	5.11 m (16.8 ft)	NO
MINIMUM SIDE YARD	3 m (9.8 ft)	6.76 m (22.1 ft)	YES
MINIMUM LANDSCAPED AREA	20%	28% (12,547.53 m <sup>2</sup> ) INCLUDES 1,953.62m <sup>2</sup> OF COMMON PARK AREA (PARK 1+2)	YES
MAXIMUM BUILDING HEIGHT	18 m BUT NO GREATER THAN 5 STOREY FOR A BUILDING CONTAINING DWELLING UNITS.	3 STOREYS 10.9 m	YES
MINIMUM BUILDING HEIGHT	7.5 m AND 2 STOREYS	7.5 m AND 2 STOREYS	YES
BUFFER STRIP	A BUFFER STRIP IS REQUIRED ALONG ANY INTERIOR SIDE LOT LINE AND REAR LOT LINE WHICH ABUTS LAND ZONED FOR RESIDENTIAL OR INSTRUCTIONAL PURPOSES. (N/A)	ОК	N/A
PARKING	CLUSTER TOWNHOUSE USE 1.0 / UNIT PLUS 0.5 / UNIT FOR FIRST 20 UNITS AND 0.25 / UNIT FOR EACH ADDITIONAL UNIT. 50% OF ADDITIONAL PARKING TO BE EXCLUSIVE VISITOR PARKING	GARAGE 273 DRIVEWAY 273 VISITORS 56	NO - FOR TOWNHOUSES YES - FOR VISITORS
BARRIER FREE PARKING	PARKING SPACES REQUIRED 301 - 400 B / F SPACES . 15	15 SPACES (25% OF VISITOR SPACES)	YES
GROSS FLOOR AREA	N/A	41,520 m <sup>2</sup> ± 446,928 sf ±	N/A
COVERAGE	N/A	17,791.96 m <sup>2</sup> ± 191,510.90 sf ± 40%±	N/A
DENSITY	N/A	61.2 UPH 24.8 UPA	N/A

Version 3.4 Concept Site Plan 350 Wellington Rd #7 Elora ON.

Client: ELORA 7 OP INC.

Date: 04/03/23

Project number: 3287 Scale: 1:1250

The intent of this drawing is to provide a preliminary concept for this community, as an instrument of service. This drawing is provided by and is the property of We Merchandise Space Inc. and Forrest Group Inc. retains ownership of copyright in all of its drawings. We Merchandise Space Inc. and Forrest Group Inc. are not responsible for the accuracy of underlying information, such as the survey. This drawing is not to be scaled. All Consultants and others must verify and accept responsibility for all dimensions and conditions on site and must notify We Merchandise Space Inc. and Forrest Group Inc. of any variations from the provided information. The Client named herein is granted a license to reproduce, distribute, exhibit or otherwise use, said materials, in accordance with this agreement, which license may be revoked for cause, including but not limited to, misuse of drawings or failure to pay accounts. It is expressly understood and agreed that no action, lawsuit, or claim may be made against the employees, officers, or directors of We Merchandise Space Inc. or Forrest Group Inc. for any reason whatsoever. For greater clarity, We Merchandise Space Inc. and Forrest Group Inc. shall not be liable, directly or indirectly, in any manner whatsoever by any party by reason of the use of the drawings and materials referred to herein.

Unit Count	
15' CONVENTIONAL 15' LIVE / WORK CONVENTIONAL 22' LIVE / WORK CONVENTIONAL	107 (172.1m <sup>2</sup> AVERAGE) 62 (146.0m <sup>2</sup> AVERAGE) 8 (146.0m <sup>2</sup> AVERAGE)
20' BACK TO BACKS	96 (134.8m <sup>2</sup> AVERAGE)
TOTAL	273 (152.3m <sup>2</sup> AVERAGE OVERALL)

Note: \*Asterik indicates a block of live/work units.

# WE MERCHANDISE SPACE INC. FORREST GROUP INC.

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

## Appendix B – Traffic Count Data





Morning Peak Diagram	Specified Period         One Hour Peak           From:         7:00:00         From:         8:00:00           To:         9:00:00         To:         9:00:00
Municipality:Centre WellingtonSite #:2214500001Intersection:Wellington Rd 7 & Middlebrook RdTFR File #:1Count date:4-Aug-22	Weather conditions: Person counted: Person prepared: Person checked:
** Non-Signalized Intersection **	Major Road: Wellington Rd 7 runs N/S
North Leg Total: 423       Heavys       0       26       0       26         North Entering:       230       Trucks       1       1       0       2         North Peds:       0       Cars       8       178       16       26         Peds Cross:       ►       Totals       9       205       16	AHeavys22East Leg Total:104Trucks12East Entering:51D2Cars159East Peds:0Totals193Peds Cross:X
Heavys Trucks Cars Totals 3 1 22 26 Middlebrook Rd	The field ington Rd 7 $ \begin{array}{ccccccccccccccccccccccccccccccccccc$
Heavys Trucks Cars Totals	David St W
1       0       2       3       II         0       0       12       12       II         2       0       13       15       II         3       0       27       Wellington Rd 7	Cars Trucks Heavys Totals 49 1 3 53
Peds Cross:XCars218CarsWest Peds:0Trucks1TruckWest Entering:30Heavys30HeavyWest Leg Total:56Totals249Total	ars       6       145       21       172       Peds Cross:       ◄         ks       0       11       1       12       South Peds:       0         ys       2       21       3       26       South Entering:       210         als       8       177       25       South Leg Total:       459
Comn	nents



Afternoon F	Peak Diagram	Specified Period From: 16:00:00	One Hour Peak From: 16:00:00
		<b>To:</b> 19:00:00	<b>To:</b> 17:00:00
Municipality:CentrSite #:22148Intersection:WellinTFR File #:1Count date:4-Aug	e Wellington 500001 ngton Rd 7 & Middlebrook Rd 9-22	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized I	ntersection **	Major Road: Wellingto	on Rd 7 runs N/S
North Leg Total: 610 North Entering: 280 North Peds: 0 Peds Cross: ►	Heavys         0         8         0         8           Trucks         0         7         0         7           Cars         7         238         20         2           Totals         7         253         20         2	Heavys 14 Trucks 3 Cars 313 Totals 330	East Leg Total: 183 East Entering: 68 East Peds: 0 Peds Cross: X
Heavys Trucks Cars Tota 1 0 33 34	als $4$ $4$ $4$ $4$	N F	Cars         Trucks         Heavys         Totals           20         1         0         21           14         0         0         14           32         0         1         33           66         1         1
Heavys Trucks Cars Tota	als 🔨	Davi	d St W
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Wellington Rd 7	s t	Cars Trucks Heavys Totals 114 1 0 115
Peds Cross:	Cars 288 🔲 C	ars 12 289 79 380	Peds Cross: м
West Peds: 0	Trucks 8 Tru	cks 0 2 1 3	South Peds: 0
West Entering: 40	Heavys 11 🗸 Hea	vys <u>1 14 0</u> 15	South Entering: 398
West Leg Total: 74	Totals 307 To	tals 13 305 80	South Leg Total: 705
	Com	ments	



# **Total Count Diagram**

Municipality:	Centr	e Wellind	Iton			Wea	ther c	ondit	ions:			
Site #:	22145	500001										
Intersection:	Wellir	naton Rd	7 & M	liddlebr	ook Rd							
TFR File #	1	.g.ee.				Pers	son co	ounted	l:			
Count date:	4-Auc	1-22				Pers	son pr	epare	d:			
oount date.	17105	,				Pers	son ch	еске	<b>:</b>			
** Non-Signali	zed l	ntersec	tion	**		Majo	or Roa	nd: W	ellingt	on F	Rd 7 runs N/S	
North Leg Total: 223	39	Heavys	0	64	1 65		$\bigtriangleup$	Heavys	68		East Leg Tota	al: 711
North Entering: 109	93	Trucks	1	18	0 19			Trucks	17		East Entering	j: 310
North Peds: 0		Cars	21	910	78 10	09		Cars	1061		East Peds:	1
Peds Cross: 🛛 🛤		Totals	22	992	79			Totals	1146	- L	Peds Cross:	X
			പ			ellington	Rd 7					
Heavys Trucks Cars	s Tota	als <	┍─┘	$\checkmark$	$\Box$				企	Care	s Trucks Hea	vys Totals
5 1 132	138									65	3 0	68
<u>/</u>		-			Ν	1			$\sim$	56	0 1	57
		_							$\frac{1}{2}$	180	2 3	185
	Middleb	orook Rd			w				v	301	5 4	
Heavys Trucks Cars	s Tota	als 🔨							Dav	rid St	W/	
1 0 16	17	<u>ل</u> ے	•		S	6			Duv			
0 0 67	67		•									/
4 1 70	75	Ś	_			4	~	N		Cars	s Trucks Hea	vys Totals
5 1 153		$\checkmark$		Wellir	ngton Rd 7	$\langle $	ſ	$\Box$		393	2 6	401
Peds Cross:		Cars	1160		Ca	rs 55	980	248	1283	Γ	Peds Cross:	X
West Peds: 1		Trucks	21		Truc	ks 0	14	2	16		South Peds:	1
West Entering: 159	9	Heavys	71	$\checkmark$	Heavy	/s 4	67	5	76		South Enterin	ng: 1375
West Leg Total: 297	7	Totals	1252	-	Tota	ls 59	1061	255	-		South Leg To	otal: 2627
					Comm	ante						
					Comm	GIII3						



				Traf	fic C	ount S	umm	ary				
Intersection:	Wellingt	on Rd 7	& Middl	ebrook F		Date: 4-Aug-22	Munio	<sup>ipality:</sup> Ce	entre We	llington		
	Nort	h Appro	ach Tot	als		North/South		Sout	h Appro	ach To	tals	
Hour	Includ	es Cars, T	rucks, & ⊢ I	leavys	Total	Total	Hour	Includ	es Cars, T I	rucks, & ⊢	leavys	Total
Ending	Left	Thru	Right	Total	Peds	Approaches	Ending	Left	Thru	Right	Total	Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	9	177	2	188	0	337	8:00:00	10	117	22	149	0
9:00:00	16	205		230			9:00:00	8		25	210	0
17:00:00	20	253		280		678	17:00:00	13	305	80	398	0
18:00:00	16	190	2	208	0	563	18:00:00	17	262	76	355	1
19:00:00	18	167	2	187	0	450	19:00:00	11	200	52	263	0
Tatala	70	000	0.0	1000		0400	C Tatalar	50	1001	055	1075	4
Totals:	79 Eas	992 t Appro	22 ach Tota	1093 als	0	2468	S Totals:	59 Wes	1061 t Appro	255 ach Tot	1375 <b>als</b>	1
Totals: Hour	79 East	992 t <b>Appro</b> es Cars, T	22 ach Tota rucks, & F	1093 als leavys	0 Total	2468 East/West Total	S Totals: Hour	59 Wes	1061 <b>t Appro</b> es Cars, T	255 <b>ach Tot</b> rucks, & ⊢	1375 als leavys	1 Total
Totals: Hour Ending	79 East Includ	992 <b>t Appro</b> es Cars, T Thru	22 ach Tota rucks, & H Right	1093 als leavys Grand Total	0 Total Peds	2468 East/West Total Approaches	S Totals: Hour Ending	59 Wes Includ Left	1061 <b>t Appro</b> es Cars, T Thru	255 ach Tot rucks, & H Right	1375 <b>als</b> leavys Grand Total	1 Total Peds
Totals: Hour Ending 7:00:00	79 Easi Includ Left 0	992 t <b>Appro</b> a es Cars, T Thru <i>0</i>	22 ach Tota rucks, & F Right 0	1093 als leavys Grand Total 0	0 Total Peds 0	2468 East/West Total Approaches 0	S Totals: Hour Ending 7:00:00	59 Wes Includ Left 0	1061 <b>t Appro</b> es Cars, T Thru 0	255 ach Tot rucks, & F Right 0	1375 als leavys Grand Total 0	1 Total Peds 0
Totals: Hour Ending 7:00:00 8:00:00	79 East Includ Left 0 56	992 t <b>Appro</b> es Cars, T Thru 0 14	22 ach Tota rucks, & F Right 0 3	1093 als Grand Total 0 73	0 Total Peds 0 0	2468 East/West Total Approaches 0 93	S Totals: Hour Ending 7:00:00 8:00:00	59 Wes Includ Left 0 3	1061 t Appro es Cars, T Thru 0 6	255 ach Tot rucks, & F Right 0 11	1375 als Grand Total 0 20	1 Total Peds 0 1
Totals: Hour Ending 7:00:00 8:00:00 9:00:00	79 East Includ Left 0 56 29 0	992 es Cars, T Thru 0 14 9 0	22 ach Tota rucks, & H Right 0 3 13	1093 als leavys Grand Total 0 73 51 0	0 Total Peds 0 0 0	2468 East/West Total Approaches 0 93 81 0	S Totals: Hour Ending 7:00:00 8:00:00 9:00:00	59 Wes Includ Left 0 3 3 0	1061 t Appro es Cars, T Thru 0 6 12 0	255 ach Tot rucks, & H Right 0 11 15 0	1375 als Grand Total 0 20 30 0	1 Total Peds 0 1 0
Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00	79 East Includ Left 0 56 29 0 33	992 t <b>Appro</b> es Cars, T Thru 0 14 9 0 14	22 ach Tota rucks, & H Right 0 3 13 0 21	1093 als leavys Grand Total 0 73 51 0 68	0 Total Peds 0 0 0 0 0 0	2468 East/West Total Approaches 0 93 81 0 108	S Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00	59 Wes Includ Left 0 3 3 0 4	1061 t Appro es Cars, T Thru 0 6 12 0 15	255 ach Tot rucks, & H Right 0 11 15 0 21	1375 als leavys Grand Total 0 20 30 0 40	1 Total Peds 0 1 0 0 0
Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00	79 East Includ Left 0 56 29 0 33 40	992 <b>Appro</b> es Cars, T Thru 0 14 9 0 14 12	22 ach Tota rucks, & H Right 0 3 13 0 21 18	1093 Iteavys Grand Total 0 73 51 0 68 70	0 Total Peds 0 0 0 0 0 0 1	2468 East/West Total Approaches 0 93 81 0 108 109	S Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00	59 Wes Includ Left 0 3 3 0 4 4 4	1061 t Appro es Cars, T Thru 0 6 12 0 15 15 17	255 ach Tot rucks, & F Right 0 11 15 0 21 18	1375 als Grand Total 0 20 30 0 40 39	1 Total Peds 0 1 0 0 0 0 0
Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	79 Eas Includ Left 0 56 29 0 33 40 27	992 <b>Appro</b> es Cars, T Thru 0 14 9 0 14 12 8	22 ach Tota rucks, & H Right 0 3 13 0 21 18 13 13	1093 leavys Grand Total 0 73 51 0 68 70 48	0 Total Peds 0 0 0 0 0 1 0	2468 East/West Total Approaches 0 93 81 0 108 109 78	S Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	59 Wes Includ Left 0 3 0 4 4 3 3	1061 <b>t Appro</b> es Cars, T Thru 0 6 12 0 15 17 17 17	255 ach Tot rucks, & F Right 0 11 15 0 21 18 10	1375 als Grand Total 0 20 30 0 40 39 30	1 Total Peds 0 1 0 0 0 0 0 0 0
Totals: Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	79 Eas Includ 0 56 29 0 33 40 27	992 <b>Appro</b> es Cars, T Thru 0 14 9 0 14 12 8	22 ach Tota rucks, & H Right 0 3 13 0 21 18 13	1093 leavys Grand Total 0 73 51 0 68 70 48	0 Total Peds 0 0 0 0 0 1 0	2468 East/West Total Approaches 0 93 81 0 108 109 78	<u>S Totals:</u> Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	59 Includ Left 0 3 0 4 4 3	1061 <b>t Appro</b> es Cars, T Thru 0 6 12 0 15 17 17 17	255 ach Tot rucks, & F 0 11 15 0 21 18 10	1375 eeavys Grand Total 0 20 30 0 40 39 30 30	1 Total Peds 0 1 0 0 0 0
Totals: Hour Ending 7:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	79 Eas Includ Left 0 56 29 0 33 40 27	992 <b>Appro</b> es Cars, T Thru 0 14 9 0 14 12 8	22 ach Tota rucks, & F Right 0 3 13 0 21 18 13 13 68 68	1093 als Grand Total 0 73 51 0 68 70 48 70 48	0 Total Peds 0 0 0 0 0 1 0	2468 East/West Total Approaches 0 93 81 0 108 109 78 78	<u>S Totals:</u> Hour Ending 7:00:00 8:00:00 16:00:00 17:00:00 18:00:00 19:00:00 19:00:00	59 Wes Includ Left 0 3 0 4 4 3 7 17	1061 <b>t Appro</b> es Cars, T Thru 0 6 12 0 15 17 17 17 67	255 ach Tot rucks, & F Right 0 11 15 0 21 18 10	1375 als Grand Total 0 20 30 0 40 39 30 30	1 Total Peds 0 1 0 0 0 0 0 0 1 1 1 1
Totals: Hour Ending 7:00:00 8:00:00 16:00:00 17:00:00 18:00:00 19:00:00 19:00:00	79 Eas Includ Left 0 56 29 0 33 40 27	992 <b>Appro</b> es Cars, T Thru 0 14 9 0 14 12 8 57 57	22 ach Tota rucks, & F Right 0 3 13 0 21 18 13 13 68 68 Calc 8:00	1093 als Grand Total 0 73 51 0 68 70 48 70 48	0 Total Peds 0 0 0 0 1 0 1 Values f	2468 East/West Total Approaches 0 93 81 0 108 109 78 78 469 or Traffic Cr	<u>S Totals:</u> Hour Ending 7:00:00 8:00:00 16:00:00 17:00:00 18:00:00 19:00:00 19:00:00 W Totals: ossing Ma	59 Wes Includ Left 0 3 0 4 4 3 0 4 3 7 17 ajor Stro 18:00	1061 t Appro es Cars, T Thru 0 6 12 0 15 17 17 17 67 eet 10:00	255 ach Tot rucks, & H Right 0 11 15 0 21 18 10 10 75	1375 als Grand Total 0 20 30 0 40 39 30 30 159	1 Total Peds 0 1 0 0 0 0 0



