TRANSPORTATION CONSULTING

Janaury 09, 2024

Mr. David Hill

Beachcroft Investments Inc.
6-20 Cachet woods Court
Markham, ON
L6C 3G1

Re: Proposed Residential Subdivision
63 and 63A Trafalgar Road (Wellington Road 24)
Town of Erin, County of Wellington
REVISED Transportation Study

CGE Transportation Consulting is pleased to submit this REVISED Transportation Study for the above noted development. This report documents the transportation impacts and needs for the proposed residential subdivision Draft Plan of Subdivision situated on a parcel of land located on the east side of Trafalgar Road (Wellington Road 24), north of Wellington Road 22, in the Town of Erin, County of Wellington.

It Is noted this is a scoped transportation study reflecting the early planning stages of the development of the Draft Plan of Subdivision and is being prepared in advance of the transportation functional design study and the draft plan approval.

Should you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

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2023 Existing Condition

2031 Background Condition

2031 Full Build Condition

2036 Future Year Condition

1.0 INTRODUCTION

CGE Transportation Consulting was retained by Beachcroft Investments Inc. to prepare a Transportation Study for a proposed Draft Plan of Subdivision located on of land located on the east side of Trafalgar Road (Wellington Road 24), north of Wellington Road 22, in the Town of Erin, County of Wellington.

Existing Site Description:

The site is bounded by Trafalgar Road (Wellington Road 24) to the east, the Barbour Fields to the west, residential developments to the north and vacant land to the south. The site is presently vacant and is currently zoned as a *Future Development (FD) Zone.*

The location of the proposed development is illustrated in **Figure 1**.

Development Proposal Description:

Based on the most recent version of the proposed Draft Plan of Subdivision, dated November 14th, 2023, the proposal comprises of 376 single-family detached homes (including a heritage house) and 286 units of low-rise multifamily housing, totaling 662 residential units.

The Draft Plan of Subdivision also designates certain lands for future development. Notably, blocks 423 and 424 are under consideration for potential development as low-rise senior housing, with an estimated 75 low-rise senior townhouse units in block 423 and 188 senior mixed-use apartment units in block 424. Discussions with the property owner suggest that the development timeline for these future blocks extends beyond the scope of this current study. However, in response to feedback received during the initial submission, the anticipated traffic generated by these future blocks has been included for a conservative analysis.

The proposed development features five external access connections. These include a connection to Wellington Road via Street “1”, two connections to Trafalgar Road (Wellington Road 24) via Street “2” and Market Street/Street “16”, an access connection to Spruce Street via Street “3”, an access connection to Currie Drive via Street “4”.

The proposed Draft Plan of Subdivision is provided in **Figure 2.**

Scope of Work:

The purpose of this transportation study is to assess the effects of the development on the study area roadways and evaluate the need for auxiliary lanes at the proposed project accesses from Trafalgar Road (Wellington Road 24) and Wellington Road 22.

As previously mentioned, the scope of this transportation study aligns with the preliminary planning stages of the Draft Plan of Subdivision. It has been developed in anticipation of the transportation functional design study and the draft plan approval.

The study area includes the following intersections, due to the expected low traffic volumes at the Spruce Street and Currie Street access points, these accesses were not included in the analysis.

- Wellington Road 22 & Trafalgar Road (Wellington Road 24)
- Wellington Road 22 & East Collector Road/Street “1”
- Trafalgar Road (Wellington Road 24) & Station Street/ Street “2”
- Trafalgar Road (Wellington Road 24) & Market Street/ Street “16”

The study analyzed the following scenarios:

- Existing 2023 Conditions
- Future Background 2031 Conditions
- Full Build 2031 Conditions
- Future Year 2036 Conditions

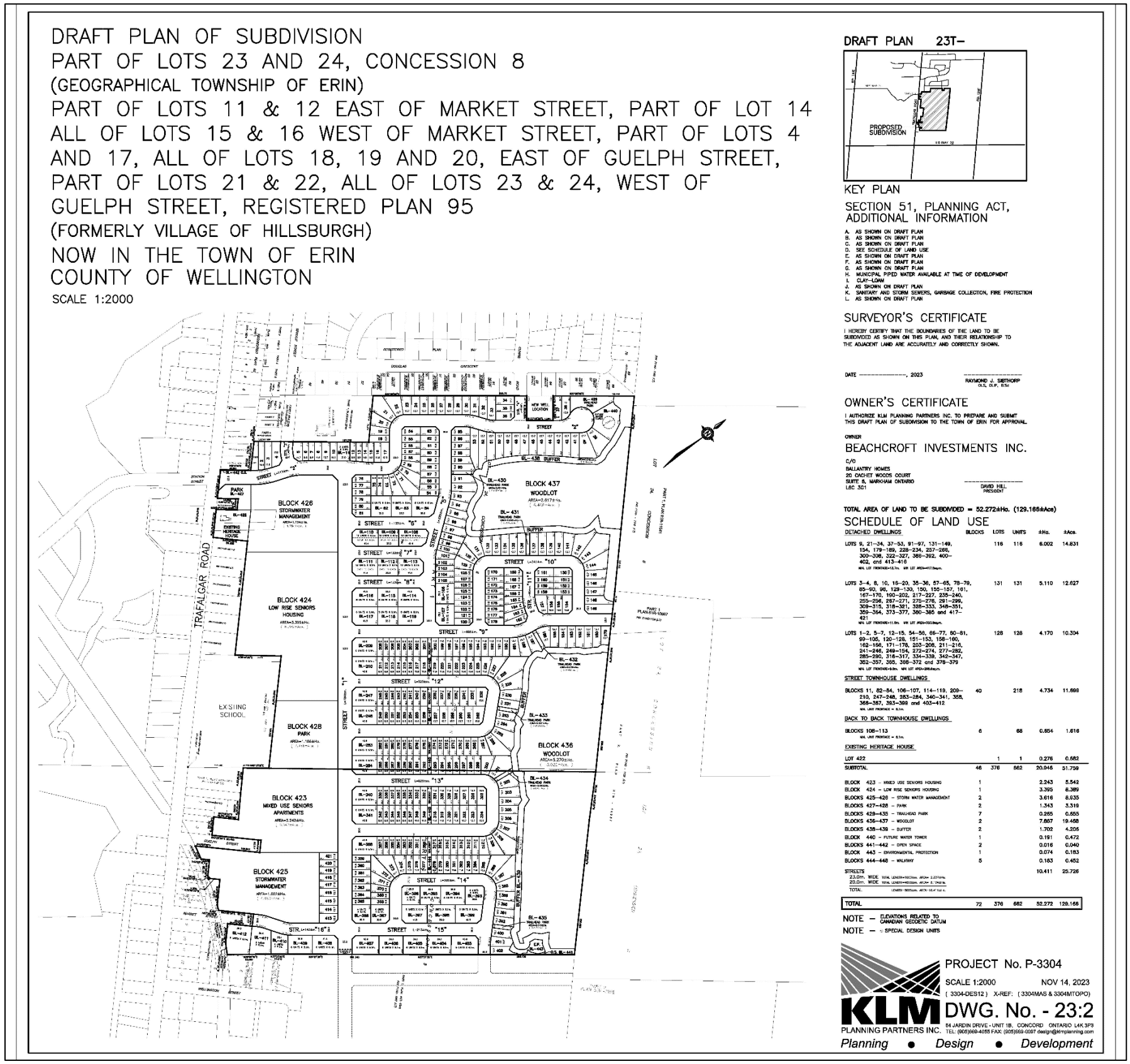
The analysis is developed for the weekday AM and weekday PM peak hours.

Notice of development on site

Figure 1 Site Location

Source: Google Maps (N.T.S)

Figure 2 Proposed Draft Plan of Subdivision



(Not to Scale)

2.0 EXISTING AREA

2.1 Existing Roadway Conditions

A summary of the existing roadway conditions in the study area is presented below.

Trafalgar Road (Wellington Road 24)	is a north-south arterial road under the jurisdictional control of the County. The roadway consists of two general-purpose lanes and maintains a posted speed limit of 40 km/h. The sidewalks along Trafalgar Road (Wellington Road 24) within the study area are not continuous.
Wellington Road 22	is an east-west arterial road under the jurisdictional control of the County. The roadway consists of two general-purpose lanes and maintains a posted speed limit of 80 km/h east of Trafalgar Road (Wellington Road 24) and 70 km/h west of Trafalgar Road.
Station Street	is an east-west collector road under the jurisdictional control of the Town. The roadway comprises of two general-purpose lanes, and sidewalks are available on the north side of the roadway near the site.
Market Street	is an east-west local road under the jurisdictional control of the Town. The roadway consists of two general-purpose lanes with no sidewalks.

2.2 Intersection Geometry

Wellington Road 22 & Trafalgar Road (Wellington Road 24) is a signalized intersection. The eastbound and westbound approaches consist of a single lane. The northbound and southbound approaches consist of a left-turn lane and a shared through-right lane.

Trafalgar Road (Wellington Road 24) & Station Street is a stop-controlled T-intersection. All approaches consist of a single lane.

Trafalgar Road (Wellington Road 24) & Market Street is a stop-controlled T-intersection. All approaches consist of a single lane.

Street “1” is proposed to be a full access connection to the proposed East Collector Road at Wellington Road 22. The East Collector Road will be located approximately 350 metres east of Trafalgar Road (Wellington Road 24).

Street “2” is proposed to be a full access connection to Trafalgar Road (Wellington Road 24). It is located approximately one kilometer north at Wellington Road 22 and will constitute the fourth leg of the existing Trafalgar Road (Wellington Road 24) & Station Street intersection.

Street “3” is proposed to be a full access connection to Spruce Street and will constitute the third leg of the Spruce Street & Douglas Crescent intersection. The conceptual draft plan suggests that the Spruce Street access connection will serve a low unit count and is in close proximity to other access points. This proximity suggests that the traffic volume would be low or negligible (less than 10 vehicles per hour). Consequently, this access has been excluded from the analysis.

Street “4” is proposed to be a full access connection to Currie Street and will constitute the fourth leg of the Douglas Crescent & Currie Drive intersection. Similarly, the draft plan suggests that the

Currie Drive access connection will serve a low unit count and is in close proximity to other access points, which would result in low or insignificant traffic volumes (approximately 4ph). Consequently, this access has been excluded from the analysis.

Street '16' is proposed to be a full access connection to Market Street at Trafalgar Road (Wellington Road 24). It is located approximately 250 metres north of Wellington Road 22.

2.3 Transit Services

There is no transit service in the vicinity of the site.

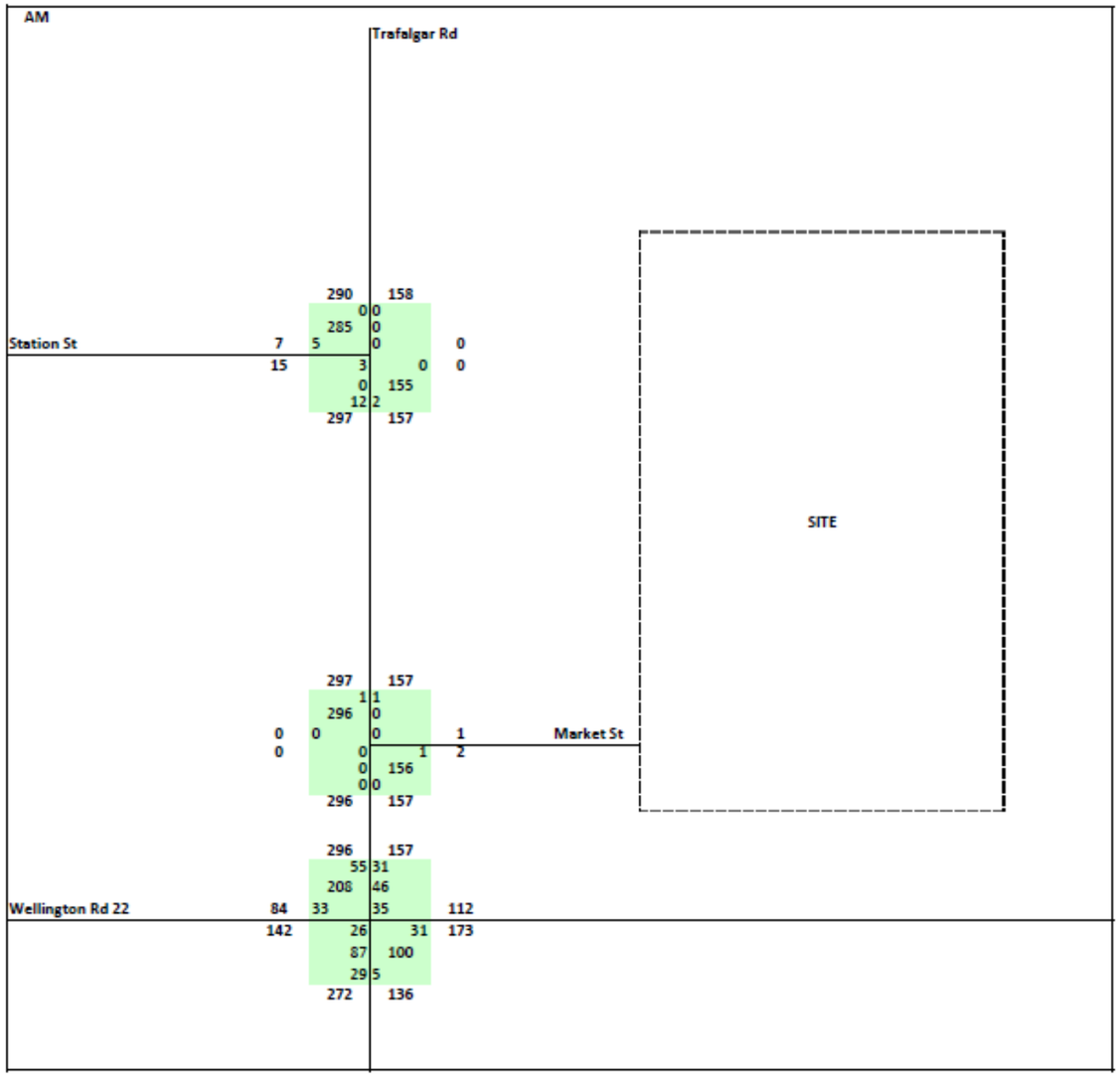
2.4 Traffic Volumes

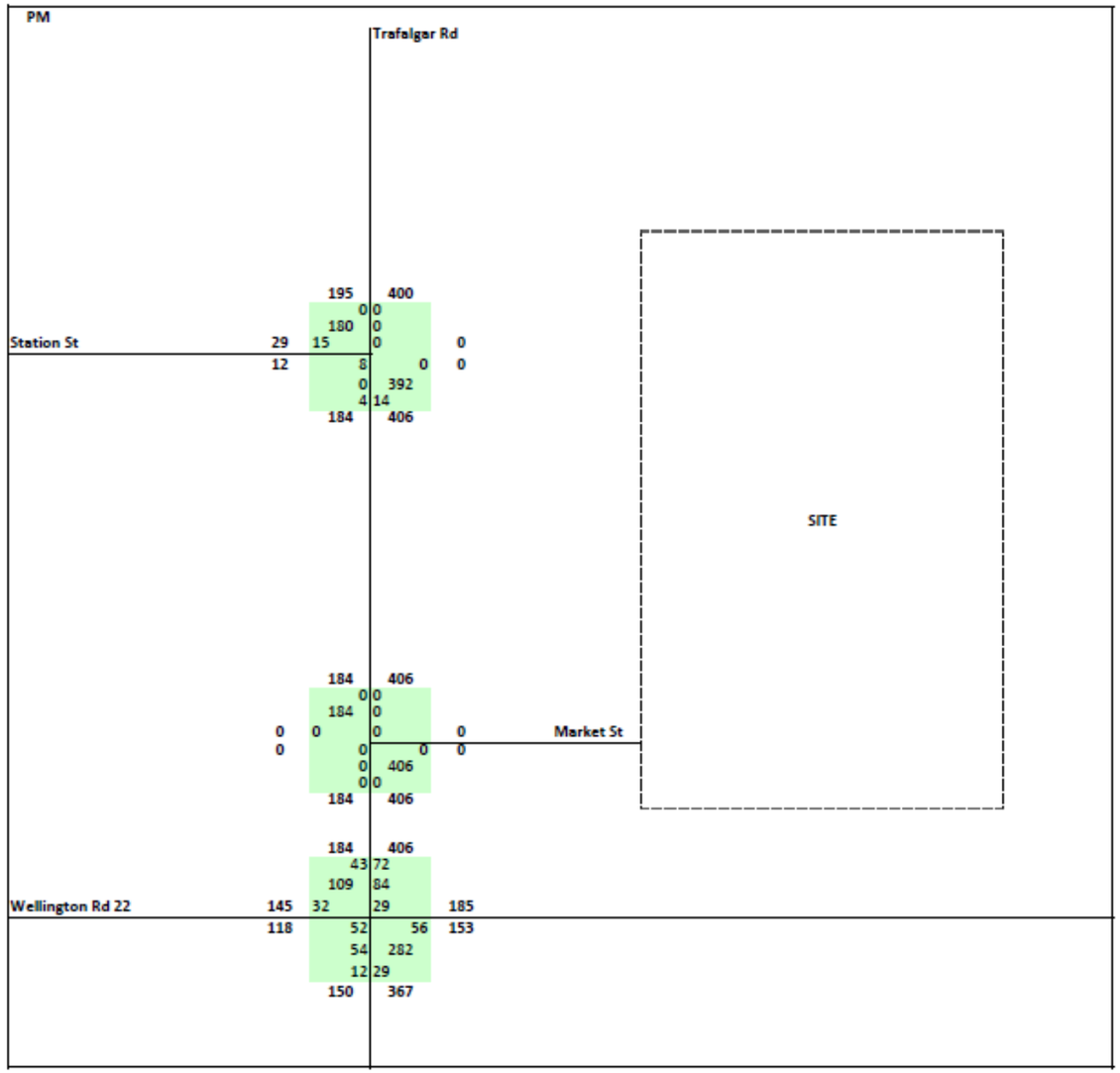
Traffic data collection for the study area intersections was performed on February 08, 2023. These volumes can be found in **Appendix A**.

Figure 3 displays existing traffic (balanced) volumes.

Posted 40km/h speed limit on Trafalgar Rd

Figure 3 Existing Traffic Volumes





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3.0 METHODOLOGY

3.1 Base Assumptions

Intersection capacity analysis was conducted using Synchro v11.0. Trip generation was calculated using the 11th edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.

Turn lane requirements were examined using the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* as well as the *Geometric Design Standards for Ontario Highways by the Ministry of Transportation, Ontario.*

The signal timing plans for the Wellington Road 22 & Trafalgar Road (Wellington Road 24) intersection were retrieved from the *Hillsburgh Heights Inc Traffic Impact Study.*

3.2 Background Growth

As stated in the *Hillsburgh Heights Inc. Traffic Impact Study*, the County provided an annual growth rate of 2% for Trafalgar Road (Wellington Road 24) and Wellington Road 22 that was obtained from the County of Wellington. For a consistent analysis, the study increased the existing traffic volumes by 2% each year to approximate the background growth for future year conditions.

3.3 Background Trips

The *Hillsburgh Heights Inc. Traffic Impact Study* pertains to a site located immediately west of Trafalgar Road (Wellington Road 24) and approximately two kilometers north of Wellington Road 22. The most recent addendum to the study, dated February 2023, notes that Full Build conditions of the proposed residential subdivision development are expected to occur in 2026. In addition to this proposed development, the study accounts for background development trips from Carson Reid Homes Ltd., Thomasfield Homes Ltd., Chantler and another subdivision owned by Hillsburgh Heights Inc all located in the vicinity of the site. The map showing the location of the background developments is included in the appendices. The transportation study analysis includes trips generated by both the proposed and background development (**See Figures 4-8).**

The *Empire Erin Eighth Line Residential Subdivision Development Traffic Impact Study* pertains to a site at the existing Erin Heights Golf Course, located on the east side of Eighth Line Road, between Sideroad 17 and Dundas Street West. The most recent addendum to this study is dated October 2023. This transportation study analysis includes trips generated by the proposed development (**Figure 9**).

According to the pre-consultation meeting with Town officials, the Town is currently developing an expansion plan for the Barbour Fields Sports Plex (approximately 66 acres), situated east of the subject site. The proposed Draft Plan of Subdivision exhibits the roadway connections

between the two locations. The Barbour Field Multi-Use Community Centre conceptual plan includes a public park with various facilities, such as ball fields, basketball courts, soccer fields, picnic areas, dog parks, ice pads, and more, covering approximately 66 acres.

In order to estimate the projected trips that the centre will generate, the ITE Trip Generation Manual, 11th Edition, was utilized and the results have been included in the analysis. The trip generation graphs are also included in the appendices for reference. This transportation study analysis includes the trips generated by proposed fields expansion (**Figure 10**).

The Town of Erin's Official Plan proposes a minor collector road that will link Trafalgar Road (Wellington Road 24) to Wellington Road 22 and will pass through the proposed subdivision. The *Hills burgh Heights Inc. Traffic Impact Study* referred to this new collector road as the "East Collector Road", which the study expects to be built by their 2026 horizon year. This new collector road has been included in the analysis.

As of December 2023, aside from the background developments totaled in **Figure 11**, the Regions and Towns Planning Website does not currently provide information regarding any additional anticipated background developments in the Hillsburgh Urban Area that could impact traffic in the study area.

3.4 Site Trip Generation

The updated plan proposes 376 single-family detached homes (inclusive of a heritage house) and 286 units of low-rise multifamily housing, for a total of 662 residential units.

The Draft Plan of Subdivision also designates certain lands for future development. Notably, blocks 423 and 424 are under consideration for potential development as low-rise senior housing, with an estimated 75 low-rise senior townhouse units in block 423 and 188 senior mixed-use apartment units in block 424. Discussions with the property owner suggest that the development timeline for these future blocks extends beyond the scope of this current study. However, in response to feedback received during the initial submission, the anticipated traffic generated by these future blocks has been included for a conservative analysis.

The *ITE Trip Generation Manual, 11th Edition* was used to estimate the projected trips by this development. **Table 1** contains the summary of the land uses and sizes used for trip generation estimates. The trip generation graphs are also included in the appendices for reference.

Table 1 Estimated Traffic Generation

AM Peak Hour						
Land Use & Data Source	**Size**		**Method**	**Entry**	**Exit**	**Total**
			Rate/Equation	**Split%**	**Split%**	
220 – Multifamily Housing (Low-Rise) – Not Close to Rail Transit	Dwelling Units	286	Best Fit (LIN)	27	85	112
			T = 0.31(X) + 22.85	24%	76%	
210 – Single-Family Detached Housing	Dwelling Units	376	Best Fit (LOG)	62	187	249
			Ln(T) =0.91Ln(X) + 0.12	25%	75%	
251 – Senior Adult Housing – Single-Family	Dwelling Units	75	Best Fit (LOG)	10	21	31
			Ln(T) = 0.76 Ln(X) + 0.16	33%	67%	
252 – Senior Adult Housing – Multifamily	Dwelling Units	188	Best Fit (LIN)	12	25	37
			T = 0.19(X) + 0.90	34%	66%	
Total						**429**
PM Peak Hour						
Land Use & Data Source	**IV**	**Size**	**Method**	**Entry**	**Exit**	**Total**
			Rate/Equation	**Split%**	**Split%**	
220 – Multifamily Housing (Low-Rise) – Not Close to Rail Transit	Dwelling Units	286	Best Fit (LIN)	90	54	144
			T = 0.43(X) + 20.55	63%	37%	
210 – Single-Family Detached Housing	Dwelling Units	376	Best Fit (LOG)	217	128	345
			Ln(T) =0.94Ln(X) + 0.27	63%	37%	
251 – Senior Adult Housing – Single-Family	Dwelling Units	75	Best Fit (LOG)	22	13	35
			Ln(T) = 0.78 Ln(X) + 0.20	61%	39%	
252 – Senior Adult Housing – Multifamily	Dwelling Units	188	Best Fit (LIN)	26	21	47
			T = 0.25(X) + 0.07	56%	44%	
Total						**571**

3.5 Trip Distribution

Trips for this proposed development were assigned to the surrounding roadway network based on existing traffic patterns and surrounding land uses.

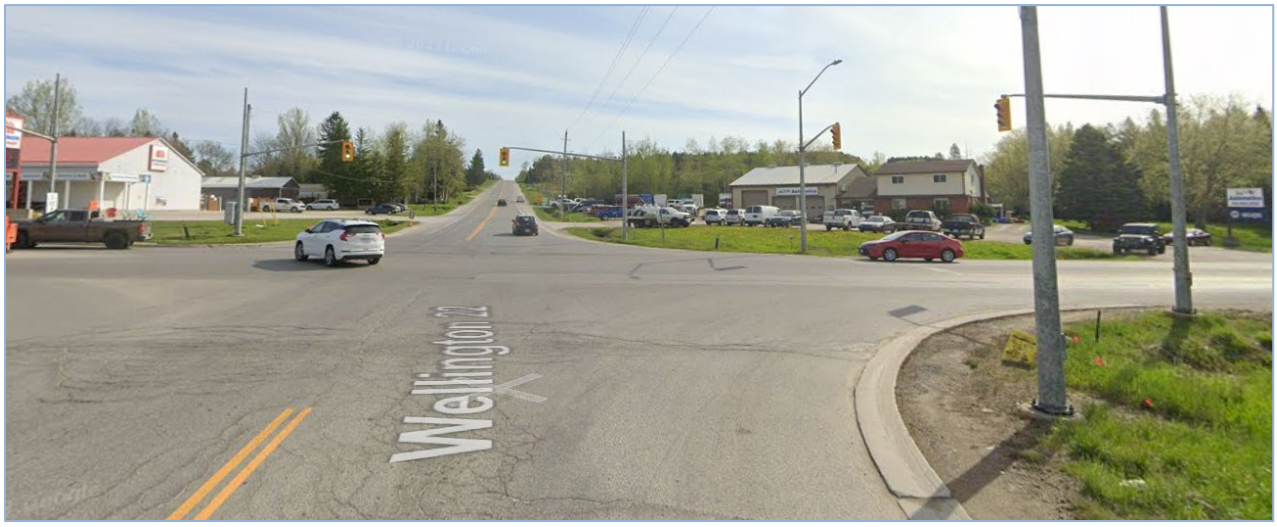
The proposed trip distribution for this project in the AM peak hour is:

- 35% to/from south of Trafalgar Road (Wellington Road 24)
- 35% to/from east of Wellington Road 22
- 20% to/from north of Trafalgar Road (Wellington Road 24)
- 5% to/from west of Wellington Road 22
- 5% to/from west of Station Street

The proposed trip distribution for this project in the PM peak hour is:

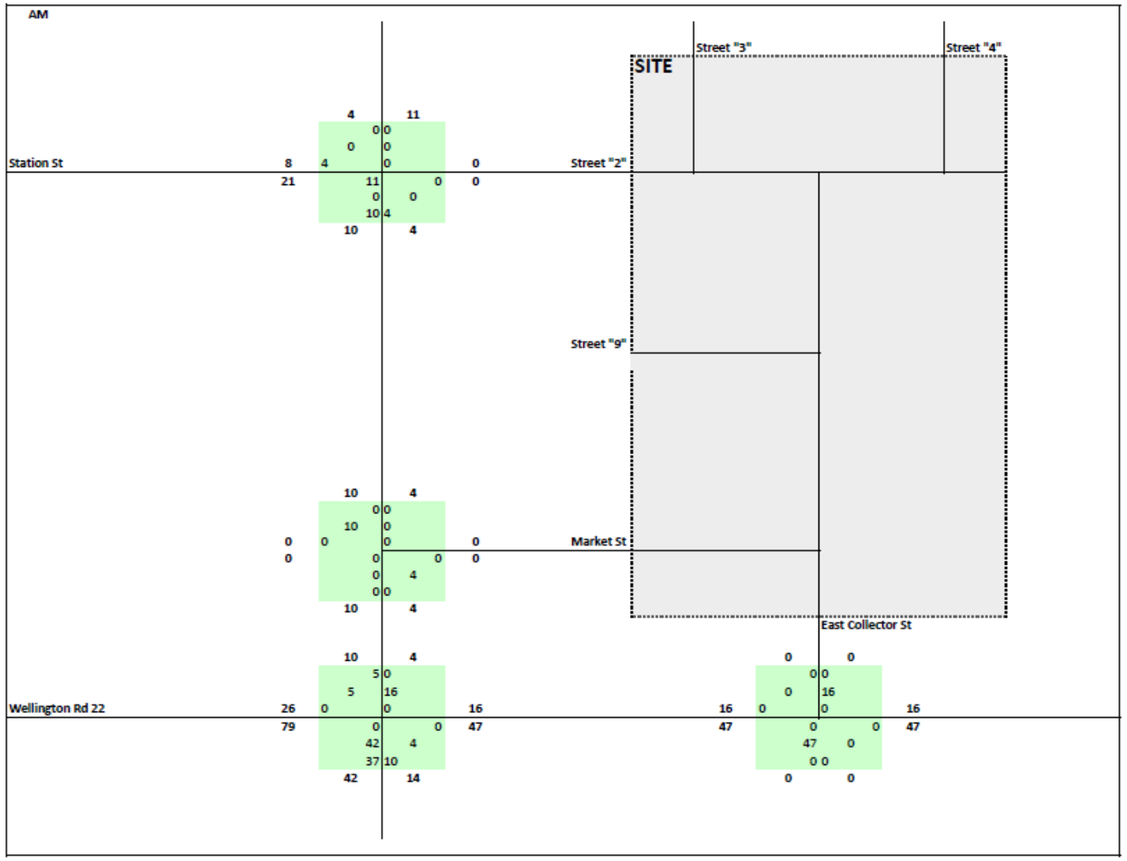
- 35% to/from north of Trafalgar Road (Wellington Road 24)
- 25% to/from west of Wellington Road 22
- 10% to/from west of Station Street
- 20% to/from south of Trafalgar Road (Wellington Road 24)
- 10% to/from east of Wellington Road 22

Trips assignment was based on the location of the proposed access and is shown **Figure 12.** Future Background volumes for 2031 are shown in **Figure 13.** Future Total 2031 volumes are shown in **Figure 14.** Future Year 2036 volumes are shown in **Figure 15.**



Wellington Road 22 & Trafalgar Road (Wellington Road 24) – looking east (google image)

Figure 4 Carson Reid Homes Ltd Trips



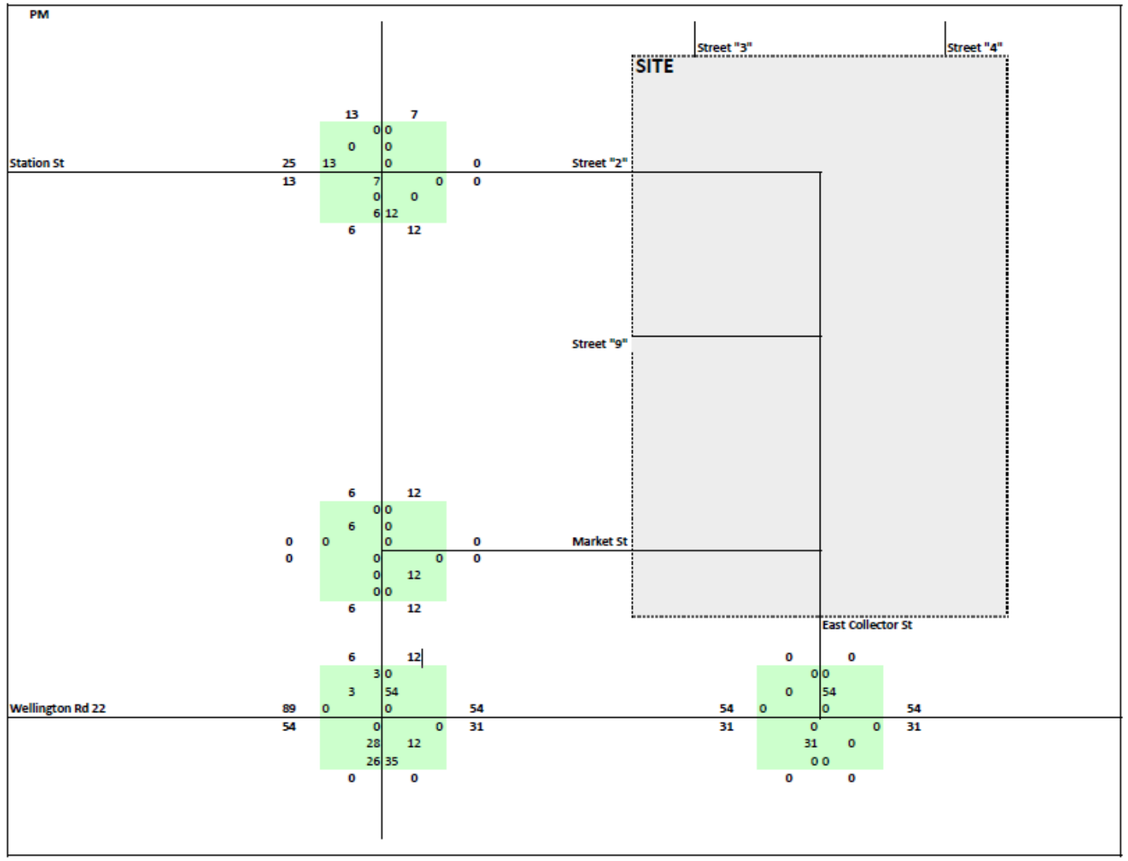


Figure 5 Thomas Field Homes Trips

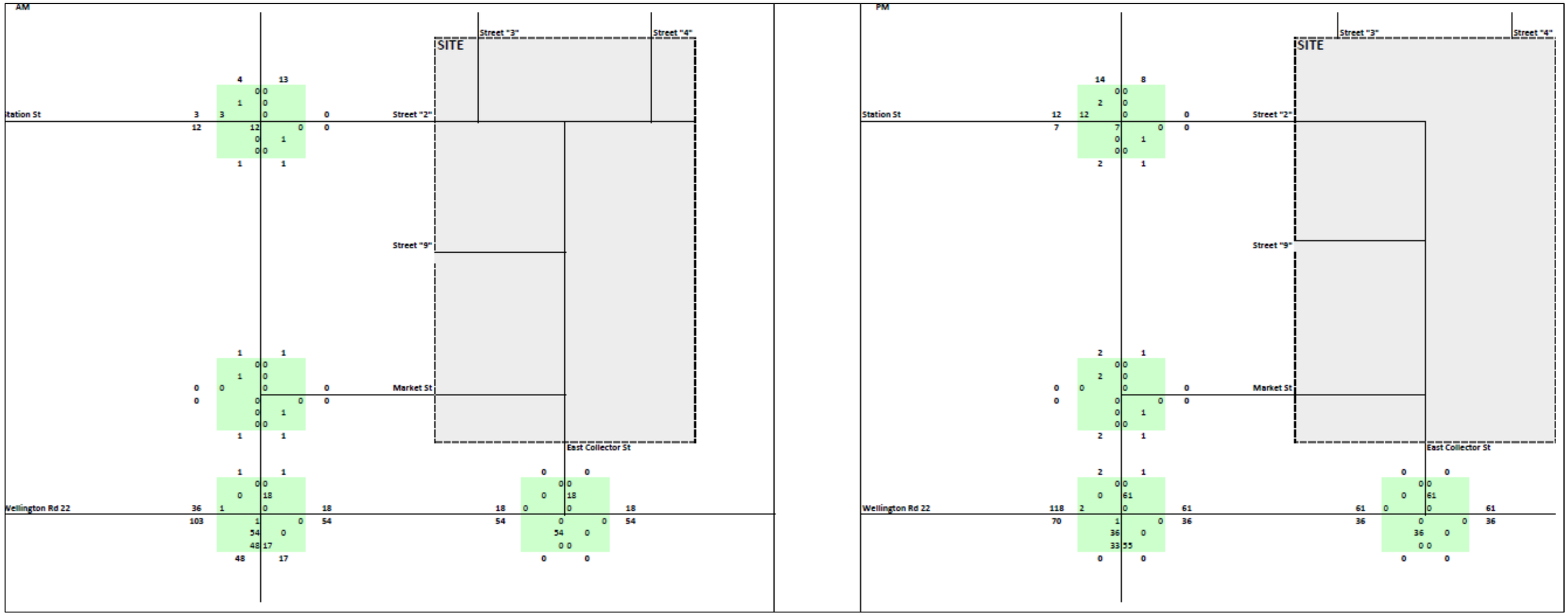
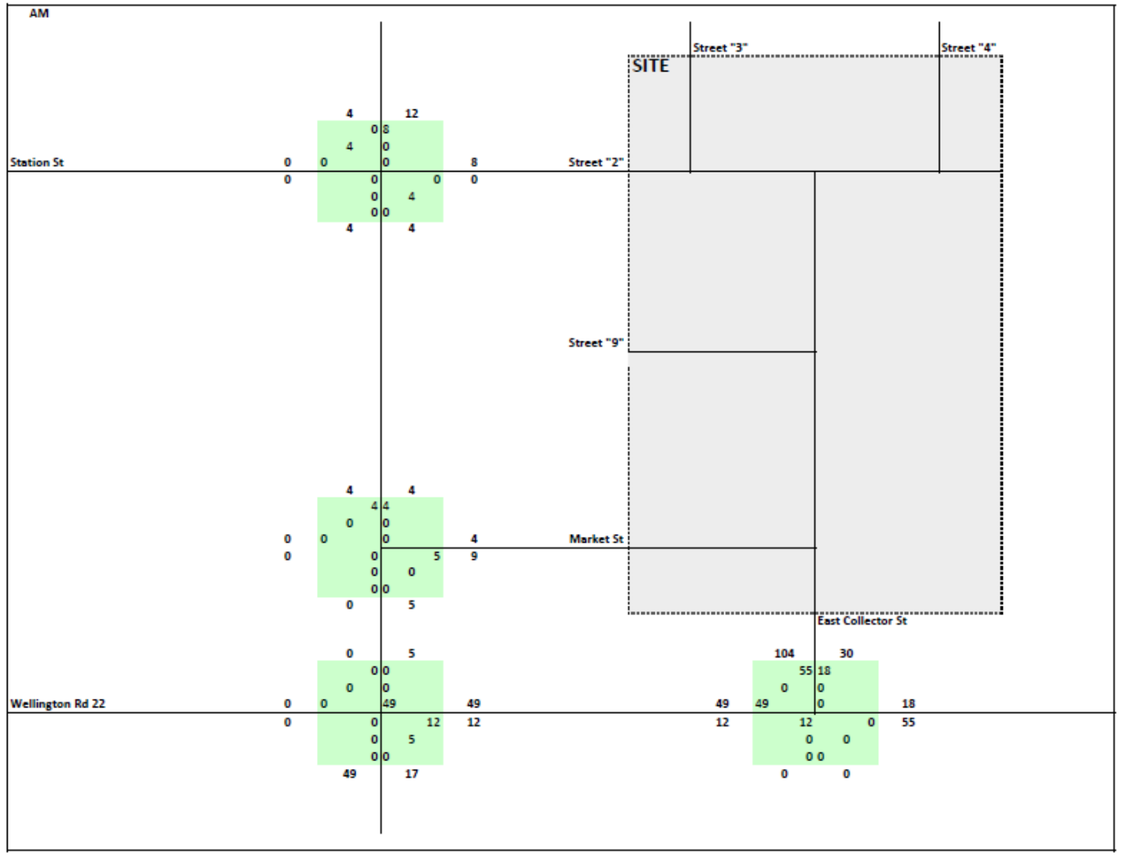