		Passen	ger Cars	- North A	pproach			True	cks - Nort	h Approa	ach		Heavys - North Approach						Pedestrians		
Interval	Le	ft	т	hru	Riç	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	ght	North	Cross	
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15:00	1	1	35	35	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	
7:30:00	2	1	85	50	0	0	0	0	0	0	0	0	1	1	7	4	0	0	0	0	
7:45:00	3	1	127	42	1	1	0	0	0	0	0	0	1	0	11	4	0	0	0	0	
8:00:00	8	5	163	36	2	1	0	0	0	0	0	0	1	0	14	3	0	0	0	0	
8:15:00	12	4	202	39	3	1	0	0	0	0	0	0	1	0	22	8	0	0	0	0	
8:30:00	17	5	249	47	3	0	0	0	1	1	0	0	1	0	32	10	0	0	0	0	
8:45:00	20	3	294	45	10	7	0	0	1	0	1	1	1	0	36	4	0	0	0	0	
9:00:00	24	4	341	47	10	0	0	0	1	0	1	0	1	0	40	4	0	0	0	0	
9:15:00	24	0	341	0	10	0	0	0	1	0	1	0	1	0	40	0	0	0	0	0	
16:00:00	24	0	341	0	10	0	0	0	1	0	1	0	1	0	40	0	0	0	0	0	
16:15:00	30	6	406	65	12	2	0	0	4	3	1	0	1	0	41	1	0	0	0	0	
16:30:00	35	5	461	55	14	2	0	0	6	2	1	0	1	0	43	2	0	0	0	0	
16:45:00	37	2	519	58	14	0	0	0	7	1	1	0	1	0	48	5	0	0	0	0	
17:00:00	44	7	579	60	17	3	0	0	8	1	1	0	1	0	48	0	0	0	0	0	
17:15:00	45	1	631	52	18	1	0	0	9	1	1	0	1	0	50	2	0	0	0	0	
17:30:00	50	5	669	38	18	0	0	0	12	3	1	0	1	0	53	3	0	0	0	0	
17:45:00	56	6	709	40	18	0	0	0	14	2	1	0	1	0	54	1	0	0	0	0	
18:00:00	60	4	754	45	19	1	0	0	15	1	1	0	1	0	56	2	0	0	0	0	
18:15:00	63	3	801	47	19	0	0	0	16	1	1	0	1	0	59	3	0	0	0	0	
18:30:00	67	4	837	36	20	1	0	0	17	1	1	0	1	0	62	3	0	0	0	0	
18:45:00	72	5	870	33	21	1	0	0	17	0	1	0	1	0	62	0	0	0	0	0	
19:00:00	78	6	910	40	21	0	0	0	18	1	1	0	1	0	64	2	0	0	0	0	
19:15:00	78	0	910	0	21	0	0	0	18	0	1	0	1	0	64	0	0	0	0	0	
19:15:15	78	0	910	0	21	0	0	0	18	0	1	0	1	0	64	0	0	0	0	0	
1	1		1		1		1		1		1		1		1		1		1		



-		Passen	ger Cars	- East Ap	proach			Tru	Trucks - East Approach					He		Pedestrians				
Interval	Le	ft	ТІ	hru	Rig	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	ght	East	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	11	11	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	23	12	6	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	38	15	10	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	56	18	14	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	66	10	14	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	72	6	16	2	5	2	0	0	0	0	0	0	1	1	1	1	0	0	0	0
8:45:00	77	5	18	2	10	5	0	0	0	0	1	1	2	1	1	0	0	0	0	0
9:00:00	83	6	22	4	15	5	0	0	0	0	1	0	2	0	1	0	0	0	0	0
9:15:00	83	0	22	0	15	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0
16:00:00	83	0	22	0	15	0	0	0	0	0	1	0	2	0	1	0	0	0	0	0
16:15:00	93	10	30	8	23	8	0	0	0	0	2	1	2	0	1	0	0	0	0	0
16:30:00	99	6	31	1	28	5	0	0	0	0	2	0	3	1	1	0	0	0	0	0
16:45:00	106	7	33	2	31	3	0	0	0	0	2	0	3	0	1	0	0	0	0	0
17:00:00	115	9	36	3	35	4	0	0	0	0	2	0	3	0	1	0	0	0	0	0
17:15:00	124	9	38	2	44	9	0	0	0	0	2	0	3	0	1	0	0	0	0	0
17:30:00	137	13	38	0	48	4	2	2	0	0	2	0	3	0	1	0	0	0	0	0
17:45:00	146	9	45	7	50	2	2	0	0	0	2	0	3	0	1	0	0	0	1	1
18:00:00	153	7	48	3	53	3	2	0	0	0	2	0	3	0	1	0	0	0	1	0
18:15:00	160	7	48	0	58	5	2	0	0	0	2	0	3	0	1	0	0	0	1	0
18:30:00	165	5	51	3	59	1	2	0	0	0	2	0	3	0	1	0	0	0	1	0
18:45:00	172	7	54	3	65	6	2	0	0	0	3	1	3	0	1	0	0	0	1	0
19:00:00	180	8	56	2	65	0	2	0	0	0	3	0	3	0	1	0	0	0	1	0
19:15:00	180	0	56	0	65	0	2	0	0	0	3	0	3	0	1	0	0	0	1	0
19:15:15	180	0	56	0	65	0	2	0	0	0	3	0	3	0	1	0	0	0	1	0
															1					



		Passeng	ger Cars -	South A	pproach		Trucks - South Approach				Heavys - South Approach						Pedestrians			
Interval	Le	ft	Th	ru	Rig	ght	Le	Left		ru	Ri	ght	Le	eft	Th	ru	Rig	jht	South	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	cr Cum Incr		Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	16	16	5	5	0	0	0	0	0	0	0	0	7	7	0	0	0	0
7:30:00	4	1	39	23	8	3	0	0	0	0	0	0	0	0	7	0	0	0	0	0
7:45:00	8	4	67	28	14	6	0	0	0	0	0	0	0	0	12	5	2	2	0	0
8:00:00	9	1	101	34	20	6	0	0	0	0	0	0	1	1	16	4	2	0	0	0
8:15:00	11	2	141	40	24	4	0	0	0	0	0	0	2	1	21	5	4	2	0	0
8:30:00	14	3	175	34	26	2	0	0	3	3	1	1	2	0	25	4	4	0	0	0
8:45:00	15	1	210	35	34	8	0	0	6	3	1	0	3	1	31	6	5	1	0	0
9:00:00	15	0	246	36	41	7	0	0	11	5	1	0	3	0	37	6	5	0	0	0
9:15:00	15	0	246	0	41	0	0	0	11	0	1	0	3	0	37	0	5	0	0	0
16:00:00	15	0	246	0	41	0	0	0	11	0	1	0	3	0	37	0	5	0	0	0
16:15:00	20	5	311	65	57	16	0	0	11	0	1	0	4	1	39	2	5	0	0	0
16:30:00	22	2	363	52	76	19	0	0	13	2	1	0	4	0	42	3	5	0	0	0
16:45:00	24	2	452	89	99	23	0	0	13	0	2	1	4	0	43	1	5	0	0	0
17:00:00	27	3	535	83	120	21	0	0	13	0	2	0	4	0	51	8	5	0	0	0
17:15:00	34	1	600	65	139	19	0	0	13	0	2	0	4	0	55	4	5	0	0	0
17:30:00	35	1	659	59	158	19	0	0		1	2	0	4	0	59	4	5	0	1	1
17:45:00	41	6	720	61	1/8	20	0	0		0	2	0	4	0	62	3	5	0	1	0
18:00:00	44	3	783	63	196	18	0	0	14	0	2	0	4	0	64	2	5	0	1	0
18:15:00	46	2	853	/0	215	19	0	0	14	0	2	0	4	0	67	3	5	0	1	0
18:30:00	48	2	896	43	227	12	0	0	14	0	2	0	4	0	67	0	5	0	1	0
10:40:00	52	4	940	44	230	12	0	0	14	0	2	0	4	0	67	0	5	0	1	0
19:00:00	55	0	900	40	240	0	0	0	14	0	2	0	4	0	67	0	5	0	1	0
19:15:15	55	0	900	0	240	0	0	0	14	0	2	0	4	0	67	0	5	0	1	0
10.10.10		0	500	0	240	0	0	0	14	0	2	0		0	07	0		0		0



		Passen	ger Cars	- West Ap	proach			Tru	Trucks - West Approach				Heavys - West Approach						Pedestrians		
Interval	Le	eft	ТІ	nru	Rig	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	lht	West	Cross	
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15:00	0	0	4	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30:00	1	1	5	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45:00	1	0	5	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
8:00:00	3	2	6	1	11	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
8:15:00	3	0	6	0	14	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
8:30:00	4	1	10	4	17	3	0	0	0	0	0	0	0	0	0	0	2	2	1	0	
8:45:00	5	1	13	3	22	5	0	0	0	0	0	0	0	0	0	0	2	0	1	0	
9:00:00	5	0	18	5	24	2	0	0	0	0	0	0	1	1	0	0	2	0	1	0	
9:15:00	5	0	18	0	24	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	
16:00:00	5	0	18	0	24	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	
16:15:00	6	1	22	4	28	4	0	0	0	0	0	0	1	0	0	0	3	1	1	0	
16:30:00	8	2	28	6	33	5	0	0	0	0	1	1	1	0	0	0	3	0	1	0	
16:45:00	9	1	32	4	41	8	0	0	0	0	1	0	1	0	0	0	3	0	1	0	
17:00:00	9	0	33	1	42	1	0	0	0	0	1	0	1	0	0	0	4	1	1	0	
17:15:00	10	1	39	6	48	6	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
17:30:00	10	0	43	4	52	4	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
17:45:00	11	1	48	5	57	5	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
18:00:00	13	2	50	2	60	3	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
18:15:00	14	1	54	4	63	3	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
18:30:00	16	2	58	4	66	3	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
18:45:00	16	0	62	4	68	2	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
19:00:00	16	0	67	5	70	2	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
19:15:00	16	0	67	0	70	0	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
19:15:15	16	0	67	0	70	0	0	0	0	0	1	0	1	0	0	0	4	0	1	0	
			1								1		1		1		1		1		



Morning Peak Diagram	Specified Period One Hour Peak
	From:         7:00:00         From:         7:45:00           To:         9:00:00         To:         8:45:00
Municipality:Centre WellingtonSite #:2214500002Intersection:Wellington Rd 7 & Wellington Rd 1TFR File #:1Count date:4-Aug-22	Weather conditions: Person counted: Person prepared: Person checked:
** Signalized Intersection **	Major Road: Wellington Rd 7 runs N/S
North Leg Total:         417         Heavys         5         20         0         25           North Entering:         226         Trucks         0         3         0         3           North Peds:         0         Cars         30         138         30         19           Peds Cross:         M         Totals         35         161         30	Heavys17East Leg Total:284Trucks7East Entering:151Cars167East Peds:0Totals191Peds Cross:Σ
Heavys Trucks Cars Totals 19 6 154 179 Wellington Rd 18	ellington Rd 7 Cars Trucks Heavys Totals 31 1 1 33 94 4 9 107 10 1 0 11 E
Heavys Trucks Cars Totals 3 1 29 33 6 4 77 87	Woolwich St W
6         1         31         38           15         6         137         Wellington Rd 7	Cars Trucks Heavys Totals 122 5 6 133
Peds Cross:Image: Carse of the c	rs       30       107       15       152       Peds Cross:       ▶         rs       2       5       1       8       South Peds:       0         rs       5       13       0       18       South Entering:       178         ls       37       125       16       South Leg Total:       388
Comm	nents



I

Afternoon Peak Diagram	Specified Period One Hour Peak
	From: 16:00:00 From: 16:00:00
	<b>To:</b> 19:00:00 <b>To:</b> 17:00:00
Municipality:Centre WellingtonSite #:2214500002Intersection:Wellington Rd 7 & Wellington Rd 1TFR File #:1	Weather conditions: Person counted: Person prepared:
Count date: 4-Aug-22	Person checked:
** Signalized Intersection **	Major Road: Wellington Rd 7 runs N/S
North Leg Total: 676       Heavys 1       10       0       11         North Entering: 290       Trucks 2       4       1       7         North Peds: 0       Cars 41       191       40       27         Peds Cross:       M       Totals 44       205       41	P2 Heavys 13 Trucks 7 Cars <u>366</u> Totals <u>386</u> Heavys 13 East Leg Total: 420 East Entering: 197 East Peds: 0 Peds Cross: X
Heavys Trucks Cars Totals 12 4 198 214 Wellington Rd 18	ellington Rd 7 Cars Trucks Heavys Totals 58 0 0 58 114 1 7 122 17
Heavys Trucks Cars Totals	Woolwich St W
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} & & \\ & & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $
Peds Cross: X Cars 252 Ca	rs 43 254 18 315 Peds Cross: 🛏
West Peds: 0 Trucks 5 Truck	ks 1 6 0 7 South Peds: 0
West Entering: 268 Heavys 12 Heavy	ys <u>4 11 0</u> 15 South Entering: 337
West Leg Total: 482 Totals 269 Tota	lls 48 271 18 South Leg Total: 606
Comm	nents



# **Total Count Diagram**

Municipality: Centre Wellington	Weather conditions:													
Site #: 2214500002														
Intersection: Wellington Rd 7 & Wellington Rd 1														
TFR File #: 1	Person counted:													
Count date: $4-\Delta u a - 22$	Person prepared:													
	Person checked:													
** Signalized Intersection **	Major Road: Wellington Rd 7 runs N/S													
North Leg Total: 2484 Heavys 13 60 1 7	4 A Heavys 63 East Leg Total: 1589													
North Entering: 1193 Trucks 3 13 5 2	1 Trucks 31 East Entering: 760													
North Peds: 0 Cars 182 753 163 1	098 Cars 1197 East Peds: 1													
Peds Cross: 🛏 Totals 198 826 169	Totals 1291 Peds Cross: X													
Peds Cross.     Peds Cross.     Peds Cross.     Peds Cross.       Items Table 0 are table     Items Table 0 are table 1 are														
Heavys Trucks Cars Totals														
53 17 805 875														
/	N 470 10 23 503													
	$\frac{63}{} \frac{63}{} \frac{1}{} \frac{64}{}$													
Wellington Rd 18	• 723 13 24													
Heavys Trucks Cars Totals	Woolwich St W													
12 3 194 209	s													
14 10 558 582	······													
11 3 163 177	Cars Trucks Heavys Totals													
37 16 915 Wellington Rd 7	✓         1         ✓         796         18         15         829													
Peds Cross:  Cars 979 C	ars 153 813 75 1041 Peds Cross: 🖂													
Vest Peds: 1   Irucks 1/ Tru	XKS         4         26         3         33         South Peds:         0           xma         47         50         0         67         Downking Figure 44.44													
West Log Total: 1842	ys 17 50 0 67 South Log Total: 2209													
West Leg Total. 1843 Totals 1067 Tot	ais 174 669 76 South Leg Total. 2206													
Comr	nents													