Figure 6 Chantler Trips



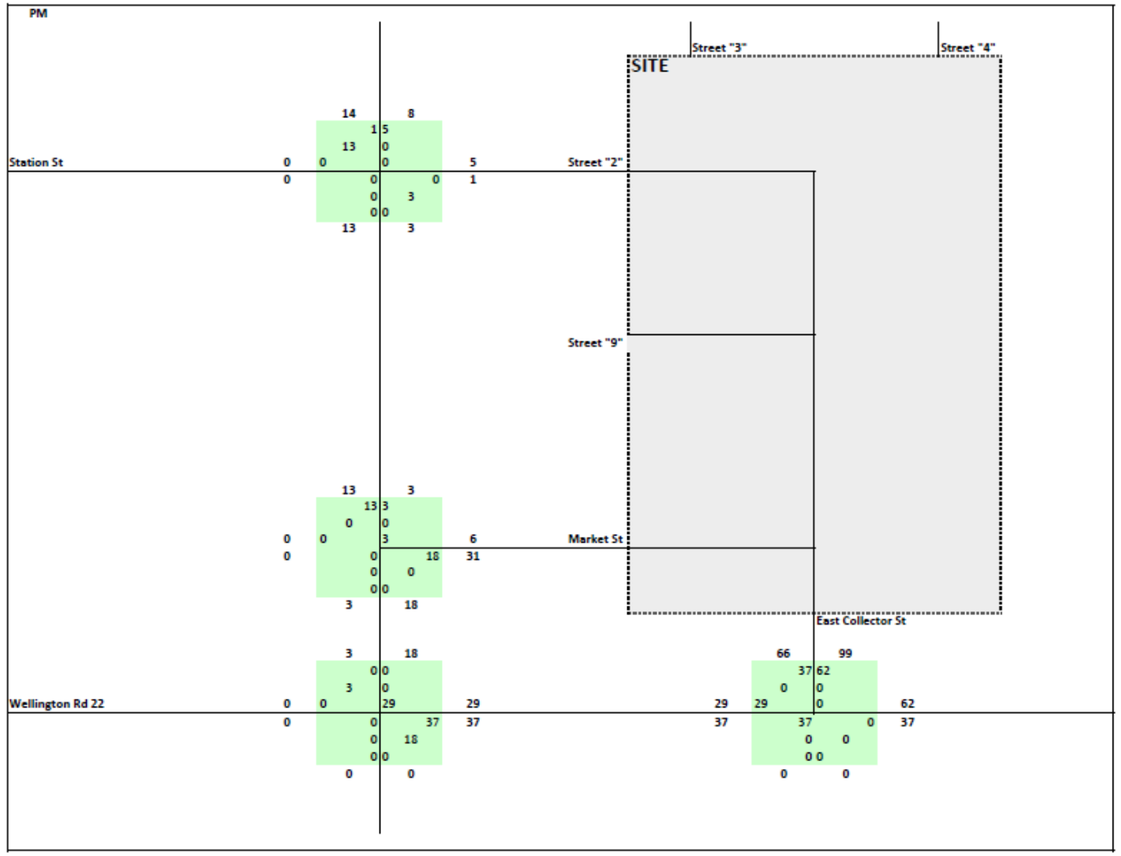


Figure 7 Hillburgh Heights (Property One) Trips

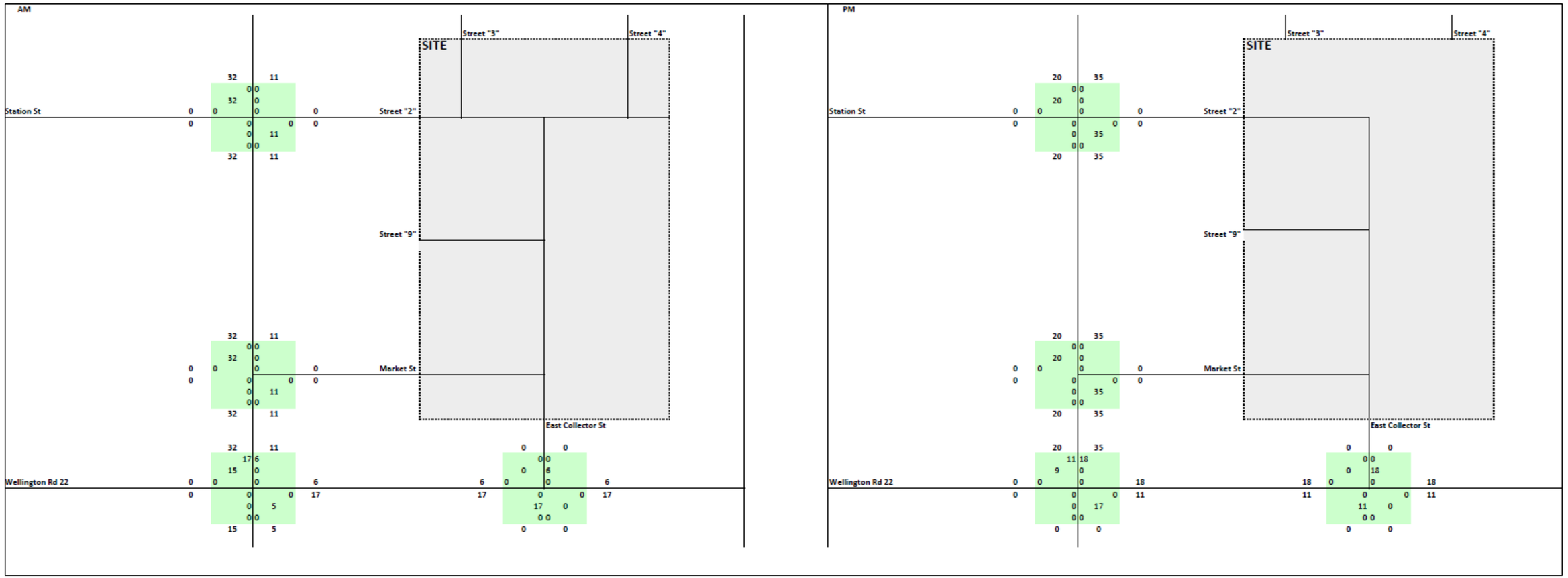
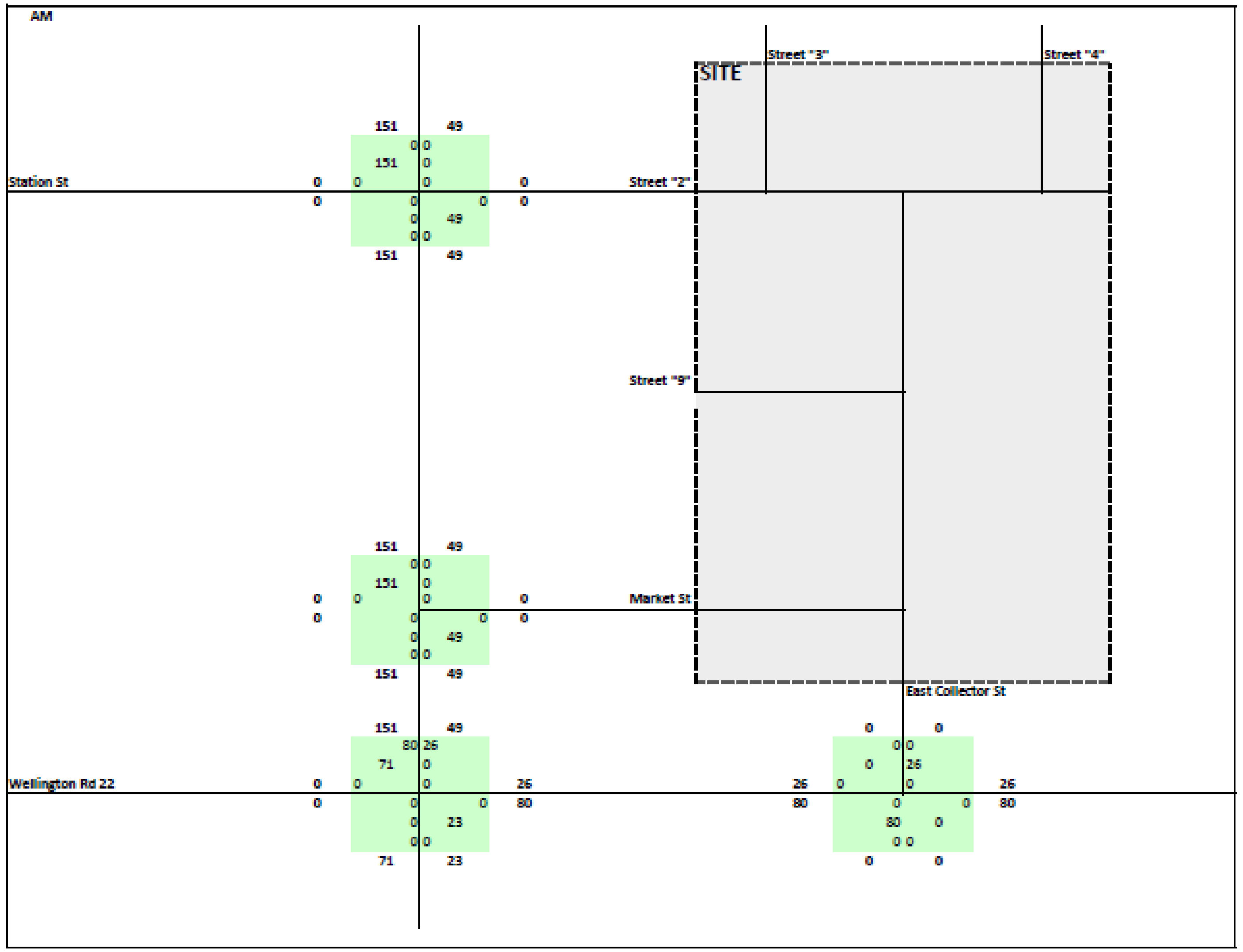


Figure 8 Hillburgh Heights (Property Two) Trips



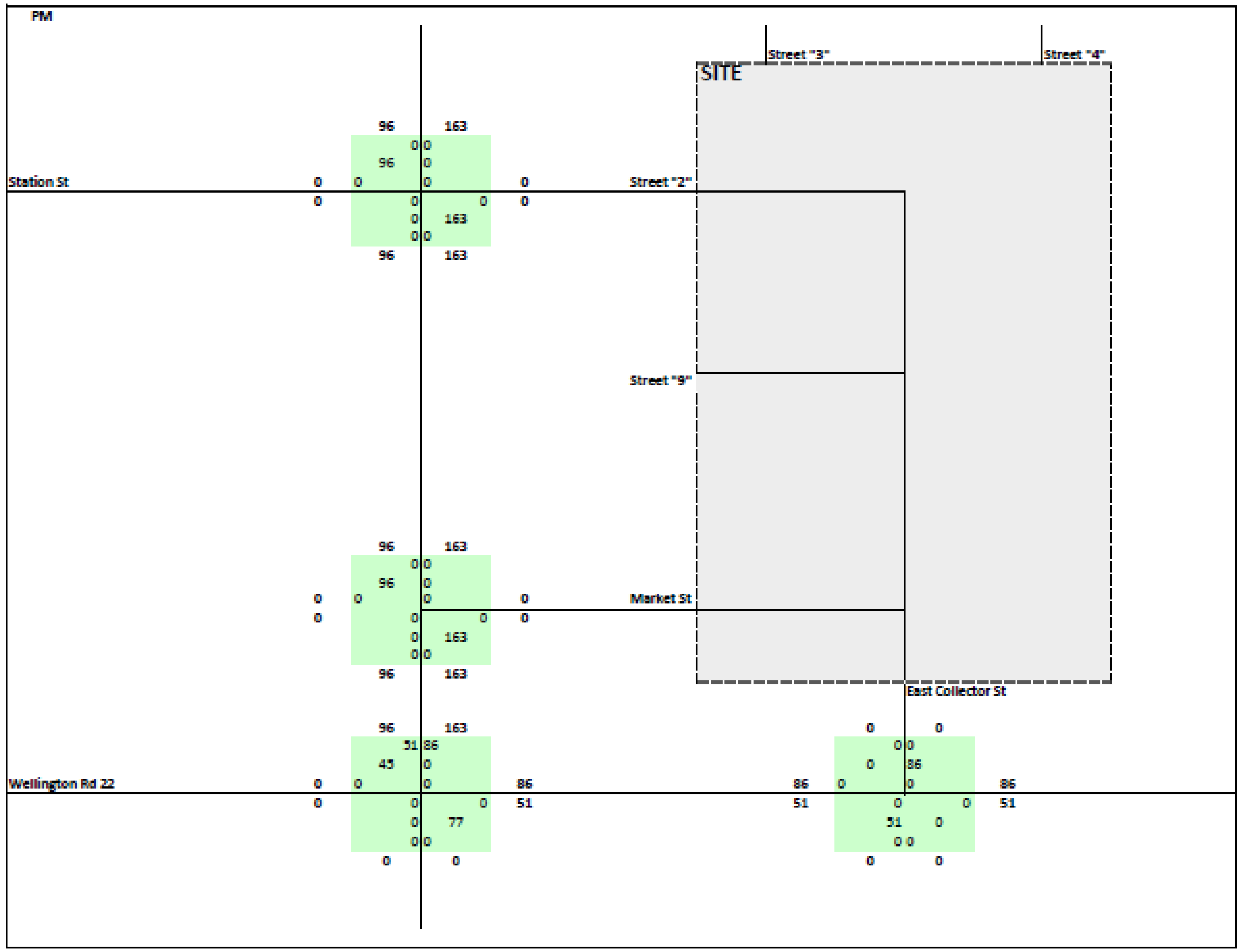


Figure 9 Empire Erin Eighth Line Residential Subdivision Development Trips

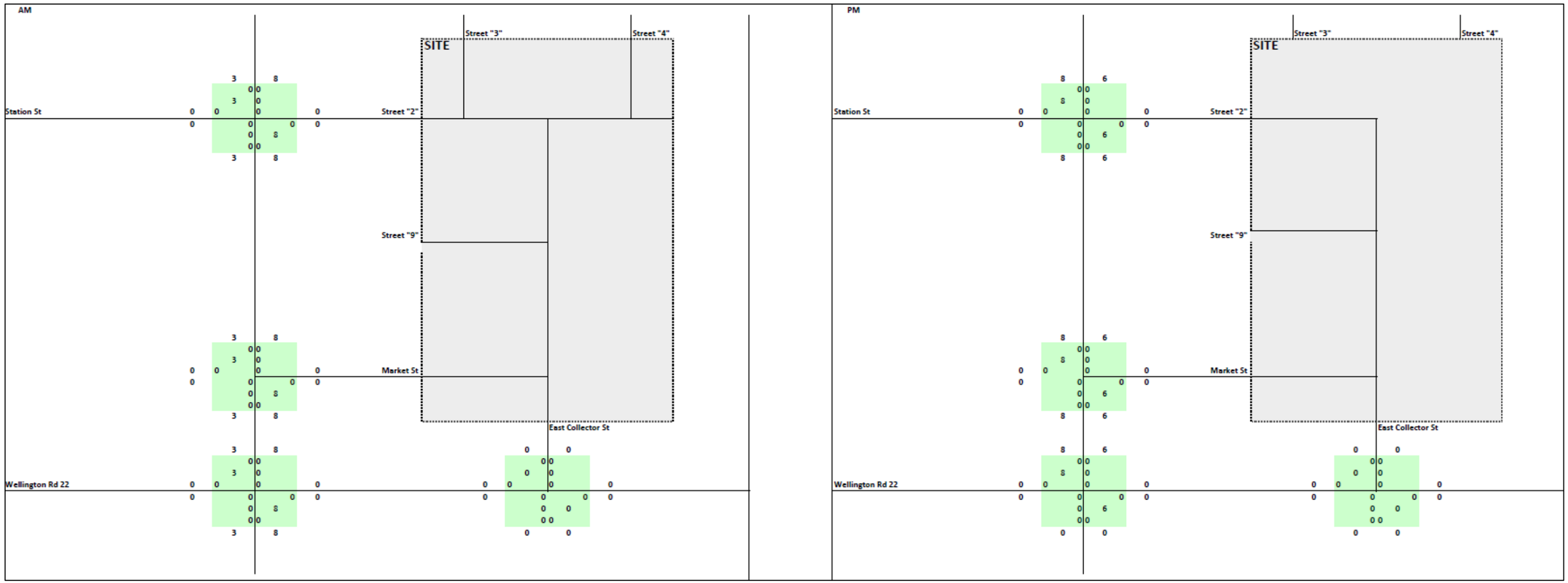
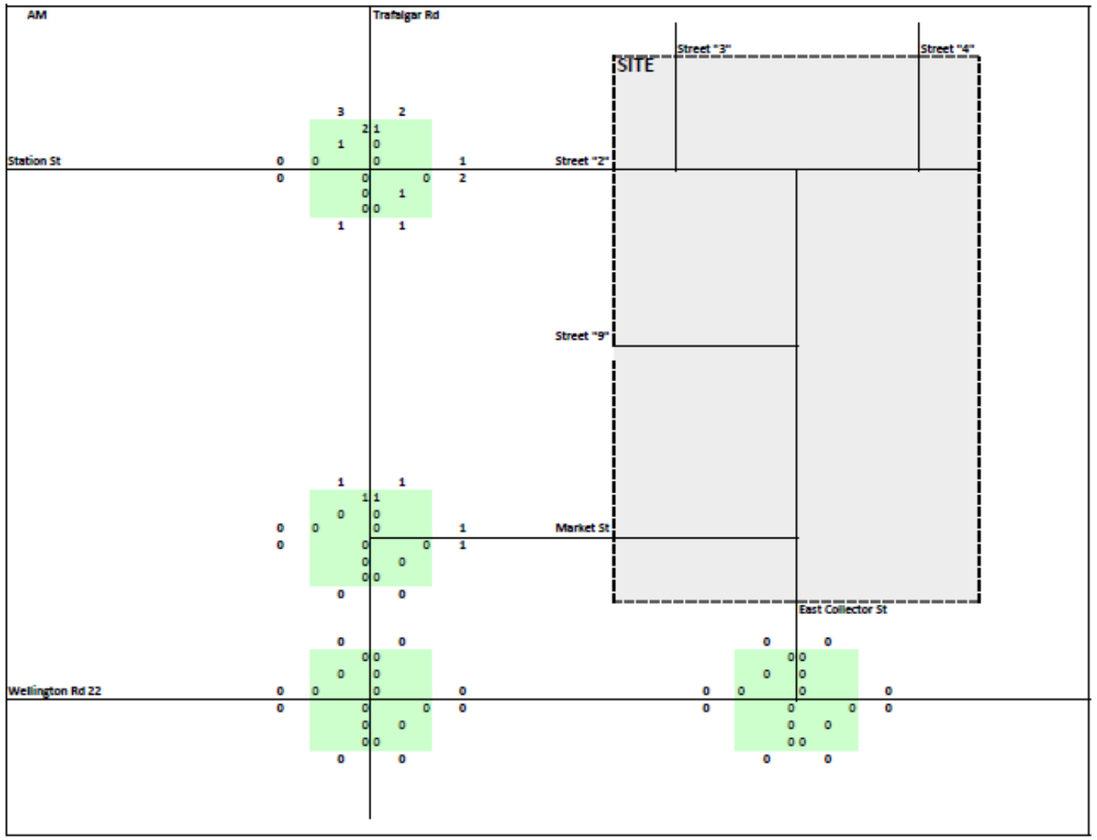


Figure 10 Barbour Field Sports Plex



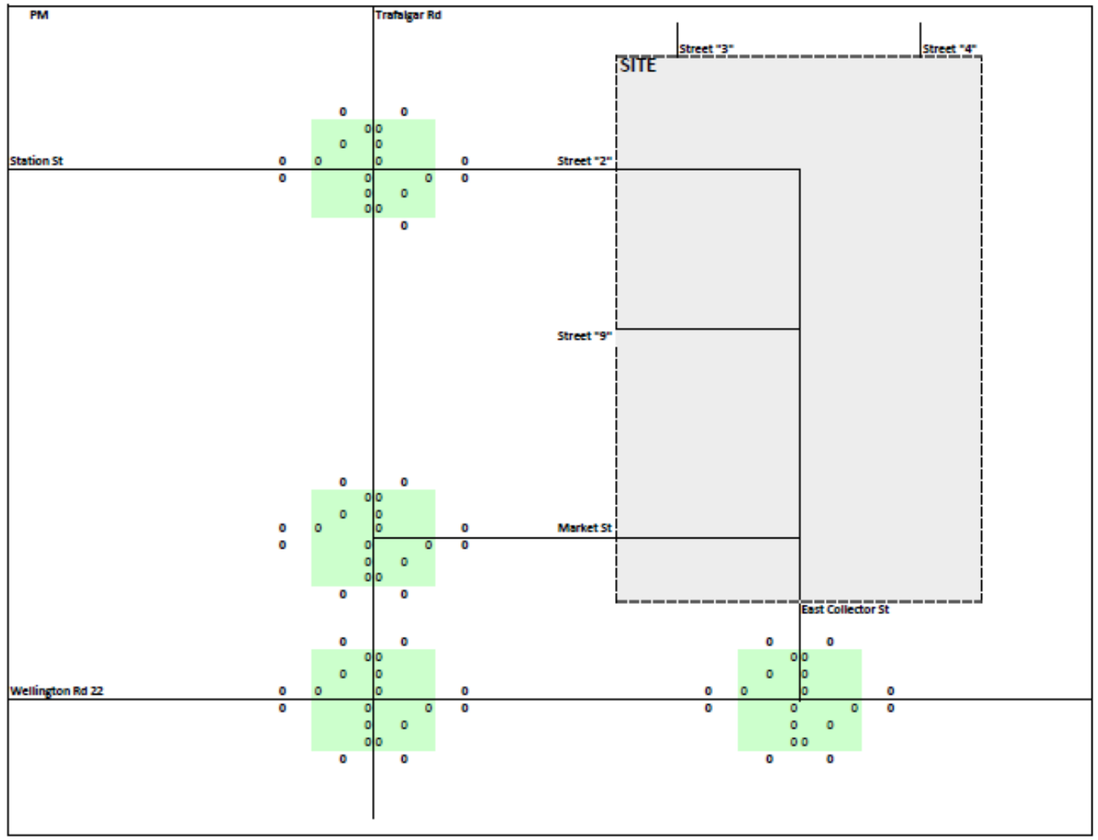
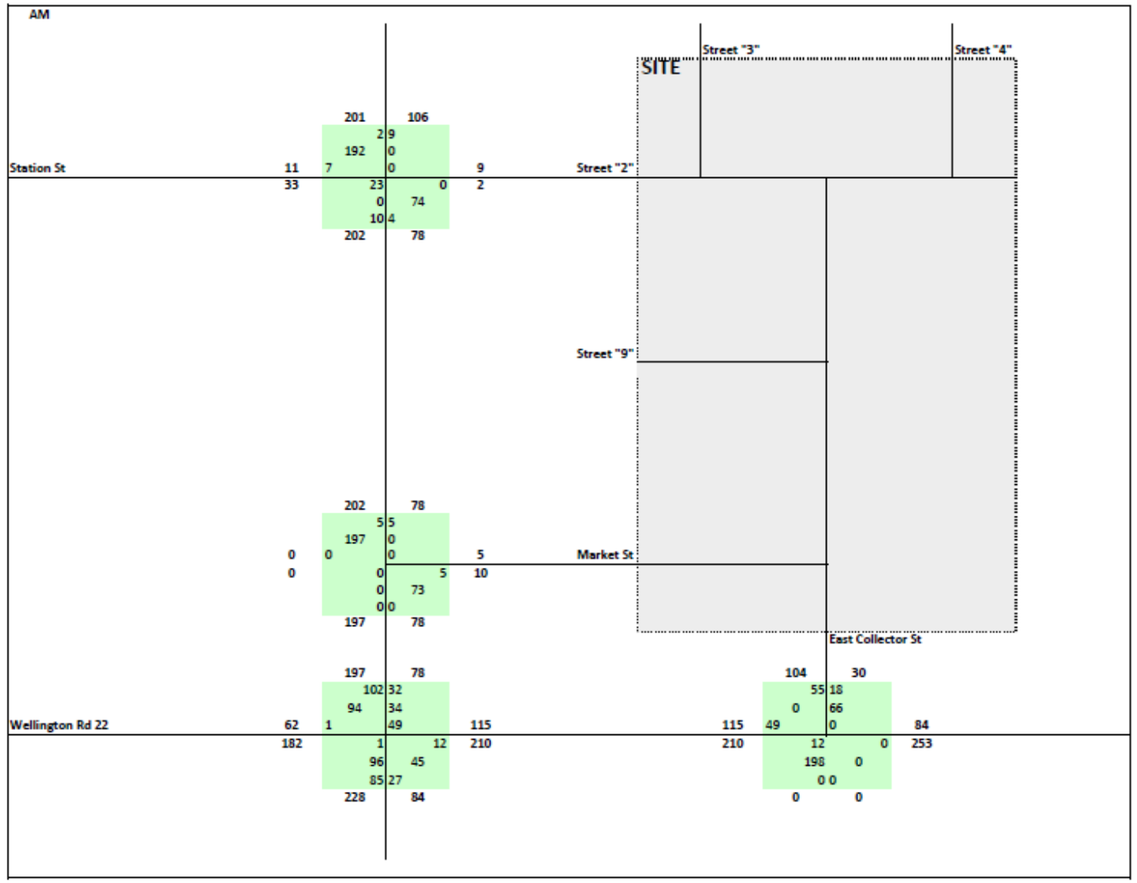


Figure 11 Background Development Site Trips



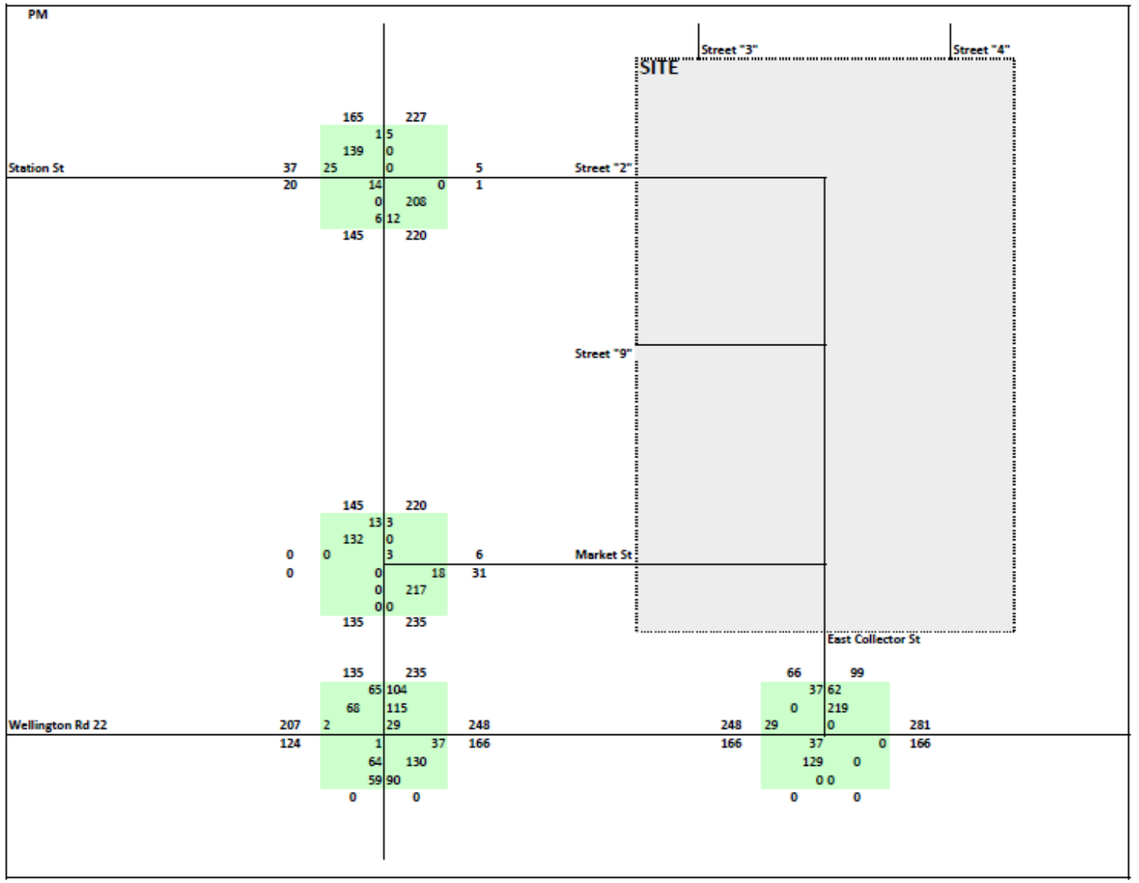
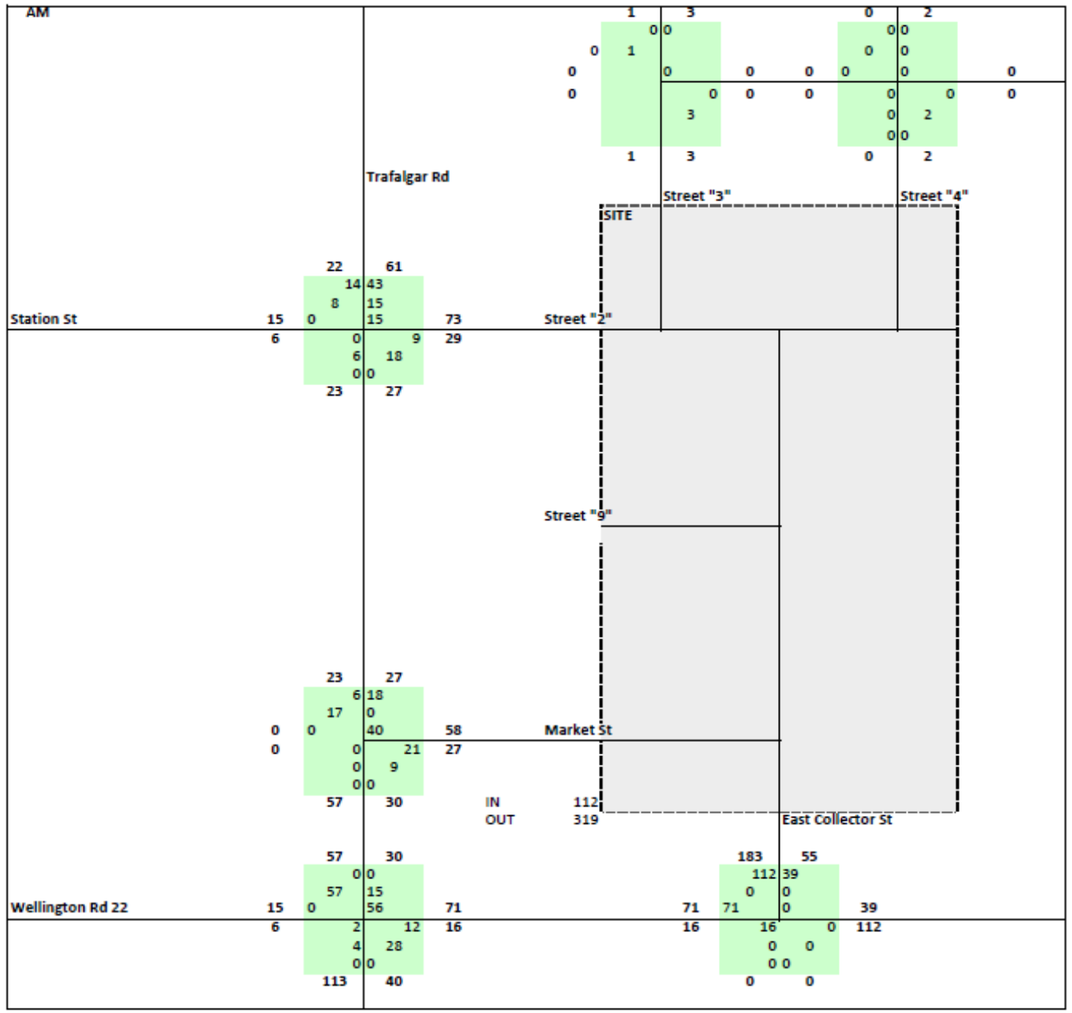


Figure 12 Site Trips



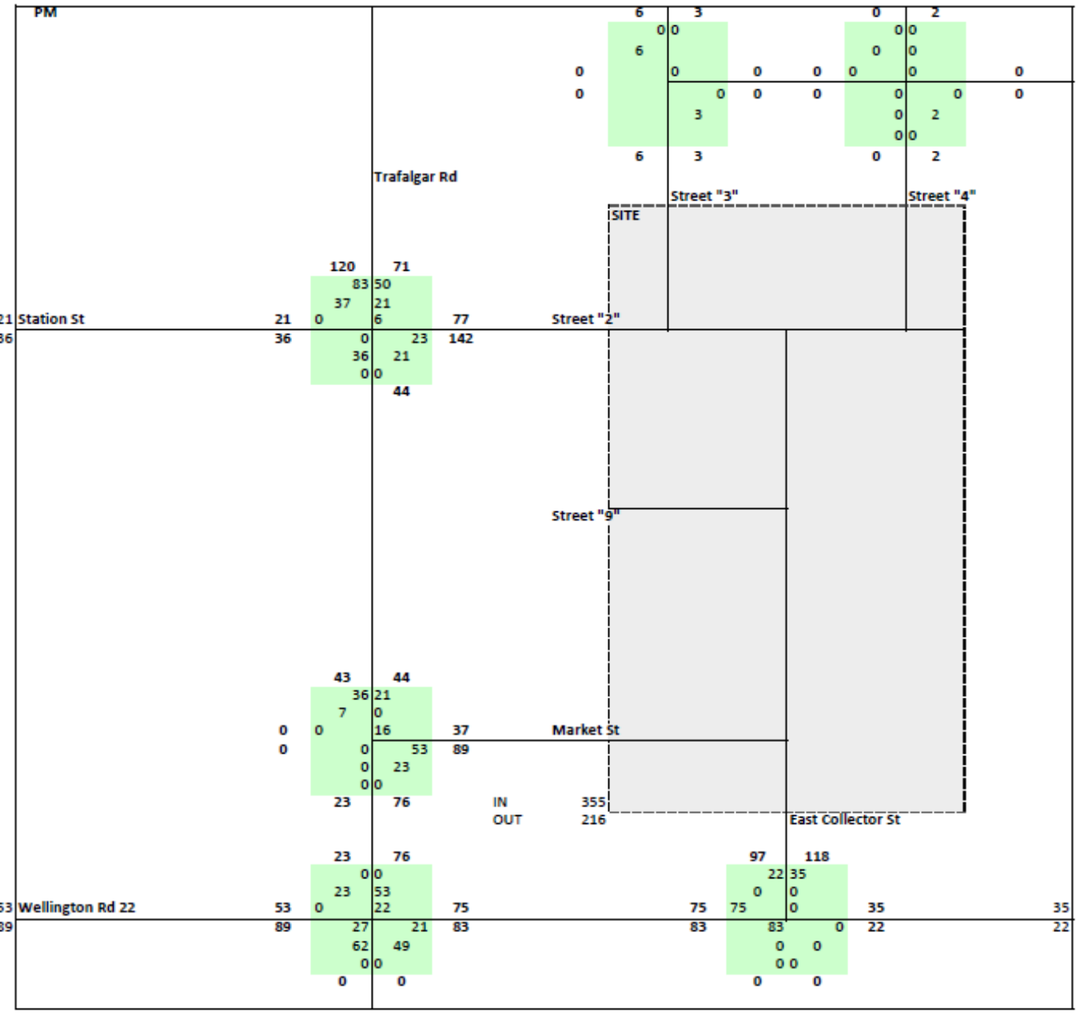
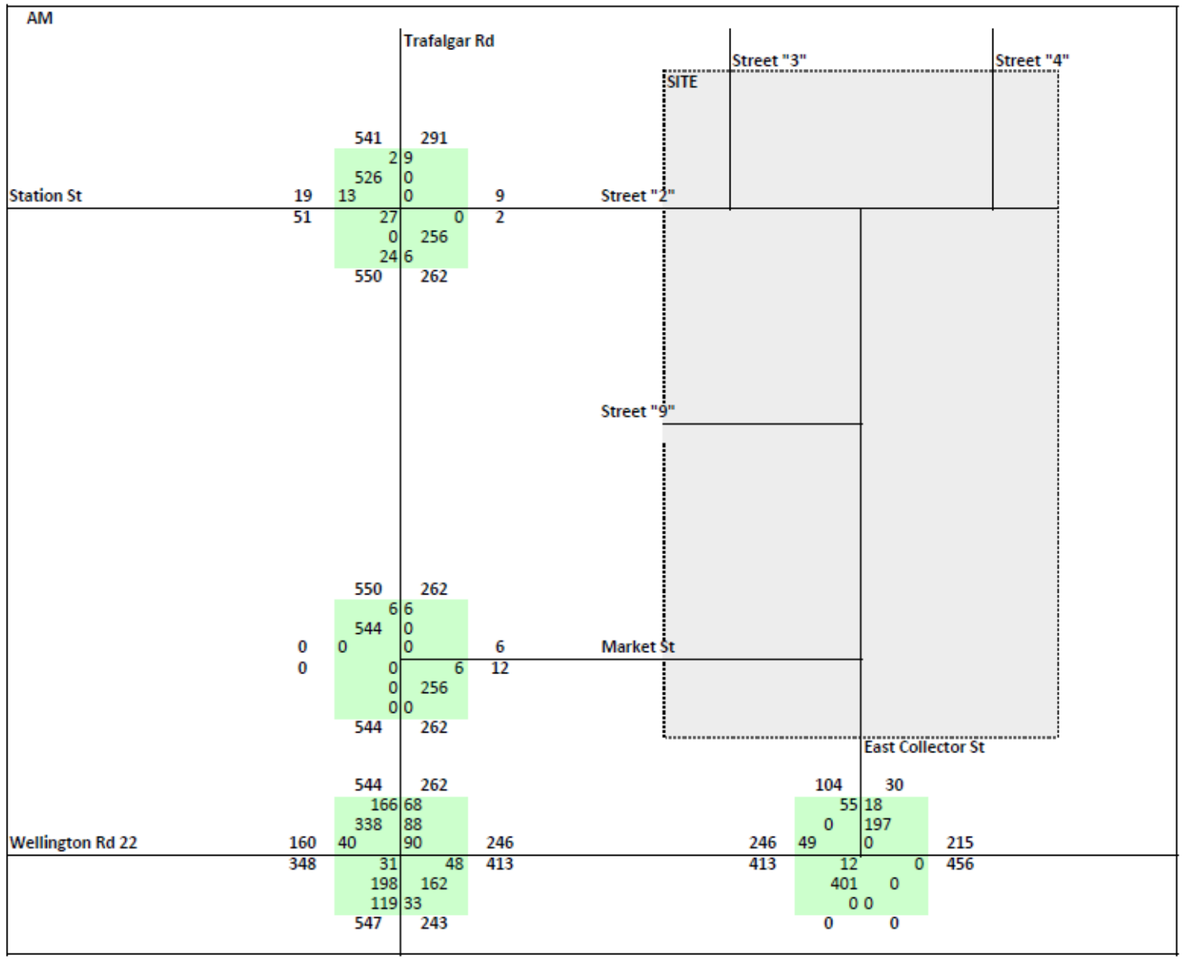


Figure 13 Future Background 2031 Volumes



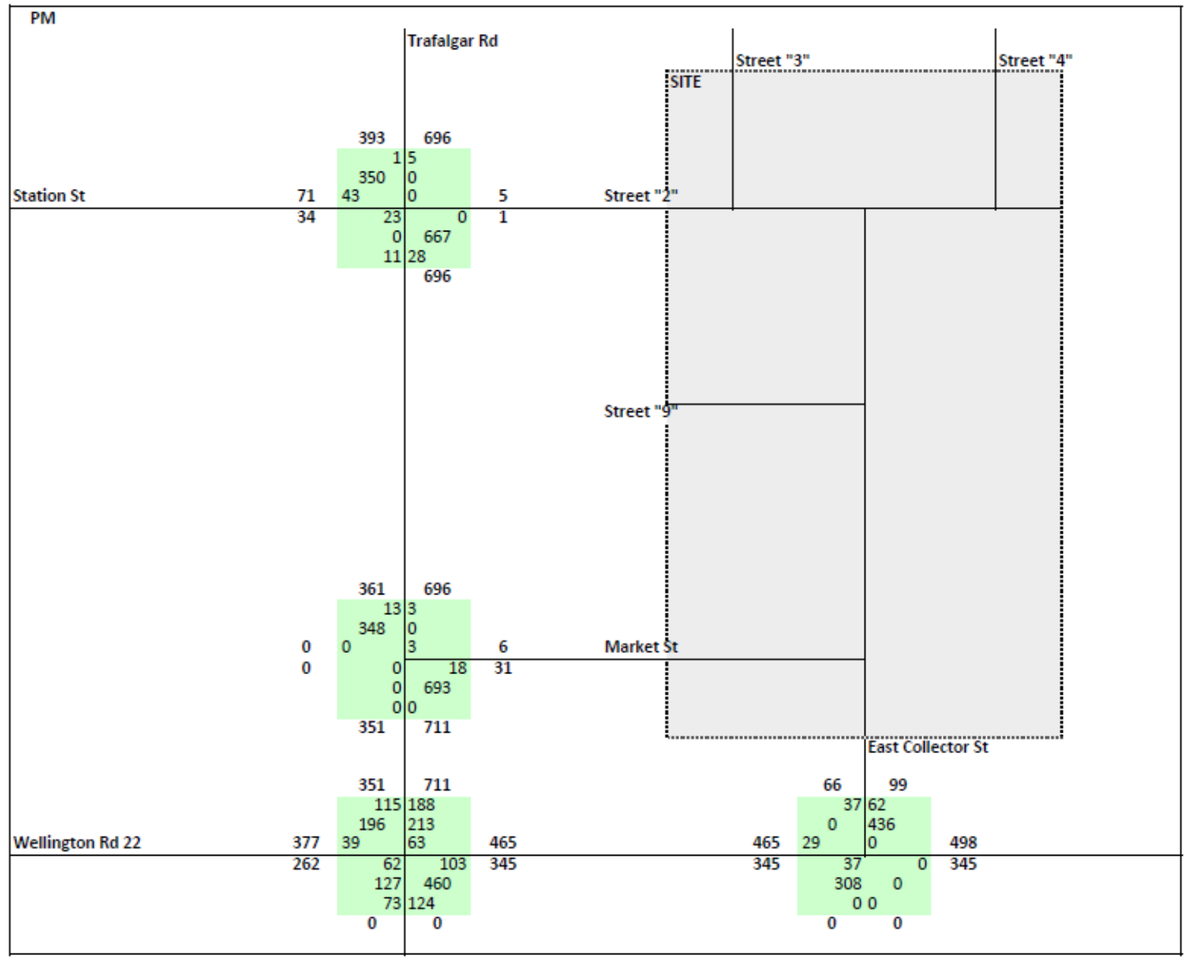


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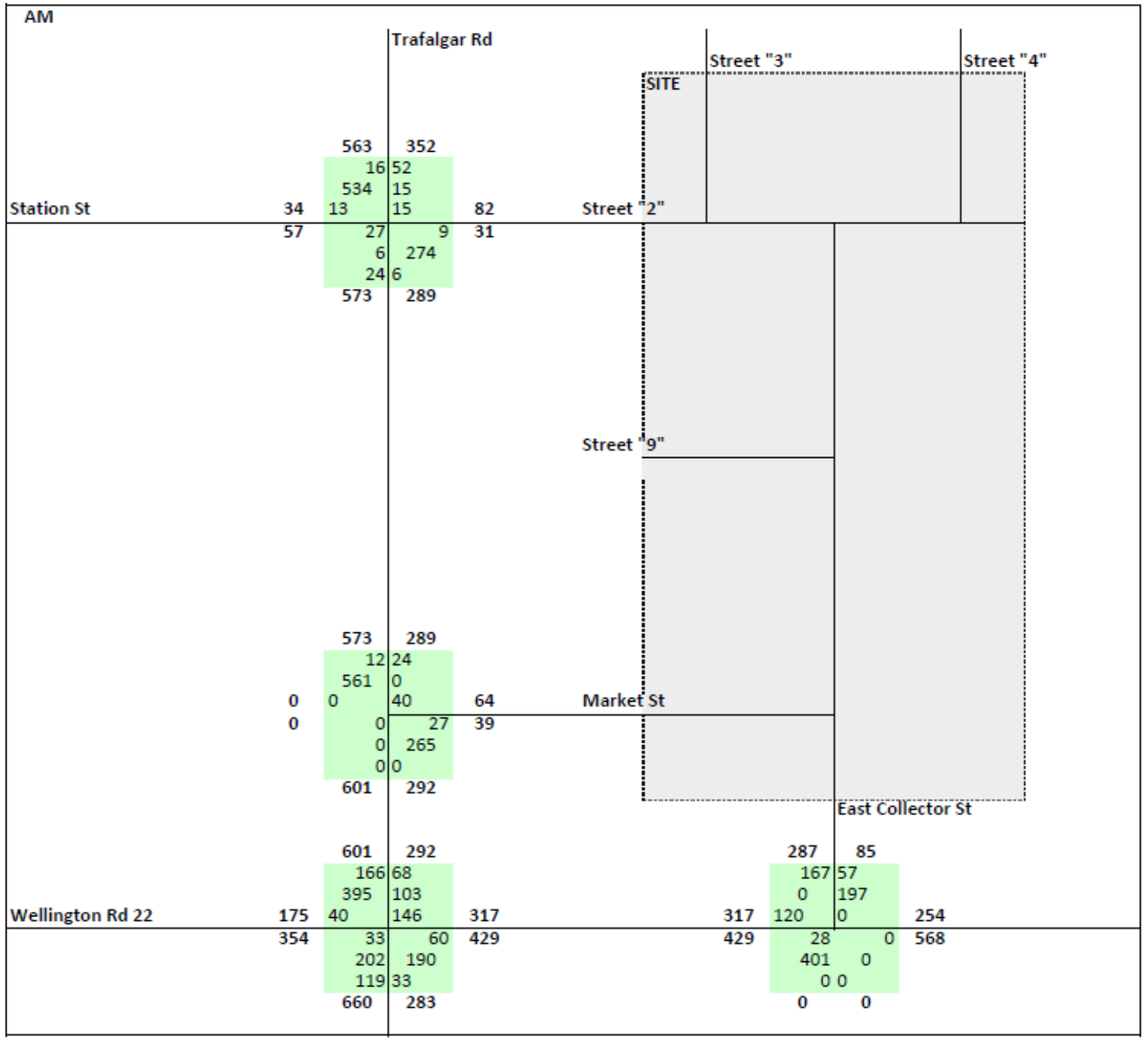
Figure 14 Future Total 2031 Volumes



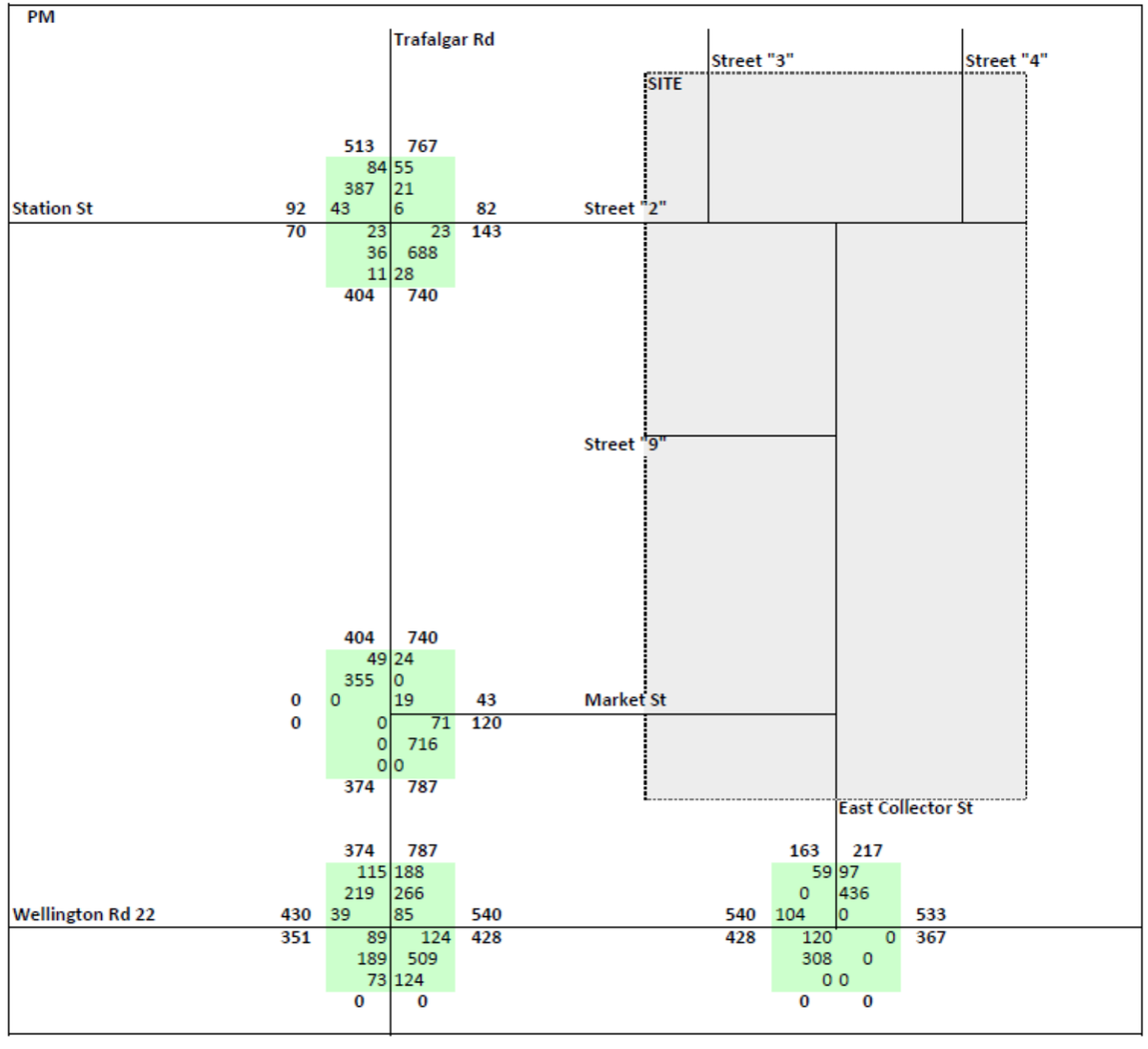


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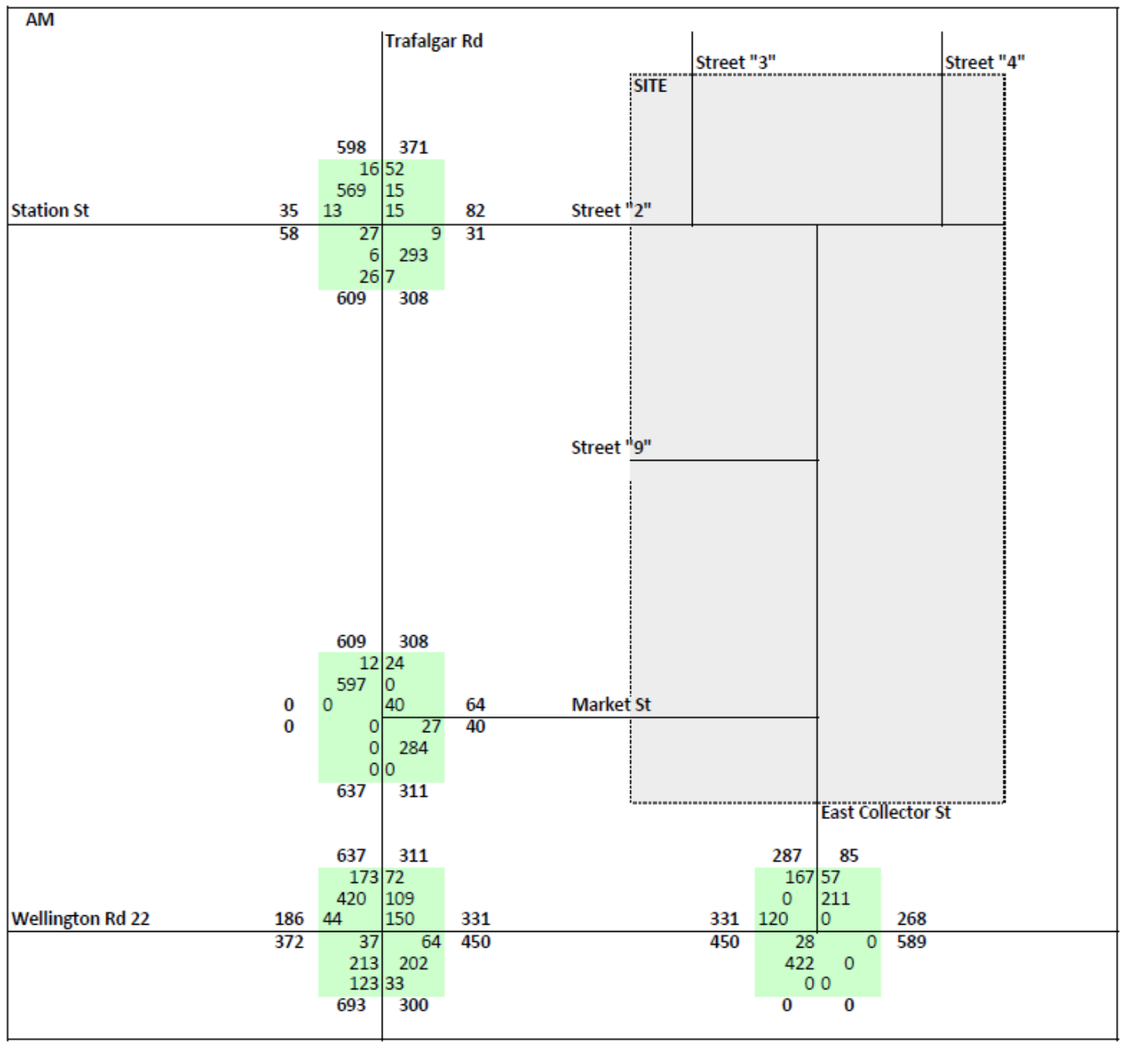
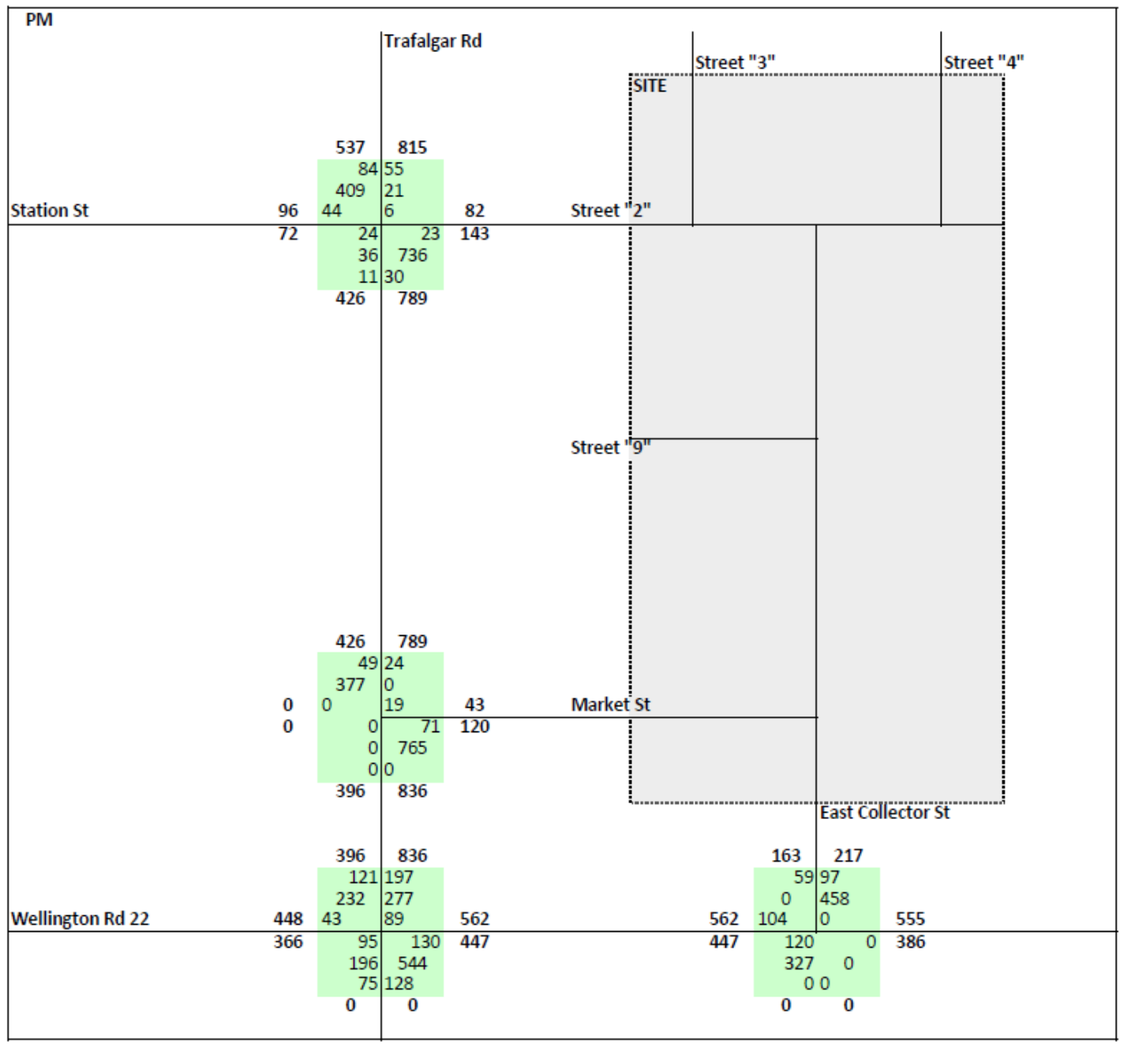
Figure 15 Future Year 2036 Volumes





4.0 TURN LANE/ACCCESS MANAGEMENT

4.1 Right-Turn Lanes

The TAC *Geometric Design Guide for Canadian Roads* recommends the use of an exclusive right-turn lane when the volume of decelerating or accelerating vehicles compared with the through traffic volume causes undue hazard.

In general, an exclusive right-turn lane may be considered when the volume of right-turning vehicles is between 10 to 20 percent of the through volume, subject to a minimum of 60 vehicles per hour in the design hour.

Table 2 shows the Full Build 2031 and Future Year 2036 volumes used in the analysis.

Table 2 Right-Turn Lane Analysis

Intersection	Horizon	Approach	AM Volume			PM Volume			Hourly Threshold	Threshold met?
			Thru	Right	% RT	Thru	Right	% RT		
Wellington Rd 22 & East Collector Rd	2031	WB	197	57	29%	436	97	22%	60	Yes
	2036		211	57	27%	458	97	21%	60	Yes
Trafalgar Rd & Market St / St "16"	2031	NB	265	27	10%	716	71	10%	60	Yes
	2036		284	27	10%	765	71	9%	60	Yes
Trafalgar Rd & Station St/ St "2"	2031	NB	274	9	3%	688	33	3%	60	No
	2036		293	9	3%	736	23	3%	60	No

Analysis shows that based on both Full Build 2031 and Future Year 2036 volumes, minimum thresholds are met for a right-turn lane from Wellington Road 22 at the proposed East Collector Road and from Trafalgar Road (Wellington Road 24) at Market Street/ Street "16". It is **recommended** to construct the following:

- A westbound right-turn lane at Wellington Road 22 and the proposed East Collector Road intersection.
- A northbound right-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street "16 intersection.

4.2 Left-Turn Lanes

The warrant for left turn lanes was based on *Chapter E, Section E.B.1 of the Geometric Design Standards for Ontario Highways by the Ministry of Transportation, Ontario* for 2-lane undivided roadways. The graphs are included in the Appendices.

Table 3 shows the Full Build 2031 and Future Year 2036 volumes used in the analysis.

Table 3 Left-Turn Lane Analysis								
Full Build 2031 Volumes								
Driveway	**Design Speed**	**Peak**	**Approach**	**Advancing Volume**	**Opposing Volume**	**Left-Turn Vol**	**Left-Turn %**	**Threshold met?**
Wellington Rd 22 & East Collector Rd	90 km/h	AM	EB	429	254	28	7%	No
		PM		428	533	120	28%	Yes
Trafalgar Rd & Market St / St "16"	50 km/h	AM	SB	573	292	12	2%	No
		PM		404	787	49	12%	Yes
Trafalgar Rd & Station St/ St "2"	50 km/h	AM	SB	563	289	16	3%	No
		PM		513	740	84	16%	Yes
Future Year 2036 Volumes								
Wellington Rd 22 & East Collector Rd	90 km/h	AM	EB	450	268	28	6%	No
		PM		447	555	120	27%	Yes
Trafalgar Rd & Market St / St "16"	50 km/h	AM	SB	609	311	12	2%	No
		PM		426	836	49	12%	Yes
Trafalgar Rd & Station St/ St "2"	50 km/h	AM	SB	598	308	16	3%	No
		PM		537	789	84	16%	Yes

Analysis shows that based on both Full Build 2031 and Future Year 2036 volumes, minimum thresholds are met for a lest-turn lane from Wellington Road 22 at the proposed East Collector Road and from Trafalgar Road (Wellington Road 24) at Market Street/ Street "16" as well as Station Street/Street "2". It is **recommended** to construct the following:

- An eastbound left-turn lane at Wellington Road 22 and the proposed East Collector Road intersection with a storage length of 30 metres.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street "16' intersection with a storage length of 25 metres.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Station Street/ Street "2" intersection with a storage length of 40 metres.

4.3 Intersection/Decision Sight Distance

Minimum sight distance requirements were evaluated based on the guidelines provided in the Transportation Association of Canada's *Geometric Design Guide for Canadian Roads, Chapter 9, Intersections (2017)*. The sight distance evaluation was conducted using a design speed of 90 km/h on Wellington Road 22 and 50 km/h on Trafalgar Road (Wellington Road 24).

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

The calculated intersection sight distance using the above formula and parameters results in the following:

- Passenger vehicle
    - 0.278*90*7.5 = 187.65 metres
    - 0.278*50*7.5 = 104.25 metres

Table 4 summarized the minimum sightline requirements and the proposed sightline distance at the proposed accesses.

Table 4 Sightline Distance Review

Intersection	Speed		Decision Sightline	
	Posted	Design	Required	Meets Requirements?
Wellington Rd 22 & East Collector Rd	80 km/h	90 km/h	188 m	Looking East – Yes: 220 m Looking West – Yes: 200 m
Trafalgar Rd & Market St / St "16"	40 km/h	50 km/h	105 m	Looking North – Yes: +250 m Looking South – Yes: 250 m
Trafalgar Rd & Station St/ St "2"	40 km/h	50 km/h	105 m	Looking North – Yes: +250 m Looking South – Yes: 120 m

Field observations show that there are no obstructions within the required sight distance at both accesses.

Wellington Road 22 at East Collector Rd – looking east

Wellington Road 22 at East Collector Rd – looking west

Trafalgar Road (Wellington Road 24) at Market Street – looking north

Trafalgar Road (Wellington Road 24) at Market Street – looking south

Trafalgar Road (Wellington Road 24) at Station Street – looking north

Trafalgar Road (Wellington Road 24) at Station Street – looking south

4.1 Traffic Signal Warrant Analysis

Based on the comments received, a signal warrant analysis was conducted for the Trafalgar Road (Wellington Road 24) at Market Street /Street “16” and Trafalgar Road (Wellington Road 24) at Station Street/ Street “2” intersections, using projected traffic volumes for the year 2036. This analysis was based on the criteria outlined in Justification 7 of the *Ontario Traffic Manual (OTM) Book 12*, which specifically considers projected traffic volumes in determining the need for traffic signalization.

Analysis shows that the projected average traffic volumes at these intersections do not satisfy the requirements of Justification 7. The analysis is included in the appendices.

Trafalgar Road (Wellington Road 24) at Station Street looking east (google image)

5.0 INTERNAL FUNCTIONAL DESIGN STUDY

As mentioned, following the review of this transportation study report, a transportation functional design study will be completed in support of the Draft Plan of Subdivision approval. The report will document the design requirements for the internal road network and transportation elements for the proposed development.

The functional design study will include the following elements and will be informed by the *Design Criteria for the Township of Mono* (1992), *Geometric Design Guide for Canadian Roads* (TAC), the *Ontario traffic Manual*, among others:

- Internal Road Classification (ROW, Driveway Dimensions etc) and Hierarchy
- Internal Design Elements such as Curb Radii, Sight Daylight Triangles, Intersection spacing and horizontal curves.
- Potential Roundabout Lotions
- Potential Transit Facilities Plan
- Pedestrians and Sidewalk Plan
- On-street Parking Plan
- Traffic Calming Plan and strategies
- Transportation Demand Management (TDM) plan

6.0 CAPACITY ANALYSIS

The Transportation Research Board's Highway Capacity Manual (HCM) utilizes a term "level of service" (LOS) to measure how traffic operates in intersections. There are currently six levels of service ranging from A to F. Level of Service "A" represents the best conditions and Level of Service "F" represents the worst. Synchro software was used to determine the level of service for intersections in the study area. All worksheet reports from the analyses can be found in the Appendix.

Table 6 shows the control delay per vehicle associated with LOS A through F for signalized and unsignalized intersections.

Table 5 Highway Capacity Manual Levels of Service and Control Delay			
Signalized Intersection		**Unsignalized Intersection**	
Level of Service	**Control Delay per Vehicle (sec)**	**Level of Service**	**Control Delay per Vehicle (sec)**
A	≤ 10	A	≤ 10
B	> 10 and ≤ 20	B	> 10 and ≤ 15
C	> 20 and ≤ 35	C	> 15 and ≤ 25
D	> 35 and ≤ 55	D	> 25 and ≤ 35
E	> 55 and ≤ 80	E	> 35 and ≤ 50
F	> 80	F	> 50

The following improvements were included in the Future Total 2031 and 2036 analysis:

- A westbound right-turn lane at Wellington Road 22 and the proposed East Collector Road intersection.
- An eastbound left-turn lane at Wellington Road 22 and the proposed East Collector Road intersection with a storage length of 30 metres.
- A northbound right-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street "16 intersection.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street "16' intersection with a storage length of 25 metres.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Station Street/ Street "2" intersection with a storage length of 40 metres.

6.1 Capacity Analysis

Table 6 shows the LOS, control delay, and 95th percentile queue length for existing, future background and future years conditions.

Table 6 Intersection LOS, Delay, and Queue by Movement

Intersection	Movement	Existing 2023 Traffic Conditions								Future Background 2031 Traffic Conditions								Future Total 2031 Traffic Conditions								Future Total 2031 Traffic Conditions (Optimized)								Future Year 2036 Traffic Conditions							
		AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
		V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS
Wellington Road 22 & Trafalgar Road (Wellington Road 24)	EBLTR	0.48	25.2	30.0	C	0.39	22.0	27.2	C	0.71	26.9	71.3	C	0.66	25.2	60.0	C	0.63	23.2	73.3	C	0.97	62.8	11.0	E														
	WBLTR	0.39	24.6	23.3	C	0.46	22.4	35.2	C	0.81	38.2	67.5	D	0.92	44.9	124.2	D	0.96	62.7	101.7	E	1.11	98.9	162.1	F														
	NBL	0.01	5.5	1.6	A	0.05	0.1	5.6	A	0.08	9.9	8.3	A	0.25	13.4	24.2	B	0.11	12.4	8.5	B	0.27	14.3	24.4	B														
	NBTR	0.13	6.2	14.4	A	0.37	8.7	43.1	A	0.25	11.2	33.2	B	0.73	22.1	114.0	C	0.33	14.3	40.1	B	0.84	29.2	154.0	C														
	SBL	0.09	6.0	8.5	A	0.10	7.3	7.8	A	0.33	12.7	32.8	B	0.60	26.9	40.3	C	0.37	15.7	33.4	B	0.87	65.2	50.0	E														
	SBTR	0.25	7.1	27.9	A	0.15	7.5	16.6	A	0.48	14.0	67.8	B	0.30	13.4	38.2	B	0.59	18.7	81.3	B	0.33	14.6	42.2	B														
Wellington Road 22 & Trafalgar Road (Wellington Road 24)	EBL																									0.12	19.5	10.3	B	0.75	44.9	38.0	E	0.13	19.4	11.1	B	0.85	64.5	42.6	E
	EBTR																									0.66	26.3	64.7	C	0.51	22.0	53.6	C	0.68	26.5	68.7	C	0.52	21.9	55.7	C
	WBL																									0.79	42.0	48.2	D	0.32	20.4	22.5	D	0.82	46.4	51.8	D	0.33	20.4	23.7	C
	WBTR																									0.70	21.4	32.0	C	0.88	40.7	116.0	D	0.38	21.3	33.9	C	0.90	42.9	123.8	D
	NBL																									0.09	9.2	8.1	A	0.25	12.0	23.4	B	0.09	9.6	8.2	A	0.26	12.7	24.3	B
	NBTR																									0.29	10.7	38.3	B	0.78	22.6	148.1	C	0.32	11.3	41.2	B	0.84	26.8	163.9	C
	SBL																									0.33	11.8	32.0	B	0.67	32.1	44.1	D	0.36	12.5	33.7	B	0.89	65.8	52.6*	E
	SBTR																									0.53	13.8	77.0	B	0.31	12.3	40.4	B	0.58	15.1	85.7	B	0.33	13.0	43.3	B
Trafalgar Road (Wellington Road 24) & Market Street/ Street "16"	WBLR	0.00	9.1	0.0	A	0.00	0.0	0.0	A	0.01	9.8	0.2	A	0.02	19.1	0.6	C																						
	NBTR	0.10	0.0	0.0	A	0.26	0.0	0.0	A	0.17	0.0	0.0	A	0.45	0.0	0.0	A																						
	SBLT	0.00	7.5	0.0	A	0.00	0.0	0.0	A	0.01	0.2	0.1	A	0.02	0.6	0.4	A																						
Trafalgar Road (Wellington Road 24) & Market Street/ Street "16" (With Turn Lanes)	WBLR																	0.18	16.3	5.1	C	0.21	24.7	6.0	C									0.19	17.4	5.6	C	0.24	28.6	7.1	D
	NBT																	0.17	0.0	0.0	A	0.46	0.0	0.0	A									0.18	0.0	0.0	A	0.49	0.0	0.0	A
	NBR																	0.02	0.0	0.0	A	0.05	0.0	0.0	A									0.02	0.0	0.0	A	0.05	0.0	0.0	A
	SBL																	0.01	7.9	0.3	A	0.07	10.4	1.9	B									0.01	8.0	0.3	A	0.08	10.8	2.0	B
	SBR																	0.36	0.0	0.0	A	0.23	0.0	0.0	A									0.38	0.0	0.0	A	0.24	0.0	0.0	A
Trafalgar Road (Wellington Road 24) & Station Street	EBLR	0.02	10.4	0.6	B	0.03	12.6	0.7	B																														
	NBTR	0.00	0.1	0.0	A	0.01	0.4	0.3	A																														
	SBLT	0.19	0.0	0.0	A	0.12	0.0	0.0	A																														
Trafalgar Road (Wellington Road 24) & Station Street/ Street "2"	EBLTR									0.16	17.5	4.5	C	0.02	5.0	0.0	A																						
	WBLTR									0.01	9.8	0.3	A	0.00	0.0	0.0	A																						
	NBLTR									0.01	0.3	0.2	A	0.98	49.8	4.6	E																						
	SBLTR									0.00	0.0	0.0	A	0.52	14.2	1.5	B																						
Trafalgar Road (Wellington Road 24) & Station Street/ Street "2" (With Turn Lanes)	EBLTR																	0.23	22.1	6.9	C	0.77	114.5	33.0	F									0.25	24.0	7.8	C	0.92	164.1	39.7	F
	WBLTR																	0.21	5.9	6.3	C	0.45	37.2	17.0	E									0.23	16.9	6.9	C	0.51	44.9	20.3	E
	NBLTR																	0.01	0..3	0.2	A	0.03	0.7	0.7	A									0.01	0.3	0.2	A	0.03	0.8	0.8	A
	SBL																	0.01	7.9	0.3	A	0.11	9.7	2.9	A									0.01	7.9	0.3	A	0.11	10.0	3.0	A
	SBTR																	0.35	0.0	0.0	A	0.28	0.0	0.0	A									0.37	0.0	0.0	A	0.29	0.0	0.0	A
Wellington Road 22 & East Collector Road/Street "1"	EBLT									0.01	0.3	0.2	A	0.04	1.3	1.0	A																						
	WBTR									0.14	0.0	0.0	A	0.32	0.0	0.0	A																						
	SBLR									0.21	13.5	6.3	B	0.20	17.1	5.7	C																						
Wellington Road 22 & East Collector Road/Street "1" (With Turn Lanes)	EBL																	0.02	7.9	0.6	A	0.13	9.2	3.6	A									0.02	7.9	0.6	A	0.09	8.7	2.2	A
	EBT																	0.26	0.0	0.0	A	0.20	0.0	0.0	A									0.27	0.0	0.0	A	0.16	0.0	0.0	A
	WBT																	0.13	0.0	0.0	A	0.28	0.0	0.0	A									0.13	0.0	0.0	A	0.21	0.0	0.0	A
	WBR																	0.04	0.0	0.0	A	0.06	0.0	0.0	A									0.04	0.0	0.0	A	0.07	0.0	0.0	A
	SBLR																	0.62	23.3	33.7	C	0.49	24.3	20.8	C									0.65	25.5	36.7	D	0.33	17.7	11.0	C

*Queue exceeds existing storage capacity

6.1.1 Wellington Road 22 & Trafalgar Road (Wellington Road 24)

Analysis indicates that, for 2031 future conditions, the intersection will see capacity and delay constraints for both eastbound and westbound approaches, as a single-lane traffic. To improve the operations of this intersection, it is **recommended** to construct eastbound and westbound left turns.

With a current cycle length of 77 seconds, the analysis shows a maximum 95th percentile queue length of 43 meters for the eastbound left-turn lane. Therefore, it is **recommended** to construct a storage length of 45 meters. Similarly, for the westbound left-turn lane, the projected 95th percentile queue length is no more than 52 meters, it is **recommended** to construct a storage length of 55 meters.

Concerning the southbound left-turn lane, the analysis, assuming the same cycle length, anticipates a 95th percentile queue length of up to 53 meters. It is **recommended** to extend the existing storage length to 55 meters to accommodate future traffic.

6.1.2 Trafalgar Road (Wellington Road 24) & Market Street/ Street "16"

Analysis shows that the intersection is expected to operate acceptably with the warranted southbound left-turn lane.