	Traffic Count Summary         tersection:       Wellington Rd 7 & Wellington Rd       Count Date: 4-Aug-22       Municipality: Centre Wellington													
Intersection:	Wellingt	on Rd 7	& Welli	ngton Rd	Count [	Date: 4-Aug-22	Munic	<sup>cipality:</sup> Ce	entre We	llington				
	Nort	h Appro	ach Tot	als		Nearth (Oscath		Sout	h Appro	ach To	tals			
Hour	Includ	es Cars, T	rucks, & H	leavys	Total	North/South	Hour	Includ	es Cars, T	rucks, & H	leavys	Total		
Ending	Left	Thru	Right	Grand Total	Peds	Approaches	Ending	Left	Thru	Right	Grand Total	Peds		
7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00	0:00         0			0 211 229 0 290 262 201	0 0 0 0 0 0	0 335 421 0 627 539 412	7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	0 21 41 0 48 40 24	0 95 134 0 271 220 169	0 8 17 0 18 17 18	0 124 192 0 337 277 211	0 0 0 0 0		
Totals:	169	826	198	1193	0	2334	S Totals:	174	889	78	1141	0		
	East	t Approa	ach Tota	als		East/West		Wes	t Appro	ach Tot	<u>als</u>			
Hour	Includ	es Cars, I	rucks, & F	Grand	Total	Total	Hour Ending	Inclua	es Cars, I	rucks, & F	Grand	Total Dodo		
Ending	Left	Thru	Right	Total	reus	Approaches	Ending	Left	Thru	Right	Total	reus		
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0		
8:00:00	10	115	27	152	1	275	8:00:00	29	64	30	123	1		
9:00:00	10	92		136	0	287	9:00:00	25	89	37	151	0		
16:00:00	0 17	122			0	0	16:00:00	0 57	161		0	0		
18.00.00	17	101	12	156	0	405	18.00.00	57 67	104	47	200	0		
10.00.00	13	73	32	110	0	266	10.00.00	31	87	20	279 147	0		
					v					20				
Totals:	64	503		760	1	1728	W Totals:	209	582	177	968	1		
			Calc	ulated V	alues f	or Traffic Cr	ossing Ma	ajor Stro	eet					
Hours E	nding:	7:00	8:00 154	9:00 127	16:00 0		17:00 238	18:00 258	19:00 132	0:00 0				



		Passeng	ger Cars	- North A	pproach			True	cks - Nort	h Approa	ach			Не	avys - No	orth Appr	oach		Pede	strians
Interval	Le	ft	т	hru	Riç	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	ght	North	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	5	26	26	10	10	0	0	0	0	0	0	1	1	2	2	0	0	0	0
7:30:00	11	6	71	45	19	9	2	2	1	1	0	0	1	0	7	5	0	0	0	0
7:45:00	16	5	102	31	26	7	2	0	1	0	0	0	1	0	9	2	1	1	0	0
8:00:00	26	10	131	29	37	11	2	0	1	0	0	0	1	0	11	2	2	1	0	0
8:15:00	30	4	166	35	46	9	2	0	2	1	0	0	1	0	21	10	2	0	0	0
8:30:00	43	13	201	35	51	5	2	0	3	1	0	0	1	0	25	4	4	2	0	0
8:45:00	46	3	240	39	56	5	2	0	4	1	0	0	1	0	29	4	6	2	0	0
9:00:00	53	7	280	40	60	4	2	0	4	0	0	0	1	0	33	4	7	1	0	0
9:15:00	53	0	280	0	60	0	2	0	4	0	0	0	1	0	33	0	7	0	0	0
16:00:00	53	0	280	0	60	0	2	0	4	0	0	0	1	0	33	0	7	0	0	0
16:15:00	65	12	326	46	70	10	2	0	5	1	1	1	1	0	37	4	7	0	0	0
16:30:00	71	6	370	44	78	8	2	0	6	1	1	0	1	0	40	3	8	1	0	0
16:45:00	86	15	419	49	88	10	3	1	6	0	1	0	1	0	43	3	8	0	0	0
17:00:00	93	7	471	52	101	13	3	0	8	2	2	1	1	0	43	0	8	0	0	0
17:15:00	104	11	515	44	116	15	3	0	8	0	2	0	1	0	45	2	8	0	0	0
17:30:00	117	13	549	34	133	17	3	0	10	2	2	0	1	0	48	3	12	4	0	0
17:45:00	131	14	590	41	141	8	3	0	11	1	2	0	1	0	50	2	12	0	0	0
18:00:00	138	7	619	29	153	12	3	0	12	1	2	0	1	0	52	2	12	0	0	0
18:15:00	151	13	658	39	162	9	4	1	13	1	3	1	1	0	55	3	13	1	0	0
18:30:00	154	3	685	27	170	8	4	0	13	0	3	0	1	0	58	3	13	0	0	0
18:45:00	157	3	716	31	176	6	5	1	13	0	3	0	1	0	58	0	13	0	0	0
19:00:00	163	6	753	37	182	6	5	0	13	0	3	0	1	0	60	2	13	0	0	0
19:15:00	163	0	753	0	182	0	5	0	13	0	3	0	1	0	60	0	13	0	0	0
19:15:15	163	0	753	0	182	0	5	0	13	0	3	0	1	0	60	0	13	0	0	0



		Passen	ger Cars	- East Ap	proach			Tru	cks - Eas	t Approa	ch			He	eavys - Ea	ast Appro	bach		Pedes	strians
Interval	Le	ft	Tł	nru	Riç	jht	L	eft	Th	ru	Ri	ght	Le	ft	Th	ru	Rig	lht	East	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	22	22	4	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	8	5	51	29	9	5	0	0	0	0	0	0	0	0	1	1	0	0	1	0
7:45:00	9	1	81	30	19	10	0	0	1	1	0	0	0	0	2	1	0	0	1	0
8:00:00	10	1	107	26	27	8	0	0	3	2	0	0	0	0	5	3	0	0	1	0
8:15:00	14	4	121	14	38	11	0	0	3	0	0	0	0	0	6	1	0	0	1	0
8:30:00	16	2	149	28	45	7	0	0	4	1	0	0	0	0	8	2	0	0	1	0
8:45:00	19	3	175	26	50	5	1	1	5	1	1	1	0	0	11	3	1	1	1	0
9:00:00	19	0	188	13	59	9	1	0	5	0	1	0	0	0	14	3	1	0	1	0
9:15:00	19	0	188	0	59	0	1	0	5	0	1	0	0	0	14	0	1	0	1	0
16:00:00	19	0	188	0	59	0	1	0	5	0	1	0	0	0	14	0	1	0	1	0
16:15:00	25	6	222	34	73	14	1	0	6	1	1	0	0	0	18	4	1	0	1	0
16:30:00	32	7	251	29	88	15	1	0	6	0	1	0	0	0	20	2	1	0	1	0
16:45:00	34	2	277	26	107	19	1	0	6	0	1	0	0	0	20	0	1	0	1	0
17:00:00	36	2	302	25	117	10	1	0	6	0	1	0	0	0	21	1	1	0	1	0
17:15:00	36	0	330	28	127	10	1	0	6	0	1	0	0	0	22	1	1	0	1	0
17:30:00	40	4	358	28	144	17	1	0	6	0	1	0	0	0	22	0	1	0	1	0
17:45:00	44	4	380	22	148	4	1	0	7	1	1	0	0	0	23	1	1	0	1	0
18:00:00	49	5	399	19	158	10	1	0	8	1	2	1	0	0	23	0	1	0	1	0
18:15:00	51	2	420	21	168	10	1	0	9	1	2	0	0	0	23	0	1	0	1	0
18:30:00	55	4	442	22	178	10	1	0	10	1	2	0	0	0	23	0	1	0	1	0
18:45:00	60	5	457	15	182	4	1	0	10	0	2	0	0	0	23	0	1	0	1	0
19:00:00	63	3	470	13	190	8	1	0	10	0	2	0	0	0	23	0	1	0	1	0
19:15:00	63	0	470	0	190	0	1	0	10	0	2	0	0	0	23	0	1	0	1	0
19:15:15	63	0	470	0	190	0	1	0	10	0	2	0	0	0	23	0	1	0	1	0
													_							



		Passeng	Jer Cars	- South A	pproach			True	ks - Sout	th Appro	ach			Не	avys - So	uth Appr	roach		Pedes	strians
Interval	Le	ft	TI	hru	Riç	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	ru	Rig	ght	South	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	4	4	11	11	2	2	0	0	2	2	1	1	1	1	4	4	0	0	0	0
7:30:00	11	7	28	17	2	0	0	0	2	0	1	0	1	0	5	1	0	0	0	0
7:45:00	16	5	51	23	3	1	0	0	2	0	1	0	2	1	7	2	0	0	0	0
8:00:00	19	3	81	30	7	4	0	0	3	1	1	0	2	0	11	4	0	0	0	0
8:15:00	34	15	106	25	8	1	0	0	3	0	1	0	4	2	13	2	0	0	0	0
8:30:00	39	5	133	27	11	3	1	1	4	1	2	1	5	1	16	3	0	0	0	0
8:45:00	46	7	158	25	18	7	2	1	7	3	2	0	7	2	20	4	0	0	0	0
9:00:00	50	4	192	34	22	4	2	0	12	5	3	1	10	3	25	5	0	0	0	0
9:15:00	50	0	192	0	22	0	2	0	12	0	3	0	10	0	25	0	0	0	0	0
16:00:00	50	0	192	0	22	0	2	0	12	0	3	0	10	0	25	0	0	0	0	0
16:15:00	64	14	255	63	29	7	3	1	13	1	3	0	11	1	27	2	0	0	0	0
16:30:00	76	12	300	45	34	5	3	0	15	2	3	0	12	1	30	3	0	0	0	0
16:45:00	83	7	371	71	36	2	3	0	16	1	3	0	12	0	31	1	0	0	0	0
17:00:00	93	10	446	75	40	4	3	0	18	2	3	0	14	2	36	5	0	0	0	0
17:15:00	102	9	498	52	48	8	3	0	18	0	3	0	15	1	39	3	0	0	0	0
17:30:00	115	13	539	41	50	2	4	1	18	0	3	0	17	2	42	3	0	0	0	0
17:45:00	121	6	602	63	54	4	4	0	19	1	3	0	17	0	44	2	0	0	0	0
18:00:00	129	8	652	50	57	3	4	0	21	2	3	0	17	0	47	3	0	0	0	0
18:15:00	136	7	702	50	64	7	4	0	22	1	3	0	17	0	50	3	0	0	0	0
18:30:00	142	6	743	41	70	6	4	0	22	0	3	0	17	0	50	0	0	0	0	0
18:45:00	153	11	780	37	70	0	4	0	25	3	3	0	17	0	50	0	0	0	0	0
19:00:00	153	0	813	33	75	5	4	0	26	1	3	0	17	0	50	0	0	0	0	0
19:15:00	153	0	813	0	75	0	4	0	26	0	3	0	17	0	50	0	0	0	0	0
19:15:15	153	0	813	0	75	0	4	0	26	0	3	0	17	0	50	0	0	0	0	0



		Passen	ger Cars	- West Ap	oproach			Tru	cks - Wes	t Approa	ich			He	eavys - W	est Appr	oach		Pede	strians
Interval	Le	ft	ТІ	hru	Rig	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	ght	West	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	9	9	8	8	0	0	1	1	0	0	1	1	1	1	2	2	0	0
7:30:00	13	10	21	12	13	5	0	0	1	0	0	0	1	0	1	0	2	0	1	1
7:45:00	18	5	39	18	19	6	0	0	2	1	0	0	1	0	3	2	3	1	1	0
8:00:00	26	8	58	19	26	7	0	0	3	1	0	0	3	2	3	0	4	1	1	0
8:15:00	31	5	79	21	33	7	0	0	4	1	1	1	3	0	6	3	5	1	1	0
8:30:00	38	7	97	18	41	8	1	1	5	1	1	0	3	0	6	0	9	4	1	0
8:45:00	47	9	116	19	50	9	1	0	6	1	1	0	4	1	9	3	9	0	1	0
9:00:00	47	0	137	21	57	7	1	0	6	0	1	0	6	2	10	1	9	0	1	0
9:15:00	47	0	137	0	57	0	1	0	6	0	1	0	6	0	10	0	9	0	1	0
16:00:00	47	0	137	0	57	0	1	0	6	0	1	0	6	0	10	0	9	0	1	0
16:15:00	61	14	168	31	70	13	1	0	6	0	2	1	7	1	12	2	9	0	1	0
16:30:00	74	13	214	46	81	11	1	0	6	0	2	0	7	0	13	1	9	0	1	0
16:45:00	90	16	253	39	89	8	2	1	8	2	2	0	8	1	14	1	11	2	1	0
17:00:00	101	11	295	42	101	12	2	0	8	0	2	0	8	0	14	0	11	0	1	0
17:15:00	123	22	343	48	107	6	3	1	8	0	3	1	8	0	14	0	11	0	1	0
17:30:00	131	8	391	48	117	10	3	0	9	1	3	0	9	1	14	0	11	0	1	0
17:45:00	150	19	439	48	126	9	3	0	10	1	3	0	11	2	14	0	11	0	1	0
18:00:00	164	14	471	32	134	8	3	0	10	0	3	0	11	0	14	0	11	0	1	0
18:15:00	178	14	490	19	142	8	3	0	10	0	3	0	12	1	14	0	11	0	1	0
18:30:00	181	3	515	25	151	9	3	0	10	0	3	0	12	0	14	0	11	0	1	0
18:45:00	192		538	23	156	5	3	0	10	0	3	0	12	0	14	0		0	1	0
19:00:00	194	2	558	20	163	1	3	0	10	0	3	0	12	0	14	0	11	0	1	0
19:15:00	194	0	558	0	163	0	3	0	10	0	3	0	12	0	14	0		0	1	0
19:15:15	194	0	558	0	163	0	3	0	10	0	3	0	12	0	14	0	11	0	1	0



Morning Pe	ak Diagram	Specified Period           From:         7:00:00           To:         9:00:00	One Hour Peak From: 8:00:00 To: 9:00:00
Municipality:CentreSite #:22145Intersection:WellinTFR File #:1Count date:4-Aug	e Wellington 500003 ngton Rd 7 & South St I-22	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized I	ntersection **	Major Road: Wellingto	on Rd 7 runs N/S
North Leg Total: 409 North Entering: 222 North Peds: 0 Peds Cross: ►	Heavys 27 0 27 Trucks 3 0 3 Cars 189 3 19 Totals 219 3 W W	Heavys 22 Trucks 7 Cars 158 Totals 187 ellington Rd 7 E South	East Leg Total: 5 East Entering: 2 East Peds: 0 Peds Cross: X Cars Trucks Heavys Totals 2 0 0 2 0 0 0 0 2 0 0 0
	Wellington Rd 7		3 0 0 3
	Cars 189 Trucks 3 Heavys 27 Totals 219 Cars 189 Cars 189 Trucks 27 Heavy Totals 219	rs 156 0 156 ks 7 0 7 /s 22 0 22 ls 185 0	Peds Cross:▶South Peds:0South Entering:185South Leg Total:404
	Comn	nents	







## **Total Count Diagram**





				Traf	fic C	ount S	umm	ary				
Intersection:	Wellingt	on Rd 7	& South	St	Count [	Date: 4-Aug-22	Munic	<sup>ipality:</sup> Ce	entre We	llington		
	Nort	h Appro	ach Tot	als				Sout	h Appro	ach To	tals	
Hour	Includ	es Cars, T	rucks, & H	leavys	Total	North/South	Hour	Includ	es Cars, T	rucks, & H	leavys	Total
Ending	Left	Thru	Right	Grand Total	Peds	Approaches	Ending	Left	Thru	Right	Grand Total	Peds
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	3	185	0	188	0	312	8:00:00	0	124	0	124	0
9:00:00	3	219		222		407	9:00:00	0	185		185	0
17:00:00	6	274		280		613	17:00:00	0	329	4	333	0
18:00:00	5	209	0	214	0	496	18:00:00	Ō	281	1	282	Ō
19:00:00	2	187	0	189	0	405	19:00:00	0	213	3	216	0
<del>-</del>	40	4074		4000		2222	C Totolo	0	1122	0	1110	
l otals:	19	1074	0	1093	0	2233	S TOLAIS.	0	1152	0	1140	- 0
	19 East	<u>1074</u> t Approa	<u>ach Tota</u>	<u>1093</u> als		East/West		Wes	t Appro	ach Tot	als	
Hour Ending	19 East Includ	<u>1074</u> t Approa es Cars, T	0 ach Tota rucks, & F	als leavys Grand	Total Peds	East/West Total	Hour Ending	Wes Includ	t Appro es Cars, T	o ach Tot rucks, & F	als leavys Grand	Total Peds
Hour Ending	19 East Includ	1074 t Approa es Cars, T Thru	ach Tota Trucks, & H Right	1093 als leavys Grand Total	Total Peds	East/West Total Approaches	Hour Ending	U Wes Includ	t Appro es Cars, T Thru	o ach Tot rucks, & H Right	als leavys Grand Total	Total Peds
Hour Ending 7:00:00	19 East Includ Left 0 0	1074 t Approa es Cars, T Thru 0 0	ach Tota rucks, & H Right 0 0	1093 als leavys Grand Total 0 0	Total Peds 0	East/West Total Approaches	Hour Ending 7:00:00	Wes Includ	t Appro es Cars, T Thru 0 0	o ach Tot rucks, & F Right 0 0	als leavys Grand Total 0 0	Total Peds 0
Hour Ending 7:00:00 8:00:00 9:00:00	19 Eas: Includ Left 0 0 0	t Approa es Cars, T Thru 0 0 0	ach Tota rucks, & H Right 0 0 2	1093 als Grand Total 0 0 2	Total Peds 0 0 0	East/West Total Approaches 0 0 2	Hour Ending 7:00:00 8:00:00 9:00:00	Wes Includ Left 0 0 0	t Appro es Cars, T Thru 0 0 0 0	o ach Tot rucks, & F Right 0 0 0	I 140 als Ieavys Grand Total 0 0 0 0	Total Peds 0 0 0
Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00	19 East Includ Left 0 0 0 0	1074 t Approa es Cars, T Thru 0 0 0 0	O           ach Tot:           Trucks, & F           Right           0           2           0           0	I 1093 als Grand Total 0 0 2 0	Total Peds 0 0 0 0	East/West Total Approaches 0 0 2 0	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00	Wes Includ Left 0 0 0 0	t Appro es Cars, T Thru 0 0 0 0	o ach Tot rucks, & F Right 0 0 0 0	Intervention of the second sec	Total Peds 0 0 0 0 0
Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00	19 East Includ Left 0 0 0 0 2	1074 t <b>Appro</b> a es Cars, T Thru 0 0 0 0 0	0 ach Tota Trucks, & F Right 0 0 2 0 7 7	I 1093 als Grand Total 0 0 2 0 9 7	Total Peds 0 0 0 0 0	East/West Total Approaches 0 0 2 0 9 9	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00	Wes Includ Left 0 0 0 0 0	t Appro es Cars, T Thru 0 0 0 0 0	o rucks, & H Right 0 0 0 0 0	Intervention of the second sec	Total Peds 0 0 0 0 0 0
Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00	19 East Includ Left 0 0 0 0 2 2 2	1074 t <b>Appro</b> es Cars, T Thru 0 0 0 0 0 0 0	0 ach Tota rucks, & F Right 0 0 2 0 7 5 5	I 1093 als Grand Total 0 0 2 0 9 7	Total Peds 0 0 0 0 0 0 0	East/West Total Approaches 0 0 2 0 9 7	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00	Wes Includ Left 0 0 0 0 0 0	Thru           0           0           0           0           0           0           0           0           0           0           0	o ach Tot rucks, & H Right 0 0 0 0 0 0 0	IT40 als Grand Total 0 0 0 0 0 0 0	Total Peds 0 0 0 0 0 0 0
Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	19 Eas: Includ 0 0 0 2 2 0	1074 <b>t Appro</b> es Cars, T Thru 0 0 0 0 0 0 0 0 0 0	O           ach Tot:           rucks, & H           Right           0           2           0           7           5           5	als leavys Grand Total 0 2 0 9 7 5	Total Peds 0 0 0 0 0 0 0	East/West Total Approaches 0 0 2 0 9 7 5	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00	Ves Includ Left 0 0 0 0 0	t Appro es Cars, T Thru 0 0 0 0 0 0 0	ach Tot rucks, & H Right 0 0 0 0 0 0 0	Intervention of the second sec	Total Peds 0 0 0 0 0 0
Iotals:           Hour           Ending           7:00:00           8:00:00           9:00:00           16:00:00           17:00:00           18:00:00           19:00:00           19:00:00	19 East Includ 0 0 0 2 2 0	1074 t Approv es Cars, T Thru 0 0 0 0 0 0 0 0 0 0 0 0 0	0 ach Tota rucks, & H 0 2 0 7 5 5 5	1093       als       leavys       Grand       Total       0       2       0       9       7       5	Total Peds 0 0 0 0 0 0 0 0 0	East/West Total Approaches	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00 19:00:00	Ves Includ Left 0 0 0 0 0 0 0 0	t Appro es Cars, T Thru 0 0 0 0 0 0 0 0	o ach Tot rucks, & H Right 0 0 0 0 0 0 0 0	IT40 als leavys Grand Total 0 0 0 0 0 0 0 0 0	Total Peds 0 0 0 0 0 0 0
Iotals:           Hour           Ending           7:00:00           8:00:00           9:00:00           16:00:00           17:00:00           18:00:00           19:00:00           19:00:00           Hours F	19 Eas: Includ 0 0 2 2 0	1074 t Approv es Cars, T Thru 0 0 0 0 0 0 0 0 0 0 0 0 0	19 19 19 10 10 10 10 10 10 10 10 10 10	23 109 109 109 109 109 109 109 109	0 Total Peds 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	East/West Total Approaches 0 2 0 9 7 5 5 7 5 7 5 7 7 5	Hour Ending 7:00:00 8:00:00 9:00:00 16:00:00 17:00:00 18:00:00 19:00:00 19:00:00	0 Wes Includ Left 0 0 0 0 0 0 0 0 0 0 0 0 0	t Appro           es Cars, T           Thru           0	0 ach Tot rucks, & H Right 0 0 0 0 0 0 0 0 0 0 0 0 0	Intervention of the second sec	Total Peds 0 0 0 0 0 0 0



		Passeng	ger Cars	- North A	pproach			True	cks - Nort	h Approa	ich			Не	avys - No	orth Appr	oach		Pedes	strians
Interval	Le	eft	ТІ	nru	Rig	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	iru	Rig	jht	North	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	36	36	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0
7:30:00	2	0	87	51	0	0	0	0	1	1	0	0	0	0	9	5	0	0	0	0
7:45:00	2	0	129	42	0	0	0	0	1	0	0	0	0	0	12	3	0	0	0	0
8:00:00	3	1	168	39	0	0	0	0	2	1	0	0	0	0	15	3	0	0	0	0
8:15:00	4	1	212	44	0	0	0	0	3	1	0	0	0	0	24	9	0	0	0	0
8:30:00	5	1	258	46	0	0	0	0	4	1	0	0	0	0	34	10	0	0	0	0
8:45:00	5	0	309	51	0	0	0	0	5	1	0	0	0	0	38	4	0	0	0	0
9:00:00	6	1	357	48	0	0	0	0	5	0	0	0	0	0	42	4	0	0	0	0
9:15:00	6	0	357	0	0	0	0	0	5	0	0	0	0	0	42	0	0	0	0	0
16:00:00	6	0	357	0	0	0	0	0	5	0	0	0	0	0	42	0	0	0	0	0
16:15:00	7	1	426	69	0	0	0	0	8	3	0	0	0	0	45	3	0	0	0	0
16:30:00	9	2	488	62	0	0	0	0	9	1	0	0	0	0	47	2	0	0	0	0
16:45:00	10	1	548	60	0	0	0	0	9	0	0	0	0	0	52	5	0	0	0	0
17:00:00	12	2	616	68	0	0	0	0	10	1	0	0	0	0	52	0	0	0	0	0
17:15:00	12	0	670	54	0	0	0	0	11	1	0	0	0	0	54	2	0	0	0	0
17:30:00	14	2	715	45	0	0	0	0	13	2	0	0	0	0	57	3	0	0	0	0
17:45:00	16	2	764	49	0	0	0	0	14	1	0	0	0	0	59	2	0	0	0	0
18:00:00	17	1	811	47	0	0	0	0	15	1	0	0	0	0	61	2	0	0	0	0
18:15:00	18	1	861	50	0	0	0	0	16	1	0	0	0	0	64	3	0	0	0	0
18:30:00	18	0	901	40	0	0	0	0	17	1	0	0	0	0	67	3	0	0	0	0
18:45:00	19	1	940	39	0	0	0	0	17	0	0	0	0	0	67	0	0	0	0	0
19:00:00	19	0	986	46	0	0	0	0	19	2	0	0	0	0	69	2	0	0	0	0
19:15:00	19	0	986	0	0	0	0	0	19	0	0	0	0	0	69	0	0	0	0	0
19:15:15	19	0	986	0	0	0	0	0	19	0	0	0	0	0	69	0	0	0	0	0



		Passen	ger Cars	- East Ap	proach			Tru	cks - Eas	t Approa	ch			He	eavys - Ea	ast Appro	bach		Pedes	strians
Interval	Le	eft	Tł	nru	Rig	ght	L	eft	Th	ru	Ri	ght	Le	eft	Th	iru	Rig	lht	East	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	1	1	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	1	0	0	0	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	1	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	2	1	0	0	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	3	1	0	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	3	0	0	0	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	4	1	0	0	13	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	4	0	0	0	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	4	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	4	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	4	0	0	0	17	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00:00	4	0	0	0	19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	4	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15:15	4	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



		Passeng	jer Cars	- South A	pproach			Truc	ks - Sout	h Approa	ach			Не	avys - So	uth Appr	oach		Pedes	strians
Interval	Le	ft	Tł	nru	Rig	jht	L	eft	Th	ru	Ri	ght	Le	eft	Th	ru	Rig	jht	South	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	17	17	0	0	0	0	2	2	0	0	0	0	7	7	0	0	0	0
7:30:00	0	0	41	24	0	0	0	0	2	0	0	0	0	0	7	0	0	0	0	0
7:45:00	0	0	70	29	0	0	0	0	2	0	0	0	0	0	11	4	0	0	0	0
8:00:00	0	0	106	36	0	0	0	0	3	1	0	0	0	0	15	4	0	0	0	0
8:15:00	0	0	146	40	0	0	0	0	3	0	0	0	0	0	20	5	0	0	0	0
8:30:00	0	0	181	35	0	0	0	0	6	3	0	0	0	0	24	4	0	0	0	0
8:45:00	0	0	221	40	0	0	0	0	10	4	0	0	0	0	30	6	0	0	0	0
9:00:00	0	0	262	41	0	0	0	0	10	0	0	0	0	0	37	7	0	0	0	0
9:15:00	0	0	262	0	0	0	0	0	10	0	0	0	0	0	37	0	0	0	0	0
16:00:00	0	0	262	0	0	0	0	0	10	0	0	0	0	0	37	0	0	0	0	0
16:15:00	0	0	338	76	0	0	0	0	11	1	0	0	0	0	39	2	0	0	0	0
16:30:00	0	0	396	58	1	1	0	0	13	2	0	0	0	0	42	3	0	0	0	0
16:45:00	0	0	487	91	3	2	0	0	14	1	0	0	0	0	43	1	0	0	0	0
17:00:00	0	0	572	85	4	1	0	0	16	2	0	0	0	0	50	7	0	0	0	0
17:15:00	0	0	642	70	4	0	0	0	16	0	0	0	0	0	54	4	0	0	0	0
17:30:00	0	0	701	59	4	0	0	0	18	2	0	0	0	0	58	4	0	0	0	0
17:45:00	0	0	770	69	5	1	0	0	19	1	0	0	0	0	61	3	0	0	0	0
18:00:00	0	0	836	66	5	0	0	0	20	1	0	0	0	0	63	2	0	0	0	0
18:15:00	0	0	905	69	6	1	0	0	21	1	0	0	0	0	66	3	0	0	0	0
18:30:00	0	0	955	50	7	1	0	0	22	1	0	0	0	0	66	0	0	0	0	0
18:45:00	0	0	1000	45	8	1	0	0	25	3	0	0	0	0	66	0	0	0	0	0
19:00:00	0	0	1040	40	8	0	0	0	26	1	0	0	0	0	66	0	0	0	0	0
19:15:00	0	0	1040	0	8	0	0	0	26	0	0	0	0	0	66	0	0	0	0	0
19:15:15	0	0	1040	0	8	0	0	0	26	0	0	0	0	0	66	0	0	0	0	0
			1				1								1		1		1	



		Passen	ger Cars	- West Ap	proach			Tru	cks - Wes	t Approa	ch			He	avys - W	est Appr	oach		Pedes	strians
Interval	Le	eft	Tł	nru	Rig	jht	L	eft	Th	ru	Ri	ght	Le	eft	Th	nru	Rig	jht	West	Cross
Time	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
18.45.00	0	0	0	0	0	0	0	0		0	0	0		0	0	0		0	0	0
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.10.10	0	0	0	0	0	0	0	0		0	0	0		0	0	0		0	0	0

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

Appendix C – Synchro Analysis Output – Existing Traffic Volumes



	≯	-	- 🖌	-	- 1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		4		\$		4	
Traffic Volume (vph)	33	87	11	107	37	125	30	161	
Future Volume (vph)	33	87	11	107	37	125	30	161	
Lane Group Flow (vph)	0	165	0	156	0	186	0	235	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.58		0.51		0.19		0.22	
Control Delay		28.2		25.5		5.2		5.2	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		28.2		25.5		5.2		5.2	
Queue Length 50th (m)		15.4		14.5		6.8		8.6	
Queue Length 95th (m)		32.0		30.0		17.3		21.0	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		960		1053		995		1049	
Starvation Cap Reductr	ו	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.17		0.15		0.19		0.22	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	62.3								
Natural Cycle: 80									
Control Type: Semi Act	-Uncool	rd							
Splits and Phases: 1:	: Welling	gton Ro	ad 7 & \	Nellingt	on Roa	d 18			

Image: mage: m	<u>≁</u> 04
45 s	45 s
Ø6	<b>↓</b> Ø8
45 s	45 s

	≯	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			4			\$			\$	
Traffic Volume (vph)	33	87	38	11	107	33	37	125	16	30	161	35
Future Volume (vph)	33	87	38	11	107	33	37	125	16	30	161	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1611			1663			1625			1648	
Flt Permitted		0.91			0.98			0.92			0.95	
Satd. Flow (perm)		1482			1628			1504			1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	34	91	40	11	111	34	39	130	17	31	168	36
RTOR Reduction (vph)	0	19	0	0	16	0	0	2	0	0	4	0
Lane Group Flow (vph)	0	146	0	0	140	0	0	184	0	0	231	0
Heavy Vehicles (%)	12%	11%	18%	9%	12%	6%	19%	14%	6%	0%	14%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.1			11.1			41.2			41.2	
Effective Green, g (s)		11.1			11.1			41.2			41.2	
Actuated g/C Ratio		0.18			0.18			0.66			0.66	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		264			290			994			1046	
v/s Ratio Prot												
v/s Ratio Perm		c0.10			0.09			0.12			c0.15	
v/c Ratio		0.55			0.48			0.18			0.22	
Uniform Delay, d1		23.3			23.0			4.1			4.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.5			1.3			0.4			0.5	
Delay (s)		25.8			24.3			4.5			4.7	
Level of Service		С			С			А			А	
Approach Delay (s)		25.8			24.3			4.5			4.7	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		13.5	ŀ	ICM 20	00 Leve	l of Serv	/ice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.29									
Actuated Cycle Length (	s)		62.3	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		40.9%	l	CU Leve	el of Sei	vice		А			
Analysis Period (min)			15									
c Critical Lane Group												

d Int

350 Wellington Road 7HCM Unsignalize2: Middlebrook Rd/David St W & Wellington Road 7

ed intersection	Capacity Analysis
Existing	(2022) AM Peak Hour

	≯	-	$\mathbf{F}$	4	←	•	1	Ť	۲	1	ţ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			4		<u> </u>	ef 👘		<u> </u>	eî 👘	
Traffic Volume (veh/h)	3	12	15	29	9	13	8	177	25	16	205	9
Future Volume (Veh/h)	3	12	15	29	9	13	8	177	25	16	205	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	13	16	31	10	14	9	188	27	17	218	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	482	490	223	494	482	202	228			215		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol										- · -		
vCu, unblocked vol	482	490	223	494	482	202	228			215		
tC, single (s)	7.4	6.5	6.3	7.2	6.6	6.3	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.4	3.6	4.1	3.4	2.4			2.2		
p0 queue free %	99	97	98	93	98	98	99			99		
cM capacity (veh/h)	426	472	790	451	462	824	1216			1367		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	32	55	9	215	17	228						
Volume Left	3	31	9	0	17	0						
Volume Right	16	14	0	27	0	10						
cSH	584	512	1216	1700	1367	1700						
Volume to Capacity	0.05	0.11	0.01	0.13	0.01	0.13						
Queue Length 95th (m)	1.4	2.9	0.2	0.0	0.3	0.0						
Control Delay (s)	11.5	12.9	8.0	0.0	7.7	0.0						
Lane LOS	В	В	A		A							
Approach Delay (s)	11.5	12.9	0.3		0.5							
Approach LOS	В	В										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Uti	lization		29.5%	](	CU Leve	el of Ser	vice		А			
Analysis Period (min)			15									

	٦	-	-	-	1	<b>†</b>	1	Ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		ф.		¢.		44	
Traffic Volume (vph)	57	164	17	122	48	271	41	205	
Future Volume (vph)	57	164	17	122	48	271	41	205	
Lane Group Flow (vph)	0	279	0	205	0	351	0	303	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.72		0.48		0.35		0.31	
Control Delay		32.4		21.7		8.7		8.0	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		32.4		21.7		8.7		8.0	
Queue Length 50th (m)		31.2		19.1		19.6		15.7	
Queue Length 95th (m)		54.9		36.4		44.3		36.9	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		952		1031		994		982	
Starvation Cap Reductr	ו	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.29		0.20		0.35		0.31	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	66.3								
Natural Cycle: 80									
Control Type: Semi Act	-Uncooi	rd							
Splits and Phases: 1	: Welling	gton Ro	ad 7 & \	Nellingt	on Roa	d 18			