6.1.3 Wellington Road 22 & East Collector Road/Street "1

Analysis indicates that the proposed East Collector Road at Wellington Road 22 is expected to operate acceptably with the warranted auxiliary lanes for eastbound-left and westbound-right turns. It is recommended that this collector road be implemented by the year 2031

6.1.4 Trafalgar Road (Wellington Road 24) & Station Street/ Street "2"

Analysis indicates that, under future conditions, this intersection will experience delay constraints for the eastbound and westbound approaches but will maintain acceptable capacities. As discussed, the criteria for a traffic signal at this intersection are not met. Only a southbound left-turn lane is warranted, which has been included in the analysis as **recommended**. However, it is **recommended** that the intersection be monitored in the future, post full build, to assess the need for potential signalization.

7.0 CONCLUSIONS

This study serves as an analysis of the traffic impacts from the proposed Draft Plan of Subdivision situated on a parcel of land located on the east side of Trafalgar Road (Wellington Road 24), north of Wellington Road 22, in the Town of Erin, County of Wellington.

This analysis was conducted to assess the impacts and necessary improvements required to accommodate additional traffic volumes generated by the proposed Draft Plan of Subdivision. This plan includes 376 single-family detached homes (incorporating a heritage house), 286 units of low-rise multifamily housing, 75 low-rise senior townhouse units, and 188 senior mixed-use apartment units.

Trip Generation

The proposed new development is expected to generate 429 trips in the AM peak hour, and 571 trips in the PM peak hour.

Turn Lanes

Analysis shows that projected volumes at the proposed accesses meet thresholds for right-turn and left-turn lanes, the following are recommended at Full Build Conditions:

- A westbound right-turn lane at Wellington Road 22 and the proposed East Collector Road intersection.
- An eastbound left-turn lane at Wellington Road 22 and the proposed East Collector Road intersection with a storage length of 30 metres.
- A northbound right-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street “16 intersection.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Market Street/ Street “16’ intersection with a storage length of 25 metres.
- A southbound left-turn lane at the Trafalgar Road (Wellington Road 24) at Station Street/ Street “2” intersection with a storage length of 40 metres.

Traffic Impacts

Wellington Road 22 & Trafalgar Road (Wellington Road 24)

Wellington Road 22 & Trafalgar Road (Wellington Road 24) is an existing signalized intersection. Under Future 2031 conditions, the single-lane approaches for both eastbound and westbound traffic are expected to experience a poor Level of Service (LOS), particularly during the PM peak hour. Additionally, the queue length for the southbound left turn exceeds the existing storage capacity.

Recommended Improvement

It is recommended to construct an eastbound left-turn lane with a storage length of 45 metres, a westbound left-turn lane with a storage length of 55 metres, and to extend the southbound left-turn lane to 55 metres.

Trafalgar Road (Wellington Road 24) & Station Street/ Street "2"

Trafalgar Road (Wellington Road 24) & Station Street/ Street "2" is an existing unsignalized T-intersection. The future four-legged intersection is expected to operate with delay constraints for the eastbound and westbound approaches but will maintain acceptable capacities. Only a southbound left-turn lane is warranted, which has been included in the analysis as recommended.

Recommended Improvement

Based on the projected future traffic volumes, a traffic signal is currently not warranted. However, it is recommended that the intersection be monitored in the future, post full build, to assess the need for potential signalization.

Internal Functional Design Study

A transportation functional design study will be completed in support of the Draft Plan of Subdivision approval. The report will document the design requirements for the internal road network and transportation elements for the proposed development.

Appendix A:

Existing Traffic Data and Signal Timing Plan

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Erin
Site #: 2302600001
Intersection: Trafalgar Rd & Wellington Rd 22
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S

North Leg Total:	442
North Entering:	286
North Peds:	0
Peds Cross:	⋈

Heavys	0	15	4	19
Trucks	1	5	0	6
Cars	32	178	51	261
Totals	33	198	55	

Heavys	14
Trucks	5
Cars	137
Totals	156

East Leg Total:	285
East Entering:	112
East Peds:	0
Peds Cross:	⧖

Heavys	Trucks	Cars	Totals
1	5	78	84

Trafalgar Rd

Cars	Trucks	Heavys	Totals
23	4	4	31
41	4	1	46
33	1	1	35
97	9	6	

Wellington Rd 22

N
W E
S

Heavys	Trucks	Cars	Totals
2	0	24	26
3	0	84	87
0	0	29	29
5	0	137	

Wellington Rd 22

Cars	Trucks	Heavys	Totals
166	0	7	173

Trafalgar Rd

Peds Cross:	⧖
West Peds:	0
West Entering:	142
West Leg Total:	226

Cars	240
Trucks	6
Heavys	16
Totals	262

Cars	5	90	31	126
Trucks	0	1	0	1
Heavys	0	8	0	8
Totals	5	99	31	

Peds Cross:	⋈
South Peds:	0
South Entering:	135
South Leg Total:	397

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Erin
Site #: 2302600001
Intersection: Trafalgar Rd & Wellington Rd 22
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S

North Leg Total: 589
North Entering: 184
North Peds: 0
Peds Cross: ⋈

Heavys	0	4	3	7
Trucks	1	0	3	4
Cars	31	105	37	173
Totals	32	109	43	

Heavys	7
Trucks	10
Cars	388
Totals	405

East Leg Total: 338
East Entering: 185
East Peds: 0
Peds Cross: ⧗

Trafalgar Rd

Heavys	Trucks	Cars	Totals
1	2	142	145

Wellington Rd 22

Cars	Trucks	Heavys	Totals
68	4	0	72
82	1	1	84
26	1	2	29
176	6	3	

N
W E
S

Heavys	Trucks	Cars	Totals
0	2	50	52
1	3	50	54
1	0	11	12
2	5	111	

Wellington Rd 22

Cars	Trucks	Heavys	Totals
139	10	4	153

Trafalgar Rd

Peds Cross: ⧗
West Peds: 0
West Entering: 118
West Leg Total: 263

Cars	142
Trucks	1
Heavys	7
Totals	150

Cars	29	270	52	351
Trucks	0	4	4	8
Heavys	0	7	0	7
Totals	29	281	56	

Peds Cross: ⋈
South Peds: 0
South Entering: 366
South Leg Total: 516

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

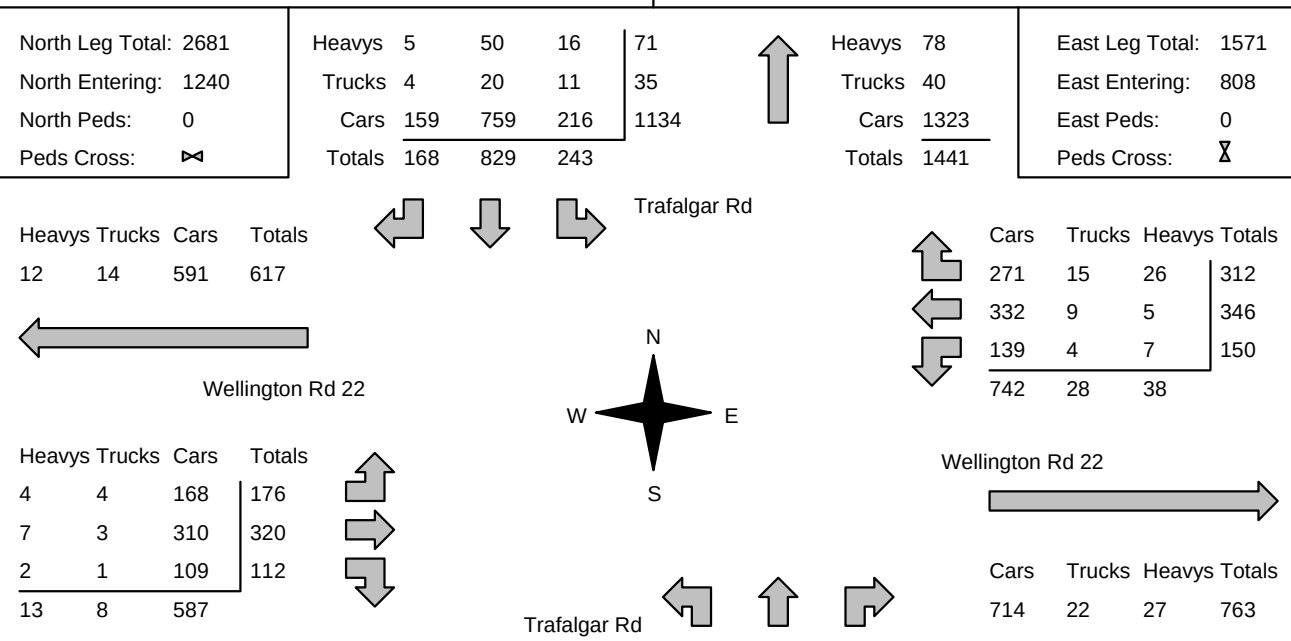
Municipality: Erin
Site #: 2302600001
Intersection: Trafalgar Rd & Wellington Rd 22
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Trafalgar Rd & Wellington Rd 22 | **Count Date:** 8-Feb-23 | **Municipality:** Erin

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*58*	*212*	*33*	*303*	*0*
9:00:00	*53*	*181*	*27*	*261*	*0*
10:00:00	*33*	*120*	*14*	*167*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*29*	*96*	*30*	*155*	*0*
17:00:00	*43*	*113*	*38*	*194*	*0*
18:00:00	*27*	*107*	*26*	*160*	*0*
Totals:	243	829	168	1240	0

North/South Total Approaches: 2496

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*5*	*71*	*26*	*102*	*0*
9:00:00	*8*	*107*	*21*	*136*	*0*
10:00:00	*10*	*73*	*14*	*97*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*24*	*167*	*29*	*220*	*0*
17:00:00	*34*	*262*	*51*	*347*	*0*
18:00:00	*22*	*273*	*59*	*354*	*0*
S Totals:	103	953	200	1256	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*26*	*46*	*21*	*93*	*0*
9:00:00	*35*	*47*	*32*	*114*	*0*
10:00:00	*17*	*36*	*42*	*95*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*17*	*57*	*76*	*150*	*0*
17:00:00	*32*	*79*	*70*	*181*	*0*
18:00:00	*23*	*81*	*71*	*175*	*0*
Totals:	150	346	312	808	0

East/West Total Approaches: 1416

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*15*	*64*	*30*	*109*	*0*
9:00:00	*24*	*83*	*29*	*136*	*0*
10:00:00	*18*	*44*	*15*	*77*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*38*	*35*	*16*	*89*	*0*
17:00:00	*40*	*49*	*12*	*101*	*0*
18:00:00	*41*	*45*	*10*	*96*	*0*
W Totals:	176	320	112	608	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*105*	*142*	*79*	*0*	*112*	*151*	*145*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600001**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	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	47	47	7	7	0	0	1	1	0	0	0	0	4	4	0	0	0	0
7:30:00	21	16	101	54	13	6	0	0	3	2	0	0	0	0	5	1	0	0	0	0
7:45:00	35	14	146	45	21	8	0	0	3	0	0	0	0	0	6	1	1	1	0	0
8:00:00	57	22	200	54	32	11	0	0	3	0	0	0	1	1	9	3	1	0	0	0
8:15:00	67	10	239	39	34	2	0	0	4	1	0	0	2	1	11	2	1	0	0	0
8:30:00	78	11	274	35	45	11	0	0	7	3	1	1	3	1	15	4	1	0	0	0
8:45:00	86	8	324	50	53	8	0	0	8	1	1	0	4	1	21	6	1	0	0	0
9:00:00	106	20	360	36	58	5	0	0	9	1	1	0	5	1	24	3	1	0	0	0
9:15:00	110	4	393	33	60	2	1	1	10	1	1	0	6	1	26	2	1	0	0	0
9:30:00	118	8	418	25	65	5	2	1	11	1	1	0	6	0	27	1	2	1	0	0
9:45:00	127	9	446	28	69	4	2	0	13	2	1	0	7	1	29	2	2	0	0	0
10:00:00	133	6	467	21	70	1	3	1	14	1	1	0	8	1	32	3	3	1	0	0
10:15:00	133	0	467	0	70	0	3	0	14	0	1	0	8	0	32	0	3	0	0	0
15:00:00	133	0	467	0	70	0	3	0	14	0	1	0	8	0	32	0	3	0	0	0
15:15:00	140	7	483	16	73	3	3	0	16	2	1	0	9	1	33	1	3	0	0	0
15:30:00	145	5	496	13	81	8	4	1	16	0	2	1	11	2	36	3	3	0	0	0
15:45:00	149	4	526	30	92	11	5	1	17	1	3	1	12	1	40	4	5	2	0	0
16:00:00	155	6	550	24	96	4	5	0	18	1	3	0	13	1	41	1	5	0	0	0
16:15:00	162	7	577	27	103	7	6	1	19	1	3	0	13	0	42	1	5	0	0	0
16:30:00	168	6	606	29	113	10	8	2	20	1	3	0	13	0	44	2	5	0	0	0
16:45:00	177	9	623	17	123	10	9	1	20	0	3	0	15	2	44	0	5	0	0	0
17:00:00	191	14	656	33	134	11	10	1	20	0	3	0	15	0	46	2	5	0	0	0
17:15:00	198	7	677	21	140	6	10	0	20	0	3	0	16	1	47	1	5	0	0	0
17:30:00	205	7	711	34	144	4	11	1	20	0	4	1	16	0	48	1	5	0	0	0
17:45:00	210	5	729	18	152	8	11	0	20	0	4	0	16	0	49	1	5	0	0	0
18:00:00	216	6	759	30	159	7	11	0	20	0	4	0	16	0	50	1	5	0	0	0
18:15:00	216	0	759	0	159	0	11	0	20	0	4	0	16	0	50	0	5	0	0	0
18:15:15	216	0	759	0	159	0	11	0	20	0	4	0	16	0	50	0	5	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600001**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	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	7	7	4	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0
7:30:00	13	10	16	9	5	1	0	0	2	2	1	0	1	1	0	0	4	4	0	0
7:45:00	18	5	32	16	5	0	0	0	3	1	1	0	1	0	0	0	7	3	0	0
8:00:00	25	7	43	11	11	6	0	0	3	0	3	2	1	0	0	0	7	0	0	0
8:15:00	34	9	54	11	13	2	0	0	4	1	3	0	2	1	0	0	7	0	0	0
8:30:00	47	13	62	8	21	8	0	0	5	1	4	1	2	0	0	0	10	3	0	0
8:45:00	51	4	73	11	28	7	1	1	7	2	5	1	2	0	1	1	11	1	0	0
9:00:00	58	7	84	11	33	5	1	0	7	0	5	0	2	0	2	1	15	4	0	0
9:15:00	64	6	95	11	44	11	1	0	7	0	7	2	2	0	3	1	15	0	0	0
9:30:00	69	5	101	6	48	4	2	1	7	0	8	1	2	0	3	0	16	1	0	0
9:45:00	72	3	109	8	53	5	2	0	7	0	9	1	2	0	3	0	17	1	0	0
10:00:00	74	2	119	10	68	15	2	0	7	0	9	0	2	0	3	0	18	1	0	0
10:15:00	74	0	119	0	68	0	2	0	7	0	9	0	2	0	3	0	18	0	0	0
15:00:00	74	0	119	0	68	0	2	0	7	0	9	0	2	0	3	0	18	0	0	0
15:15:00	77	3	126	7	87	19	2	0	7	0	9	0	3	1	3	0	20	2	0	0
15:30:00	82	5	143	17	102	15	2	0	7	0	10	1	3	0	3	0	23	3	0	0
15:45:00	85	3	157	14	121	19	2	0	7	0	11	1	3	0	3	0	24	1	0	0
16:00:00	89	4	175	18	136	15	2	0	7	0	11	0	4	1	4	1	24	0	0	0
16:15:00	98	9	196	21	157	21	3	1	7	0	11	0	4	0	4	0	25	1	0	0
16:30:00	105	7	214	18	165	8	3	0	7	0	11	0	5	1	4	0	26	1	0	0
16:45:00	109	4	231	17	185	20	3	0	7	0	12	1	6	1	4	0	26	0	0	0
17:00:00	117	8	253	22	203	18	3	0	7	0	12	0	7	1	5	1	26	0	0	0
17:15:00	121	4	273	20	216	13	3	0	7	0	15	3	7	0	5	0	26	0	0	0
17:30:00	131	10	296	23	233	17	4	1	8	1	15	0	7	0	5	0	26	0	0	0
17:45:00	134	3	316	20	250	17	4	0	9	1	15	0	7	0	5	0	26	0	0	0
18:00:00	139	5	332	16	271	21	4	0	9	0	15	0	7	0	5	0	26	0	0	0
18:15:00	139	0	332	0	271	0	4	0	9	0	15	0	7	0	5	0	26	0	0	0
18:15:15	139	0	332	0	271	0	4	0	9	0	15	0	7	0	5	0	26	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600001**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	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	5	5	3	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0
7:30:00	3	0	23	18	7	4	0	0	1	1	0	0	0	0	2	1	0	0	0	0
7:45:00	5	2	41	18	14	7	0	0	1	0	0	0	0	0	5	3	0	0	0	0
8:00:00	5	0	65	24	26	12	0	0	1	0	0	0	0	0	5	0	0	0	0	0
8:15:00	7	2	89	24	33	7	0	0	2	1	0	0	0	0	7	2	0	0	0	0
8:30:00	10	3	112	23	40	7	0	0	2	0	0	0	0	0	12	5	0	0	0	0
8:45:00	10	0	131	19	45	5	0	0	2	0	0	0	0	0	13	1	0	0	0	0
9:00:00	12	2	161	30	47	2	0	0	3	1	0	0	1	1	14	1	0	0	0	0
9:15:00	14	2	175	14	49	2	0	0	5	2	1	1	1	0	15	1	0	0	0	0
9:30:00	14	0	190	15	55	6	0	0	6	1	1	0	1	0	17	2	0	0	0	0
9:45:00	17	3	204	14	56	1	0	0	7	1	1	0	1	0	21	4	0	0	0	0
10:00:00	22	5	222	18	60	4	0	0	7	0	1	0	1	0	22	1	0	0	0	0
10:15:00	22	0	222	0	60	0	0	0	7	0	1	0	1	0	22	0	0	0	0	0
15:00:00	22	0	222	0	60	0	0	0	7	0	1	0	1	0	22	0	0	0	0	0
15:15:00	27	5	256	34	69	9	0	0	8	1	2	1	1	0	23	1	0	0	0	0
15:30:00	33	6	297	41	72	3	0	0	9	1	3	1	1	0	25	2	0	0	0	0
15:45:00	40	7	337	40	78	6	0	0	10	1	3	0	1	0	30	5	0	0	0	0
16:00:00	46	6	377	40	85	7	0	0	10	0	3	0	1	0	31	1	2	2	0	0
16:15:00	53	7	428	51	100	15	1	1	12	2	3	0	1	0	37	6	3	1	0	0
16:30:00	60	7	487	59	109	9	1	0	13	1	3	0	1	0	40	3	4	1	0	0
16:45:00	77	17	547	60	124	15	1	0	14	1	3	0	1	0	42	2	4	0	0	0
17:00:00	79	2	622	75	132	8	1	0	15	1	5	2	1	0	43	1	4	0	0	0
17:15:00	85	6	677	55	144	12	1	0	16	1	6	1	1	0	46	3	4	0	0	0
17:30:00	89	4	757	80	161	17	1	0	17	1	7	1	1	0	47	1	4	0	0	0
17:45:00	96	7	818	61	177	16	1	0	19	2	8	1	2	1	47	0	4	0	0	0
18:00:00	100	4	884	66	188	11	1	0	21	2	8	0	2	0	48	1	4	0	0	0
18:15:00	100	0	884	0	188	0	1	0	21	0	8	0	2	0	48	0	4	0	0	0
18:15:15	100	0	884	0	188	0	1	0	21	0	8	0	2	0	48	0	4	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 Site #: 2302600001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	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	14	14	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	2	2	29	15	14	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	7	5	42	13	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	14	7	63	21	30	10	0	0	0	0	0	0	1	1	1	1	0	0	0	0
8:15:00	16	2	82	19	35	5	0	0	0	0	0	0	1	0	2	1	0	0	0	0
8:30:00	23	7	106	24	41	6	0	0	0	0	0	0	2	1	2	0	0	0	0	0
8:45:00	31	8	126	20	49	8	0	0	0	0	0	0	2	0	3	1	0	0	0	0
9:00:00	37	6	144	18	59	10	0	0	0	0	0	0	2	0	3	0	0	0	0	0
9:15:00	40	3	149	5	64	5	0	0	0	0	0	0	2	0	3	0	0	0	0	0
9:30:00	45	5	158	9	69	5	0	0	0	0	0	0	2	0	4	1	0	0	0	0
9:45:00	50	5	169	11	70	1	0	0	0	0	0	0	2	0	5	1	0	0	0	0
10:00:00	55	5	185	16	74	4	0	0	0	0	0	0	2	0	6	1	0	0	0	0
10:15:00	55	0	185	0	74	0	0	0	0	0	0	0	2	0	6	0	0	0	0	0
15:00:00	55	0	185	0	74	0	0	0	0	0	0	0	2	0	6	0	0	0	0	0
15:15:00	62	7	199	14	79	5	0	0	0	0	0	0	2	0	6	0	1	1	0	0
15:30:00	73	11	210	11	82	3	1	1	0	0	0	0	2	0	6	0	1	0	0	0
15:45:00	83	10	213	3	87	5	1	0	0	0	1	1	3	1	6	0	1	0	0	0
16:00:00	91	8	220	7	88	1	1	0	0	0	1	0	3	0	6	0	1	0	0	0
16:15:00	96	5	228	8	91	3	1	0	0	0	1	0	4	1	6	0	1	0	0	0
16:30:00	104	8	238	10	94	3	1	0	0	0	1	0	4	0	6	0	1	0	0	0
16:45:00	115	11	248	10	96	2	2	1	1	1	1	0	4	0	6	0	1	0	0	0
17:00:00	129	14	266	18	99	3	2	0	2	1	1	0	4	0	7	1	2	1	0	0
17:15:00	145	16	280	14	101	2	3	1	2	0	1	0	4	0	7	0	2	0	0	0
17:30:00	154	9	288	8	105	4	3	0	3	1	1	0	4	0	7	0	2	0	0	0
17:45:00	162	8	299	11	107	2	4	1	3	0	1	0	4	0	7	0	2	0	0	0
18:00:00	168	6	310	11	109	2	4	0	3	0	1	0	4	0	7	0	2	0	0	0
18:15:00	168	0	310	0	109	0	4	0	3	0	1	0	4	0	7	0	2	0	0	0
18:15:15	168	0	310	0	109	0	4	0	3	0	1	0	4	0	7	0	2	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:00:00
To: 8:00:00

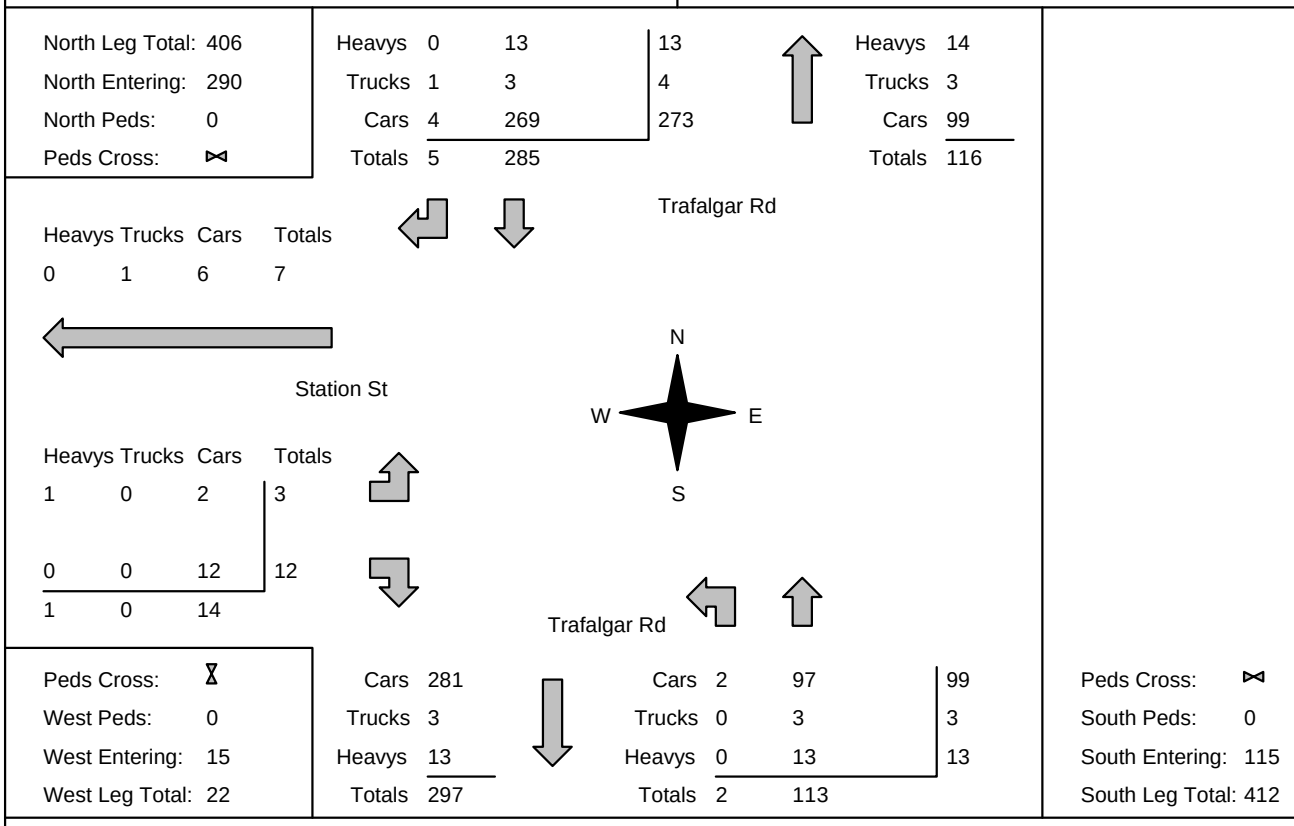
Municipality: Erin
Site #: 2302600002
Intersection: Trafalgar Rd & Station St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

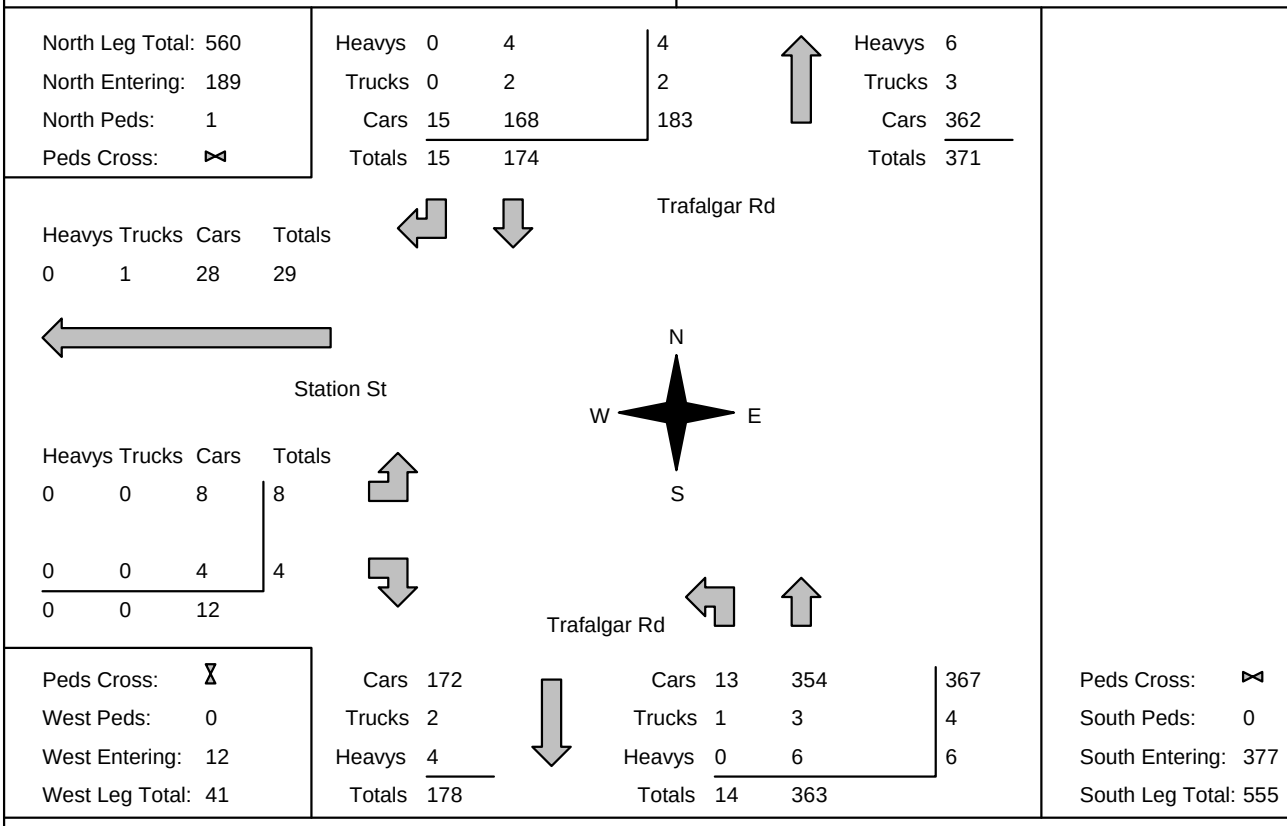
Municipality: Erin
Site #: 2302600002
Intersection: Trafalgar Rd & Station St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

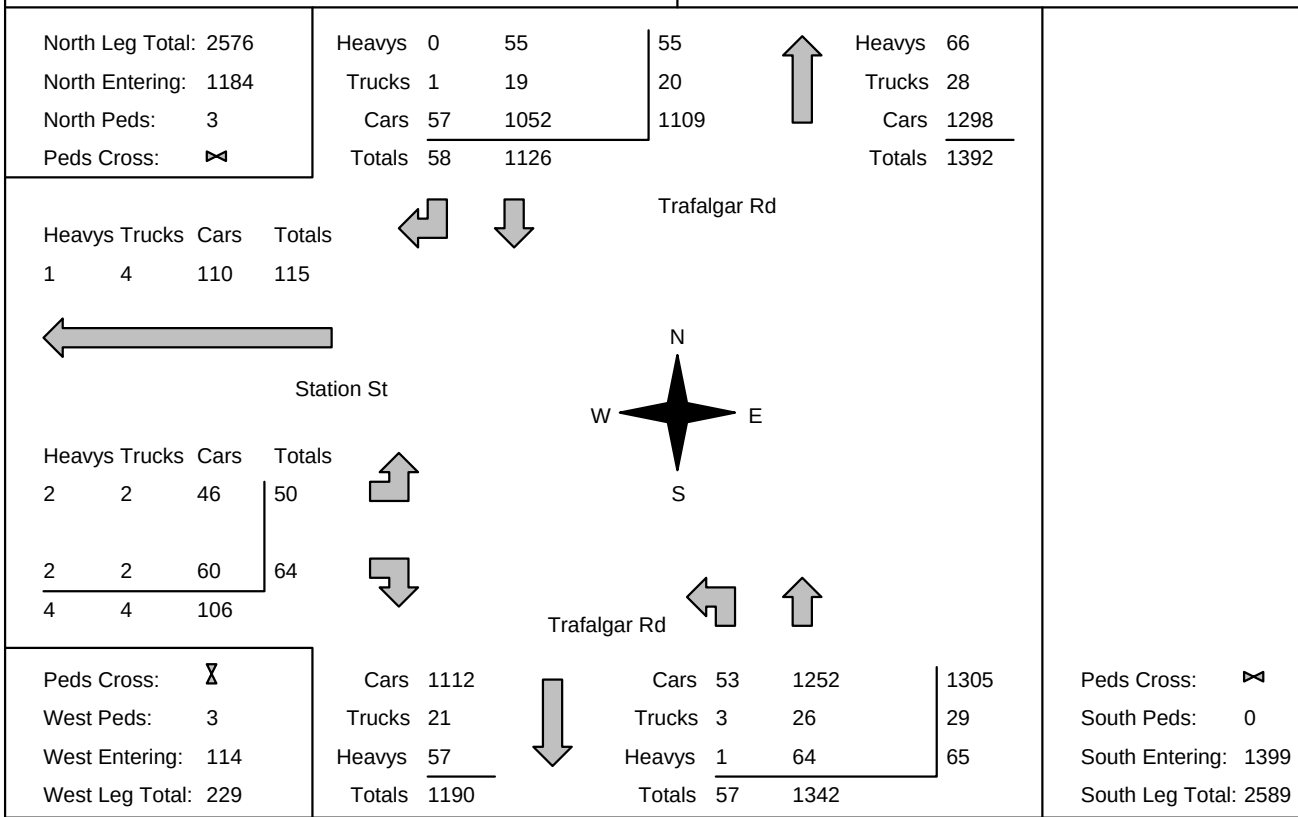
Municipality: Erin
Site #: 2302600002
Intersection: Trafalgar Rd & Station St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Trafalgar Rd & Station St | **Count Date:** 8-Feb-23 | **Municipality:** Erin

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*285*	*5*	*290*	*0*
9:00:00	*0*	*226*	*2*	*228*	*0*
10:00:00	*0*	*162*	*5*	*167*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*140*	*10*	*150*	*1*
17:00:00	*0*	*181*	*12*	*193*	*0*
18:00:00	*0*	*132*	*24*	*156*	*1*
Totals:	0	1126	58	1184	3

North/South Total Approaches: 2583

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*2*	*113*	*0*	*115*	*0*
9:00:00	*8*	*152*	*0*	*160*	*0*
10:00:00	*5*	*134*	*0*	*139*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*11*	*260*	*0*	*271*	*0*
17:00:00	*11*	*337*	*0*	*348*	*0*
18:00:00	*20*	*346*	*0*	*366*	*0*
S Totals:	57	1342	0	1399	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*0*	*0*	*0*	*0*	*0*
10:00:00	*0*	*0*	*0*	*0*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*0*	*0*	*0*	*0*
18:00:00	*0*	*0*	*0*	*0*	*0*
Totals:	0	0	0	0	0

East/West Total Approaches: 114

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*3*	*0*	*12*	*15*	*0*
9:00:00	*3*	*0*	*18*	*21*	*0*
10:00:00	*13*	*0*	*3*	*16*	*2*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*11*	*0*	*10*	*21*	*1*
17:00:00	*7*	*0*	*4*	*11*	*0*
18:00:00	*13*	*0*	*17*	*30*	*0*
W Totals:	50	0	64	114	3