¶ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
✓Ø6	₩ Ø8
45 s	45 s

	≯	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			\$			4	
Traffic Volume (vph)	57	164	47	17	122	58	48	271	18	41	205	44
Future Volume (vph)	57	164	47	17	122	58	48	271	18	41	205	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.96			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1755			1741			1763			1739	
Flt Permitted		0.88			0.96			0.92			0.92	
Satd. Flow (perm)		1562			1684			1639			1612	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	171	49	18	127	60	50	282	19	43	214	46
RTOR Reduction (vph)	0	11	0	0	23	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	268	0	0	182	0	0	349	0	0	298	0
Heavy Vehicles (%)	5%	4%	6%	0%	7%	0%	10%	6%	0%	2%	7%	7%
	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.1			16.1			40.2			40.2	
Effective Green, g (s)		16.1			16.1			40.2			40.2	
Actuated g/C Ratio		0.24			0.24			0.61			0.61	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		379			408			993			977	
v/s Ratio Prot												
v/s Ratio Perm		c0.17			0.11			c0.21			0.18	
v/c Ratio		0.71			0.45			0.35			0.30	
Uniform Delay, d1		22.9			21.3			6.5			6.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		5.9			0.8			1.0			0.8	
Delay (s)		28.8			22.1			7.5			7.1	
Level of Service		С			С			А			А	
Approach Delay (s)		28.8			22.1			7.5			7.1	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		15.3		ICM 20	00 Leve	l of Ser	vice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.45									
Actuated Cycle Length (	s)		66.3	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		60.1%	]	CU Leve	el of Sei	vice		В			
Analysis Period (min)			15									
c Critical Lane Group												

350 Wellington Road 7

HCM Unsignalized Intersection Capacity Analysis Road 7 Existing (2022) PM Peak Hour

2: Middlebrook Rd/David St W & Wellington Road 7 ۶

	≯	-	$\mathbf{r}$	4	+	•	1	1	1	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			4		5	f,		ሻ	f,	
Traffic Volume (veh/h)	4	15	21	33	14	21	13	305	80	20	253	7
Future Volume (Veh/h)	4	15	21	33	14	21	13	305	80	20	253	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	16	22	35	15	22	14	321	84	21	266	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	690	744	270	729	706	363	273			405		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	690	744	270	729	706	363	273			405		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	95	97	89	96	97	99			98		
cM capacity (veh/h)	331	335	741	308	352	675	1256			1165		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	72	14	405	21	273						
Volume Left	4	35	14	0	21	0						
Volume Right	22	22	0	84	0	7						
cSH	469	382	1256	1700	1165	1700						
Volume to Capacity	0.09	0.19	0.01	0.24	0.02	0.16						
Queue Length 95th (m)	2.3	5.5	0.3	0.0	0.4	0.0						
Control Delay (s)	13.4	16.6	7.9	0.0	8.1	0.0						
Lane LOS	В	С	А		А							
Approach Delay (s)	13.4	16.6	0.3		0.6							
Approach LOS	В	С										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Uti	ilization		38.1%	[(	CU Leve	el of Ser	vice		Α			

15

Analysis Period (min)

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

Appendix D – Synchro Analysis Output – Background Traffic Volumes



	≯	-	-	-	1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		<b>.</b>		4		4	
Traffic Volume (vph)	41	108	14	133	46	156	37	201	
Future Volume (vph)	41	108	14	133	46	156	37	201	
Lane Group Flow (vph)	0	205	0	197	0	232	0	294	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.65		0.56		0.25		0.29	
Control Delay		30.5		26.5		6.4		6.6	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		30.5		26.5		6.4		6.6	
Queue Length 50th (m)		20.4		19.5		10.0		12.9	
Queue Length 95th (m)	1	39.9		37.4		24.7		30.8	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		923		1038		940		999	
Starvation Cap Reductr	า	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.22		0.19		0.25		0.29	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	63.2								
Natural Cycle: 80									
Control Type: Semi Act	-Uncool	rd							
Splits and Phases: 1	: Welling	gton Ro	ad 7 & \	Nellingt	on Roa	d 18			

1 ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
	₩ Ø8
45 s	45 s

	≯	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			\$			\$			\$	
Traffic Volume (vph)	41	108	47	14	133	41	46	156	20	37	201	44
Future Volume (vph)	41	108	47	14	133	41	46	156	20	37	201	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1612			1663			1625			1648	
Flt Permitted		0.88			0.97			0.90			0.94	
Satd. Flow (perm)		1439			1623			1476			1565	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	43	112	49	15	139	43	48	162	21	39	209	46
RTOR Reduction (vph)	0	18	0	0	16	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	187	0	0	181	0	0	229	0	0	289	0
Heavy Vehicles (%)	12%	11%	18%	9%	12%	6%	19%	14%	6%	0%	14%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8	-		2			6	-	
Actuated Green, G (s)		13.0		-	13.0			40.1		-	40.1	
Effective Green, g (s)		13.0			13.0			40.1			40.1	
Actuated g/C Ratio		0.21			0.21			0.64			0.64	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		296			334			937			994	
v/s Ratio Prot												
v/s Ratio Perm		c0.13			0.11			0.16			c0.18	
v/c Ratio		0.63			0.54			0.24			0.29	
Uniform Delay. d1		22.9			22.4			5.0			5.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay. d2		4.3			1.8			0.6			0.7	
Delay (s)		27.2			24.2			5.6			5.9	
Level of Service		С			С			А			А	
Approach Delay (s)		27.2			24.2			5.6			5.9	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		14.4	H	ICM 20	00 Leve	l of Serv	/ice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.37									
Actuated Cycle Length (	s)		63.1	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		48.7%	](	CU Leve	el of Sei	rvice		А			
Analysis Period (min)			15									
c Critical Lane Group												

JD Engineering
HCM Unsignalized Intersection Capacity Analysis Road 7 Background (2027) AM Peak Hour

350 Wellington Road 7HCM U2: Middlebrook Rd/David St W & Wellington Road 7

	≯	-	$\rightarrow$	1	+	•	1	<b>†</b>	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		٦	4		٦	f)	
Traffic Volume (veh/h)	4	15	19	36	11	16	10	221	31	20	255	11
Future Volume (Veh/h)	4	15	19	36	11	16	10	221	31	20	255	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	16	20	38	12	17	11	235	33	21	271	12
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	599	609	277	614	598	252	283			268		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	599	609	277	614	598	252	283			268		
tC, single (s)	7.4	6.5	6.3	7.2	6.6	6.3	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.4	3.6	4.1	3.4	2.4			2.2		
p0 queue free %	99	96	97	90	97	98	99			98		
cM capacity (veh/h)	348	402	736	367	393	773	1158			1307		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	67	11	268	21	283						
Volume Left	4	38	11	0	21	0						
Volume Right	20	17	0	33	0	12						
cSH	510	429	1158	1700	1307	1700						
Volume to Capacity	0.08	0.16	0.01	0.16	0.02	0.17						
Queue Length 95th (m)	2.0	4.4	0.2	0.0	0.4	0.0						
Control Delay (s)	12.7	14.9	8.1	0.0	7.8	0.0						
Lane LOS	В	В	Α		A							
Approach Delay (s)	12.7	14.9	0.3		0.5							
Approach LOS	В	В										
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Uti	ilization		33.5%	](	CU Leve	el of Ser	vice		Α			
Analysis Period (min)			15									

	٦	-	-	-	1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		4		4		4	
Traffic Volume (vph)	71	204	21	152	60	338	51	255	
Future Volume (vph)	71	204	21	152	60	338	51	255	
Lane Group Flow (vph)	0	348	0	255	0	438	0	376	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.79		0.51		0.48		0.41	
Control Delay		35.7		21.8		12.3		11.2	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		35.7		21.8		12.3		11.2	
Queue Length 50th (m)		42.1		25.5		31.7		25.1	
Queue Length 95th (m)		70.7		45.2		71.4		58.1	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		868		969		918		907	
Starvation Cap Reductr	ו	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.40		0.26		0.48		0.41	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	70.4								
Natural Cycle: 80									
Control Type: Semi Act	-Uncool	rd							
Splits and Phases: 1: Wellington Road 7 & Wellington Road 18									

dØ2	<u>→</u> <sub>04</sub>
45 s	45 s
▼ Ø6	₩ Ø8
45 s	45 s

	٠	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	Ŧ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			đ.			<b>.</b>	
Traffic Volume (vph)	71	204	59	21	152	72	60	338	22	51	255	55
Future Volume (vph)	71	204	59	21	152	72	60	338	22	51	255	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.96			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1755			1741			1763			1739	
Flt Permitted		0.85			0.96			0.90			0.90	
Satd. Flow (perm)		1507			1673			1604			1576	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	74	212	61	22	158	75	62	352	23	53	266	57
RTOR Reduction (vph)	0	11	0	0	21	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	337	0	0	234	0	0	436	0	0	370	0
Heavy Vehicles (%)	5%	4%	6%	0%	7%	0%	10%	6%	0%	2%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.1			20.1			40.3			40.3	
Effective Green, g (s)		20.1			20.1			40.3			40.3	
Actuated g/C Ratio		0.29			0.29			0.57			0.57	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		430			477			918			902	
v/s Ratio Prot												
v/s Ratio Perm		c0.22			0.14			c0.27			0.24	
v/c Ratio		0.78			0.49			0.48			0.41	
Uniform Delay, d1		23.2			20.9			8.8			8.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.1			0.8			1.8			1.4	
Delay (s)		32.2			21.7			10.6			9.8	
Level of Service		С			С			В			А	
Approach Delay (s)		32.2			21.7			10.6			9.8	
Approach LOS		С			С			В			А	
Intersection Summary												
HCM 2000 Control Dela	у		17.7	F	ICM 20	00 Leve	l of Ser	vice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.58									
Actuated Cycle Length (	s)		70.4	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		73.0%	[	CU Leve	el of Sei	rvice		D			
Analysis Period (min)			15									
c Critical Lane Group												

الما ا ... • • HCM Unsig 12 .

350 Wellington Road 7HCM U2: Middlebrook Rd/David St W & Wellington Road 7

gnal	Ized	In	tersec	tion (	Capa	acity A	\nal	ysis
		E	Backgro	und (2	2027)	) PM P	eak	Hour

	≯	-	$\rightarrow$	1	+	•	1	<b>†</b>	1	1	ŧ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		٦	eî 👘		٦	el 👘	
Traffic Volume (veh/h)	5	19	26	41	17	26	16	380	100	25	315	9
Future Volume (Veh/h)	5	19	26	41	17	26	16	380	100	25	315	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph) Pedestrians	5	20	27	43	18	27	17	400	105	26	332	9
Lane Width (m)												
vvalking Speed (m/s)												
Percent Blockage												
Right turn flare (ven)								Nama			Nama	
Median type								None			None	
Niedlan storage ven)												
Opstream signal (m)												
px, platoon unblocked	050	000	226	000	000	450	244			FOF		
vC1 stage 1 confive	828	928	330	908	880	452	341			505		
vCz, stage z com vol	050	0.20	226	000	000	150	2/1			505		
	7 1	920	530	900	000 6 5	402	341			505		
$C_{1}$ single (S)	7.1	0.5	0.5	7.1	0.5	0.2	4.2			4.1		
tE(c)	35	4.0	3.4	35	4.0	33	23			2.2		
n0 queue free %	0.0	4.0	06	9.5 81	4.0	06	2.5			2.2		
cM capacity (yeb/b)	246	260	670	224	277	601	1185			1070		
							1105			1070		
Direction, Lane #	EBI	VVB 1	INB 1	INB Z	<u>58 1</u>	<u>SB 2</u>						
Volume I otal	52	88	17	505	26	341						
Volume Left	5	43	1/	0	26	0						
Volume Right	27	27	0	105	0	4700						
cSH	379	292	1185	1700	1070	1700						
Volume to Capacity	0.14	0.30	0.01	0.30	0.02	0.20						
Queue Length 95th (m)	3.8	9.9	0.3	0.0	0.6	0.0						
Control Delay (s)	16.0	22.6	8.1	0.0	8.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	16.0	22.6	0.3		0.6							
Approach LOS	С	С										
Intersection Summary												
Average Delay			3.1		<b></b>							
Intersection Capacity Uti	lization		44.2%	10	CU Leve	el of Ser	vice		A			
Analysis Period (min)			15									

	٭	-	-	-	1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		4		4		4	
Traffic Volume (vph)	51	135	17	166	57	194	47	250	
Future Volume (vph)	51	135	17	166	57	194	47	250	
Lane Group Flow (vph)	0	255	0	244	0	287	0	365	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.73		0.61		0.33		0.39	
Control Delay		33.8		27.0		8.4		8.8	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		33.8		27.0		8.4		8.8	
Queue Length 50th (m)		27.5		25.5		15.2		19.9	
Queue Length 95th (m)		50.4		46.0		36.9		46.8	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		856		995		880		945	
Starvation Cap Reductr	ר	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.30		0.25		0.33		0.39	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	65.9								
Natural Cycle: 80									
Control Type: Semi Act	-Uncooi	rd							
Splits and Phases: 1	: Welling	gton Ro	ad 7 & \	Wellingt	on Roa	d 18			
		-		0					

¶ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
▼Ø6	₩ Ø8
45 s	45 s

	٠	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			4			\$			4	
Traffic Volume (vph)	51	135	59	17	166	51	57	194	25	47	250	54
Future Volume (vph)	51	135	59	17	166	51	57	194	25	47	250	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1612			1663			1625			1648	
Flt Permitted		0.85			0.97			0.88			0.93	
Satd. Flow (perm)		1391			1619			1439			1544	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adi, Flow (vph)	53	141	61	18	173	53	59	202	26	49	260	56
RTOR Reduction (vph)	0	18	0	0	15	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	237	0	0	229	0	0	284	0	0	360	0
Heavy Vehicles (%)	12%	11%	18%	9%	12%	6%	19%	14%	6%	0%	14%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8	•		2	_		6	•	
Actuated Green, G (s)		15.7		-	15.7			40.2		-	40.2	
Effective Green, g (s)		15.7			15.7			40.2			40.2	
Actuated g/C Ratio		0.24			0.24			0.61			0.61	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		331			385			877			941	
v/s Ratio Prot												
v/s Ratio Perm		c0.17			0.14			0.20			c0.23	
v/c Ratio		0.72			0.59			0.32			0.38	
Uniform Delay, d1		23.1			22.3			6.2			6.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay. d2		7.2			2.5			1.0			1.2	
Delay (s)		30.3			24.7			7.2			7.7	
Level of Service		С			С			А			А	
Approach Delay (s)		30.3			24.7			7.2			7.7	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		16.2	F	ICM 20	00 Leve	l of Serv	/ice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.48									
Actuated Cycle Length (	s)		65.9	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		58.6%	](	CU Leve	el of Sei	rvice		В			
Analysis Period (min)			15									
c Critical Lane Group												

JD Engineering

HCM Unsignalized Intersection Capacity Analysis Road 7 Background (2032) AM Peak Hour

350 Wellington Road 7HCM U2: Middlebrook Rd/David St W & Wellington Road 7

	≯	-	$\rightarrow$	-	+	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		<u>ل</u>	eî		5	ţ,	
Traffic Volume (veh/h)	5	19	23	45	14	20	12	275	39	25	318	14
Future Volume (Veh/h)	5	19	23	45	14	20	12	275	39	25	318	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph) Pedestrians	5	20	24	48	15	21	13	293	41	27	338	15
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	747	760	346	766	746	314	353			334		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	747	760	346	766	746	314	353			334		
tC, single (s)	7.4	6.5	6.3	7.2	6.6	6.3	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.4	3.6	4.1	3.4	2.4			2.2		
p0 queue free %	98	94	96	83	95	97	99			98		
cM capacity (veh/h)	267	327	673	281	320	713	1089			1237		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	49	84	13	334	27	353						
Volume Left	5	48	13	0	27	0						
Volume Right	24	21	0	41	0	15						
cSH	424	340	1089	1700	1237	1700						
Volume to Capacity	0.12	0.25	0.01	0.20	0.02	0.21						
Queue Length 95th (m)	3.1	7.6	0.3	0.0	0.5	0.0						
Control Delay (s)	14.6	19.0	8.3	0.0	8.0	0.0						
Lane LOS	В	С	A		A							
Approach Delay (s)	14.6	19.0	0.3		0.6							
Approach LOS	В	С										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Uti	lization		38.6%	10	CU Leve	el of Ser	vice		А			
Analysis Period (min)			15									

	≯	-	- 🖌	+	1	<b>†</b>	- <b>`</b>	↓ ↓	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		\$		4		4		\$	
Traffic Volume (vph)	89	255	26	189	75	421	64	318	
Future Volume (vph)	89	255	26	189	75	421	64	318	
Lane Group Flow (vph)	0	435	0	318	0	546	0	469	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	51.0	51.0	51.0	51.0	39.0	39.0	39.0	39.0	
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.84		0.53		0.69		0.60	
Control Delay		34.2		18.7		20.7		17.5	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		34.2		18.7		20.7		17.5	
Queue Length 50th (m)		49.8		29.2		50.2		39.7	
Queue Length 95th (m)		82.7		49.8		#128.8		92.7	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		1013		1146		795		782	
Starvation Cap Reductn	l –	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.43		0.28		0.69		0.60	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	68								
Natural Cycle: 80									
Control Type: Semi Act-	Uncool	d	.,						
# 95th percentile volui	me exc	eeds ca	pacity, o	queue n	nay be l	onger.			
Queue shown is may	kimum a	after two	o cycles	•					
Splits and Phases: 1:	Welling	gton Ro	ad 7 & \	Nellingt	on Roa	d 18			
1 92					04				
					21				

1 Ø2	
39 s	51s
	€ Ø8
39 s	51 s

	۶	-	$\mathbf{r}$	-	-	•	1	<b>†</b>	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			4			\$	
Traffic Volume (vph)	89	255	73	26	189	90	75	421	28	64	318	68
Future Volume (vph)	89	255	73	26	189	90	75	421	28	64	318	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.98			0.96			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1755			1741			1763			1739	
Flt Permitted		0.83			0.95			0.88			0.88	
Satd. Flow (perm)		1474			1661			1570			1537	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adi, Flow (vph)	93	266	76	27	197	94	78	439	29	67	331	71
RTOR Reduction (vph)	0	11	0	0	22	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	424	0	0	296	0	0	544	0	0	464	0
Heavy Vehicles (%)	5%	4%	6%	0%	7%	0%	10%	6%	0%	2%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8	•		2	_		6	· ·	
Actuated Green, G (s)	-	23.5		-	23.5			34.4		-	34.4	
Effective Green, g (s)		23.5			23.5			34.4			34.4	
Actuated g/C Ratio		0.35			0.35			0.51			0.51	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		510			574			795			778	
v/s Ratio Prot												
v/s Ratio Perm		c0.29			0.18			c0.35			0.30	
v/c Ratio		0.83			0.52			0.68			0.60	
Uniform Delay, d1		20.4			17.7			12.6			11.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		11.0			0.8			4.7			3.3	
Delay (s)		31.4			18.5			17.4			15.2	
Level of Service		С			В			В			В	
Approach Delay (s)		31.4			18.5			17.4			15.2	
Approach LOS		С			В			В			В	
Intersection Summary												
HCM 2000 Control Dela	y		20.5	H	ICM 20	00 Leve	l of Ser	/ice	С			
HCM 2000 Volume to C	apacity	ratio	0.74									
Actuated Cycle Length (	(s)		67.9	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		89.2%	](	CU Leve	el of Sei	vice		E			
Analysis Period (min)			15									

c Critical Lane Group

ad Inte ... • • HCM Unsig 12 .