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*3*	*3*	*14*	*0*	*12*	*7*	*14*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600002**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	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	62	62	2	2	0	0	1	1	0	0	0	0	4	4	0	0	0	0
7:30:00	0	0	123	61	2	0	0	0	2	1	1	1	0	0	6	2	0	0	0	0
7:45:00	0	0	197	74	3	1	0	0	2	0	1	0	0	0	8	2	0	0	0	0
8:00:00	0	0	269	72	4	1	0	0	3	1	1	0	0	0	13	5	0	0	0	0
8:15:00	0	0	315	46	4	0	0	0	3	0	1	0	0	0	18	5	0	0	0	0
8:30:00	0	0	365	50	4	0	0	0	5	2	1	0	0	0	21	3	0	0	0	0
8:45:00	0	0	422	57	5	1	0	0	6	1	1	0	0	0	22	1	0	0	0	0
9:00:00	0	0	480	58	6	1	0	0	6	0	1	0	0	0	25	3	0	0	0	0
9:15:00	0	0	521	41	7	1	0	0	7	1	1	0	0	0	27	2	0	0	0	0
9:30:00	0	0	554	33	8	1	0	0	10	3	1	0	0	0	31	4	0	0	0	0
9:45:00	0	0	591	37	9	1	0	0	11	1	1	0	0	0	33	2	0	0	0	0
10:00:00	0	0	626	35	11	2	0	0	13	2	1	0	0	0	34	1	0	0	1	1
10:15:00	0	0	626	0	11	0	0	0	13	0	1	0	0	0	34	0	0	0	1	0
15:00:00	0	0	626	0	11	0	0	0	13	0	1	0	0	0	34	0	0	0	1	0
15:15:00	0	0	649	23	13	2	0	0	14	1	1	0	0	0	36	2	0	0	1	0
15:30:00	0	0	676	27	16	3	0	0	15	1	1	0	0	0	40	4	0	0	2	1
15:45:00	0	0	717	41	20	4	0	0	15	0	1	0	0	0	47	7	0	0	2	0
16:00:00	0	0	750	33	21	1	0	0	15	0	1	0	0	0	48	1	0	0	2	0
16:15:00	0	0	792	42	24	3	0	0	15	0	1	0	0	0	49	1	0	0	2	0
16:30:00	0	0	836	44	26	2	0	0	16	1	1	0	0	0	51	2	0	0	2	0
16:45:00	0	0	870	34	31	5	0	0	17	1	1	0	0	0	52	1	0	0	2	0
17:00:00	0	0	923	53	33	2	0	0	18	1	1	0	0	0	53	1	0	0	2	0
17:15:00	0	0	964	41	36	3	0	0	18	0	1	0	0	0	55	2	0	0	3	1
17:30:00	0	0	1004	40	41	5	0	0	18	0	1	0	0	0	55	0	0	0	3	0
17:45:00	0	0	1027	23	46	5	0	0	18	0	1	0	0	0	55	0	0	0	3	0
18:00:00	0	0	1052	25	57	11	0	0	19	1	1	0	0	0	55	0	0	0	3	0
18:15:00	0	0	1052	0	57	0	0	0	19	0	1	0	0	0	55	0	0	0	3	0
18:15:15	0	0	1052	0	57	0	0	0	19	0	1	0	0	0	55	0	0	0	3	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600002**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	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
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	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	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
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600002**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	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	14	14	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:30:00	0	0	40	26	0	0	0	0	1	0	0	0	0	0	5	4	0	0	0	0
7:45:00	2	2	62	22	0	0	0	0	2	1	0	0	0	0	10	5	0	0	0	0
8:00:00	2	0	97	35	0	0	0	0	3	1	0	0	0	0	13	3	0	0	0	0
8:15:00	3	1	125	28	0	0	0	0	4	1	0	0	0	0	14	1	0	0	0	0
8:30:00	6	3	155	30	0	0	0	0	5	1	0	0	0	0	19	5	0	0	0	0
8:45:00	8	2	189	34	0	0	0	0	7	2	0	0	1	1	24	5	0	0	0	0
9:00:00	9	1	230	41	0	0	0	0	8	1	0	0	1	0	27	3	0	0	0	0
9:15:00	9	0	262	32	0	0	0	0	9	1	0	0	1	0	32	5	0	0	0	0
9:30:00	9	0	289	27	0	0	0	0	11	2	0	0	1	0	35	3	0	0	0	0
9:45:00	11	2	318	29	0	0	0	0	12	1	0	0	1	0	38	3	0	0	0	0
10:00:00	14	3	349	31	0	0	0	0	12	0	0	0	1	0	38	0	0	0	0	0
10:15:00	14	0	349	0	0	0	0	0	12	0	0	0	1	0	38	0	0	0	0	0
15:00:00	14	0	349	0	0	0	0	0	12	0	0	0	1	0	38	0	0	0	0	0
15:15:00	15	1	402	53	0	0	0	0	13	1	0	0	1	0	40	2	0	0	0	0
15:30:00	20	5	463	61	0	0	1	1	16	3	0	0	1	0	44	4	0	0	0	0
15:45:00	22	2	522	59	0	0	1	0	17	1	0	0	1	0	49	5	0	0	0	0
16:00:00	24	2	589	67	0	0	1	0	20	3	0	0	1	0	50	1	0	0	0	0
16:15:00	26	2	666	77	0	0	1	0	21	1	0	0	1	0	55	5	0	0	0	0
16:30:00	27	1	740	74	0	0	1	0	22	1	0	0	1	0	58	3	0	0	0	0
16:45:00	30	3	830	90	0	0	1	0	24	2	0	0	1	0	60	2	0	0	0	0
17:00:00	35	5	911	81	0	0	1	0	24	0	0	0	1	0	61	1	0	0	0	0
17:15:00	39	4	995	84	0	0	1	0	24	0	0	0	1	0	63	2	0	0	0	0
17:30:00	40	1	1094	99	0	0	2	1	25	1	0	0	1	0	64	1	0	0	0	0
17:45:00	44	4	1181	87	0	0	2	0	26	1	0	0	1	0	64	0	0	0	0	0
18:00:00	53	9	1252	71	0	0	3	1	26	0	0	0	1	0	64	0	0	0	0	0
18:15:00	53	0	1252	0	0	0	3	0	26	0	0	0	1	0	64	0	0	0	0	0
18:15:15	53	0	1252	0	0	0	3	0	26	0	0	0	1	0	64	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 **Site #: 2302600002**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	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	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	1	0	0	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	1	0	0	0	7	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
8:00:00	2	1	0	0	12	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0
8:15:00	2	0	0	0	16	4	0	0	0	0	0	0	1	0	0	0	0	0	0	0
8:30:00	2	0	0	0	17	1	0	0	0	0	0	0	1	0	0	0	2	2	0	0
8:45:00	3	1	0	0	22	5	0	0	0	0	0	0	1	0	0	0	2	0	0	0
9:00:00	5	2	0	0	28	6	0	0	0	0	0	0	1	0	0	0	2	0	0	0
9:15:00	8	3	0	0	28	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0
9:30:00	10	2	0	0	28	0	0	0	0	0	0	0	1	0	0	0	2	0	2	2
9:45:00	14	4	0	0	29	1	0	0	0	0	1	1	1	0	0	0	2	0	2	0
10:00:00	18	4	0	0	30	1	0	0	0	0	1	0	1	0	0	0	2	0	2	0
10:15:00	18	0	0	0	30	0	0	0	0	0	1	0	1	0	0	0	2	0	2	0
15:00:00	18	0	0	0	30	0	0	0	0	0	1	0	1	0	0	0	2	0	2	0
15:15:00	20	2	0	0	34	4	0	0	0	0	1	0	1	0	0	0	2	0	2	0
15:30:00	25	5	0	0	37	3	0	0	0	0	1	0	1	0	0	0	2	0	2	0
15:45:00	27	2	0	0	38	1	0	0	0	0	2	1	1	0	0	0	2	0	2	0
16:00:00	29	2	0	0	39	1	0	0	0	0	2	0	1	0	0	0	2	0	3	1
16:15:00	31	2	0	0	41	2	0	0	0	0	2	0	1	0	0	0	2	0	3	0
16:30:00	34	3	0	0	41	0	0	0	0	0	2	0	1	0	0	0	2	0	3	0
16:45:00	35	1	0	0	42	1	0	0	0	0	2	0	1	0	0	0	2	0	3	0
17:00:00	36	1	0	0	43	1	0	0	0	0	2	0	1	0	0	0	2	0	3	0
17:15:00	40	4	0	0	44	1	0	0	0	0	2	0	1	0	0	0	2	0	3	0
17:30:00	42	2	0	0	45	1	0	0	0	0	2	0	1	0	0	0	2	0	3	0
17:45:00	44	2	0	0	52	7	0	0	0	0	2	0	1	0	0	0	2	0	3	0
18:00:00	46	2	0	0	60	8	2	2	0	0	2	0	2	1	0	0	2	0	3	0
18:15:00	46	0	0	0	60	0	2	0	0	0	2	0	2	0	0	0	2	0	3	0
18:15:15	46	0	0	0	60	0	2	0	0	0	2	0	2	0	0	0	2	0	3	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Erin
Site #: 2302600003
Intersection: Trafalgar Rd & Market St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

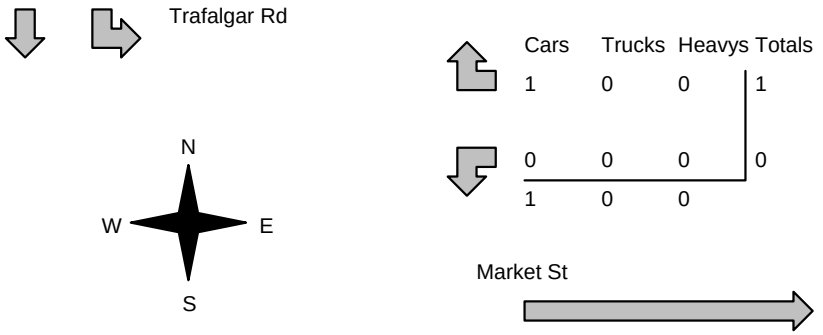
Major Road: Trafalgar Rd runs N/S

North Leg Total: 439
North Entering: 282
North Peds: 0
Peds Cross: ⋈

Heavys	19	0	19
Trucks	4	0	4
Cars	258	1	259
Totals	281	1	

Heavys	14
Trucks	4
Cars	139
Totals	157

East Leg Total: 3
East Entering: 1
East Peds: 0
Peds Cross: ⋈



Cars	258		
Trucks	4		
Heavys	19		
Totals	281		

Cars	138	1	139
Trucks	4	0	4
Heavys	14	0	14
Totals	156	1	

Peds Cross: ⋈
South Peds: 0
South Entering: 157
South Leg Total: 438

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Erin
Site #: 2302600003
Intersection: Trafalgar Rd & Market St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

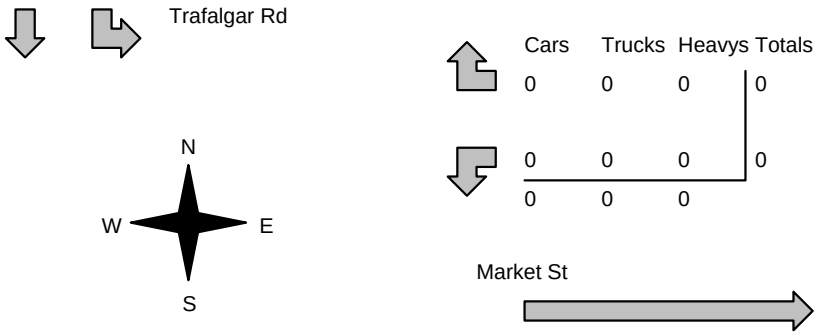
Major Road: Trafalgar Rd runs N/S

North Leg Total: 587
North Entering: 181
North Peds: 0
Peds Cross: ⋈

Heavys	9	0	9
Trucks	3	0	3
Cars	169	0	169
Totals	181	0	

Heavys	11
Trucks	6
Cars	389
Totals	406

East Leg Total: 0
East Entering: 0
East Peds: 0
Peds Cross: ⋈



Cars	169		
Trucks	3		
Heavys	9		
Totals	181		

Cars	389	0	389
Trucks	6	0	6
Heavys	11	0	11
Totals	406	0	

Peds Cross: ⋈
South Peds: 0
South Entering: 406
South Leg Total: 587

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Erin
Site #: 2302600003
Intersection: Trafalgar Rd & Market St
TFR File #: 1
Count date: 8-Feb-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

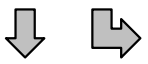
Major Road: Trafalgar Rd runs N/S

North Leg Total: 2668
North Entering: 1232
North Peds: 0
Peds Cross: ⋈

Heavys	75	0	75
Trucks	23	0	23
Cars	1132	2	1134
Totals	1230	2	

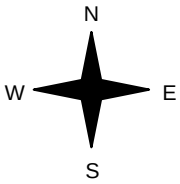
Heavys	86	
Trucks	29	
Cars	1321	
Totals	1436	

East Leg Total: 9
East Entering: 4
East Peds: 0
Peds Cross: ⋈



Trafalgar Rd

Cars	Trucks	Heavys	Totals
2	0	0	2
2	0	0	2
4	0	0	



Market St

Cars	Trucks	Heavys	Totals
5	0	0	5

Trafalgar Rd

Cars	1134		
Trucks	23		
Heavys	75		
Totals	1232		

Cars	1319	3	1322
Trucks	29	0	29
Heavys	86	0	86
Totals	1434	3	

Peds Cross: ⋈
South Peds: 0
South Entering: 1437
South Leg Total: 2669

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Trafalgar Rd & Market St | **Count Date:** 8-Feb-23 | **Municipality:** Erin

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	1	302	0	303	0
9:00:00	1	257	0	258	0
10:00:00	0	165	0	165	0
15:00:00	0	0	0	0	0
16:00:00	0	156	0	156	0
17:00:00	0	195	0	195	0
18:00:00	0	155	0	155	0
Totals:	2	1230	0	1232	0

North/South Total Approaches: 2669

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	106	0	106	0
9:00:00	0	162	1	163	0
10:00:00	0	133	2	135	0
15:00:00	0	0	0	0	0
16:00:00	0	276	0	276	0
17:00:00	0	378	0	378	0
18:00:00	0	379	0	379	0
S Totals:	0	1434	3	1437	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	0	1	1	0
9:00:00	0	0	1	1	0
10:00:00	2	0	0	2	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	2	0	2	4	0

East/West Total Approaches: 4

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
W Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	0	0	2	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 Site #: 2302600003

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	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	64	64	0	0	0	0	1	1	0	0	0	0	4	4	0	0	0	0
7:30:00	0	0	137	73	0	0	0	0	3	2	0	0	0	0	5	1	0	0	0	0
7:45:00	1	1	205	68	0	0	0	0	3	0	0	0	0	0	7	2	0	0	0	0
8:00:00	1	0	287	82	0	0	0	0	3	0	0	0	0	0	12	5	0	0	0	0
8:15:00	1	0	339	52	0	0	0	0	3	0	0	0	0	0	15	3	0	0	0	0
8:30:00	2	1	396	57	0	0	0	0	6	3	0	0	0	0	22	7	0	0	0	0
8:45:00	2	0	463	67	0	0	0	0	7	1	0	0	0	0	26	4	0	0	0	0
9:00:00	2	0	522	59	0	0	0	0	7	0	0	0	0	0	30	4	0	0	0	0
9:15:00	2	0	562	40	0	0	0	0	8	1	0	0	0	0	33	3	0	0	0	0
9:30:00	2	0	600	38	0	0	0	0	10	2	0	0	0	0	35	2	0	0	0	0
9:45:00	2	0	639	39	0	0	0	0	12	2	0	0	0	0	37	2	0	0	0	0
10:00:00	2	0	669	30	0	0	0	0	14	2	0	0	0	0	41	4	0	0	0	0
10:15:00	2	0	669	0	0	0	0	0	14	0	0	0	0	0	41	0	0	0	0	0
15:00:00	2	0	669	0	0	0	0	0	14	0	0	0	0	0	41	0	0	0	0	0
15:15:00	2	0	694	25	0	0	0	0	16	2	0	0	0	0	43	2	0	0	0	0
15:30:00	2	0	721	27	0	0	0	0	18	2	0	0	0	0	48	5	0	0	0	0
15:45:00	2	0	764	43	0	0	0	0	19	1	0	0	0	0	58	10	0	0	0	0
16:00:00	2	0	801	37	0	0	0	0	19	0	0	0	0	0	60	2	0	0	0	0
16:15:00	2	0	845	44	0	0	0	0	19	0	0	0	0	0	62	2	0	0	0	0
16:30:00	2	0	891	46	0	0	0	0	20	1	0	0	0	0	64	2	0	0	0	0
16:45:00	2	0	925	34	0	0	0	0	21	1	0	0	0	0	67	3	0	0	0	0
17:00:00	2	0	984	59	0	0	0	0	22	1	0	0	0	0	69	2	0	0	0	0
17:15:00	2	0	1017	33	0	0	0	0	22	0	0	0	0	0	71	2	0	0	0	0
17:30:00	2	0	1060	43	0	0	0	0	23	1	0	0	0	0	73	2	0	0	0	0
17:45:00	2	0	1093	33	0	0	0	0	23	0	0	0	0	0	74	1	0	0	0	0
18:00:00	2	0	1132	39	0	0	0	0	23	0	0	0	0	0	75	1	0	0	0	0
18:15:00	2	0	1132	0	0	0	0	0	23	0	0	0	0	0	75	0	0	0	0	0
10:15:15	2	0	1132	0	0	0	0	0	23	0	0	0	0	0	75	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 Site #: 2302600003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	1	0	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	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	2	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 Site #: 2302600003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	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	9	9	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:30:00	0	0	29	20	0	0	0	0	2	1	0	0	0	0	6	5	0	0	0	0
7:45:00	0	0	52	23	0	0	0	0	2	0	0	0	0	0	12	6	0	0	0	0
8:00:00	0	0	90	38	0	0	0	0	3	1	0	0	0	0	13	1	0	0	0	0
8:15:00	0	0	120	30	0	0	0	0	4	1	0	0	0	0	15	2	0	0	0	0
8:30:00	0	0	156	36	0	0	0	0	5	1	0	0	0	0	24	9	0	0	0	0
8:45:00	0	0	190	34	1	1	0	0	6	1	0	0	0	0	26	2	0	0	0	0
9:00:00	0	0	229	39	1	0	0	0	8	2	0	0	0	0	31	5	0	0	0	0
9:15:00	0	0	259	30	3	2	0	0	10	2	0	0	0	0	32	1	0	0	0	0
9:30:00	0	0	283	24	3	0	0	0	12	2	0	0	0	0	35	3	0	0	0	0
9:45:00	0	0	309	26	3	0	0	0	13	1	0	0	0	0	40	5	0	0	0	0
10:00:00	0	0	346	37	3	0	0	0	13	0	0	0	0	0	42	2	0	0	0	0
10:15:00	0	0	346	0	3	0	0	0	13	0	0	0	0	0	42	0	0	0	0	0
15:00:00	0	0	346	0	3	0	0	0	13	0	0	0	0	0	42	0	0	0	0	0
15:15:00	0	0	403	57	3	0	0	0	14	1	0	0	0	0	45	3	0	0	0	0
15:30:00	0	0	470	67	3	0	0	0	17	3	0	0	0	0	50	5	0	0	0	0
15:45:00	0	0	535	65	3	0	0	0	18	1	0	0	0	0	57	7	0	0	0	0
16:00:00	0	0	600	65	3	0	0	0	18	0	0	0	0	0	59	2	0	0	0	0
16:15:00	0	0	678	78	3	0	0	0	19	1	0	0	0	0	69	10	0	0	0	0
16:30:00	0	0	754	76	3	0	0	0	20	1	0	0	0	0	73	4	0	0	0	0
16:45:00	0	0	845	91	3	0	0	0	22	2	0	0	0	0	78	5	0	0	0	0
17:00:00	0	0	953	108	3	0	0	0	22	0	0	0	0	0	80	2	0	0	0	0
17:15:00	0	0	1037	84	3	0	0	0	25	3	0	0	0	0	83	3	0	0	0	0
17:30:00	0	0	1143	106	3	0	0	0	26	1	0	0	0	0	84	1	0	0	0	0
17:45:00	0	0	1229	86	3	0	0	0	28	2	0	0	0	0	85	1	0	0	0	0
18:00:00	0	0	1319	90	3	0	0	0	29	1	0	0	0	0	86	1	0	0	0	0
18:15:00	0	0	1319	0	3	0	0	0	29	0	0	0	0	0	86	0	0	0	0	0
10:15:15	0	0	1319	0	3	0	0	0	29	0	0	0	0	0	86	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 8-Feb-23 Site #: 2302600003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	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
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	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	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
10:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Configuration

Controller Sequence Priority

	1	2	3	4	5	6	7	8	9	10	11	12
Ring 1 Phases . .	1	2	3	4	9	10	0	0	0	0	0	0
Ring 2 Phases . .	5	6	7	8	11	12	0	0	0	0	0	0

Phase

	1	2	3	4	5	6	7	8	9	10	11	12
In Use.		X		X		X		X				
Exclusive Ped . . .												
Direction												

Overlap

	A	B	C	D
Direction . . .				

Load Switch Channel/Driver Group Assign (Info Only):

Load Switch (MMU) Channel	Signal Driver Phase/ Ovlap	Group Ped
1	1	.
2	2	.
3	3	.
4	4	.
5	5	.
6	6	.
7	7	.
8	8	.
9	2	X
10	4	X
11	6	X
12	8	X
13	A	.
14	B	.
15	C	.
16	D	.

Configuration Continued

```
                Enable BIU: 1  2  3  4  5  6  7  8
Terminal/Facilities. . . . . .  .  .  .  .  .  .  .
Detector Rack. . . . . .  .  .  .  .  .  .  .  .

Type 2 Runs as Type 1. . .  .
MMU Disable. . . . . .  X
Diagnostic Enable. . . . .  .
Peer-Peer Comm Enable. . .  .

                              1    2    3    4    5    6    7    8    9   10
Peer To Peer Addresses . . 255  255  255  255  255  255  255  255  255  255
```

Port 2:

```
Port 2 Protocol . . . . . Terminal
Port 2 Enable . . . . . YES
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1
```

Port 3:

```
Port 3 Protocol . . . . . Telemetry
Port 3 Enable . . . . . NO
Telemetry Address . . . . . 0
System Detector 9-16 Address. . 0
Telemetry Response Delay. . . . 7800
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Duplex. . . . . Full
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1
```

Configuration Continued

Event Enabling		Alarm Enabling	
Critical RFE'S (MMU/TF)	X	ALARM 1	X
Non-Critical RFE'S (DET/TEST)	X	ALARM 2	X
Detector Errors	X	ALARM 3	X
Coordination Errors	X	ALARM 4	.
MMU Flash Faults.	X	ALARM 5	.
Local Flash Faults.	X	ALARM 6	.
Preempt	X	ALARM 7	.
Power On/Off.	X	ALARM 8	.
Low Battery	X	ALARM 9	.
		ALARM 10.	.
		ALARM 11.	.
		ALARM 12.	.
		ALARM 13.	.
		ALARM 14.	.
		ALARM 15.	.
		ALARM 16.	.

Supervisor Access Code. . . ****
Data Change Access Code . . ****

MMU Compatibility Program (Info Only)

Channel	Is Allowed to Time With Channel														
	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.	.	.	.	.				
6	.	.	.	.	.	.	.	.	.	.					
7	.	.	.	.	.	.	.	.	.						
8	.	.	.	.	.	.	.	.							
9	.	.	.	.	.	.	.								
10	.	.	.	.	.	.									
11	.	.	.	.	.										
12	.	.	.	.											
13	.	.	.												
14	.	.													
15	.														

Version Info:

Software Assy.	Part No.	Version
Boot	27831	2.83
Program	45561	7.9
Application		. 3
Help	27891	6.33
Configuration	27918	C000

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By-Phase Timing Data

	Phase											
Direction	1	2	3	4	5	6	7	8	9	10	11	12
Minimum Green	5	30	5	15	5	30	5	15	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	5	0	5	0	5	0	5	0	10	0	10
Ped Clearance	0	7	0	7	0	7	0	7	0	16	0	16
Veh Extension	5.0	5.0	5.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	35	35	35	27	35	35	35	27	35	35	35	35
Max 2	40	15	40	40	40	15	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.5	3.0	5.5	3.0	5.5	3.0	5.5	3.0	3.0	3.0	3.0
Red Clearance	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

No-Serve Phases

	Phase Cannot Serve With Phase										
Phase	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.				
6	.	.	.	.	.	.					
7	.	.	.	.	.						
8	.	.	.	.							
9	.	.	.								
10	.	.									
11	.										

Ped Carryover

Ped Start Phase	Carry Over Phase
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Vehicle/Ped Phase as Overlap

Ped Ovlap Phase	Ped Phase As Overlap Consists of Ped Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.

Veh Ovlap Phase	Veh Phase As Overlap Consists of Veh Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X

Overlap Data

Overlap A	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap B	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap C	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap D	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Power Start, Remote Flash

	Phase																	
	1	2	3	4	5	6	7	8	9	10	11	12	Overlap					
													A		B		C	D
Power Start	.	X	.	.	.	X	.	.	.	.	.	.						
External Start	.	X	.	.	.	X	.	.	.	.	.	.						
Into Remote Flash	.	X	.	.	.	X	.	.	.	.	.	.						
Exit Remote Flash	.	X	.	.	.	X	.	.	.	.	.	.						
Remote Flash Yellow	.	.	.	.	.	.	.	.	.	.	.	.						
Flash Together	.	X	.	X	.	X	.	X	.	X	.	X	.		X		.	X

Initialization Interval:

Power Start	Yellow
External Start	Yellow

Power Start All Red Time	0
Power Start Flash Time	0

Remote Flash Options:

Out of Flash Yellow	NO
Out of Flash All Red	NO
Minimum Recall	NO
Alternate Flash	NO
Flash Thru Load Switches	NO
Cycle Through Phases	NO

Option Data

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Guaranteed Passage												
Call To NonActuated 1		X				X						
Call To NonActuated 2				X				X				
Dual Entry		X		X		X		X		X		X
Conditional Service	X		X		X		X		X		X	
Conditional Reservice												
Actuated Rest in Walk												
Flashing Walk												

Enable Programmable Options

Dual Entry	ON	Backup Protection Group 1	OFF
Conditional Service	OFF	Backup Protection Group 2	OFF
Ped Clearance Protection	OFF	Backup Protection Group 3	OFF
Special Preempt Overlap Flash	OFF	Simultaneous Gap Group 1	OFF
Cond Service Det Cross Switch	OFF	Simultaneous Gap Group 2	OFF
Lock Detectors in Red Only	OFF	Simultaneous Gap Group 3	OFF

Five Section Left Turn Control

Phases:	5-2	7-4	1-6	3-8	11-10	9-12
Left Turn Head						

Recall Data, Dimming

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Locking Detector. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Recall.	.	X	.	.	.	X	.	.	.	.	.	.
Pedestrian Recall . . .	.	.	.	.	.	.	.	.	.	.	.	.
Recall To Max	.	.	.	.	.	.	.	.	.	.	.	.
Soft Recall	.	.	.	.	.	.	.	.	.	.	.	.
Don't Rest Here	.	.	.	.	.	.	.	.	.	.	.	.
Ped Dark if No Call . .	.	.	.	.	.	.	.	.	.	.	.	.

Dimming:

	Load Switch															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green/Walk. . . .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Yellow/Ped Clear.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Red/Don't Walk. .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

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Detector Type/Timers

Det.	Locking Memory	Log Enable	Timers Extend	Delay	Don't Reset Extend	Type
1	NO	NO	0.0	0	.	0 - Normal
2	NO	NO	0.0	0	.	0 - Normal
3	NO	NO	0.0	0	.	0 - Normal
4	NO	NO	0.0	7	.	1 - Extend/Delay
5	NO	NO	0.0	0	.	0 - Normal
6	NO	NO	0.0	0	.	0 - Normal
7	NO	NO	0.0	0	.	0 - Normal
8	NO	NO	0.0	7	.	1 - Extend/Delay
9	NO	NO	0.0	0	.	0 - Normal
10	NO	NO	0.0	0	.	0 - Normal
11	NO	NO	0.0	0	.	0 - Normal
12	NO	NO	0.0	0	.	0 - Normal
13	NO	NO	0.0	0	.	0 - Normal
14	NO	NO	0.0	0	.	0 - Normal
15	NO	NO	0.0	0	.	0 - Normal
16	NO	NO	0.0	0	.	0 - Normal
17	NO	NO	0.0	0	.	0 - Normal
18	NO	NO	0.0	0	.	0 - Normal
19	NO	NO	0.0	0	.	0 - Normal
20	NO	NO	0.0	0	.	0 - Normal
21	NO	NO	0.0	0	.	0 - Normal
22	NO	NO	0.0	0	.	0 - Normal
23	NO	NO	0.0	0	.	0 - Normal
24	NO	NO	0.0	0	.	0 - Normal
25	NO	NO	0.0	0	.	0 - Normal
26	NO	NO	0.0	0	.	0 - Normal
27	NO	NO	0.0	0	.	0 - Normal
28	NO	NO	0.0	0	.	0 - Normal
29	NO	NO	0.0	0	.	0 - Normal
30	NO	NO	0.0	0	.	0 - Normal
31	NO	NO	0.0	0	.	0 - Normal
32	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 1: Detector 1	Det 17: Detector 17
Det 2: Detector 2	Det 18: Detector 18
Det 3: Detector 3	Det 19: Detector 19
Det 4: Detector 4	Det 20: Detector 20
Det 5: Detector 5	Det 21: Detector 21
Det 6: Detector 6	Det 22: Detector 22
Det 7: Detector 7	Det 23: Detector 23
Det 8: Detector 8	Det 24: Detector 24
Det 9: Detector 9	Det 25: Detector 25
Det 10: Detector 10	Det 26: Detector 26
Det 11: Detector 11	Det 27: Detector 27
Det 12: Detector 12	Det 28: Detector 28
Det 13: Detector 13	Det 29: Detector 29
Det 14: Detector 14	Det 30: Detector 30
Det 15: Detector 15	Det 31: Detector 31
Det 16: Detector 16	Det 32: Detector 32

Detector Type/Timers

33	NO	NO	0.0	0	.	0 - Normal
34	NO	NO	0.0	0	.	0 - Normal
35	NO	NO	0.0	0	.	0 - Normal
36	NO	NO	0.0	0	.	0 - Normal
37	NO	NO	0.0	0	.	0 - Normal
38	NO	NO	0.0	0	.	0 - Normal
39	NO	NO	0.0	0	.	0 - Normal
40	NO	NO	0.0	0	.	0 - Normal
41	NO	NO	0.0	0	.	0 - Normal
42	NO	NO	0.0	0	.	0 - Normal
43	NO	NO	0.0	0	.	0 - Normal
44	NO	NO	0.0	0	.	0 - Normal
45	NO	NO	0.0	0	.	0 - Normal
46	NO	NO	0.0	0	.	0 - Normal
47	NO	NO	0.0	0	.	0 - Normal
48	NO	NO	0.0	0	.	0 - Normal
49	NO	NO	0.0	0	.	0 - Normal
50	NO	NO	0.0	0	.	0 - Normal
51	NO	NO	0.0	0	.	0 - Normal
52	NO	NO	0.0	0	.	0 - Normal
53	NO	NO	0.0	0	.	0 - Normal
54	NO	NO	0.0	0	.	0 - Normal
55	NO	NO	0.0	0	.	0 - Normal
56	NO	NO	0.0	0	.	0 - Normal
57	NO	NO	0.0	0	.	0 - Normal
58	NO	NO	0.0	0	.	0 - Normal
59	NO	NO	0.0	0	.	0 - Normal
60	NO	NO	0.0	0	.	0 - Normal
61	NO	NO	0.0	0	.	0 - Normal
62	NO	NO	0.0	0	.	0 - Normal
63	NO	NO	0.0	0	.	0 - Normal
64	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 33: Detector 33	Det 49: Detector 49
Det 34: Detector 34	Det 50: Detector 50
Det 35: Detector 35	Det 51: Detector 51
Det 36: Detector 36	Det 52: Detector 52
Det 37: Detector 37	Det 53: Detector 53
Det 38: Detector 38	Det 54: Detector 54
Det 39: Detector 39	Det 55: Detector 55
Det 40: Detector 40	Det 56: Detector 56
Det 41: Detector 41	Det 57: Detector 57
Det 42: Detector 42	Det 58: Detector 58
Det 43: Detector 43	Det 59: Detector 59
Det 44: Detector 44	Det 60: Detector 60
Det 45: Detector 45	Det 61: Detector 61
Det 46: Detector 46	Det 62: Detector 62
Det 47: Detector 47	Det 63: Detector 63
Det 48: Detector 48	Det 64: Detector 64

Detector Phase Assignment

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X
13	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	.	.	.	.	.

Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
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Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
33	.	.	.	.	.	.	.	.	.	.	.	.
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64	.	.	.	.	.	.	.	.	.	.	.	.

Ped/SD Local Assign,Log Interval

	Phase Ped Detector											
	1	2	3	4	5	6	7	8	9	10	11	12
Is Ped Detector No. . . .	1	2	3	4	5	6	7	8	9	10	11	12

	*Local System Detector No.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Is Local Detector No. . .	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Detector Log Interval . . 0

*NOTE: System master designations cross referenced to local
system detector numbers are:
SDA1 = 1 & 9
SDA2 = 2 & 10
SDB1 = 3 & 11
SDB2 = 4 & 12
SDC1 = 5 & 13
SDC2 = 6 & 14
SDD1 = 7 & 15
SDD2 = 8 & 16

Diagnostic Plans/Fail Action

	Detector															
Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

Diagnostic Plans/Fail Action

	Detector															
Plan	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

Ped Diagnostic Plans

Plan		1	2	3	4	5	6	7	8	9	10	11	12
1	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
2	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
3	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
4	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
5	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
6	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
7	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
8	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1

Detector Diagnostic Intervals

Diagnostic Number	*No-Activity Diagnostic Interval	*Max Presence Diagnostic Interval	Erratic Counts
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0

*NOTE: Scaling is specified in each detector diagnostic plan.

Speed Detectors

	Local Speed Detector							
One Detector Speed:	1	2	3	4	5	6	7	8
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

	Local Speed Detector							
One Detector Speed:	9	10	11	12	13	14	15	16
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

Units. . . . . Inches

NOTE: Speed Detector 1 = STA, Speed Detector 2 = STB

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

Coordinator Manual Command and Options

Manual Enable . . . . . Pattern 0

Split Units . . . . . Percent OffsetUnits . . . . . Percent
Interconnect Format . STD Interconnect Source . NIC
Transition. . . . . SMOOTH Dwell Period. 0
Resync Count. 0

Actuated Coord Phase . . . . Actuated Walk Rest . . . .
Inhibit Max Timing . . . . . Max 2 Select . . . . . .
Floating Force Off . . . . . Multisync. . . . . .

Split Demand:	Call	Time	Cyc Count	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Demand 1 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.
Demand 2 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.

	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Auto Permissive Min Green .	0	0	0	0	0	0	0	0	0	0	0	0

	A	B	C	D	E	F
Free Alternate Sequence . .	.	.	.	.	.	.

Coordination Patterns

Preemptors

Preemptor 1

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Preemptor 2

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptors

Preemptor 3

Active		Det Lock	Ped Dark
Priority Preemption		Yel-Red To Grn	Ped Active
Outputs Only During Hold		Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP		Terminate Phases	Ped Clr Thru Yel
Don't Override Flash		Duration Time	0
Flash During Hold		Delay Time	0
No CVM in Flash		Inhibit Time	0
Fast Flash Grn on Hold Phase		Min Ped Clear	0
Enable Max Time		Max Time	0
		Exit Max	0
		Min Hold Time	0
		Hold Delay Time	0

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptor 4

Active		Det Lock	Ped Dark
Priority Preemption		Yel-Red To Grn	Ped Active
Outputs Only During Hold		Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP		Terminate Phases	Ped Clr Thru Yel
Don't Override Flash		Duration Time	0
Flash During Hold		Delay Time	0
No CVM in Flash		Inhibit Time	0
Fast Flash Grn on Hold Phase		Min Ped Clear	0
Enable Max Time		Max Time	0
		Exit Max	0
		Min Hold Time	0
		Hold Delay Time	0

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptors

Preemptor 5

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptor 6

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Bus Preemptors

	Bus Preemptor 1	2	3	4
Preemptor Active	.	.	.	.
Detector Lock	.	.	.	.
Maximum Time	0	0	0	0
Reservice Time	0	0	0	0
Delay Time	0	0	0	0
Inhibit Time	0	0	0	0
Entrance Green	0	0	0	0
Entrance Ped Clearance	0	0	0	0
Entrance Yellow	0.0	0.0	0.0	0.0
Entrance Red	0.0	0.0	0.0	0.0
Minimum Hold Time	0	0	0	0

	Hold Phases 1	2	3	4	5	6	7	8	9	10	11	12
Preemptor 1	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 2	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 3	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 4	.	.	.	.	.	.	.	.	.	.	.	.

NIC/TOD Clock/Calendar

Manual NIC Program Step 0

Manual TOD Program Step 0

NIC Resync Time 0000

Sync Reference is . . . . . Reference Time

Week 1 Begins on 1st Sunday . . . . . NO If NO, then week containing Jan. 1

Disable Daylight Savings Time . . . . . NO

Daylight Savings
Begins Last Sunday in March . . . . . NO If NO, then Second Sunday as per 2007 DST Law

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

TOD Weekly/Yearly

Weekly Program Numbers

	1	2	3	4	5	6	7	8	9	10	
Sunday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Monday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Tuesday. . .	1	1	1	1	1	1	1	1	1	1	Program No.
Wednesday. .	1	1	1	1	1	1	1	1	1	1	Program No.
Thursday . .	1	1	1	1	1	1	1	1	1	1	Program No.
Friday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Saturday . .	1	1	1	1	1	1	1	1	1	1	Program No.