350 Wellington Road 7HCM U2: Middlebrook Rd/David St W & Wellington Road 7

ignalized	Intersection Capacity Analysis	;
	Background (2032) PM Peak Hour	ſ

	≯	-	$\rightarrow$	-	+	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		ľ	eî 👘		<u>ک</u>	el el	
Traffic Volume (veh/h)	6	23	33	51	22	33	20	474	124	31	393	11
Future Volume (Veh/h)	6	23	33	51	22	33	20	474	124	31	393	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph) Pedestrians	6	24	35	54	23	35	21	499	131	33	414	12
Lane Width (m) Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)								Nono			Nono	
Median storage veh)								NONE			NONE	
Upstream signal (m)												
pX, platoon unblocked	1074	1150	420	1124	1009	EG A	406			620		
vC1, stage 1 conf vol	1074	1150	420	1134	1090	504	420			030		
vC2, stage 2 conf vol												
vCu, unblocked vol	1074	1158	420	1134	1098	564	426			630		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	96	87	94	63	89	93	98			97		
cM capacity (veh/h)	163	187	608	146	203	519	1102			962		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	65	112	21	630	33	426						
Volume Left	6	54	21	0	33	0						
Volume Right	35	35	0	131	0	12						
cSH	292	204	1102	1700	962	1700						
Volume to Capacity	0.22	0.55	0.02	0.37	0.03	0.25						
Queue Length 95th (m)	6.7	23.4	0.5	0.0	0.9	0.0						
Control Delay (s)	20.8	42.4	8.3	0.0	8.9	0.0						
Lane LOS	С	E	А		А							
Approach Delay (s)	20.8	42.4	0.3		0.6							
Approach LOS	С	Ε										
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Uti Analysis Period (min)	lization		51.8% 15	l	CU Leve	el of Ser	vice		A			

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

Appendix E – Synchro Analysis Output – Total Traffic Volumes



	≯	-	- 🖌	+	- 1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		\$		\$		\$		\$	
Traffic Volume (vph)	41	108	16	133	56	161	37	203	
Future Volume (vph)	41	108	16	133	56	161	37	203	
Lane Group Flow (vph)	0	208	0	199	0	255	0	296	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.66		0.57		0.28		0.30	
Control Delay		30.5		26.6		6.7		6.7	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		30.5		26.6		6.7		6.7	
Queue Length 50th (m)		20.7		19.7		11.3		13.2	
Queue Length 95th (m)		40.3		37.6		27.7		31.3	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		920		1032		920		994	
Starvation Cap Reductr	ו	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.23		0.19		0.28		0.30	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	63.3								
Natural Cycle: 80									
Control Type: Semi Act	-Uncoo	rd							
Splits and Phases: 1	Wellin	gton Ro	ad 7 & \	<u>Vell</u> ingt	on Roa	d 18			
				_	A				

1 ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
▼Ø6	₩ Ø8
45 s	45 s

	≯	-	$\rightarrow$	-	+	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			\$			\$	
Traffic Volume (vph)	41	108	50	16	133	41	56	161	28	37	203	44
Future Volume (vph)	41	108	50	16	133	41	56	161	28	37	203	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.98			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1609			1663			1619			1648	
Flt Permitted		0.88			0.97			0.88			0.94	
Satd. Flow (perm)		1438			1617			1446			1561	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	43	112	52	17	139	43	58	168	29	39	211	46
RTOR Reduction (vph)	0	19	0	0	16	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	189	0	0	183	0	0	252	0	0	291	0
Heavy Vehicles (%)	12%	11%	18%	9%	12%	6%	19%	14%	6%	0%	14%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.1			13.1			40.1			40.1	
Effective Green, q (s)		13.1			13.1			40.1			40.1	
Actuated g/C Ratio		0.21			0.21			0.63			0.63	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		298			335			917			990	
v/s Ratio Prot												
v/s Ratio Perm		c0.13			0.11			0.17			c0.19	
v/c Ratio		0.63			0.55			0.27			0.29	
Uniform Delay, d1		22.9			22.4			5.1			5.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.4			1.8			0.7			0.8	
Delay (s)		27.2			24.2			5.9			5.9	
Level of Service		С			С			А			А	
Approach Delay (s)		27.2			24.2			5.9			5.9	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		14.3	F	ICM 20	00 Leve	l of Serv	/ice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.38									
Actuated Cycle Length (	s)		63.2	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		51.0%	10	CU Leve	el of Sei	rvice		Α			
Analysis Period (min)			15									
c Critical Lane Group												

tiz 0 :1 . :

350 Wellington Road 7HCM Unsignalized Integration2: Middlebrook Rd/David St W & Wellington Road 7

tersection Capacity Analysi	S
Total (2027) AM Peak Hou	ır

	≯	-	$\mathbf{F}$	4	←	•	1	Ť	1	1	Ļ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		۲	¢Î		۲	eî 👘	
Traffic Volume (veh/h)	4	15	19	36	11	18	10	238	31	28	308	11
Future Volume (Veh/h)	4	15	19	36	11	18	10	238	31	28	308	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	4	16	20	38	12	19	11	253	33	30	328	12
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	004	700	004	700	000	070	0.40			000		
VC, conflicting volume	694	702	334	708	692	270	340			286		
vC1, stage 1 conf vol												
vCz, stage z com vol	604	700	224	700	602	270	240			206		
	7 4	6.5	6.2	700	092	210	340			200		
$C_{1}$ stage (s)	7.4	0.5	0.5	1.2	0.0	0.5	4.5			4.1		
tE(c)	3.8	4.0	3 /	3.6	11	3.4	24			2.2		
$n \alpha \alpha \beta $	00	4.0	97	88	4.1	07	2.4			2.2		
cM canacity (veh/h)	295	353	683	314	345	755	1101			1288		
						00	1101			1200		
Direction, Lane #					<u> 38 I</u>	<u> 38 2</u>						
Volume Loft	40	09	11	280	30	340						
Volume Leit	20	30 10	0	22	30	12						
	20	201	1101	1700	1299	1700						
Volume to Canacity	0.00	0.18	0.01	0 17	0.02	0.20						
Oueue Length 95th (m)	23	5.2	0.01	0.17	0.02	0.20						
Control Delay (s)	13.7	16.5	83	0.0	79	0.0						
Lane LOS	13.7 R	10.5 C	Δ	0.0	Λ.5	0.0						
Annroach Delay (s)	13.7	16.5	03		0.6							
Approach LOS	B	10.0 C	0.0		0.0							
Intersection Summary												
Average Delay			2.6									
Intersection Canacity Liti	lization		40.3%	10		el of Ser	vice		А			
Analysis Period (min)			15		2.5 2.57							

### 350 Wellington Road 7 3: Wellington Road 7 & North Access

MovementEBLEBRNBLNBTSBTSBRLane Configurations $\checkmark$ $\uparrow$ $\uparrow$ $\downarrow$ Traffic Volume (veh/h)101552462813Future Volume (Veh/h)101552462813Sign ControlStopFreeFreeGrade0%0%0%0%Peak Hour Factor0.920.920.920.920.92Hourly flow rate (vph)111652673053PedestriansImage: StopImage: StopImage: StopImage: StopImage: StopLane Width (m)Image: StopImage: StopImage: StopImage: StopImage: StopWalking Speed (m/s)Image: StopImage: StopImage: StopImage: StopImage: StopPercent BlockageImage: StopImage: StopImage: StopImage: StopImage: StopMedian typeNoneNoneNoneImage: StopImage: StopImage: StopUpstream signal (m)Image: StopStaf306308Image: StopImage: StopVC1, stage 1 conf volImage: StopImage: StopImage: StopImage: StopImage: StopImage: StopVC2, stage 2 conf volImage: StopImage: StopImage: StopImage: StopImage: StopImage: StopImage: StopVC2, stage 2 conf volImage: StopImage: StopImage: StopImage: StopImage: StopImage: StopImage: Stop<
Lane ConfigurationsYYYYTraffic Volume (veh/h)101552462813Future Volume (Veh/h)101552462813Sign ControlStopFreeFreeGrade0%0%Grade0%0%0%0%0%Peak Hour Factor0.920.920.920.920.92Hourly flow rate (vph)111652673053PedestriansImage: Stop Stop Stop Stop Stop Stop Stop Stop
Traffic Volume (veh/h)  10  15  5  246  281  3    Future Volume (Veh/h)  10  15  5  246  281  3    Sign Control  Stop  Free  Free  Free  Grade  0%  0%    Grade  0%  0%  0%  0%  0%  0%  0%    Peak Hour Factor  0.92  0.92  0.92  0.92  0.92  0.92    Hourly flow rate (vph)  11  16  5  267  305  3    Pedestrians
Future Volume (Veh/h)  10  15  5  246  281  3    Sign Control  Stop  Free  Free  Free  Grade  0%  0%  0%    Peak Hour Factor  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92    Hourly flow rate (vph)  11  16  5  267  305  3    Pedestrians  Lane Width (m)  Valking Speed (m/s)  Valking Speed (m/s)  Valking Speed (m/s)  Valking Speed (m/s)    Percent Blockage  None  None  None  None    Median type  None  None  None  None    Median storage veh)  Upstream signal (m)  Valking Speed (m/s)  Valking Speed (m/s)  Valking Speed (m/s)    pX, platoon unblocked  VC, conflicting volume  584  306  308  Valking Speed (m/s)    vC1, stage 1 conf vol  Valking Speed (m/s)  Valking Speed (m/s)  Valking Speed (m/s)  Valking Speed (m/s)    vC2, stage 2 conf vol  584  306  308  Valking Speed (m/s)  Valking Speed (m/s)    vC1, unblocked vol  584
Sign Control    Stop    Free    Free    Free      Grade    0%<
Grade  0%  0%  0%  0%    Peak Hour Factor  0.92  0.92  0.92  0.92  0.92  0.92    Hourly flow rate (vph)  11  16  5  267  305  3    Pedestrians
Peak Hour Factor    0.92
Hourly flow rate (vph)  11  16  5  267  305  3    Pedestrians  Lane Width (m)  Valking Speed (m/s)  Velocity  Veloci
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 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vC4, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
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 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vC4, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
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 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vC4, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
Percent Blockage Right turn flare (veh) Median type None None Median storage veh) Upstream signal (m) pX, platoon unblocked vC, conflicting volume 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
Right turn flare (veh)NoneMedian typeNoneMedian storage veh)Upstream signal (m)pX, platoon unblockedVC, conflicting volumevC, conflicting volume584306308vC1, stage 1 conf volvC2, stage 2 conf volvCu, unblocked vol584306308tC, single (s)6.46.24.1
Median typeNoneNoneMedian storage veh)Upstream signal (m)pX, platoon unblocked700 mm m
Median storage veh) Upstream signal (m) pX, platoon unblocked vC, conflicting volume 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
Upstream signal (m) pX, platoon unblocked vC, conflicting volume 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
pX, platoon unblocked vC, conflicting volume 584 306 308 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
vC, conflicting volume584306308vC1, stage 1 conf volvC2, stage 2 conf volvC2, stage 2 conf volvCu, unblocked vol584306308tC, single (s)6.46.24.1
vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
vC2, stage 2 conf vol      vCu, unblocked vol    584    306    308      tC, single (s)    6.4    6.2    4.1
vCu, unblocked vol 584 306 308 tC, single (s) 6.4 6.2 4.1
tC, single (s) 6.4 6.2 4.1
tC, 2 stage (s)
tF (s) 3.5 3.3 2.2
p0 queue free % 98 98 100
cM capacity (veh/h) 476 738 1264
Direction, Lane # EB 1 NB 1 NB 2 SB 1
Volume Total 27 5 267 308
Volume Left 11 5 0 0
Volume Right 16 0 0 3
cSH 603 1264 1700 1700
Volume to Capacity 0.04 0.00 0.16 0.18
Queue Length 95th (m) $11 01 00 000$
Control Delay (s) $11.3$ 7.9 0.0 0.0
Lane LOS B A
Approach Delay (s) $11.3$ $0.1$ $0.0$
Approach LOS B
Intersection Summary
Average Delay 0.6
Intersection Capacity Utilization 25.0% ICUL evel of Service /
Analysis Period (min) 15

### 350 Wellington Road 7 4: Wellington Road 7 & Centre Access

	≯	$\rightarrow$	-	1	Ŧ	-	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	- M		5	•	ĥ		
Traffic Volume (veh/h)	8	21	7	241	290	2	
Future Volume (Veh/h)	8	21	7	241	290	2	
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)	9	23	8	262	315	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	594	316	317				
vC1. stage 1 conf vol			-				
vC2. stage 2 conf vol							
vCu, unblocked vol	594	316	317				
tC. single (s)	6.4	6.2	4.1				
tC. 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	98	97	99				
cM capacity (veh/h)	468	729	1255				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1			
Volume Total	32	8	262	317			
Volume Left	9	8	0	0			
Volume Right	23	0	0	2			
cSH	630	1255	1700	1700			
Volume to Capacity	0.05	0.01	0.15	0 19			
Queue Length 95th (m)	1.3	0.01	0.10	0.10			
Control Delay (s)	11.0	7.9	0.0	0.0			
	R 11.0	Δ	0.0	0.0			
Approach Delay (s)	11.0	0.2		0.0			
Approach LOS	В	0.2		0.0			
Intersection Summary							
			0.7				
Interspection Consoits Liti	ilization		25 40/	1,		of Son in	
Analysis Period (min)	mzauon		20.4%	ľ	CO Leve		C
Analysis Period (min)			15				

	≯	$\rightarrow$	1	<b>†</b>	+	-	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Υ.		5	+	ħ		
Traffic Volume (veh/h)	6	24	8	242	310	1	
Future Volume (Veh/h)	6	24	8	242	310	1	
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)	7	26	9	263	337	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	618	338	338				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	618	338	338				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.2				
p0 queue free %	98	96	99				
cM capacity (veh/h)	452	709	1232				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1			
Volume Total	33	9	263	338			
Volume Left	7	9	0	0			
Volume Right	26	0	0	1			
cSH	633	1232	1700	1700			
Volume to Capacity	0.05	0.01	0.15	0.20			
Queue Length 95th (m)	1.3	0.2	0.0	0.0			
Control Delay (s)	11.0	7.9	0.0	0.0			
Lane LOS	В	А					
Approach Delay (s)	11.0	0.3		0.0			
Approach LOS	В						
Intersection Summary							
Average Delay			0.7				
Intersection Capacity Uti	ilization		26.4%		CU Leve	el of Servi	ce
Analysis Period (min)			15				

	≯	-	- 🖌	+	1	<b>†</b>	1	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		\$		\$		\$		\$	
Traffic Volume (vph)	71	204	29	152	66	341	51	260	
Future Volume (vph)	71	204	29	152	66	341	51	260	
Lane Group Flow (vph)	0	360	0	263	0	452	0	381	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.80		0.53		0.50		0.42	
Control Delay		35.7		22.3		13.1		11.6	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		35.7		22.3		13.1		11.6	
Queue Length 50th (m)		43.7		26.9		34.0		26.3	
Queue Length 95th (m)		72.8		47.0		76.7		60.6	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		862		938		901		898	
Starvation Cap Reductr	า	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.42		0.28		0.50		0.42	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	71								
Natural Cycle: 80									
Control Type: Semi Act	-Uncoo	rd							
Splits and Phases: 1:	: Wellin	gton Ro	ad 7 & \	Wellinat	ton Roa	d 18			

1 ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
▼Ø6	₩ Ø8
45 s	45 s

	٦	-	$\rightarrow$	-	-	•	1	<b>†</b>	1	1	Ŧ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<b>.</b>			4			4			<b>.</b>	
Traffic Volume (vph)	71	204	70	29	152	72	66	341	27	51	260	55
Future Volume (vph)	71	204	70	29	152	72	66	341	27	51	260	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.96			0.99			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1749			1743			1760			1739	
Flt Permitted		0.85			0.93			0.89			0.90	
Satd. Flow (perm)		1507			1632			1586			1574	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	74	212	73	30	158	75	69	355	28	53	271	57
RTOR Reduction (vph)	0	13	0	0	21	0	0	2	0	0	6	0
Lane Group Flow (vph)	0	347	0	0	242	0	0	450	0	0	375	0
Heavy Vehicles (%)	5%	4%	6%	0%	7%	0%	10%	6%	0%	2%	7%	7%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.7			20.7			40.3			40.3	
Effective Green, g (s)		20.7			20.7			40.3			40.3	
Actuated g/C Ratio		0.29			0.29			0.57			0.57	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		439			475			900			893	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.15			c0.28			0.24	
v/c Ratio		0.79			0.51			0.50			0.42	
Uniform Delay, d1		23.2			20.9			9.3			8.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.4			0.9			2.0			1.5	
Delay (s)		32.6			21.9			11.2			10.2	
Level of Service		С			С			В			В	
Approach Delay (s)		32.6			21.9			11.2			10.2	
Approach LOS		С			С			В			В	
Intersection Summary												
HCM 2000 Control Dela	у		18.2	F	ICM 20	00 Leve	l of Ser	vice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.60									
Actuated Cycle Length (	s)		71.0	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		71.7%	l	CU Leve	el of Sei	rvice		С			
Analysis Period (min)			15									
c Critical Lane Group												

350 Wellington Road 7 HCM 2: Middlebrook Rd/David St W & Wellington Road 7

HCM Unsignalized Intersection Capacity Analysis Road 7 Total (2027) PM Peak Hour

٠ ∡ t Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR **♣** 17 Lane Configurations 4 ኘ Þ ኘ Þ Traffic Volume (veh/h) 5 19 26 41 34 16 436 100 30 348 9 Future Volume (Veh/h) 436 100 30 348 5 19 26 41 17 34 16 9 Sign Control Free Stop Stop Free Grade 0% 0% 0% 0% 0.95 0.95 0.95 0.95 0.95 0.95 0.95 Peak Hour Factor 0.95 0.95 0.95 0.95 0.95 Hourly flow rate (vph) 20 43 32 366 5 27 18 36 17 459 105 9 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 972 1032 370 1012 984 512 375 564 vC1, stage 1 conf vol vC2, stage 2 conf vol vCu, unblocked vol 972 1032 370 1012 984 512 375 564 tC, single (s) 7.1 6.5 6.3 7.1 6.5 6.2 4.2 4.1 tC, 2 stage (s) 2.3 2.2 3.5 4.0 3.4 3.5 4.0 3.3 tF (s) p0 queue free % 97 91 96 92 94 99 97 77 cM capacity (veh/h) 199 224 649 187 239 556 1151 1018 WB 1 Direction, Lane # EB 1 NB 1 NB 2 SB 1 SB 2 Volume Total 52 97 17 564 32 375 Volume Left 43 17 0 32 0 5 27 9 Volume Right 36 0 105 0 cSH 333 262 1151 1700 1018 1700 Volume to Capacity 0.16 0.37 0.01 0.33 0.03 0.22 Queue Length 95th (m) 4.4 13.1 0.4 0.0 0.8 0.0 Control Delay (s) 17.8 26.6 8.2 0.0 8.7 0.0 Lane LOS С D А А Approach Delay (s) 17.8 26.6 0.2 0.7 Approach LOS С D Intersection Summary Average Delay 3.4 47.6% Intersection Capacity Utilization ICU Level of Service А Analysis Period (min) 15

### 350 Wellington Road 7 3: Wellington Road 7 & North Access

	≯	$\rightarrow$	1	<b>†</b>	Ŧ	-
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W.		5	*	1.	
Traffic Volume (veh/h)	6	10	16	427	363	10
Future Volume (Veh/h)	6	10	16	427	363	10
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)	7	11	17	464	395	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	898	400	406			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	898	400	406			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	308	654	1164			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	18	17	464	406		
Volume Left	7	17	0	0		
Volume Right	11	0	0	11		
cSH	455	1164	1700	1700		
Volume to Capacity	0.04	0.01	0.27	0.24		
Queue Length 95th (m)	1.0	0.4	0.0	0.0		
Control Delay (s)	13.2	8.1	0.0	0.0		
Lane LOS	В	А				
Approach Delay (s)	13.2	0.3		0.0		
Approach LOS	В					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Uti	ilization		32.5%		CU Leve	el of Servi
Analysis Period (min)			15			

### 350 Wellington Road 7 4: Wellington Road 7 & Centre Access

	≯	$\rightarrow$	1	<b>†</b>	Ŧ	-	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	- M		5	•	î,		7
Traffic Volume (veh/h)	5	13	22	434	360	8	
Future Volume (Veh/h)	5	13	22	434	360	8	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	5	14	24	472	391	9	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				None	None		
Median storage veh)				Herre	Home		
Upstream signal (m)							
nX platoon unblocked							
vC conflicting volume	916	396	400				
vC1_stage 1 conf vol	010	000	100				
vC2_stage 2 conf vol							
vCu unblocked vol	916	396	400				
$C_{\rm single}(s)$	64	6.2	400				
$C_{2}$ stage (s)	0.4	0.2	7.1				
tE(s)	35	33	2.2				
n (3)	0.0	0.0	2.2				
cM capacity (yeb/b)	200	658	1170				
	233	000	1170				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1			
Volume Total	19	24	472	400			
Volume Left	5	24	0	0			
Volume Right	14	0	0	9			
cSH	500	1170	1700	1700			
Volume to Capacity	0.04	0.02	0.28	0.24			
Queue Length 95th (m)	0.9	0.5	0.0	0.0			
Control Delay (s)	12.5	8.1	0.0	0.0			
Lane LOS	В	А					
Approach Delay (s)	12.5	0.4		0.0			
Approach LOS	В						
Intersection Summary							Į
Average Delay			0.5				i
Intersection Capacity Uti	ilization		32.8%	l	CULeve	el of Servi	1
Analysis Period (min)			15				

### 350 Wellington Road 7 5: Wellington Road 7 & South Access

	≯	$\rightarrow$	1	<b>†</b>	ŧ	-			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	- Y		٦	<b>†</b>	eî 👘				
Traffic Volume (veh/h)	3	15	26	453	367	6			
Future Volume (Veh/h)	3	15	26	453	367	6			
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)	3	16	28	492	399	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	950	402	406						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	950	402	406						
tC, single (s)	6.4	6.2	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	99	98	98						
cM capacity (veh/h)	284	652	1164						
Direction, Lane #	EB 1	NB 1	NB 2	SB 1					
Volume Total	19	28	492	406					
Volume Left	3	28	0	0					
Volume Right	16	0	0	7					
cSH	541	1164	1700	1700					
Volume to Capacity	0.04	0.02	0.29	0.24					
Queue Length 95th (m)	0.9	0.6	0.0	0.0					
Control Delay (s)	11.9	8.2	0.0	0.0					
Lane LOS	В	А							
Approach Delay (s)	11.9	0.4		0.0					
Approach LOS	В								
Intersection Summary									
Average Delay			0.5						
Intersection Capacity Uti	ilization		33.8%	I	CU Leve	el of Servio	e	А	
Analysis Period (min)			15						

	≯	-	- 🖌	+	- 1	<b>†</b>	×	ŧ	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		4		\$		4		\$	
Traffic Volume (vph)	51	135	19	166	67	199	47	252	
Future Volume (vph)	51	135	19	166	67	199	47	252	
Lane Group Flow (vph)	0	259	0	246	0	311	0	368	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.74		0.61		0.36		0.39	
Control Delay		33.7		27.1		8.9		9.0	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		33.7		27.1		8.9		9.0	
Queue Length 50th (m)		27.8		25.7		17.0		20.3	
Queue Length 95th (m)		51.2		46.4		41.3		48.0	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		855		988		858		939	
Starvation Cap Reductr	ר	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.30		0.25		0.36		0.39	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	66.1								
Natural Cycle: 80									
Control Type: Semi Act	-Uncoo	rd							
Splits and Phases: 1	: Wellin	aton Ro	ad 7 & \	Nellinat	on Roa	d 18			
		9.01110							

<sup>™</sup> ¶ø2	<u>→</u> <sub>Ø4</sub>
45 s	45 s
▼Ø6	₩ Ø8
45 s	45 s

	≯	-	$\rightarrow$	1	-	•	1	<b>†</b>	1	1	ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$			\$			\$	
Traffic Volume (vph)	51	135	62	19	166	51	67	199	33	47	252	54
Future Volume (vph)	51	135	62	19	166	51	67	199	33	47	252	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.99			0.98	
Flt Protected		0.99			1.00			0.99			0.99	
Satd. Flow (prot)		1609			1663			1620			1649	
Flt Permitted		0.86			0.97			0.86			0.93	
Satd. Flow (perm)		1393			1613			1407			1539	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	53	141	65	20	173	53	70	207	34	49	262	56
RTOR Reduction (vph)	0	18	0	0	15	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	241	0	0	231	0	0	307	0	0	363	0
Heavy Vehicles (%)	12%	11%	18%	9%	12%	6%	19%	14%	6%	0%	14%	14%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.9			15.9			40.2			40.2	
Effective Green, g (s)		15.9			15.9			40.2			40.2	
Actuated g/C Ratio		0.24			0.24			0.61			0.61	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		335			387			855			935	
v/s Ratio Prot												
v/s Ratio Perm		c0.17			0.14			0.22			c0.24	
v/c Ratio		0.72			0.60			0.36			0.39	
Uniform Delay, d1		23.0			22.3			6.5			6.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.2			2.5			1.2			1.2	
Delay (s)		30.2			24.7			7.7			7.9	
Level of Service		С			С			Α			Α	
Approach Delay (s)		30.2			24.7			7.7			7.9	
Approach LOS		С			С			А			А	
Intersection Summary												
HCM 2000 Control Dela	у		16.2	F	ICM 20	00 Leve	l of Serv	vice	В			
HCM 2000 Volume to Ca	apacity	ratio	0.48									
Actuated Cycle Length (	s)		66.1	S	Sum of l	ost time	(s)		10.0			
Intersection Capacity Ut	ilization		60.8%	](	CU Leve	el of Sei	rvice		В			
Analysis Period (min)			15									
c Critical Lane Group												

350 Wellington Road 7HCM Unsignalized Intersection Capacity Analysis2: Middlebrook Rd/David St W & Wellington Road 7Total (2032) AM Peak Hour

Intersection	Capa	acity	Analys	SIS
Total	(2032)	) AM	Peak He	our

	≯	-	$\mathbf{F}$	4	+	•	1	Ť	۲	1	ţ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		<u> </u>	ef 👘		ኘ	ef 👘	
Traffic Volume (veh/h)	5	19	23	45	14	22	12	292	39	33	371	14
Future Volume (Veh/h)	5	19	23	45	14	22	12	292	39	33	371	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	20	24	48	15	23	13	311	41	35	395	15
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	840	850	402	856	838	332	410			352		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	840	850	402	856	838	332	410			352		
tC, single (s)	7.4	6.5	6.3	7.2	6.6	6.3	4.3			4.1		
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.4	3.6	4.1	3.4	2.4			2.2		
p0 queue free %	98	93	96	80	95	97	99			97		
cM capacity (veh/h)	227	287	625	240	281	697	1035			1218		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	49	86	13	352	35	410						
Volume Left	5	48	13	0	35	0						
Volume Right	24	23	0	41	0	15						
cSH	377	300	1035	1700	1218	1700						
Volume to Capacity	0.13	0.29	0.01	0.21	0.03	0.24						
Queue Length 95th (m)	3.5	9.2	0.3	0.0	0.7	0.0						
Control Delay (s)	16.0	21.7	8.5	0.0	8.0	0.0						
Lane LOS	С	С	А		A							
Approach Delay (s)	16.0	21.7	0.3		0.6							
Approach LOS	С	С										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Uti	lization		44.9%	10	CU Leve	el of Ser	vice		А			
Analysis Period (min)			15									

### 350 Wellington Road 7 3: Wellington Road 7 & North Access

	≯	$\rightarrow$	1	<b>†</b>	Ŧ	-			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	¥		<u>ل</u>	•	el 🕴				
Traffic Volume (veh/h)	10	15	5	303	349	3			
Future Volume (Veh/h)	10	15	5	303	349	3			
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)	11	16	5	329	379	3			
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	720	380	382						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	720	380	382						
tC, single (s)	6.4	6.2	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	97	98	100						
cM capacity (veh/h)	396	671	1188						
Direction. Lane #	EB 1	NB 1	NB 2	SB 1					
Volume Total	27	5	329	382					
Volume Left	11	5	0	0					
Volume Right	16	0	0	3					
cSH	523	1188	1700	1700					
Volume to Capacity	0.05	0.00	0.19	0.22					
Queue Length 95th (m)	1.3	0.1	0.0	0.0					
Control Delay (s)	12.3	8.0	0.0	0.0					
Lane LOS	В	A							
Approach Delay (s)	12.3	0.1		0.0					
Approach LOS	В								
Intersection Summary									
Average Delay			0.5						
Intersection Capacity Ut	ilization		28.6%	I	CU Leve	el of Servic	е	А	
Analysis Period (min)			15						

### 350 Wellington Road 7 4: Wellington Road 7 & Centre Access

	≯	$\rightarrow$	1	1	Ŧ	-
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	¥		5	•	ĥ	
Traffic Volume (veh/h)	8	21	7	297	357	2
Future Volume (Veh/h)	8	21	7	297	357	2
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)	9	23	8	323	388	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	728	389	390			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	728	389	390			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	99			
cM capacity (veh/h)	391	664	1180			
Direction. Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	32	8	323	390		
Volume Left	9	8	0	0		
Volume Right	23	0	0	2		
cSH	555	1180	1700	1700		
Volume to Capacity	0.06	0.01	0.19	0.23		
Queue Length 95th (m)	1.5	0.2	0.0	0.0		
Control Delay (s)	11.9	8.1	0.0	0.0		
Lane LOS	B	A	0.0	0.0		
Approach Delay (s)	11.9	0.2		0.0		
Approach LOS	В	0.1		0.0		
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Ut	ilization		28.9%		CU Leve	el of Servio
Analysis Period (min)			15			

	≯	$\rightarrow$	1	<b>†</b>	ŧ	~	
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W.		5	*	1.		
Traffic Volume (veh/h)	6	24	8	298	377	1	
Future Volume (Veh/h)	6	24	8	298	377	1	
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)	7	26	9	324	410	1	
Malking Speed (m/s)							
Walking Speed (III/S)							
Percent blockage							
Median type				None	None		
Median storage yeb)				None	None		
Upstroom signal (m)							
nX platoon unblocked							
$\gamma C$ conflicting volume	752	410	/11				
vC1_stage 1_conf_vol	152	410	411				
vC2 stage 2 conf vol							
VCz, stage z com vol	750	410	111				
tC, single (s)	6.4	410	411				
$C_{1}$ stage (s)	0.4	0.2	4.1				
tE(c)	2.5	2.2	2.2				
r (s)	0.0	0.0	2.2				
cM capacity (yoh/h)	30	646	99				
	5/0	040	1159				
Direction, Lane #	EB 1	NB 1	NB 2	SB 1			
Volume Total	33	9	324	411			
Volume Left	7	9	0	0			
Volume Right	26	0	0	1			
cSH	561	1159	1700	1700			
Volume to Capacity	0.06	0.01	0.19	0.24			
Queue Length 95th (m)	1.5	0.2	0.0	0.0			
Control Delay (s)	11.8	8.1	0.0	0.0			
Lane LOS	В	А					
Approach Delay (s)	11.8	0.2		0.0			
Approach LOS	В						
Intersection Summary							
Average Delay			0.6				
Intersection Capacity Uti	ilization		29.9%	I	CU Leve	el of Servic	e
Analysis Period (min)			15				