Week of Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Holiday Programs

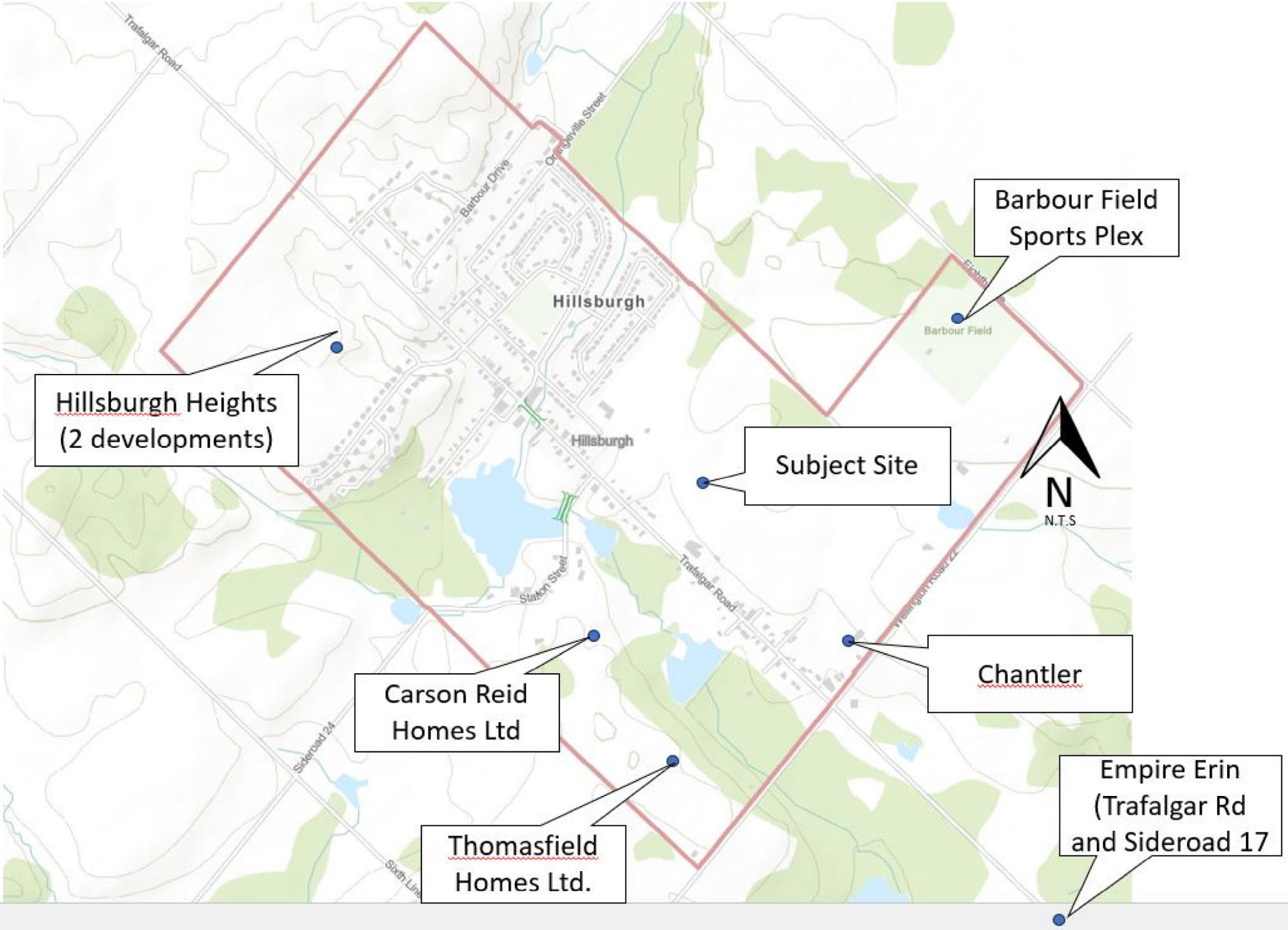
Holiday	Type	Month	Day of Week/ Day of Month	Week of Year/ Year	Program
1	Fixed	0	0	0	0
2	Fixed	0	0	0	0
3	Fixed	0	0	0	0
4	Fixed	0	0	0	0
5	Fixed	0	0	0	0
6	Fixed	0	0	0	0
7	Fixed	0	0	0	0
8	Fixed	0	0	0	0
9	Fixed	0	0	0	0
10	Fixed	0	0	0	0
11	Fixed	0	0	0	0
12	Fixed	0	0	0	0
13	Fixed	0	0	0	0
14	Fixed	0	0	0	0
15	Fixed	0	0	0	0
16	Fixed	0	0	0	0
17	Fixed	0	0	0	0
18	Fixed	0	0	0	0
19	Fixed	0	0	0	0
20	Fixed	0	0	0	0
21	Fixed	0	0	0	0
22	Fixed	0	0	0	0
23	Fixed	0	0	0	0
24	Fixed	0	0	0	0
25	Fixed	0	0	0	0
26	Fixed	0	0	0	0
27	Fixed	0	0	0	0
28	Fixed	0	0	0	0
29	Fixed	0	0	0	0
30	Fixed	0	0	0	0
31	Fixed	0	0	0	0
32	Fixed	0	0	0	0
33	Fixed	0	0	0	0
34	Fixed	0	0	0	0
35	Fixed	0	0	0	0
36	Fixed	0	0	0	0

NIC Program Steps

Step	Program	Step Begins	Pattern	Override

Appendix B:

Background Developments Map


Barbour Field Sports Plex
Hillsburgh Heights (2 developments)
Subject Site
N
N.T.S
Carson Reid Homes Ltd
Chantler
Thomasfield Homes Ltd.
Empire Erin (Trafalgar Rd and Sideroad 17
Trafalgar Road
Barbour Drive
Orangeville Street
Hillsburgh
Barbour Field
Station Street
Sideroad 24
Sixth Line

Appendix C:

Trip Generation Graphs – Barbour Fields

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
411

LAND USE GROUP:
(400-499) Recreational

LAND USE :
411 - Public Park

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

INDEPENDENT VARIABLE (IV):
Acres

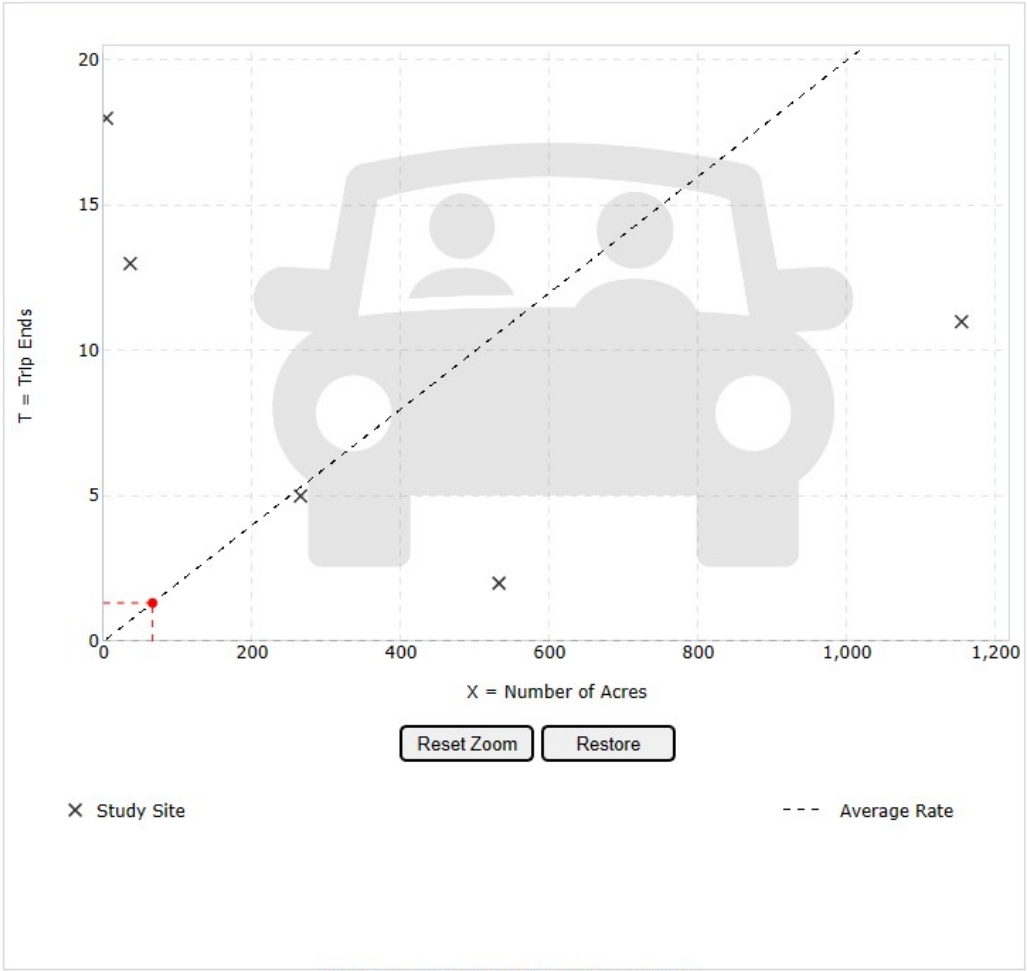
TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
66 Calculate

Data Plot and Equation

Caution – Small Sample Size



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Public Park (411) Click for Description and Data Plots

Independent Variable:
Acres

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
5

Avg. Num. of Acres:
398

Average Rate:
0.02

Range of Rates:
0.00 - 4.50

Standard Deviation:
0.23

Fitted Curve Equation:
Not Given

R^2:
****

Directional Distribution:
59% entering, 41% exiting

Calculated Trip Ends:
Average Rate: 1 (Total), 1 (Entry), 0 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
411

LAND USE GROUP:
(400-499) Recreational

LAND USE :
411 - Public Park

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

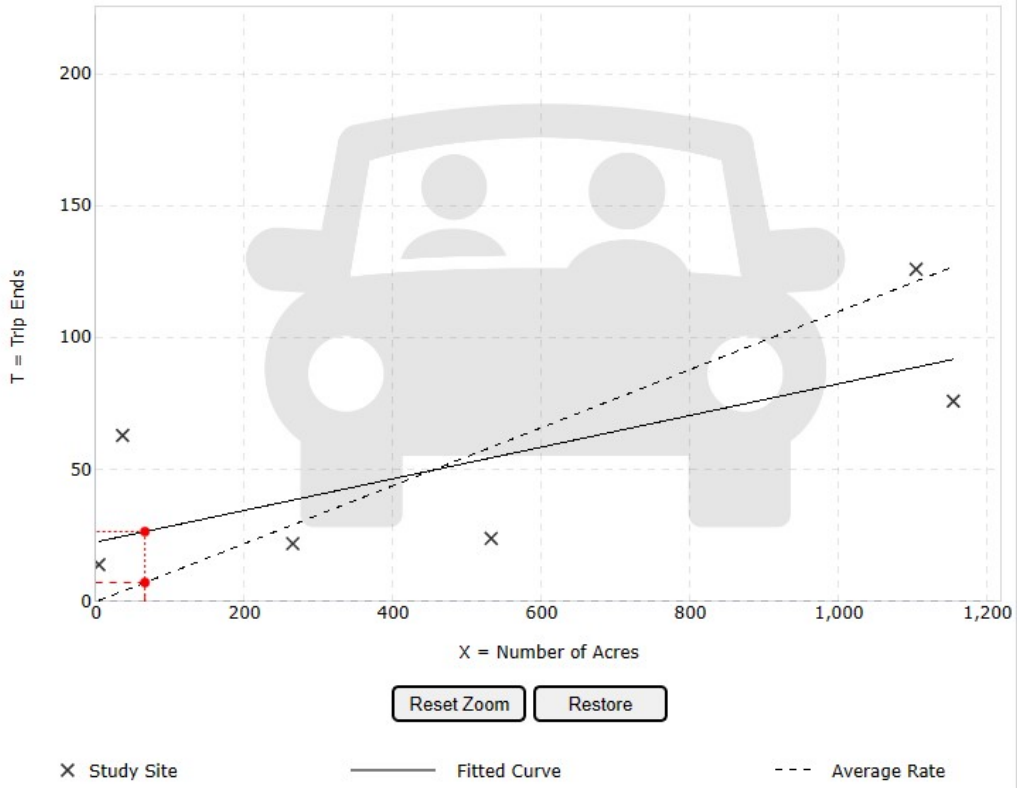
INDEPENDENT VARIABLE (IV):
Acres

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
66 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Public Park (411) Click for Description and Data Plots

Independent Variable:
Acres

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
6

Avg. Num. of Acres:
516

Average Rate:
0.11

Range of Rates:
0.05 - 3.50

Standard Deviation:
0.24

Fitted Curve Equation:
T = 0.06(X) + 22.60

R^2:
0.53

Directional Distribution:
55% entering, 45% exiting

Calculated Trip Ends:
Average Rate: 7 (Total), 4 (Entry), 3 (Exit)
Fitted Curve: 27 (Total), 15 (Entry), 12 (Exit)

Appendix D:

Trip Generation Graphs – Subject Site

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
220

LAND USE GROUP:
(200-299) Residential

LAND USE :
220 - Multifamily Housing (Low-Rise)

LAND USE SUBCATEGORY:
Not Close to Rail Transit

SETTING/LOCATION:
General Urban/Suburban

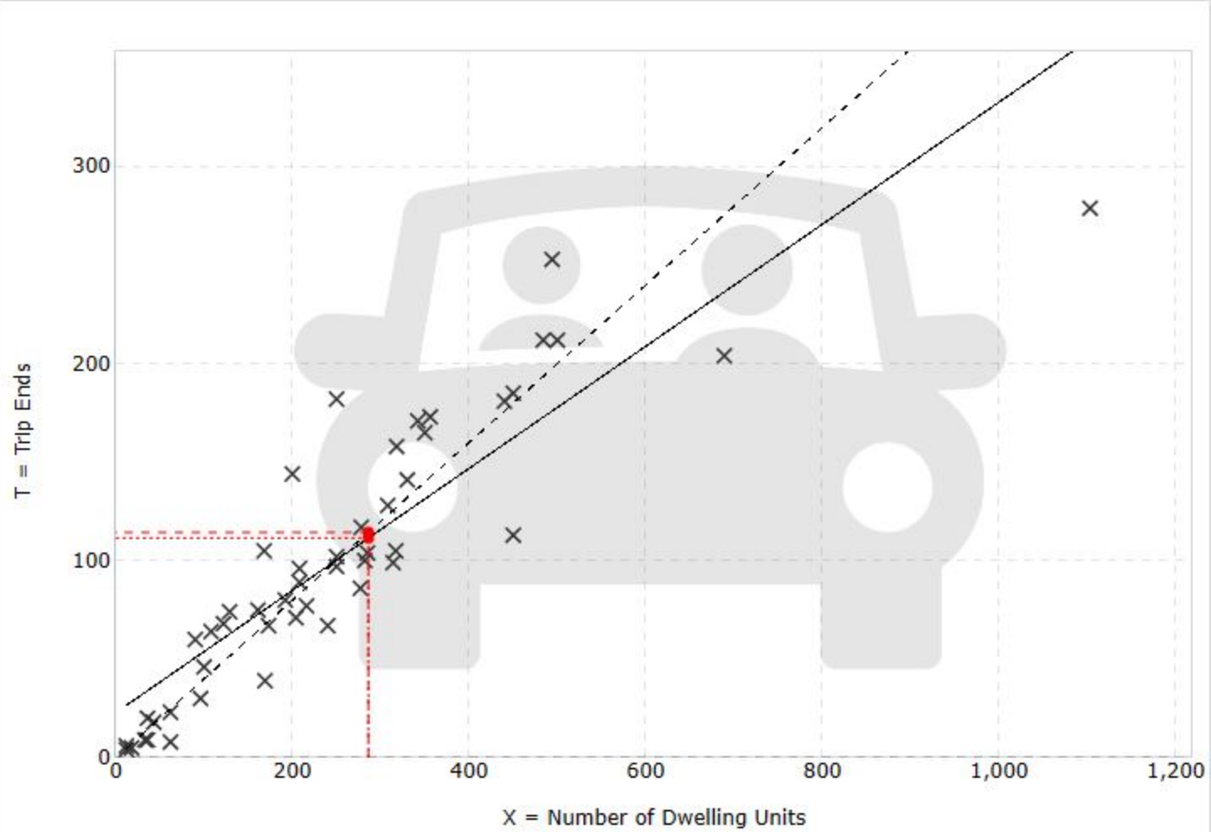
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
286 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Low-Rise) - Not Close to Rail Transit (220) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
49

Avg. Num. of Dwelling Units:
249

Average Rate:
0.40

Range of Rates:
0.13 - 0.73

Standard Deviation:
0.12

Fitted Curve Equation:
T = 0.31(X) + 22.85

R^2:
0.79

Directional Distribution:
24% entering, 76% exiting

Calculated Trip Ends:
Average Rate: 114 (Total), 27 (Entry), 87 (Exit)
Fitted Curve: 112 (Total), 27 (Entry), 85 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
220

LAND USE GROUP:
(200-299) Residential

LAND USE :
220 - Multifamily Housing (Low-Rise)

LAND USE SUBCATEGORY:
Not Close to Rail Transit

SETTING/LOCATION:
General Urban/Suburban

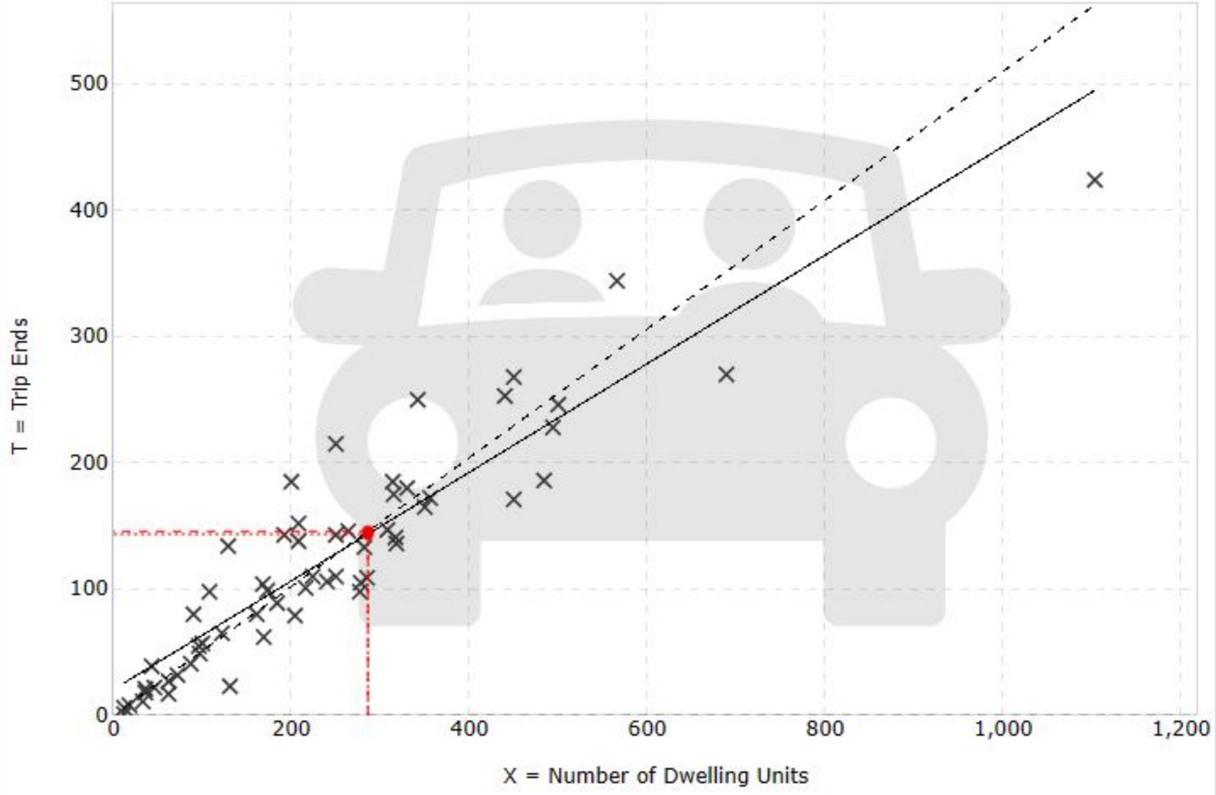
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
286 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Low-Rise) - Not Close to Rail Transit (220) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
59

Avg. Num. of Dwelling Units:
241

Average Rate:
0.51

Range of Rates:
0.08 - 1.04

Standard Deviation:
0.15

Fitted Curve Equation:
T = 0.43(X) + 20.55

R^2:
0.84

Directional Distribution:
63% entering, 37% exiting

Calculated Trip Ends:
Average Rate: 146 (Total), 92 (Entry), 54 (Exit)
Fitted Curve: 144 (Total), 90 (Entry), 54 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

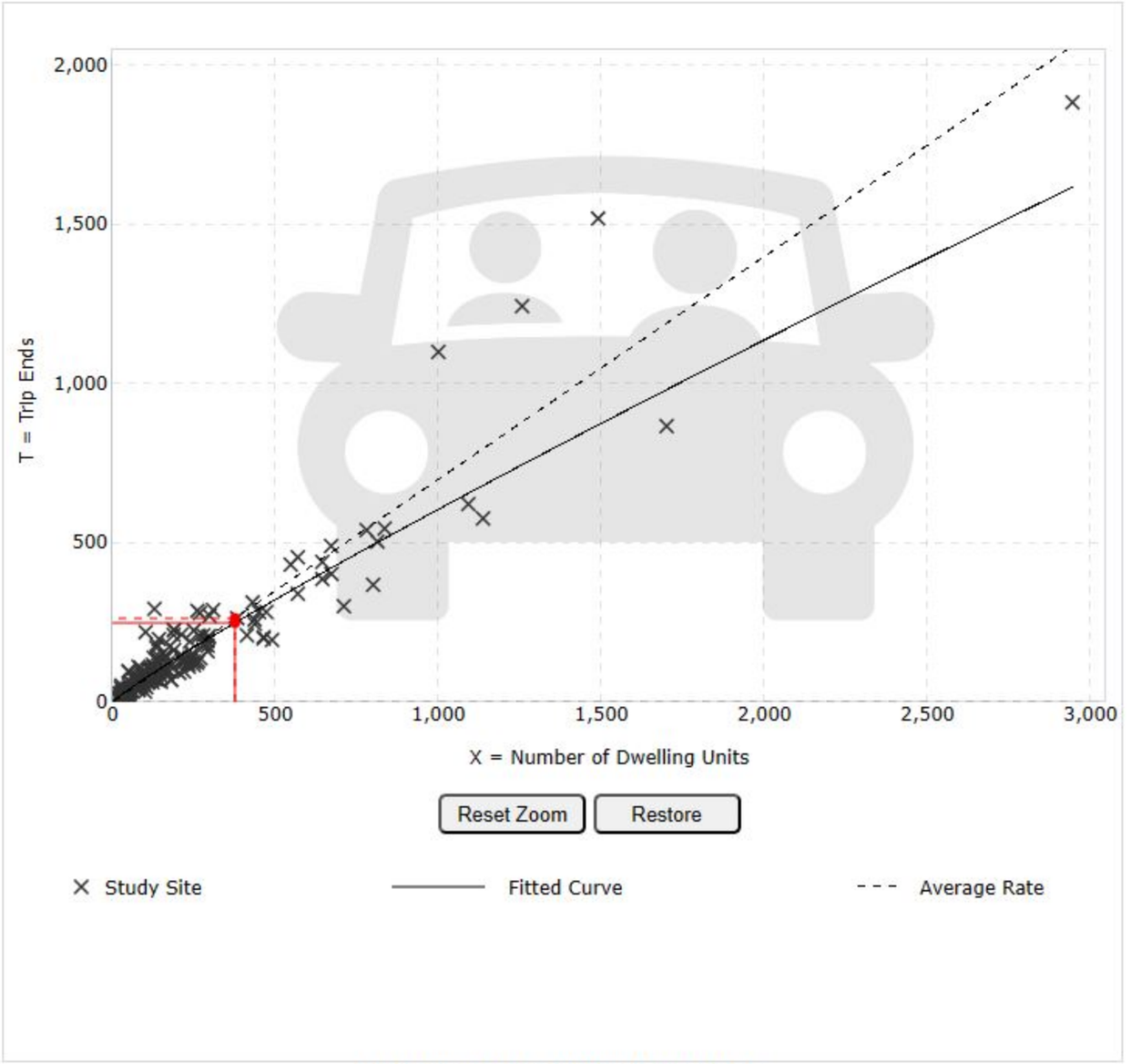
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
376 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
192

Avg. Num. of Dwelling Units:
226

Average Rate:
0.70

Range of Rates:
0.27 - 2.27

Standard Deviation:
0.24

Fitted Curve Equation:
Ln(T) = 0.91 Ln(X) + 0.12

R^2:
0.90

Directional Distribution:
25% entering, 75% exiting

Calculated Trip Ends:
Average Rate: 263 (Total), 66 (Entry), 197 (Exit)
Fitted Curve: 249 (Total), 62 (Entry), 187 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

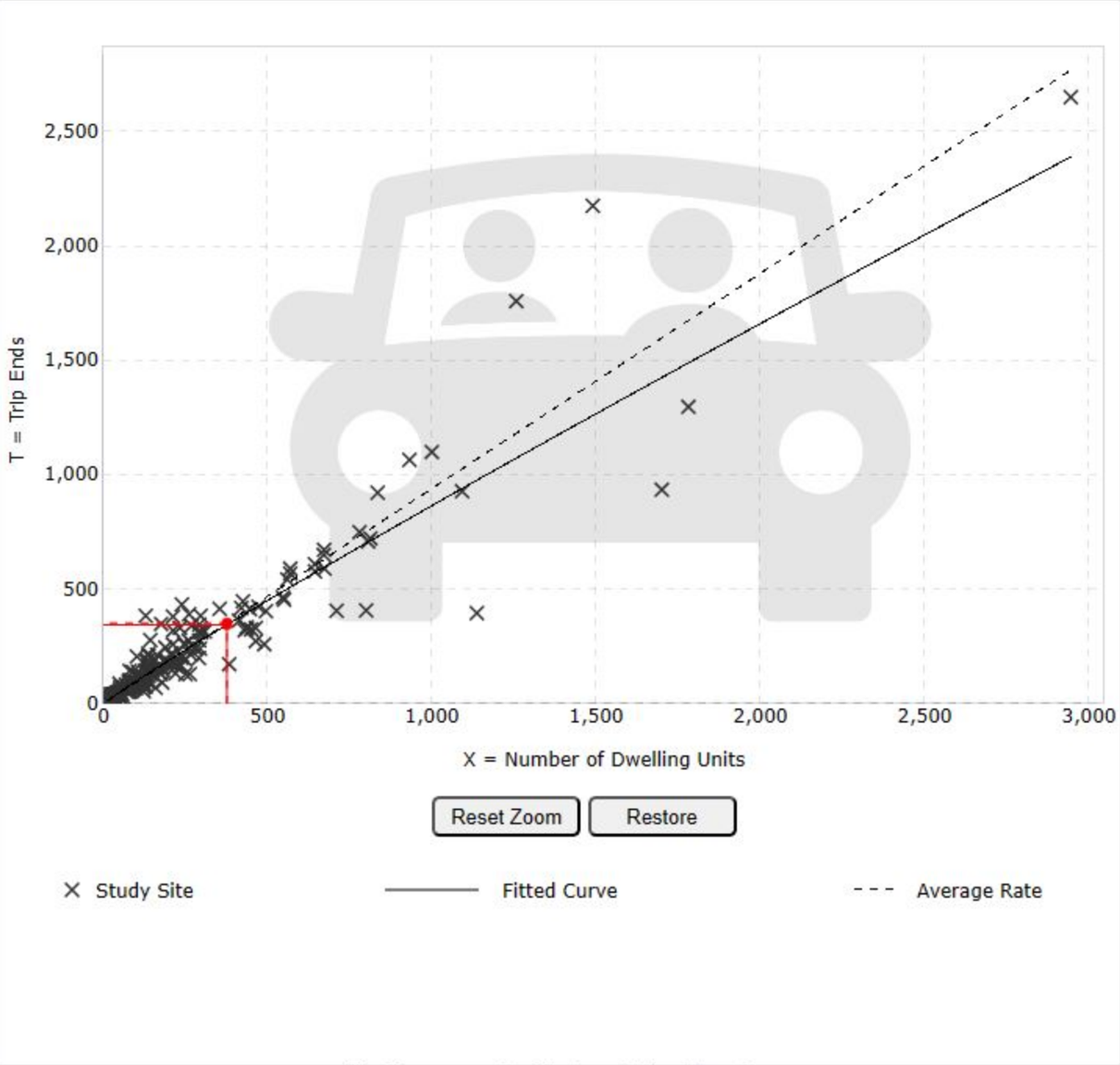
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
376 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
208

Avg. Num. of Dwelling Units:
248

Average Rate:
0.94

Range of Rates:
0.35 - 2.98

Standard Deviation:
0.31

Fitted Curve Equation:
Ln(T) = 0.94 Ln(X) + 0.27

R^2:
0.92

Directional Distribution:
63% entering, 37% exiting

Calculated Trip Ends:
Average Rate: 353 (Total), 223 (Entry), 130 (Exit)
Fitted Curve: 345 (Total), 217 (Entry), 128 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
251

LAND USE GROUP:
(200-299) Residential

LAND USE :
251 - Senior Adult Housing - Single-Family

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

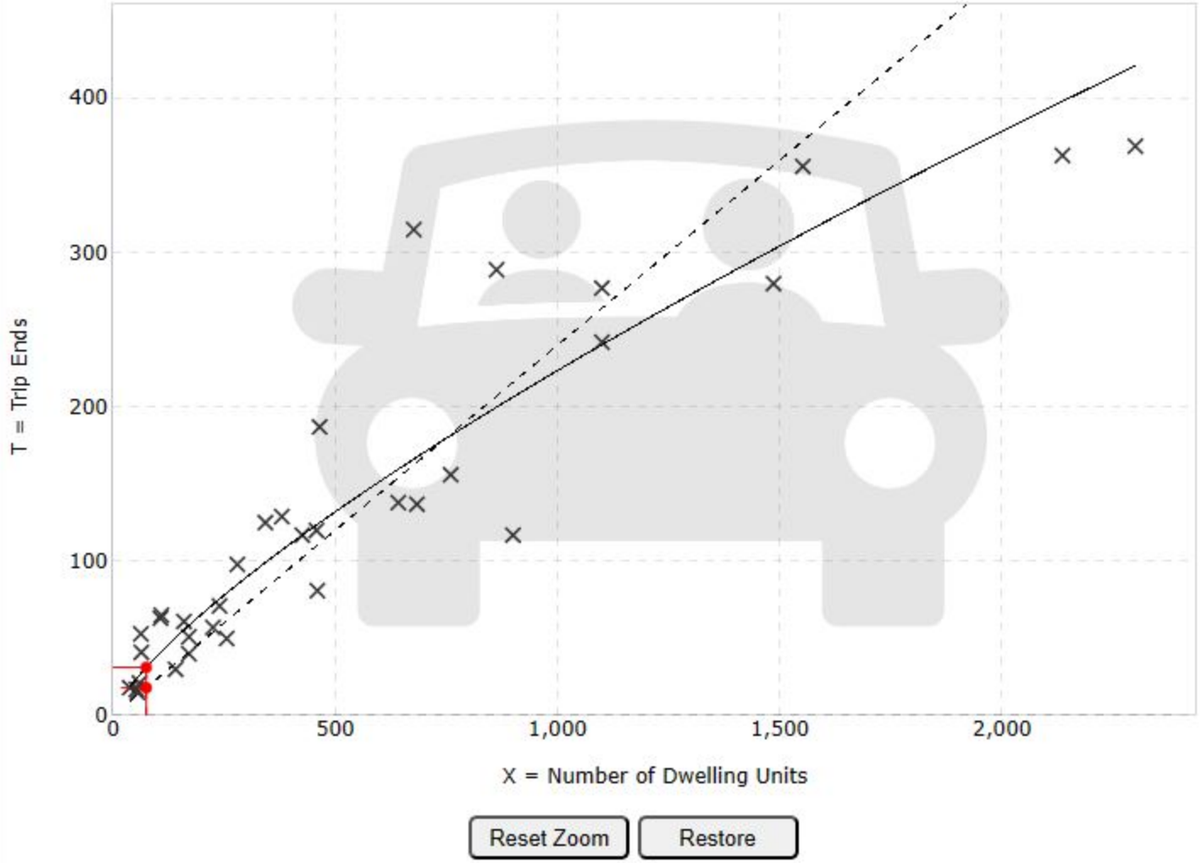
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
75 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Single-Family (251) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
34

Avg. Num. of Dwelling Units:
557

Average Rate:
0.24

Range of Rates:
0.13 - 0.84

Standard Deviation:
0.10

Fitted Curve Equation:
Ln(T) = 0.76 Ln(X) + 0.16

R^2:
0.88

Directional Distribution:
33% entering, 67% exiting

Calculated Trip Ends:
Average Rate: 18 (Total), 6 (Entry), 12 (Exit)
Fitted Curve: 31 (Total), 10 (Entry), 21 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
251

LAND USE GROUP:
(200-299) Residential

LAND USE :
251 - Senior Adult Housing - Single-Family

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

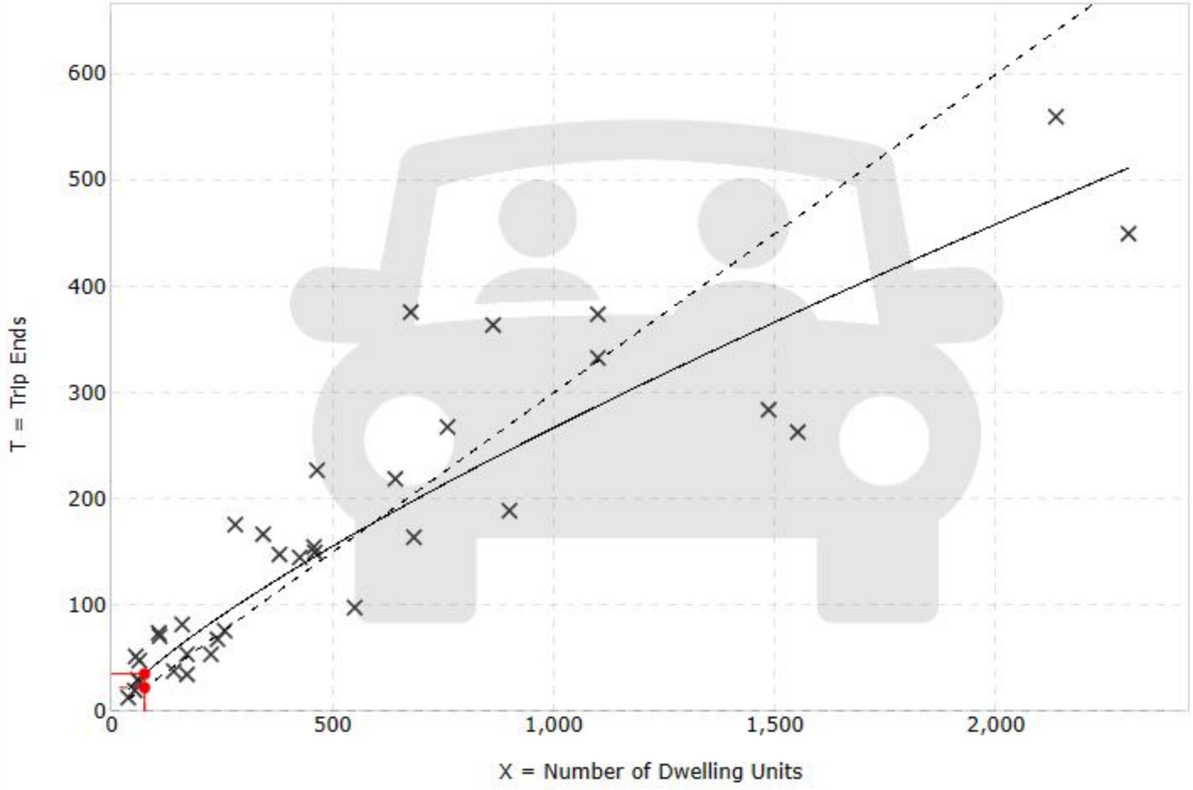
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
75 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Single-Family (251) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
35

Avg. Num. of Dwelling Units:
556

Average Rate:
0.30

Range of Rates:
0.17 - 0.95

Standard Deviation:
0.12

Fitted Curve Equation:
Ln(T) = 0.78 Ln(X) + 0.20

R^2:
0.86

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 23 (Total), 14 (Entry), 9 (Exit)
Fitted Curve: 35 (Total), 22 (Entry), 13 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
252

LAND USE GROUP:
(200-299) Residential

LAND USE :
252 - Senior Adult Housing - Multifamily

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

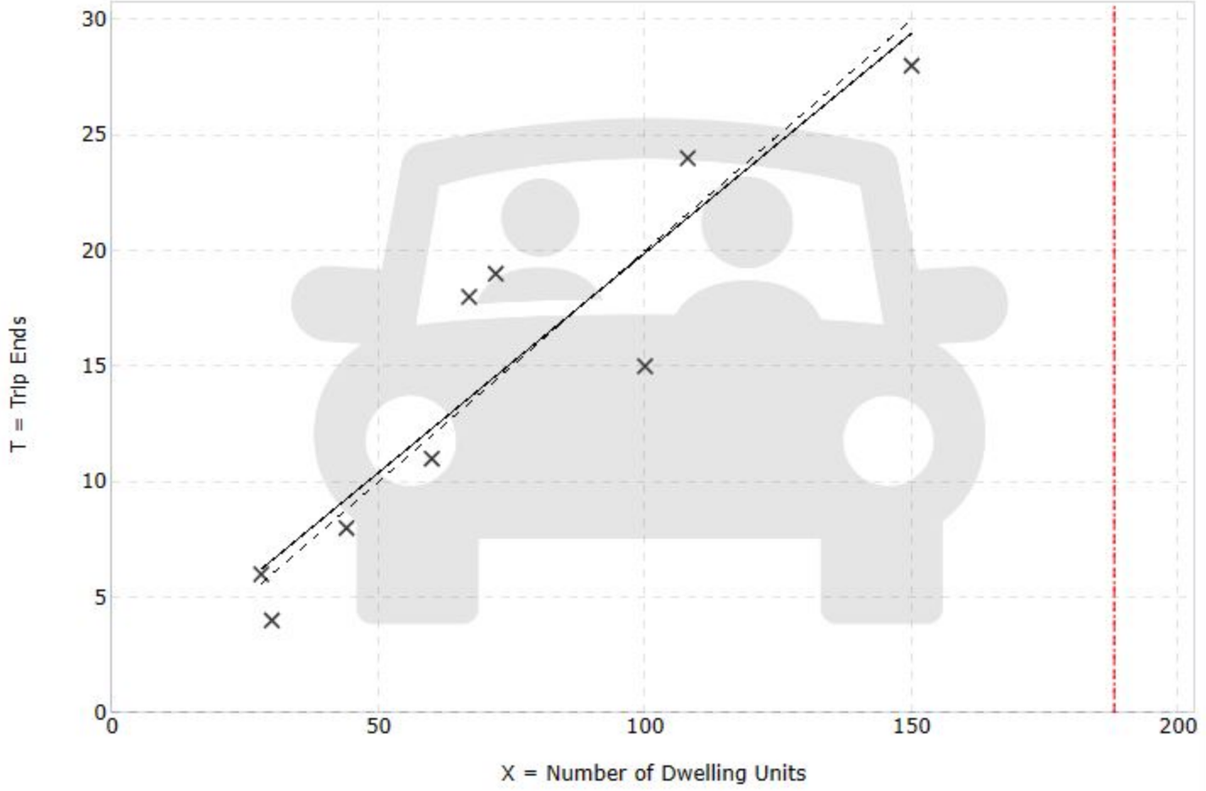
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
188 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Multifamily (252) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
9

Avg. Num. of Dwelling Units:
73

Average Rate:
0.20

Range of Rates:
0.13 - 0.27

Standard Deviation:
0.04

Fitted Curve Equation:
T = 0.19(X) + 0.90

R^2:
0.85

Directional Distribution:
34% entering, 66% exiting

Calculated Trip Ends:
Average Rate: 38 (Total), 13 (Entry), 25 (Exit)
Fitted Curve: 37 (Total), 12 (Entry), 25 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
252

LAND USE GROUP:
(200-299) Residential

LAND USE :
252 - Senior Adult Housing - Multifamily

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

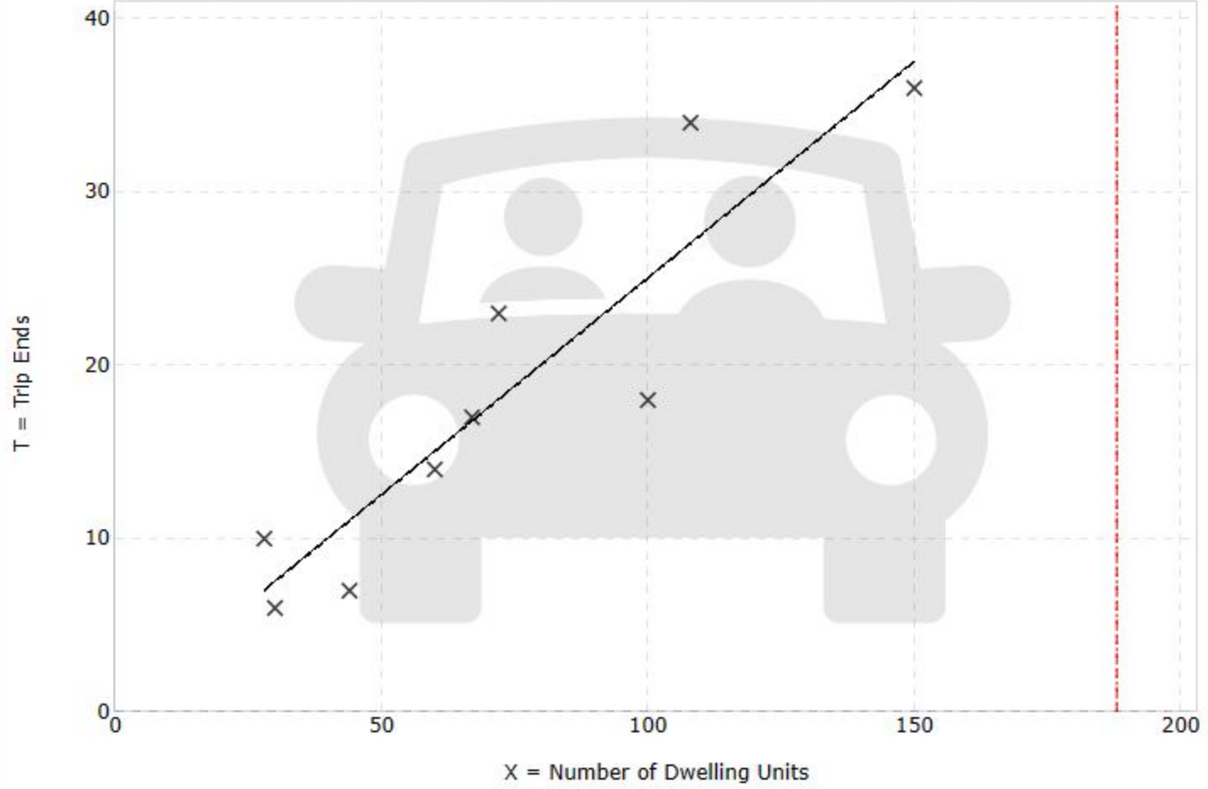
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
188 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Multifamily (252) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
9