	≯	-	- 🖌	-	1	<b>†</b>	•	↓ ↓	
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations		\$		4		4		4	
Traffic Volume (vph)	89	255	34	189	81	424	64	323	
Future Volume (vph)	89	255	34	189	81	424	64	323	
Lane Group Flow (vph)	0	447	0	326	0	560	0	474	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		
Detector Phase	4	4	8	8	2	2	6	6	
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	
Total Split (s)	51.0	51.0	51.0	51.0	39.0	39.0	39.0	39.0	
Total Split (%)	56.7%	56.7%	56.7%	56.7%	43.3%	43.3%	43.3%	43.3%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0		0.0		0.0	
Total Lost Time (s)		5.0		5.0		5.0		5.0	
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	
v/c Ratio		0.84		0.55		0.72		0.61	
Control Delay		34.0		19.1		22.3		18.3	
Queue Delay		0.0		0.0		0.0		0.0	
Total Delay		34.0		19.1		22.3		18.3	
Queue Length 50th (m)		51.3		30.4		53.8		41.4	
Queue Length 95th (m)		85.0		51.8		#138.0		96.5	
Internal Link Dist (m)		549.0		565.6		505.0		454.0	
Turn Bay Length (m)									
Base Capacity (vph)		1006		1112		782		775	
Starvation Cap Reductn	l	0		0		0		0	
Spillback Cap Reductn		0		0		0		0	
Storage Cap Reductn		0		0		0		0	
Reduced v/c Ratio		0.44		0.29		0.72		0.61	
Intersection Summary									
Cycle Length: 90									
Actuated Cycle Length:	68.7								
Natural Cycle: 80									
Control Type: Semi Act-	Uncool	rd							
# 95th percentile volu	me exc	eeds ca	pacity, o	queue n	nay be l	onger.			
Queue shown is may	kimum a	after two	cycles	•					
Splits and Phases: 1:	Welling	gton Ro	ad 7 & \	Nellingt	on Road	d 18			
		-			73.4				
102					94				

192	-04
39 s	51 s
Ø6	₩ Ø8
39 s	51 s

Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SB	
	Movement
Lane Configurations 👶 🛟	Lane Configurations
Traffic Volume (vph) 89 255 84 34 189 90 81 424 33 64 323 6	Traffic Volume (vph)
Future Volume (vph) 89 255 84 34 189 90 81 424 33 64 323 6	Future Volume (vph)
Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 1900 190	Ideal Flow (vphpl)
Total Lost time (s)    5.0    5.0    5.0    5.0	Total Lost time (s)
Lane Util. Factor 1.00 1.00 1.00 1.00	Lane Util. Factor
Frt 0.97 0.96 0.99 0.98	Frt
Flt Protected 0.99 0.99 0.99 0.99	Flt Protected
Satd. Flow (prot) 1750 1743 1761 1739	Satd. Flow (prot)
Flt Permitted 0.83 0.93 0.88 0.88	Flt Permitted
Satd. Flow (perm) 1476 1628 1559 1537	Satd. Flow (perm)
Peak-hour factor, PHF 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96	Peak-hour factor, PHF
Adj. Flow (vph) 93 266 88 35 197 94 84 442 34 67 336 7	Adj. Flow (vph)
RTOR Reduction (vph) 0 13 0 0 21 0 0 2 0 0 5	RTOR Reduction (vph)
Lane Group Flow (vph) 0 434 0 0 305 0 0 558 0 0 469	Lane Group Flow (vph)
Heavy Vehicles (%) 5% 4% 6% 0% 7% 0% 10% 6% 0% 2% 7% 7%	Heavy Vehicles (%)
Turn Type Perm NA Perm NA Perm NA Perm NA	Turn Type
Protected Phases 4 8 2 6	Protected Phases
Permitted Phases 4 8 2 6	Permitted Phases
Actuated Green, G (s) 24.2 24.2 34.4 34.4	Actuated Green, G (s)
Effective Green, g (s) 24.2 24.2 34.4 34.4	Effective Green, g (s)
Actuated g/C Ratio 0.35 0.35 0.50 0.50	Actuated g/C Ratio
Clearance Time (s)    5.0    5.0    5.0    5.0	Clearance Time (s)
Vehicle Extension (s)    3.0    3.0    3.0    3.0	Vehicle Extension (s)
Lane Grp Cap (vph) 520 574 781 770	Lane Grp Cap (vph)
v/s Ratio Prot	v/s Ratio Prot
v/s Ratio Perm c0.29 0.19 c0.36 0.30	v/s Ratio Perm
v/c Ratio 0.83 0.53 0.71 0.61	v/c Ratio
Uniform Delay, d1 20.4 17.7 13.3 12.3	Uniform Delay, d1
Progression Factor    1.00    1.00    1.00    1.00	Progression Factor
Incremental Delay, d2 11.1 0.9 5.5 3.6	Incremental Delay, d2
Delay (s) 31.4 18.6 18.8 15.8	Delay (s)
Level of Service C B B B	Level of Service
Approach Delay (s) 31.4 18.6 18.8 15.8	Approach Delay (s)
Approach LOS C B B B	Approach LOS
Intersection Summary	Intersection Summary
HCM 2000 Control Delay 21.1 HCM 2000 Level of Service C	HCM 2000 Control Dela
HCM 2000 Volume to Capacity ratio 0.76	HCM 2000 Volume to C
Actuated Cycle Length (s)68.6Sum of lost time (s)10.0	Actuated Cycle Length (
Intersection Capacity Utilization 87.6% ICU Level of Service E	Intersection Capacity Ut
Analysis Period (min) 15	Analysis Period (min)

c Critical Lane Group

stic 0 .:. . :

350 Wellington Road 7HCM Unsignalized Integration2: Middlebrook Rd/David St W & Wellington Road 7

tersection Capacity Analys	SIS
Total (2032) PM Peak Ho	our

	≯	-	$\mathbf{F}$	4	-	•	1	Ť	۲	1	Ļ	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			\$		<u>۲</u>	el F		<u>۲</u>	eî 👘	
Traffic Volume (veh/h)	6	23	33	51	22	41	20	530	124	36	426	11
Future Volume (Veh/h)	6	23	33	51	22	41	20	530	124	36	426	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	6	24	35	54	23	43	21	558	131	38	448	12
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	1184	1261	454	1236	1202	624	460			689		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1184	1261	454	1236	1202	624	460			689		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)			~ .									
t⊢ (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	95	85	94	55	87	91	98			96		
cM capacity (veh/h)	131	161	582	121	175	480	1070			915		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	65	120	21	689	38	460						
Volume Left	6	54	21	0	38	0						
Volume Right	35	43	0	131	0	12						
cSH	255	180	1070	1700	915	1700						
Volume to Capacity	0.25	0.67	0.02	0.41	0.04	0.27						
Queue Length 95th (m)	7.9	31.5	0.5	0.0	1.0	0.0						
Control Delay (s)	23.9	58.0	8.4	0.0	9.1	0.0						
Lane LOS	С	F	A		A							
Approach Delay (s)	23.9	58.0	0.2		0.7							
Approach LOS	С	F										
Intersection Summary												
Average Delay			6.5									
Intersection Capacity Uti	lization		55.2%	I	CU Leve	el of Ser	vice		В			
Analysis Period (min)			15									

### 350 Wellington Road 7 3: Wellington Road 7 & North Access

	۶	$\mathbf{F}$	1	t	ţ	∢			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	Y		۲	1	eî 👘				
Traffic Volume (veh/h)	6	10	16	530	449	10			
Future Volume (Veh/h)	6	10	16	530	449	10			
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)	7	11	17	576	488	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	1104	494	499						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	1104	494	499						
tC, single (s)	6.4	6.2	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	97	98	98						
cM capacity (veh/h)	232	580	1075						
Direction, Lane #	EB 1	NB 1	NB 2	SB 1					
Volume Total	18	17	576	499					
Volume Left	7	17	0	0					
Volume Right	11	0	0	11					
cSH	366	1075	1700	1700					
Volume to Capacity	0.05	0.02	0.34	0.29					
Queue Length 95th (m)	1.2	0.4	0.0	0.0					
Control Delay (s)	15.3	8.4	0.0	0.0					
Lane LOS	С	Α							
Approach Delay (s)	15.3	0.2		0.0					
Approach LOS	С								
Intersection Summary									
Average Delay			0.4						
Intersection Capacity Uti	lization		37.9%	ŀ	CU Leve	l of Servi	се	А	
Analysis Period (min)			15						

### 350 Wellington Road 7 4: Wellington Road 7 & Centre Access

	≯	$\mathbf{r}$	1	1	Ŧ	<
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	- M		5	•	ĥ	
Traffic Volume (veh/h)	5	13	22	536	445	8
Future Volume (Veh/h)	5	13	22	536	445	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	14	24	583	484	9
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	1120	488	493			
vC1. stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1120	488	493			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	98			
cM capacity (veh/h)	226	583	1081			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	19	24	583	493		
Volume Left	5	24	0	0		
Volume Right	14	0	0	9		
cSH	412	1081	1700	1700		
Volume to Capacity	0.05	0.02	0.34	0.29		
Queue Length 95th (m)	12	0.5	0.0	0.0		
Control Delay (s)	14.2	8.4	0.0	0.0		
Lane LOS	B	A	0.0	0.0		
Approach Delay (s)	14.2	0.3		0.0		
Approach LOS	В	0.0		0.0		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Uti	ilization		38.2%		CU Leve	el of Servio
Analysis Period (min)			15			

### 350 Wellington Road 7 5: Wellington Road 7 & South Access

	۶	$\mathbf{F}$	1	t	Ļ	1			
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations	Y		5	<b>†</b>	4Î				
Traffic Volume (veh/h)	3	15	26	555	452	6			
Future Volume (Veh/h)	3	15	26	555	452	6			
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)	3	16	28	603	491	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	1154	494	498						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	1154	494	498						
tC, single (s)	6.4	6.2	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	99	97	97						
cM capacity (veh/h)	214	579	1076						
Direction, Lane #	EB 1	NB 1	NB 2	SB 1					
Volume Total	19	28	603	498					
Volume Left	3	28	0	0					
Volume Right	16	0	0	7					
cSH	456	1076	1700	1700					
Volume to Capacity	0.04	0.03	0.35	0.29					
Queue Length 95th (m)	1.0	0.6	0.0	0.0					
Control Delay (s)	13.2	8.4	0.0	0.0					
Lane LOS	В	А							
Approach Delay (s)	13.2	0.4		0.0					
Approach LOS	В								
Intersection Summary									
Average Delay			0.4						
Intersection Capacity Uti	lization		39.2%	l	CU Leve	l of Servic	e	А	
Analysis Period (min)			15						

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

# Appendix F – MTO Left Turn Analysis


















Chapter 9 – Intersections









































350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

Appendix G – OTM Signal Justification Sheets



Wellington Road 7 / Middlebrook Road / David Street West

			Compliance			Signal	Underground
Justification	Description		Sectional		Entiro %	Warrant	Provisions
		Rest. Flow	Numerical	%	Entile 70	Wallant	Warrant
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches						
	(average hour)	720	553	77%	- 37%	NO	NO
	B. Vehicle volume, along minor streets						
	(average hour)	170	76	45%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street						
	(average hour)	720	430	60%	41%	NO	NO
	B. Combined vehicle and pedestrian						
	volume crossing artery from minor						
	streets (average hour)	75	37	50%		NO	NO

Wellington Road 7 / North Access

Justification			(	Compliance	;	Signal	Underground
	Description		Sectional		Entire %	Signal Warrant	Provisions
		Rest. Flow	Numerical	%	Entile 70	Wallani	Warrant
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches						
	(average hour)	720	426	59%	3%	NO	NO
	B. Vehicle volume, along minor streets						
	(average hour)	255	10	4%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street						
	(average hour)	720	413	57%		NO	NO
	B. Combined vehicle and pedestrian				4%		
	volume crossing artery from minor						
	streets (average hour)	75	4	5%		NO	NO

Wellington Road 7 / Centre Access

Justification			(	Compliance	;	Signal	Underground
	Description		Sectional		Entire %	Signal Warrant	Provisions
		Rest. Flow	Numerical	%	Entile 70	wairan	Warrant
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches						
	(average hour)	720	430	60%	3%	NO	NO
	B. Vehicle volume, along minor streets						
	(average hour)	255	12	5%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street						
	(average hour)	720	416	58%		NO	NO
	B. Combined vehicle and pedestrian				3%		
	volume crossing artery from minor						
	streets (average hour)	75	3	4%		NO	NO

Wellington Road 7 / South Access

Justification			(	;	Signal	Underground	
	Description		Sectional		Entire %	Signal Warrant	Provisions
		Rest. Flow	Numerical	%	Entile 70	wairan	Warrant
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches						
	(average hour)	720	443	61%	3%	NO	NO
	B. Vehicle volume, along minor streets						
	(average hour)	255	12	5%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street						
	(average hour)	720	429	60%		NO	NO
	B. Combined vehicle and pedestrian				2%		
	volume crossing artery from minor						
	streets (average hour)	75	2	3%		NO	NO

350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

Appendix H – Pedestrian Crossing Warrant







Figure 3: OTM Book 12 Justification 6 - Pedestrian Volume



# Wellington Road 7 / Middlebrook Road / David Street West Total 2032 - Southbound

Figure 5: 4-Hour Pedestrian Volume Criterion for Communities of Population Less than 10,000
350 Wellington Road 7 Elora 7 OP Inc. JDE-22030 Date: April 27<sup>th</sup>, 2023

## Appendix I – 2016 Transportation Tomorrow Survey Output



Fri Oct 14 2022 18:46:52 GMT-0400 (Eastern Daylight Time) - Run Time: 2990ms	Fri Oct 14 2022 18:48:57 GMT-0400 (Eastern Daylight Time) - Run Time: 2650ms
	Our a Tabab free Our Free The 2040 of 4
Cross Tabulation Query Form - Trip - 2016 V1.1	Cross Tabulation Query Form - Trip - 2016 V1.1
Row: Planning district of destination - pd_dest	Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of household - gta06_hhld	Column: 2006 GTA zone of household - gta06_hhld
Filters:	Filters:
(2006 GTA zone of household - gta06_hhld In 8344); and	(2006 GTA zone of household - gta06_hhld In 8344); and
(Start time of trip - start_time In 700 - 900); and	(Start time of trip - start_time In 700 - 900); and
(Trip purpose of destination - purp_dest In W, R)	(Trip purpose of destination - purp_dest In W); and
	(Planning district of destination - pd_dest In 73)
Trip 2016	
ROW : pd_dest	ROW : gta06_dest
COLUMN : gta06_hhld	COLUMN : gta06_hhld

## **TTS Cross Tabulation**

Cross Tabulation Query Form - Trip - 2016 v1.1		
Filter Variables		
Planning district of desti X • 2006 GTA zone of hous X • (Optional) Ta	able Attribute	
Group Attributes		
Den Couries Couries Table Couries		
Grouping file Choose File No file chosen		
Filter Selection +		
2008 GTA topo of household a line at 8344		
And *	2	
Add Delete		
Output		
Comma-delimited table Column format Expansion Factor On Click to Select	Load Load	
Execute Query Select All Save As		
Tue Nov 01 2022 17:14:53 GMT-0400 (Eastern Daylight Time) - Run Time: 2558ms		
Cross Tabulation Query Form - Trip - 2016 v1.1		
Row: Planning district of destination - pd_dest Column: 2006 GTA zone of household - gta06_hhld		
Filters:		
2006 GTA zone of household - gta06_hhld In 8344 and		
Start time of trip - start_time In 700 - 900 and		
Trip purpose of destination - purp_dest In W, R		
Trip 2016 ROW : pd_dest COLUMN : gta06_hhld		
4 8344 50		
36 8344 19		
39 8344 25		
46 8344 27		
64 8344 112 64 8344 115		
65 8344 83		
69 8344 31		
70 8344 301		
73 8344 19		
79 8344 26		
121 8344 94		

## **TTS Cross Tabulation**

Cross Tabulation Query Form - Trip - 2016 v1.1			
Filter Variables			
2006 GTA zone of desti × • 2006 GTA zone of hous ×	(Optional) Table Attribute		
Group Attributes			
Row Grouping Column Grouping Ta Grouping file: Choose File No file chosen	able Grouping		
Filter Selection +			
2006 GTA zone of household *  Ir	* 8344		
And *			
Start time of trip *	700 - 900		
And *			
Trip purpose of destination Trip purpose of destination	W, R		
And *			
Planning district of destination * Ir	n v 73.		
Output Comma-delimited table Ocolumn format Expansion Factor O	n Click to Select Load Load		
Execute Query Select All Save As			
Tue Nov 01 2022 17:16:43 GMT-0400 (Eastern Daylight Time) - Run Time: 2377ms			
Cross Tabulation Query Form - Trip - 2016 v1.1			
Row: 2006 GTA zone of destination - gta06_dest Column: 2006 GTA zone of household - gta06_hhld			
Filters: 2006 GTA zone of household - gta06_hhld In 8344 and Start time of trip - start_time In 700 - 900 and This superconst doctiontion			
and Planning district of destination - pd dest In 73,			
Trip 2016 Table:			
,8344 8344,136 8346,60 8350,18 8351,206 8354,16 8355,16			