Avg. Num. of Dwelling Units:
73

Average Rate:
0.25

Range of Rates:
0.16 - 0.36

Standard Deviation:
0.06

Fitted Curve Equation:
T = 0.25(X) + 0.07

R^2:
0.84

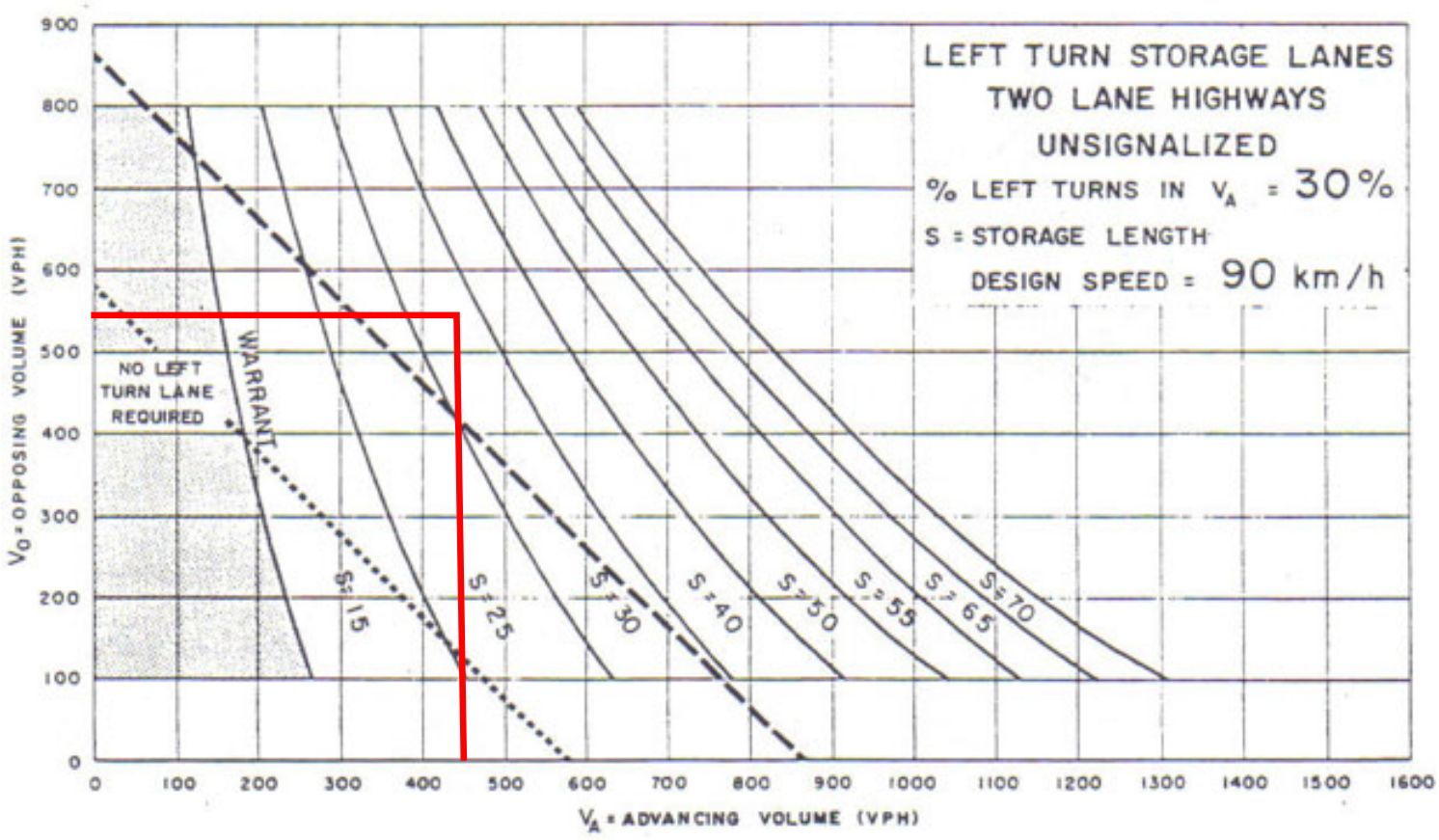
Directional Distribution:
56% entering, 44% exiting

Calculated Trip Ends:
Average Rate: 47 (Total), 26 (Entry), 21 (Exit)
Fitted Curve: 47 (Total), 26 (Entry), 21 (Exit)

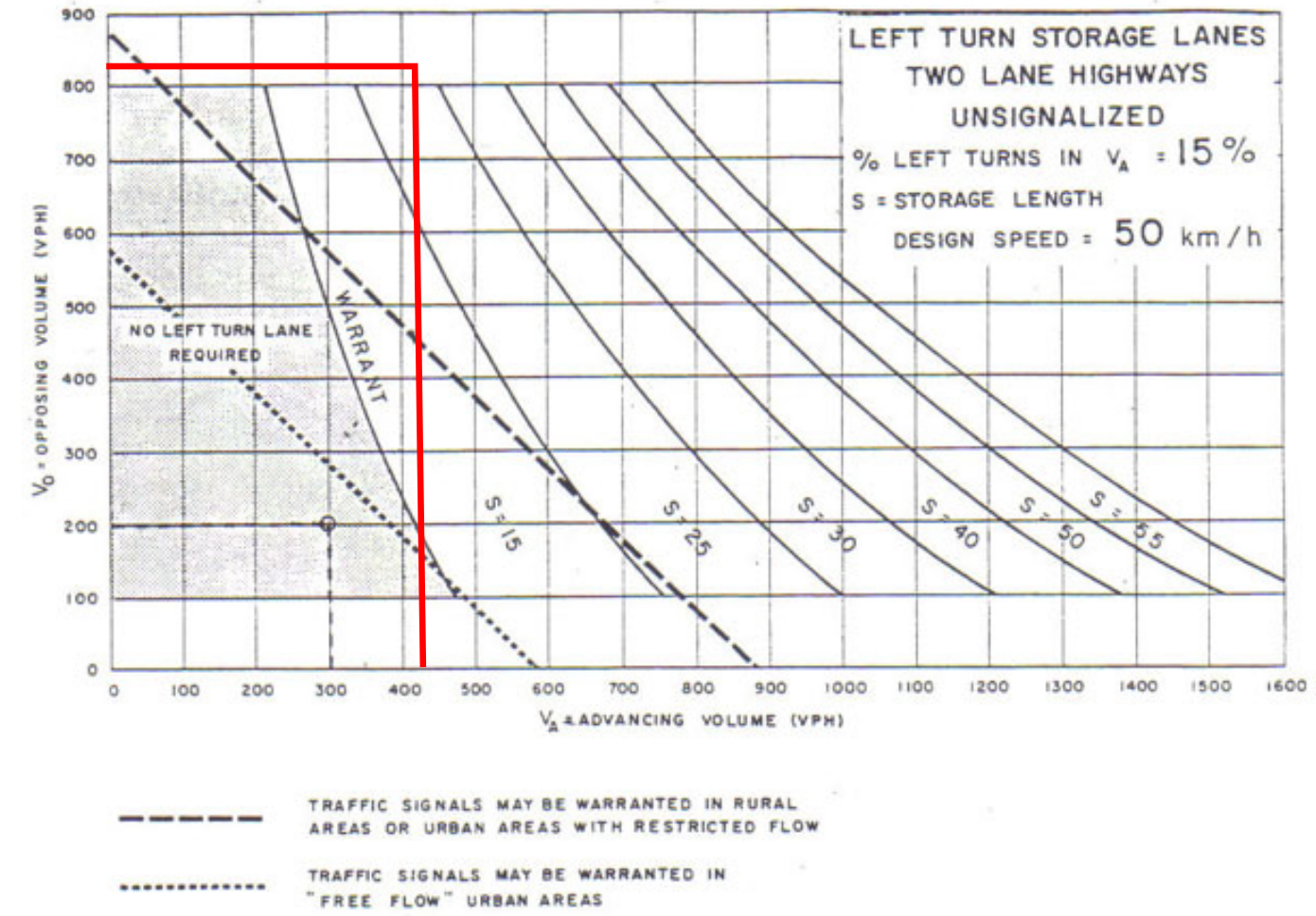
Appendix E:

Left-Turn Graphs

Wellington Rd 22 & East Collector Rd – FT 2036 - PM Peak Hour



Trafalgar Rd & Market St / St "16"– FT 2036 - PM Peak Hour



Trafalgar Rd & Station St/ St “2” - FT 2036 - PM Peak Hour

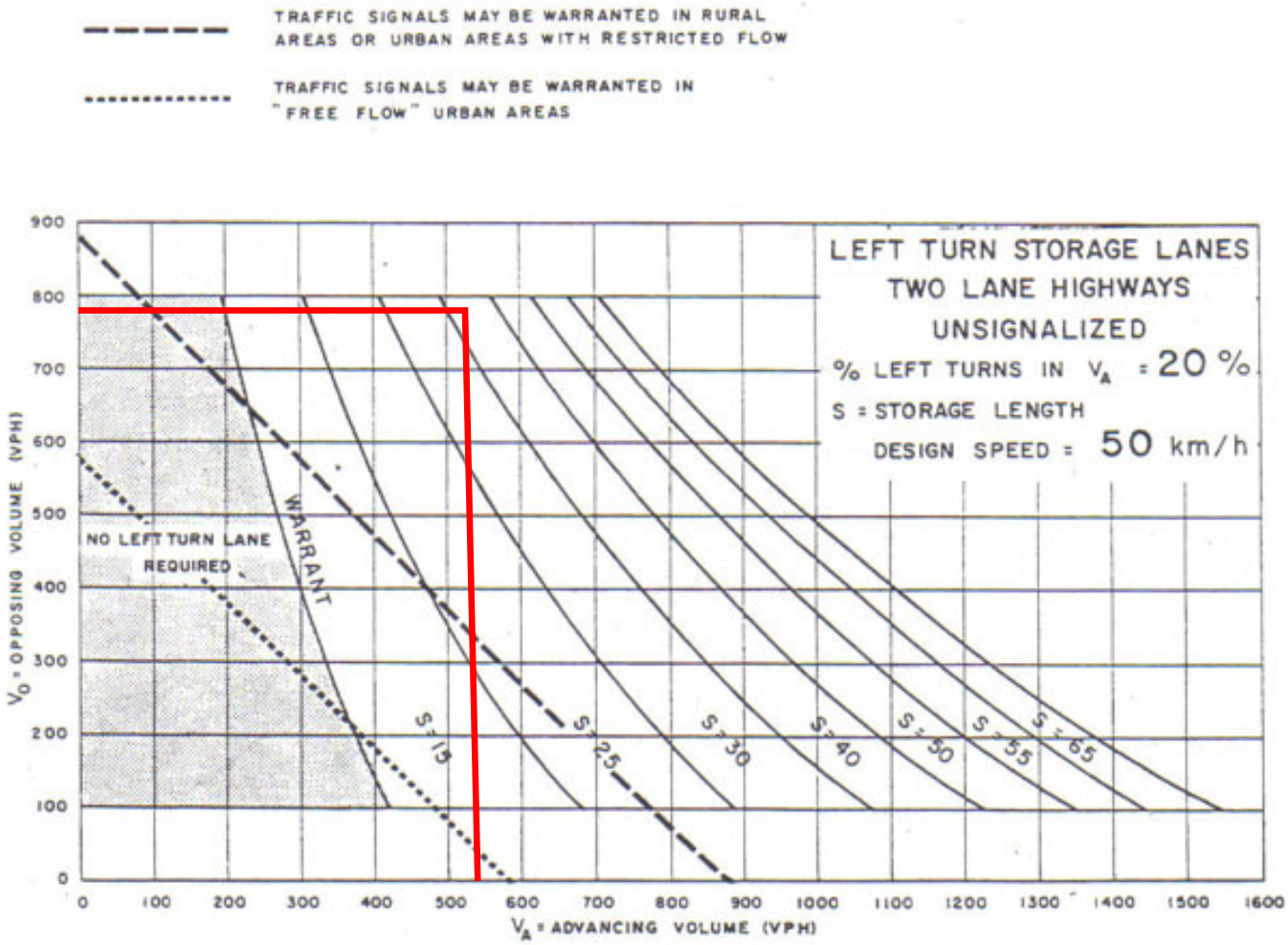


Figure EA-3

Appendix F:

Signal Warrants

Signal Warrant Calculation

Major Street: Trafalgar Road (Wellington Road 24)

Minor Street: Station Street / Street "2"

Comment FT 2036 Volumes

VOLUME	AM	PM	FACTOR *	
1A - All	1,046	1,480	n/a	505
1B - Minor	140	154	20%	59
2A - Major	906	1,326	20%	446
2B - Crossi	57	66	20%	25

* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

Number of Approaches: 1 [X] 2 [ ]

Tee Intersection Configuration: Yes [ ] No [X]

Flow Condition: Free Flow (Rural) [ ] Restricted Flow (Urban) [X]

OVERALL WARRANT

150% Satisfied:	Yes [ ]	No [X]	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes [ ]	No [X]	

* Consider full underground provisions if 100% for forecast traffi

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WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
ALL APPROACHES	480	720	600	900	505
	% FULFILLED				70%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
MINOR STREET APPROACHES	120	170	120	170	59
	% FULFILLED				35%

150% Satisfied:	Yes [ ]	No [X]
120% Satisfied:	Yes [ ]	No [X]
100% Satisfied:	Yes [ ]	No [X]
80% Satisfied:	Yes [ ]	No [X]

WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
MAJOR STREET APPROACHES	480	720	600	900	446
	% FULFILLED				62%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	25
	% FULFILLED				33%

150% Satisfied:	Yes [ ]	No [X]
120% Satisfied:	Yes [ ]	No [X]
100% Satisfied:	Yes [ ]	No [X]
80% Satisfied:	Yes [ ]	No [X]

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on minor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both minor streets, (2) heaviest through from minor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

Signal Warrant Calculation

Major Street: Trafalgar Road (Wellington Road 24)

Minor Street: Market Street /Street "16"

Comment FT 2036 Volumes

Number of Lanes on Approaches: 1 [x] 2 [ ]

Tee Intersection Configuration: Yes [X] No [ ]

Flow Condition: Free Flow (Rural) [ ] Restricted Flow (Urban) [X]

VOLUME	AM	PM	FACTOR *	
1A - All	984	1,305	n/a	457
1B - Minor	64	43	20%	21
2A - Major	920	1,262	20%	436
2B - Crossi	40	19	20%	12

* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

OVERALL WARRANT

150% Satisfied:	Yes [ ]	No [X]	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes [ ]	No [X]	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes [ ]	No [X]	

* Consider full underground provisions if 100% for forecast traffi

WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
ALL APPROACHES	480	720	600	900	457
	% FULFILLED				63%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
MINOR STREET APPROACHES	180	255	180	255	21
	% FULFILLED				8%

150% Satisfied:	Yes [ ]	No [X]
120% Satisfied:	Yes [ ]	No [X]
100% Satisfied:	Yes [ ]	No [X]
80% Satisfied:	Yes [ ]	No [X]

WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
MAJOR STREET APPROACHES	480	720	600	900	436
	% FULFILLED				61%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW X	FREE FLOW	REST. FLOW	
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	12
	% FULFILLED				16%

150% Satisfied:	Yes [ ]	No [X]
120% Satisfied:	Yes [ ]	No [X]
100% Satisfied:	Yes [ ]	No [X]
80% Satisfied:	Yes [ ]	No [X]

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on minor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both minor streets, (2) heaviest through from minor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

Appendix G:

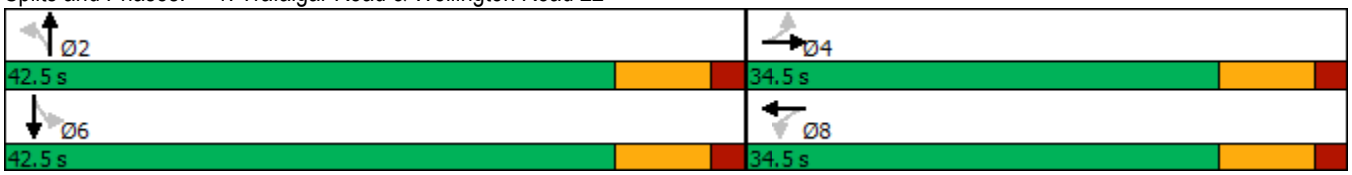
Synchro Outputs

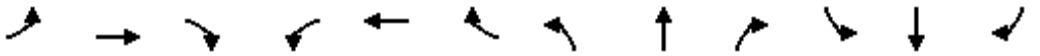
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	87	29	35	46	31	5	100	31	55	208	33
Future Volume (vph)	26	87	29	35	46	31	5	100	31	55	208	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.972			0.962			0.964			0.979	
Flt Protected		0.991			0.985		0.950			0.950		
Satd. Flow (prot)	0	1772	0	0	1585	0	1805	1714	0	1687	1706	0
Flt Permitted		0.907			0.869		0.597			0.666		
Satd. Flow (perm)	0	1622	0	0	1398	0	1134	1714	0	1183	1706	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			28			27			14	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			880.8			555.2			339.8	
Travel Time (s)		31.5			39.6			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Adj. Flow (vph)	28	95	32	38	50	34	5	109	34	60	226	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	155	0	0	122	0	5	143	0	60	262	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		15.0			15.0		40.1	40.1		40.1	40.1	
Actuated g/C Ratio		0.24			0.24		0.63	0.63		0.63	0.63	
v/c Ratio		0.39			0.35		0.01	0.13		0.08	0.24	
Control Delay		21.9			19.8		7.0	6.5		7.8	8.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.9			19.8		7.0	6.5		7.8	8.0	
LOS		C			B		A	A		A	A	
Approach Delay		21.9			19.8			6.6			8.0	
Approach LOS		C			B			A			A	
Queue Length 50th (m)		14.5			9.9		0.3	6.7		3.4	15.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		30.0			23.3		1.6	14.4		8.5	27.9	
Internal Link Dist (m)		589.2			856.8			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		701			612		715	1091		746	1081	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.22			0.20		0.01	0.13		0.08	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 63.5			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Trafalgar Road & Wellington Road 22





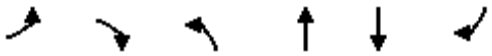
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	87	29	35	46	31	5	100	31	55	208	33
Future Volume (vph)	26	87	29	35	46	31	5	100	31	55	208	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.96		1.00	0.96		1.00	0.98	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772			1585		1805	1715		1687	1707	
Flt Permitted		0.91			0.87		0.60	1.00		0.67	1.00	
Satd. Flow (perm)		1623			1398		1135	1715		1182	1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	95	32	38	50	34	5	109	34	60	226	36
RTOR Reduction (vph)	0	16	0	0	23	0	0	11	0	0	6	0
Lane Group Flow (vph)	0	139	0	0	99	0	5	132	0	60	256	0
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		11.7			11.7		38.4	38.4		38.4	38.4	
Effective Green, g (s)		11.7			11.7		38.4	38.4		38.4	38.4	
Actuated g/C Ratio		0.18			0.18		0.59	0.59		0.59	0.59	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		291			251		669	1011		697	1006	
v/s Ratio Prot								0.08			c0.15	
v/s Ratio Perm		c0.09			0.07		0.00			0.05		
v/c Ratio		0.48			0.39		0.01	0.13		0.09	0.25	
Uniform Delay, d1		24.0			23.6		5.5	5.9		5.8	6.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2			1.0		0.0	0.3		0.2	0.6	
Delay (s)		25.2			24.6		5.5	6.2		6.0	7.1	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		25.2			24.6			6.2			6.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	1	156	1	1	296
Future Volume (Veh/h)	0	1	156	1	1	296
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	170	1	1	322
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked						
vC, conflicting volume	494	170			171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	494	170			171	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	537	879			1418	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	1	171	323
Volume Left	0	0	1
Volume Right	1	1	0
cSH	879	1700	1418
Volume to Capacity	0.00	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	9.1	0.0	0.0
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.0
Approach LOS	A		

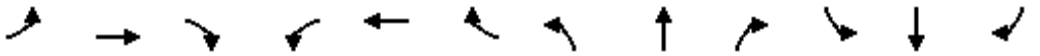
Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		26.4%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	12	2	155	285	5
Future Volume (Veh/h)	3	12	2	155	285	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	13	2	168	310	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	484	312	315			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484	312	315			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	99	98	100			
cM capacity (veh/h)	544	732	1217			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	170	315
Volume Left	3	2	0
Volume Right	13	0	5
cSH	688	1217	1700
Volume to Capacity	0.02	0.00	0.19
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	10.4	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

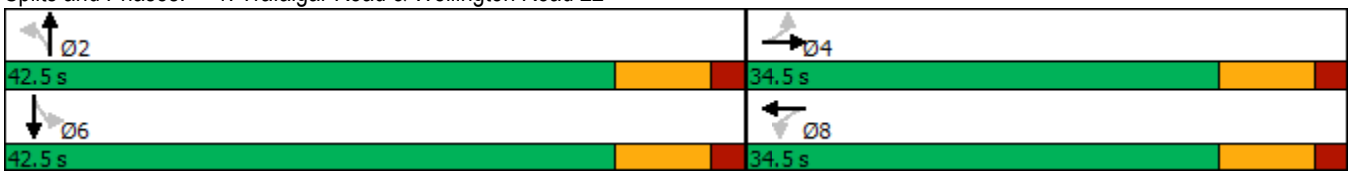


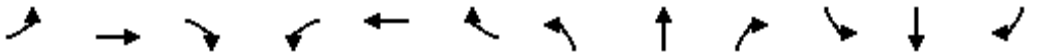
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	54	12	29	84	72	29	282	56	43	109	32
Future Volume (vph)	52	54	12	29	84	72	29	282	56	43	109	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.948			0.975			0.966	
Flt Protected		0.978			0.992		0.950			0.950		
Satd. Flow (prot)	0	1732	0	0	1690	0	1805	1773	0	1583	1769	0
Flt Permitted		0.782			0.920		0.660			0.537		
Satd. Flow (perm)	0	1385	0	0	1567	0	1254	1773	0	895	1769	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			46			17			25	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			880.8			555.2			339.8	
Travel Time (s)		31.5			39.6			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
Adj. Flow (vph)	57	59	13	32	91	78	32	307	61	47	118	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	201	0	32	368	0	47	153	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		15.5			15.5		37.0	37.0		37.0	37.0	
Actuated g/C Ratio		0.23			0.23		0.55	0.55		0.55	0.55	
v/c Ratio		0.40			0.51		0.05	0.38		0.10	0.16	
Control Delay		24.1			21.8		7.8	9.9		8.4	7.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.1			21.8		7.8	9.9		8.4	7.0	
LOS		C			C		A	A		A	A	
Approach Delay		24.1			21.8			9.7			7.3	
Approach LOS		C			C			A			A	
Queue Length 50th (m)		13.0			16.8		1.8	23.4		2.7	7.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		27.2			35.2		5.6	43.1		7.8	16.6	
Internal Link Dist (m)		589.2			856.8			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		560			656		687	979		490	981	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.23			0.31		0.05	0.38		0.10	0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 67.5			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Trafalgar Road & Wellington Road 22





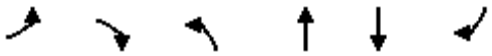
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	54	12	29	84	72	29	282	56	43	109	32
Future Volume (vph)	52	54	12	29	84	72	29	282	56	43	109	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.95		1.00	0.98		1.00	0.97	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1734			1689		1805	1773		1583	1768	
Flt Permitted		0.78			0.92		0.66	1.00		0.54	1.00	
Satd. Flow (perm)		1386			1567		1254	1773		895	1768	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	59	13	32	91	78	32	307	61	47	118	35
RTOR Reduction (vph)	0	6	0	0	35	0	0	8	0	0	11	0
Lane Group Flow (vph)	0	123	0	0	166	0	32	360	0	47	142	0
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
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)		15.5			15.5		37.0	37.0		37.0	37.0	
Effective Green, g (s)		15.5			15.5		37.0	37.0		37.0	37.0	
Actuated g/C Ratio		0.23			0.23		0.55	0.55		0.55	0.55	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		318			359		687	971		490	969	
v/s Ratio Prot								c0.20			0.08	
v/s Ratio Perm		0.09			c0.11		0.03			0.05		
v/c Ratio		0.39			0.46		0.05	0.37		0.10	0.15	
Uniform Delay, d1		22.0			22.4		7.1	8.7		7.3	7.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.9		0.1	1.1		0.4	0.3	
Delay (s)		22.8			23.3		7.2	9.7		7.7	7.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		22.8			23.3			9.5			7.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	406	0	0	184
Future Volume (Veh/h)	0	0	406	0	0	184
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	441	0	0	200
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked						
vC, conflicting volume	641	441			441	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	641	441			441	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	442	621			1130	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	441	200
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1130
Volume to Capacity	0.00	0.26	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

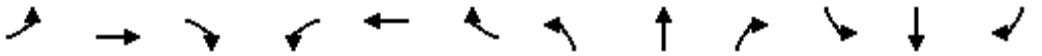
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	4	14	392	180	15
Future Volume (Veh/h)	8	4	14	392	180	15
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	4	15	426	196	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	660	204	212			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	660	204	212			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	98	100	99			
cM capacity (veh/h)	414	827	1329			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	441	212
Volume Left	9	15	0
Volume Right	4	0	16
cSH	489	1329	1700
Volume to Capacity	0.03	0.01	0.12
Queue Length 95th (m)	0.7	0.3	0.0
Control Delay (s)	12.6	0.4	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		



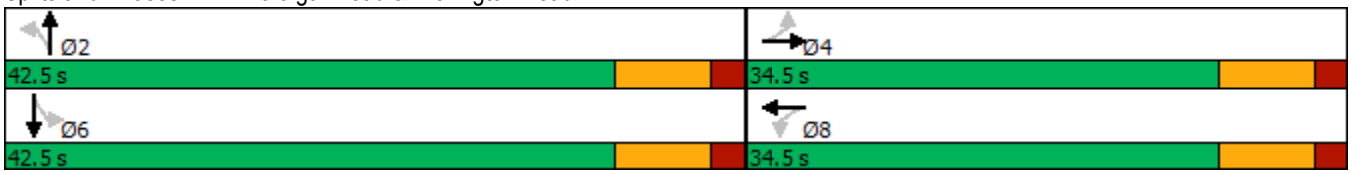
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	198	119	90	88	68	33	162	48	166	338	40
Future Volume (vph)	31	198	119	90	88	68	33	162	48	166	338	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.954			0.963			0.966			0.984	
Flt Protected		0.996			0.982		0.950			0.950		
Satd. Flow (prot)	0	1763	0	0	1586	0	1805	1716	0	1687	1711	0
Flt Permitted		0.948			0.642		0.475			0.616		
Satd. Flow (perm)	0	1678	0	0	1037	0	902	1716	0	1094	1711	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			27			25			10	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			341.2			555.2			339.8	
Travel Time (s)		31.5			15.4			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Adj. Flow (vph)	34	215	129	98	96	74	36	176	52	180	367	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	378	0	0	268	0	36	228	0	180	410	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		21.2			21.2		35.2	35.2		35.2	35.2	
Actuated g/C Ratio		0.30			0.30		0.49	0.49		0.49	0.49	
v/c Ratio		0.72			0.82		0.08	0.27		0.33	0.48	
Control Delay		28.6			42.2		12.0	11.4		14.6	15.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		28.6			42.2		12.0	11.4		14.6	15.3	
LOS		C			D		B	B		B	B	
Approach Delay		28.6			42.2			11.5			15.1	
Approach LOS		C			D			B			B	
Queue Length 50th (m)		42.5			31.3		2.6	15.6		14.6	35.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		71.3			#67.5		8.3	33.2		32.8	67.8	
Internal Link Dist (m)		589.2			317.2			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		660			410		444	857		538	847	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.57			0.65		0.08	0.27		0.33	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 71.4			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 22.7		Intersection LOS: C	
Intersection Capacity Utilization 105.6%		ICU Level of Service G	
Analysis Period (min) 15			

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

Splits and Phases: 1: Trafalgar Road & Wellington Road 22



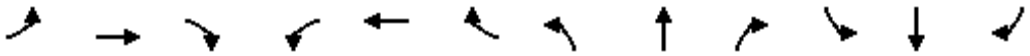
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	198	119	90	88	68	33	162	48	166	338	40
Future Volume (vph)	31	198	119	90	88	68	33	162	48	166	338	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.96		1.00	0.97		1.00	0.98	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1762			1585		1805	1716		1687	1712	
Flt Permitted		0.95			0.64		0.47	1.00		0.62	1.00	
Satd. Flow (perm)		1677			1037		902	1716		1094	1712	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	215	129	98	96	74	36	176	52	180	367	43
RTOR Reduction (vph)	0	26	0	0	19	0	0	13	0	0	5	0
Lane Group Flow (vph)	0	352	0	0	249	0	36	215	0	180	405	0
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
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)		21.2			21.2		35.2	35.2		35.2	35.2	
Effective Green, g (s)		21.2			21.2		35.2	35.2		35.2	35.2	
Actuated g/C Ratio		0.30			0.30		0.49	0.49		0.49	0.49	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		497			307		444	845		539	844	
v/s Ratio Prot								0.13			c0.24	
v/s Ratio Perm		0.21			c0.24		0.04			0.16		
v/c Ratio		0.71			0.81		0.08	0.25		0.33	0.48	
Uniform Delay, d1		22.3			23.2		9.6	10.5		11.0	12.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.6			14.9		0.4	0.7		1.7	2.0	
Delay (s)		26.9			38.2		9.9	11.2		12.7	14.0	
Level of Service		C			D		A	B		B	B	
Approach Delay (s)		26.9			38.2			11.0			13.6	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	6	256	6	6	544
Future Volume (Veh/h)	0	6	256	6	6	544
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	278	7	7	591
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked						
vC, conflicting volume	886	282			285	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	886	282			285	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	316	762			1289	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	285	598
Volume Left	0	0	7
Volume Right	7	7	0
cSH	762	1700	1289
Volume to Capacity	0.01	0.17	0.01
Queue Length 95th (m)	0.2	0.0	0.1
Control Delay (s)	9.8	0.0	0.2
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	0.2
Approach LOS	A		

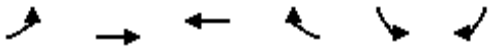
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	24	0	0	9	6	256	0	2	526	13
Future Volume (Veh/h)	27	0	24	0	0	9	6	256	0	2	526	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	26	0	0	10	7	278	0	2	572	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	885	875	579	901	882	278	586			278		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	885	875	579	901	882	278	586			278		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	89	100	95	100	100	99	99			100		
cM capacity (veh/h)	262	287	519	246	285	766	965			1296		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	55	10	285	588
Volume Left	29	0	7	2
Volume Right	26	10	0	14
cSH	342	766	965	1296
Volume to Capacity	0.16	0.01	0.01	0.00
Queue Length 95th (m)	4.5	0.3	0.2	0.0
Control Delay (s)	17.5	9.8	0.3	0.0
Lane LOS	C	A	A	A
Approach Delay (s)	17.5	9.8	0.3	0.0
Approach LOS	C	A		

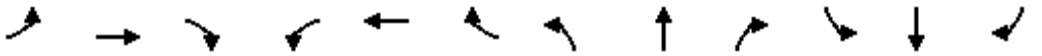
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	401	197	18	55	49
Future Volume (Veh/h)	12	401	197	18	55	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	436	214	20	60	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		341				
pX, platoon unblocked						
vC, conflicting volume	234				686	224
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234				686	224
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				85	94
cM capacity (veh/h)	1333				409	815

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	449	234	113
Volume Left	13	0	60
Volume Right	0	20	53
cSH	1333	1700	534
Volume to Capacity	0.01	0.14	0.21
Queue Length 95th (m)	0.2	0.0	6.3
Control Delay (s)	0.3	0.0	13.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	13.5
Approach LOS			B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		



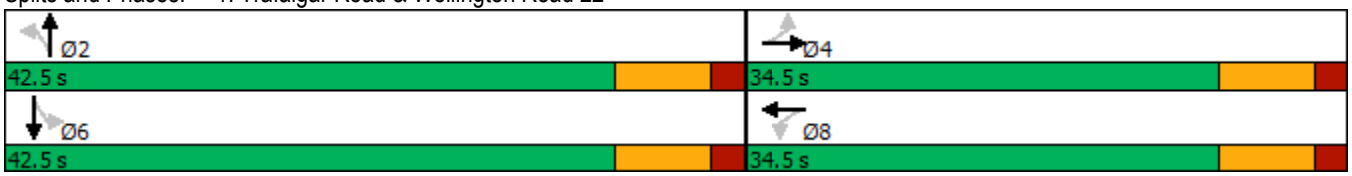
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	127	73	63	213	188	124	460	103	115	196	39
Future Volume (vph)	62	127	73	63	213	188	124	460	103	115	196	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.962			0.945			0.973			0.975	
Flt Protected		0.988			0.993		0.950			0.950		
Satd. Flow (prot)	0	1695	0	0	1686	0	1805	1768	0	1583	1784	0
Flt Permitted		0.702			0.904		0.601			0.269		
Satd. Flow (perm)	0	1204	0	0	1534	0	1142	1768	0	448	1784	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			49			19			17	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			352.1			555.2			339.8	
Travel Time (s)		31.5			15.8			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
Adj. Flow (vph)	67	138	79	68	232	204	135	500	112	125	213	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	284	0	0	504	0	135	612	0	125	255	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	25.5	25.5		25.5	25.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		25.2			25.2		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.33			0.33		0.46	0.46		0.46	0.46	
v/c Ratio		0.67			0.92		0.25	0.73		0.60	0.30	
Control Delay		28.2			47.0		14.5	22.9		31.3	13.4	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		28.2			47.0		14.5	22.9		31.3	13.4	
LOS		C			D		B	C		C	B	
Approach Delay		28.2			47.0			21.4			19.3	
Approach LOS		C			D			C			B	
Queue Length 50th (m)		32.3			65.3		12.3	72.3		13.9	22.0	

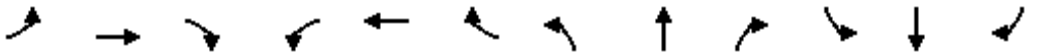
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		60.0			#124.2		24.2	114.0		#40.3	38.2	
Internal Link Dist (m)		589.2			328.1			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		450			581		531	833		208	839	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.63			0.87		0.25	0.73		0.60	0.30	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 75.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 28.7		Intersection LOS: C	
Intersection Capacity Utilization 104.7%		ICU Level of Service G	
Analysis Period (min) 15			

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

Splits and Phases: 1: Trafalgar Road & Wellington Road 22





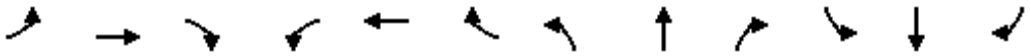
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	127	73	63	213	188	124	460	103	115	196	39
Future Volume (vph)	62	127	73	63	213	188	124	460	103	115	196	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.95		1.00	0.97		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1696			1687		1805	1767		1583	1785	
Flt Permitted		0.70			0.90		0.60	1.00		0.27	1.00	
Satd. Flow (perm)		1205			1535		1142	1767		449	1785	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	138	79	68	232	204	135	500	112	125	213	42
RTOR Reduction (vph)	0	19	0	0	33	0	0	10	0	0	9	0
Lane Group Flow (vph)	0	265	0	0	471	0	135	602	0	125	246	0
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
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)		25.3			25.3		35.1	35.1		35.1	35.1	
Effective Green, g (s)		25.3			25.3		35.1	35.1		35.1	35.1	
Actuated g/C Ratio		0.34			0.34		0.47	0.47		0.47	0.47	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		404			515		531	822		209	830	
v/s Ratio Prot								c0.34			0.14	
v/s Ratio Perm		0.22			c0.31		0.12			0.28		
v/c Ratio		0.66			0.92		0.25	0.73		0.60	0.30	
Uniform Delay, d1		21.4			24.0		12.2	16.3		14.9	12.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.8			20.9		1.2	5.7		12.0	0.9	
Delay (s)		25.2			44.9		13.4	22.1		26.9	13.4	
Level of Service		C			D		B	C		C	B	
Approach Delay (s)		25.2			44.9			20.5			17.9	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	3	693	18	13	348
Future Volume (Veh/h)	3	3	693	18	13	348
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	3	753	20	14	378
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	1169	763			773	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1088	583			595	
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	99			98	
cM capacity (veh/h)	190	415			796	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	773	392
Volume Left	3	0	14
Volume Right	3	20	0
cSH	261	1700	796
Volume to Capacity	0.02	0.45	0.02
Queue Length 95th (m)	0.6	0.0	0.4
Control Delay (s)	19.1	0.0	0.6
Lane LOS	C		A
Approach Delay (s)	19.1	0.0	0.6
Approach LOS	C		

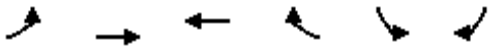
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	11	0	0	5	28	667	0	1	350	43
Future Volume (Veh/h)	23	0	11	0	0	5	28	667	0	1	350	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	0	12	0	0	5	30	725	0	1	380	47
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	5			12			296	61	6	421	64	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	5			12			296	61	6	421	64	2
tC, single (s)	4.2			4.1			7.2	6.6	6.2	7.1	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.6	4.1	3.3	3.5	4.1	3.3
p0 queue free %	98			100			92	10	100	99	53	96
cM capacity (veh/h)	1578			1620			385	807	1083	122	804	1082

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	5	755	428
Volume Left	25	0	30	1
Volume Right	12	5	0	47
cSH	1578	1620	774	816
Volume to Capacity	0.02	0.00	0.98	0.52
Queue Length 95th (m)	0.4	0.0	125.6	24.9
Control Delay (s)	5.0	0.0	49.8	14.2
Lane LOS	A		E	B
Approach Delay (s)	5.0	0.0	49.8	14.2
Approach LOS			E	B

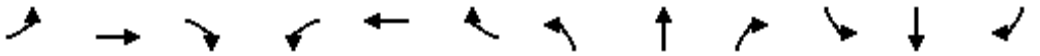
Intersection Summary				
Average Delay	35.8			
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	308	436	62	37	29
Future Volume (Veh/h)	37	308	436	62	37	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	335	474	67	40	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		352				
pX, platoon unblocked						
vC, conflicting volume	541				922	508
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	541				922	508
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				86	94
cM capacity (veh/h)	1028				288	565

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	375	541	72
Volume Left	40	0	40
Volume Right	0	67	32
cSH	1028	1700	368
Volume to Capacity	0.04	0.32	0.20
Queue Length 95th (m)	1.0	0.0	5.7
Control Delay (s)	1.3	0.0	17.1
Lane LOS	A		C
Approach Delay (s)	1.3	0.0	17.1
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		



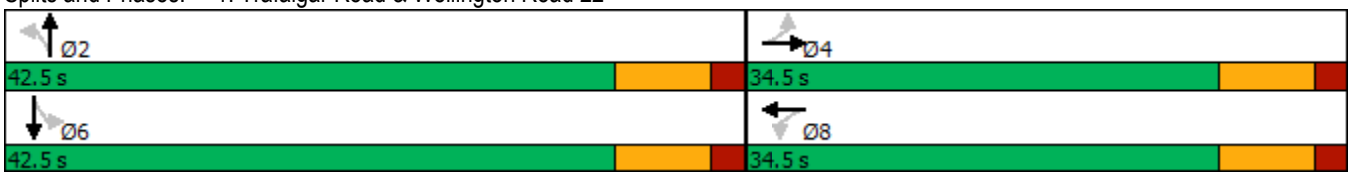
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Future Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.971			0.964			0.986	
Flt Protected		0.995			0.977		0.950			0.950		
Satd. Flow (prot)	0	1762	0	0	1611	0	1805	1714	0	1687	1713	0
Flt Permitted		0.939			0.609		0.392			0.592		
Satd. Flow (perm)	0	1663	0	0	1004	0	745	1714	0	1051	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			20			27			9	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			341.2			555.2			339.8	
Travel Time (s)		31.5			15.4			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Adj. Flow (vph)	36	220	129	159	112	74	36	207	65	180	429	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	385	0	0	345	0	36	272	0	180	472	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		26.3			26.3		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.34			0.34		0.46	0.46		0.46	0.46	
v/c Ratio		0.65			0.96		0.11	0.34		0.37	0.60	
Control Delay		24.9			65.0		13.2	13.5		16.6	19.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.9			65.0		13.2	13.5		16.6	19.2	
LOS		C			E		B	B		B	B	
Approach Delay		24.9			65.0			13.5			18.5	
Approach LOS		C			E			B			B	
Queue Length 50th (m)		43.8			48.0		3.0	22.9		17.4	51.0	

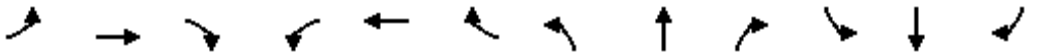
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		73.3			#101.7		8.5	40.1		33.4	81.3	
Internal Link Dist (m)		589.2			317.2			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		611			368		341	800		481	790	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.63			0.94		0.11	0.34		0.37	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 76.3			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 28.5		Intersection LOS: C	
Intersection Capacity Utilization 112.4%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 1: Trafalgar Road & Wellington Road 22





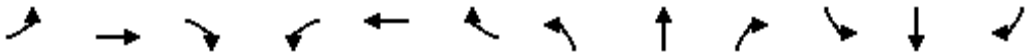
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Future Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	0.96		1.00	0.99	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1762			1611		1805	1714		1687	1714	
Flt Permitted		0.94			0.61		0.39	1.00		0.59	1.00	
Satd. Flow (perm)		1663			1003		744	1714		1051	1714	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	220	129	159	112	74	36	207	65	180	429	43
RTOR Reduction (vph)	0	24	0	0	13	0	0	15	0	0	5	0
Lane Group Flow (vph)	0	361	0	0	332	0	36	257	0	180	467	0
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
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)		26.3			26.3		35.0	35.0		35.0	35.0	
Effective Green, g (s)		26.3			26.3		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.34			0.34		0.46	0.46		0.46	0.46	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		573			345		341	786		482	786	
v/s Ratio Prot								0.15			c0.27	
v/s Ratio Perm		0.22			c0.33		0.05			0.17		
v/c Ratio		0.63			0.96		0.11	0.33		0.37	0.59	
Uniform Delay, d1		20.9			24.5		11.7	13.2		13.5	15.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.3			38.2		0.6	1.1		2.2	3.3	
Delay (s)		23.2			62.7		12.4	14.3		15.7	18.7	
Level of Service		C			E		B	B		B	B	
Approach Delay (s)		23.2			62.7			14.0			17.8	
Approach LOS		C			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	76.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	112.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	24	265	27	12	561
Future Volume (Veh/h)	40	24	265	27	12	561
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)	43	26	288	29	13	610
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked						
vC, conflicting volume	924	288			317	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	924	288			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 %	86	97			99	
cM capacity (veh/h)	298	756			1255	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	288	29	13	610
Volume Left	43	0	0	13	0
Volume Right	26	0	29	0	0
cSH	387	1700	1700	1255	1700
Volume to Capacity	0.18	0.17	0.02	0.01	0.36
Queue Length 95th (m)	5.1	0.0	0.0	0.3	0.0
Control Delay (s)	16.3	0.0	0.0	7.9	0.0
Lane LOS	C			A	
Approach Delay (s)	16.3	0.0		0.2	
Approach LOS	C				

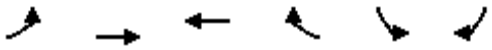
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	6	24	15	15	52	6	274	9	16	534	13
Future Volume (Veh/h)	27	6	24	15	15	52	6	274	9	16	534	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	7	26	16	16	57	7	298	10	17	580	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1003	943	587	960	945	303	594			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1003	943	587	960	945	303	594			308		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	85	97	95	93	94	92	99			99		
cM capacity (veh/h)	193	259	513	218	258	741	958			1264		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	62	89	315	17	594
Volume Left	29	16	7	17	0
Volume Right	26	57	10	0	14
cSH	272	419	958	1264	1700
Volume to Capacity	0.23	0.21	0.01	0.01	0.35
Queue Length 95th (m)	6.9	6.3	0.2	0.3	0.0
Control Delay (s)	22.1	15.9	0.3	7.9	0.0
Lane LOS	C	C	A	A	
Approach Delay (s)	22.1	15.9	0.3	0.2	
Approach LOS	C	C			

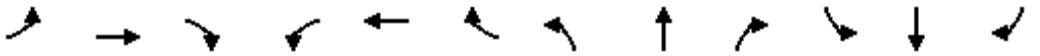
Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	42.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	401	197	57	167	120
Future Volume (Veh/h)	28	401	197	57	167	120
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	436	214	62	182	130
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		341				
pX, platoon unblocked					1.00	
vC, conflicting volume	276				710	214
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	276				709	214
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				53	84
cM capacity (veh/h)	1287				391	826

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	30	436	214	62	312
Volume Left	30	0	0	0	182
Volume Right	0	0	0	62	130
cSH	1287	1700	1700	1700	501
Volume to Capacity	0.02	0.26	0.13	0.04	0.62
Queue Length 95th (m)	0.6	0.0	0.0	0.0	33.7
Control Delay (s)	7.9	0.0	0.0	0.0	23.3
Lane LOS	A				C
Approach Delay (s)	0.5		0.0		23.3
Approach LOS					C

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Future Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.972			0.953			0.971			0.977	
Flt Protected		0.987			0.992		0.950			0.950		
Satd. Flow (prot)	0	1712	0	0	1704	0	1805	1764	0	1583	1787	0
Flt Permitted		0.626			0.838		0.584			0.190		
Satd. Flow (perm)	0	1086	0	0	1439	0	1110	1764	0	317	1787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			39			21			15	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			352.1			555.2			339.8	
Travel Time (s)		31.5			15.8			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
Adj. Flow (vph)	97	205	79	92	289	204	135	553	135	125	238	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	381	0	0	585	0	135	688	0	125	280	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.97			1.11		0.27	0.85		0.87	0.34	
Control Delay		65.1			97.0		14.9	30.1		71.9	14.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		65.1			97.0		14.9	30.1		71.9	14.2	
LOS		E			F		B	C		E	B	
Approach Delay		65.1			97.0			27.6			32.1	
Approach LOS		E			F			C			C	
Queue Length 50th (m)		54.2			~100.1		12.3	87.1		16.6	24.9	

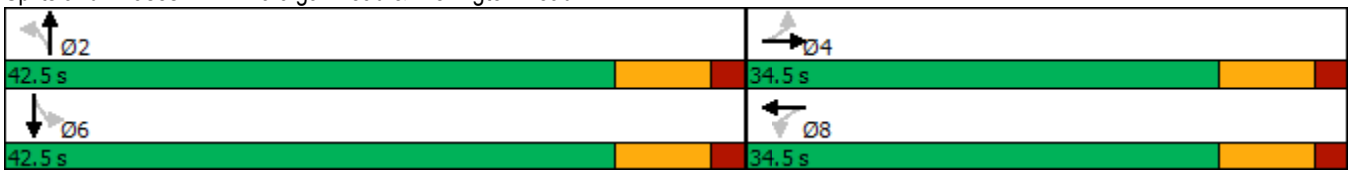
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)		#111.0			#162.1		24.4	#154.0		#50.0	42.2	
Internal Link Dist (m)		589.2			328.1			531.2			315.8	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		393			529		504	813		144	820	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.97			1.11		0.27	0.85		0.87	0.34	

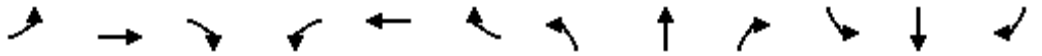
Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 77			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 53.4		Intersection LOS: D	
Intersection Capacity Utilization 113.6%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

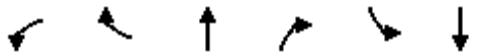
Splits and Phases: 1: Trafalgar Road & Wellington Road 22





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Future Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.95		1.00	0.97		1.00	0.98	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1713			1704		1805	1763		1583	1788	
Flt Permitted		0.63			0.84		0.58	1.00		0.19	1.00	
Satd. Flow (perm)		1086			1440		1109	1763		317	1788	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	205	79	92	289	204	135	553	135	125	238	42
RTOR Reduction (vph)	0	12	0	0	25	0	0	11	0	0	8	0
Lane Group Flow (vph)	0	369	0	0	560	0	135	677	0	125	272	0
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
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)		27.0			27.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
Clearance Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		380			504		504	801		144	812	
v/s Ratio Prot								0.38			0.15	
v/s Ratio Perm		0.34			c0.39		0.12			c0.39		
v/c Ratio		0.97			1.11		0.27	0.84		0.87	0.33	
Uniform Delay, d1		24.6			25.0		13.0	18.6		18.9	13.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		38.2			73.9		1.3	10.6		46.2	1.1	
Delay (s)		62.8			98.9		14.3	29.2		65.2	14.6	
Level of Service		E			F		B	C		E	B	
Approach Delay (s)		62.8			98.9			26.8			30.2	
Approach LOS		E			F			C			C	

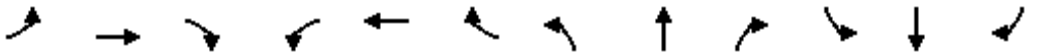
Intersection Summary			
HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	24	716	71	49	355
Future Volume (Veh/h)	19	24	716	71	49	355
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)	21	26	778	77	53	386
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked	0.79	0.79			0.79	
vC, conflicting volume	1270	778			855	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1207	582			680	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	94			93	
cM capacity (veh/h)	149	406			725	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	47	778	77	53	386
Volume Left	21	0	0	53	0
Volume Right	26	0	77	0	0
cSH	229	1700	1700	725	1700
Volume to Capacity	0.21	0.46	0.05	0.07	0.23
Queue Length 95th (m)	6.0	0.0	0.0	1.9	0.0
Control Delay (s)	24.7	0.0	0.0	10.4	0.0
Lane LOS	C			B	
Approach Delay (s)	24.7	0.0		1.3	
Approach LOS	C				

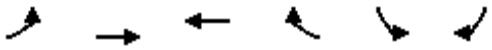
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	36	11	6	21	55	28	688	23	84	387	43
Future Volume (Veh/h)	23	36	11	6	21	55	28	688	23	84	387	43
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	39	12	7	23	60	30	748	25	91	421	47
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	1518	1460	444	1455	1470	760	468			773		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1518	1460	444	1455	1470	760	468			773		
tC, single (s)	7.2	6.5	6.3	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	59	66	98	90	79	85	97			89		
cM capacity (veh/h)	61	113	605	71	111	409	1068			851		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	76	90	803	91	468
Volume Left	25	7	30	91	0
Volume Right	12	60	25	0	47
cSH	98	199	1068	851	1700
Volume to Capacity	0.77	0.45	0.03	0.11	0.28
Queue Length 95th (m)	33.0	17.1	0.7	2.9	0.0
Control Delay (s)	114.5	37.2	0.7	9.7	0.0
Lane LOS	F	E	A	A	
Approach Delay (s)	114.5	37.2	0.7	1.6	
Approach LOS	F	E			

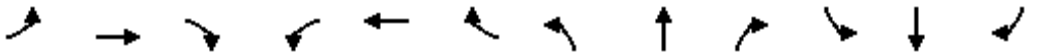
Intersection Summary				
Average Delay	8.9			
Intersection Capacity Utilization	77.5%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	120	308	436	97	59	104
Future Volume (Veh/h)	120	308	436	97	59	104
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	130	335	474	105	64	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		352				
pX, platoon unblocked						
vC, conflicting volume	579				1069	474
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579				1069	474
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				70	81
cM capacity (veh/h)	995				213	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	130	335	474	105	177
Volume Left	130	0	0	0	64
Volume Right	0	0	0	105	113
cSH	995	1700	1700	1700	360
Volume to Capacity	0.13	0.20	0.28	0.06	0.49
Queue Length 95th (m)	3.6	0.0	0.0	0.0	20.8
Control Delay (s)	9.2	0.0	0.0	0.0	24.3
Lane LOS	A				C
Approach Delay (s)	2.6		0.0		24.3
Approach LOS					C

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



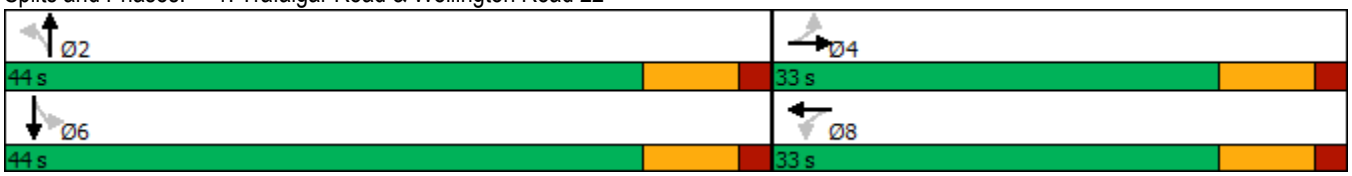
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Future Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.945			0.940			0.964			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1671	1762	0	1703	1527	0	1805	1714	0	1687	1713	0
Flt Permitted	0.640			0.413			0.429			0.592		
Satd. Flow (perm)	1126	1762	0	740	1527	0	815	1714	0	1051	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			46			28			9	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			341.2			555.2			339.8	
Travel Time (s)		31.5			15.4			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Adj. Flow (vph)	36	220	129	159	112	74	36	207	65	180	429	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	349	0	159	186	0	36	272	0	180	472	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	33.0	33.0		33.0	33.0		44.0	44.0		44.0	44.0	
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	19.5	19.5		19.5	19.5		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.51	0.51		0.51	0.51	
v/c Ratio	0.12	0.68		0.79	0.41		0.09	0.30		0.33	0.53	
Control Delay	19.6	27.4		51.2	18.2		11.1	10.9		13.5	15.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.6	27.4		51.2	18.2		11.1	10.9		13.5	15.1	
LOS	B	C		D	B		B	B		B	B	
Approach Delay		26.6			33.4			10.9			14.6	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	3.8	38.2		20.5	15.6		2.4	17.7		13.6	39.7	

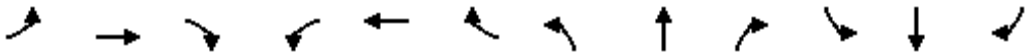
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	10.3	64.7		#48.2	32.0		8.1	38.3		32.0	77.8	
Internal Link Dist (m)		589.2			317.2			531.2			315.8	
Turn Bay Length (m)	40.0			40.0			40.0			45.0		
Base Capacity (vph)	404	659		265	577		419	895		540	885	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.53		0.60	0.32		0.09	0.30		0.33	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 71.2			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 105.4%		ICU Level of Service G	
Analysis Period (min) 15			

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

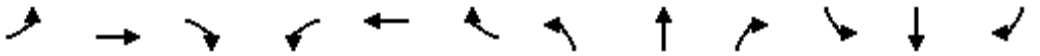
Splits and Phases: 1: Trafalgar Road & Wellington Road 22





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Future Volume (vph)	33	202	119	146	103	68	33	190	60	166	395	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1761		1703	1527		1805	1714		1687	1714	
Flt Permitted	0.64	1.00		0.41	1.00		0.43	1.00		0.59	1.00	
Satd. Flow (perm)	1126	1761		740	1527		814	1714		1051	1714	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	220	129	159	112	74	36	207	65	180	429	43
RTOR Reduction (vph)	0	30	0	0	33	0	0	14	0	0	4	0
Lane Group Flow (vph)	36	319	0	159	153	0	36	258	0	180	468	0
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
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)	19.5	19.5		19.5	19.5		36.6	36.6		36.6	36.6	
Effective Green, g (s)	19.5	19.5		19.5	19.5		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.51	0.51		0.51	0.51	
Clearance Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	308	482		202	418		419	882		541	882	
v/s Ratio Prot		0.18			0.10			0.15			c0.27	
v/s Ratio Perm	0.03			c0.21			0.04			0.17		
v/c Ratio	0.12	0.66		0.79	0.37		0.09	0.29		0.33	0.53	
Uniform Delay, d1	19.3	22.9		23.9	20.8		8.8	9.9		10.1	11.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.4		18.1	0.5		0.4	0.8		1.6	2.3	
Delay (s)	19.5	26.3		42.0	21.4		9.2	10.7		11.8	13.8	
Level of Service	B	C		D	C		A	B		B	B	
Approach Delay (s)		25.7			30.8			10.5			13.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



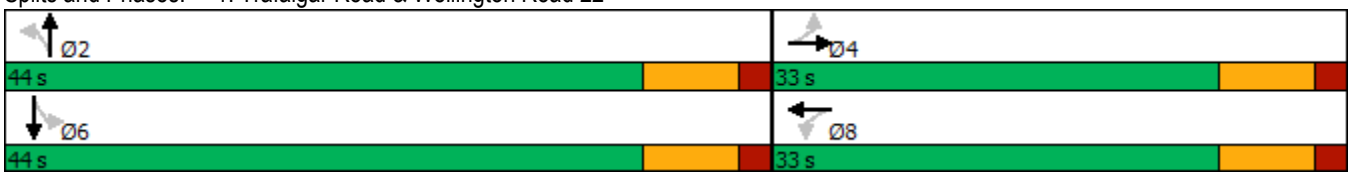
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Future Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.938			0.971			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1697	0	1703	1692	0	1805	1764	0	1583	1787	0
Flt Permitted	0.231			0.530			0.588			0.228		
Satd. Flow (perm)	422	1697	0	950	1692	0	1117	1764	0	380	1787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			49			22			16	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			352.1			555.2			339.8	
Travel Time (s)		31.5			15.8			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
Adj. Flow (vph)	97	205	79	92	289	204	135	553	135	125	238	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	97	284	0	92	493	0	135	688	0	125	280	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	33.0	33.0		33.0	33.0		44.0	44.0		44.0	44.0	
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	23.0	23.0		23.0	23.0		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.49	0.49		0.49	0.49	
v/c Ratio	0.75	0.52		0.32	0.89		0.25	0.79		0.67	0.32	
Control Delay	59.9	22.9		22.9	42.3		13.4	24.2		37.9	12.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	59.9	22.9		22.9	42.3		13.4	24.2		37.9	12.6	
LOS	E	C		C	D		B	C		D	B	
Approach Delay		32.3			39.2			22.4			20.4	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	12.7	30.8		10.3	62.5		11.8	83.3		14.3	23.7	

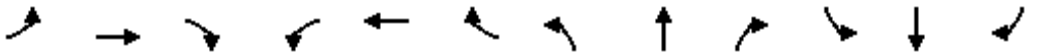
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	#38.0	53.6		22.5	#116.0		23.4	#148.1		#44.1	40.4	
Internal Link Dist (m)		589.2			328.1			531.2			315.8	
Turn Bay Length (m)	40.0			40.0			40.0			45.0		
Base Capacity (vph)	144	599		325	612		548	876		186	884	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.67	0.47		0.28	0.81		0.25	0.79		0.67	0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 74.6			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 28.2		Intersection LOS: C	
Intersection Capacity Utilization 122.3%		ICU Level of Service H	
Analysis Period (min) 15			

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

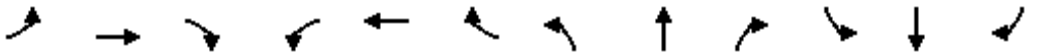
Splits and Phases: 1: Trafalgar Road & Wellington Road 22





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Future Volume (vph)	89	189	73	85	266	188	124	509	124	115	219	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1697		1703	1692		1805	1763		1583	1788	
Flt Permitted	0.23	1.00		0.53	1.00		0.59	1.00		0.23	1.00	
Satd. Flow (perm)	422	1697		950	1692		1117	1763		379	1788	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	205	79	92	289	204	135	553	135	125	238	42
RTOR Reduction (vph)	0	19	0	0	34	0	0	11	0	0	8	0
Lane Group Flow (vph)	97	265	0	92	459	0	135	677	0	125	272	0
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
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)	22.9	22.9		22.9	22.9		36.6	36.6		36.6	36.6	
Effective Green, g (s)	22.9	22.9		22.9	22.9		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.49	0.49		0.49	0.49	
Clearance Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129	521		292	520		548	866		186	878	
v/s Ratio Prot		0.16			c0.27			c0.38			0.15	
v/s Ratio Perm	0.23			0.10			0.12			0.33		
v/c Ratio	0.75	0.51		0.32	0.88		0.25	0.78		0.67	0.31	
Uniform Delay, d1	23.2	21.2		19.8	24.5		11.0	15.6		14.4	11.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.6	0.8		0.6	16.1		1.1	6.9		17.7	0.9	
Delay (s)	44.9	22.0		20.4	40.7		12.0	22.6		32.1	12.3	
Level of Service	D	C		C	D		B	C		C	B	
Approach Delay (s)		27.8			37.5			20.9			18.4	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	122.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	213	123	150	109	72	33	202	64	173	420	44
Future Volume (vph)	37	213	123	150	109	72	33	202	64	173	420	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.945			0.940			0.964			0.986	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1671	1762	0	1703	1527	0	1805	1715	0	1687	1713	0
Flt Permitted	0.634			0.392			0.396			0.582		
Satd. Flow (perm)	1115	1762	0	703	1527	0	752	1715	0	1033	1713	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			46			28			9	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			341.2			555.2			339.8	
Travel Time (s)		31.5			15.4			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
Adj. Flow (vph)	40	232	134	163	118	78	36	220	70	188	457	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	366	0	163	196	0	36	290	0	188	505	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	33.0	33.0		33.0	33.0		44.0	44.0		44.0	44.0	
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	
Maximum Green (s)	25.5	25.5		25.5	25.5		36.5	36.5		36.5	36.5	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	20.4	20.4		20.4	20.4		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.51	0.51		0.51	0.51	
v/c Ratio	0.13	0.69		0.82	0.42		0.09	0.33		0.36	0.58	
Control Delay	19.6	27.8		56.7	18.5		11.6	11.5		14.3	16.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.6	27.8		56.7	18.5		11.6	11.5		14.3	16.4	
LOS	B	C		E	B		B	B		B	B	
Approach Delay		27.0			35.8			11.5			15.8	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	4.2	40.9		21.5	16.9		2.5	20.7		15.4	46.7	
Queue Length 95th (m)	11.1	68.7		#51.8	33.9		8.2	41.2		33.7	85.7	
Internal Link Dist (m)		589.2			317.2			531.2			315.8	
Turn Bay Length (m)	40.0			40.0			40.0			45.0		
Base Capacity (vph)	396	651		249	571		382	885		524	874	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.56		0.65	0.34		0.09	0.33		0.36	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 72.1			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 106.2%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Trafalgar Road & Wellington Road 22

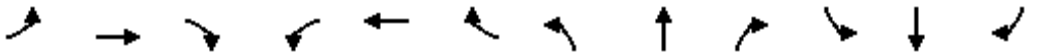
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	213	123	150	109	72	33	202	64	173	420	44
Future Volume (vph)	37	213	123	150	109	72	33	202	64	173	420	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1762		1703	1527		1805	1714		1687	1713	
Flt Permitted	0.63	1.00		0.39	1.00		0.40	1.00		0.58	1.00	
Satd. Flow (perm)	1116	1762		703	1527		752	1714		1034	1713	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	232	134	163	118	78	36	220	70	188	457	48
RTOR Reduction (vph)	0	29	0	0	33	0	0	14	0	0	4	0
Lane Group Flow (vph)	40	337	0	163	163	0	36	276	0	188	501	0
Heavy Vehicles (%)	8%	3%	0%	6%	11%	26%	0%	9%	0%	7%	10%	3%
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)	20.4	20.4		20.4	20.4		36.6	36.6		36.6	36.6	
Effective Green, g (s)	20.4	20.4		20.4	20.4		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.51	0.51		0.51	0.51	
Clearance Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	316	499		199	432		382	871		525	870	
v/s Ratio Prot		0.19			0.11			0.16			c0.29	
v/s Ratio Perm	0.04			c0.23			0.05			0.18		
v/c Ratio	0.13	0.68		0.82	0.38		0.09	0.32		0.36	0.58	
Uniform Delay, d1	19.2	22.9		24.1	20.7		9.1	10.4		10.6	12.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.6		22.4	0.6		0.5	1.0		1.9	2.8	
Delay (s)	19.4	26.5		46.4	21.3		9.6	11.3		12.5	15.1	
Level of Service	B	C		D	C		A	B		B	B	
Approach Delay (s)		25.8			32.7			11.1			14.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	24	284	27	12	597
Future Volume (Veh/h)	40	24	284	27	12	597
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)	43	26	309	29	13	649
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked						
vC, conflicting volume	984	309			338	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	984	309			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 %	84	96			99	
cM capacity (veh/h)	275	736			1232	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	309	29	13	649
Volume Left	43	0	0	13	0
Volume Right	26	0	29	0	0
cSH	360	1700	1700	1232	1700
Volume to Capacity	0.19	0.18	0.02	0.01	0.38
Queue Length 95th (m)	5.6	0.0	0.0	0.3	0.0
Control Delay (s)	17.4	0.0	0.0	8.0	0.0
Lane LOS	C			A	
Approach Delay (s)	17.4	0.0		0.2	
Approach LOS	C				

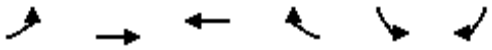
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	41.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	6	26	15	15	52	7	293	9	16	569	13
Future Volume (Veh/h)	27	6	26	15	15	52	7	293	9	16	569	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	7	28	16	16	57	8	318	10	17	618	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1063	1003	625	1022	1005	323	632			328		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1063	1003	625	1022	1005	323	632			328		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	83	97	94	92	93	92	99			99		
cM capacity (veh/h)	174	239	488	196	238	723	927			1243		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	64	89	336	17	632
Volume Left	29	16	8	17	0
Volume Right	28	57	10	0	14
cSH	253	391	927	1243	1700
Volume to Capacity	0.25	0.23	0.01	0.01	0.37
Queue Length 95th (m)	7.8	6.9	0.2	0.3	0.0
Control Delay (s)	24.0	16.9	0.3	7.9	0.0
Lane LOS	C	C	A	A	
Approach Delay (s)	24.0	16.9	0.3	0.2	
Approach LOS	C	C			

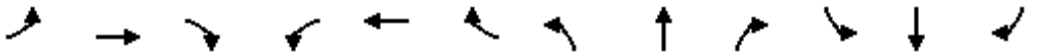
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	44.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	422	211	57	167	120
Future Volume (Veh/h)	28	422	211	57	167	120
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	459	229	62	182	130
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		341				
pX, platoon unblocked						
vC, conflicting volume	291				748	229
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291				748	229
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				51	84
cM capacity (veh/h)	1271				371	810

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	30	459	229	62	312
Volume Left	30	0	0	0	182
Volume Right	0	0	0	62	130
cSH	1271	1700	1700	1700	479
Volume to Capacity	0.02	0.27	0.13	0.04	0.65
Queue Length 95th (m)	0.6	0.0	0.0	0.0	36.7
Control Delay (s)	7.9	0.0	0.0	0.0	25.5
Lane LOS	A				D
Approach Delay (s)	0.5		0.0		25.5
Approach LOS					D

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		



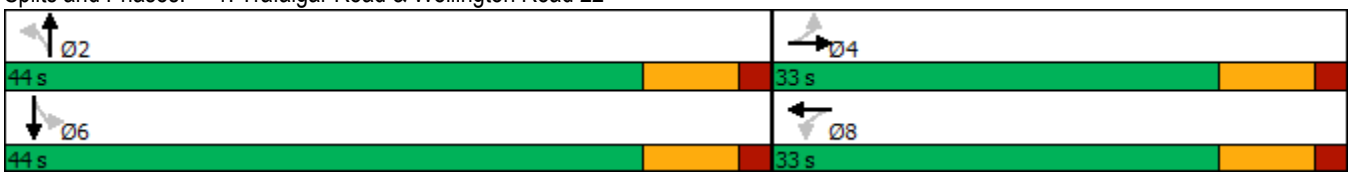
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	196	75	89	277	197	128	544	130	121	232	43
Future Volume (vph)	95	196	75	89	277	197	128	544	130	121	232	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.938			0.971			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1697	0	1703	1692	0	1805	1764	0	1583	1786	0
Flt Permitted	0.211			0.516			0.574			0.185		
Satd. Flow (perm)	385	1697	0	925	1692	0	1091	1764	0	308	1786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			50			21			17	
Link Speed (k/h)		70			80			40			40	
Link Distance (m)		613.2			352.1			555.2			339.8	
Travel Time (s)		31.5			15.8			50.0			30.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
Adj. Flow (vph)	103	213	82	97	301	214	139	591	141	132	252	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	295	0	97	515	0	139	732	0	132	299	0
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)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	33.0	33.0		33.0	33.0		44.0	44.0		44.0	44.0	
Total Split (%)	42.9%	42.9%		42.9%	42.9%		57.1%	57.1%		57.1%	57.1%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
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		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	23.7	23.7		23.7	23.7		36.5	36.5		36.5	36.5	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.48	0.48		0.48	0.48	
v/c Ratio	0.85	0.53		0.33	0.91		0.26	0.85		0.89	0.34	
Control Delay	78.8	23.1		23.3	44.6		13.8	28.4		73.7	13.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	78.8	23.1		23.3	44.6		13.8	28.4		73.7	13.1	
LOS	E	C		C	D		B	C		E	B	
Approach Delay		37.5			41.2			26.1			31.6	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	14.2	32.4		11.0	66.7		12.2	92.9		17.7	25.7	

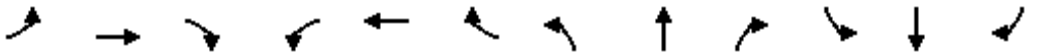
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (m)	#42.6	55.7		23.7	#123.8		24.3	#163.9		#52.6	43.3	
Internal Link Dist (m)		589.2			328.1			531.2			315.8	
Turn Bay Length (m)	40.0			40.0			40.0			45.0		
Base Capacity (vph)	130	593		313	606		529	866		149	875	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.79	0.50		0.31	0.85		0.26	0.85		0.89	0.34	

Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 75.3			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 33.1		Intersection LOS: C	
Intersection Capacity Utilization 125.6%		ICU Level of Service H	
Analysis Period (min) 15			

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

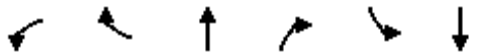
Splits and Phases: 1: Trafalgar Road & Wellington Road 22





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	196	75	89	277	197	128	544	130	121	232	43
Future Volume (vph)	95	196	75	89	277	197	128	544	130	121	232	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1697		1703	1692		1805	1764		1583	1787	
Flt Permitted	0.21	1.00		0.52	1.00		0.57	1.00		0.19	1.00	
Satd. Flow (perm)	386	1697		925	1692		1091	1764		309	1787	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	213	82	97	301	214	139	591	141	132	252	47
RTOR Reduction (vph)	0	18	0	0	34	0	0	11	0	0	9	0
Lane Group Flow (vph)	103	277	0	97	481	0	139	721	0	132	290	0
Heavy Vehicles (%)	4%	7%	8%	6%	2%	10%	0%	4%	7%	14%	4%	3%
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)	23.8	23.8		23.8	23.8		36.6	36.6		36.6	36.6	
Effective Green, g (s)	23.8	23.8		23.8	23.8		36.6	36.6		36.6	36.6	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.49	0.49		0.49	0.49	
Clearance Time (s)	7.5	7.5		7.5	7.5		7.5	7.5		7.5	7.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	121	535		291	534		529	856		149	867	
v/s Ratio Prot		0.16			c0.28			0.41			0.16	
v/s Ratio Perm	0.27			0.10			0.13			c0.43		
v/c Ratio	0.85	0.52		0.33	0.90		0.26	0.84		0.89	0.33	
Uniform Delay, d1	24.1	21.1		19.7	24.7		11.4	16.9		17.5	11.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.4	0.8		0.7	18.2		1.2	9.9		48.3	1.0	
Delay (s)	64.5	21.9		20.4	42.9		12.7	26.8		65.8	13.0	
Level of Service	E	C		C	D		B	C		E	B	
Approach Delay (s)		33.0			39.3			24.5			29.2	
Approach LOS		C			D			C			C	

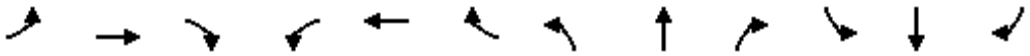
Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	125.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	24	765	71	49	377
Future Volume (Veh/h)	19	24	765	71	49	377
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)	21	26	832	77	53	410
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			340			
pX, platoon unblocked	0.76	0.76			0.76	
vC, conflicting volume	1348	832			909	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1301	624			725	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	93			92	
cM capacity (veh/h)	126	373			676	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	47	832	77	53	410
Volume Left	21	0	0	53	0
Volume Right	26	0	77	0	0
cSH	199	1700	1700	676	1700
Volume to Capacity	0.24	0.49	0.05	0.08	0.24
Queue Length 95th (m)	7.1	0.0	0.0	2.0	0.0
Control Delay (s)	28.6	0.0	0.0	10.8	0.0
Lane LOS	D			B	
Approach Delay (s)	28.6	0.0		1.2	
Approach LOS	D				

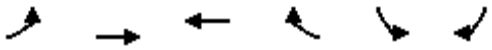
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	36	11	6	21	55	30	736	23	84	409	44
Future Volume (Veh/h)	24	36	11	6	21	55	30	736	23	84	409	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	39	12	7	23	60	33	800	25	91	445	48
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	1601	1542	469	1537	1554	812	493			825		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1601	1542	469	1537	1554	812	493			825		
tC, single (s)	7.2	6.5	6.3	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.4	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	49	61	98	88	77	84	97			89		
cM capacity (veh/h)	51	100	586	59	98	382	1045			814		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	77	90	858	91	493
Volume Left	26	7	33	91	0
Volume Right	12	60	25	0	48
cSH	84	176	1045	814	1700
Volume to Capacity	0.92	0.51	0.03	0.11	0.29
Queue Length 95th (m)	39.7	20.3	0.8	3.0	0.0
Control Delay (s)	164.1	44.9	0.8	10.0	0.0
Lane LOS	F	E	A	A	
Approach Delay (s)	164.1	44.9	0.8	1.6	
Approach LOS	F	E			

Intersection Summary				
Average Delay	11.4			
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	246	332	116	69	57
Future Volume (Veh/h)	85	246	332	116	69	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	267	361	126	75	62
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		352				
pX, platoon unblocked						
vC, conflicting volume	487				812	361
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	487				812	361
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				76	91
cM capacity (veh/h)	1076				319	684

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	92	267	361	126	137
Volume Left	92	0	0	0	75
Volume Right	0	0	0	126	62
cSH	1076	1700	1700	1700	420
Volume to Capacity	0.09	0.16	0.21	0.07	0.33
Queue Length 95th (m)	2.2	0.0	0.0	0.0	11.2
Control Delay (s)	8.7	0.0	0.0	0.0	17.7
Lane LOS	A				C
Approach Delay (s)	2.2		0.0		17.7
Approach LOS					C

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		