September 2018

Summerside West Phase 4-6

TIA Strategy Report

Prepared for:

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Summerside West Phase 4 – 6

TIA Strategy Report

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TIA Strategy Report

1. SCREENING FORM

The screening form was submitted for the subject development on September 13th, 2017 to City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). The Trip Generation and Location triggers were met based on the unit count and proximity to the cycling spine route along Mer Bleue Road and Tenth Line Road. City staff provided confirmation to proceed with Step 2 – Scoping Report on October 3rd, 2017 and provide the exemptions review prior to producing Step 3 - Forecasting and Step 4 – Analysis.

The Screening and Scoping Report was submitted on October 25th, 2017 to City of Ottawa staff for review and confirmation of the study area scope, trip generation requirements, and exemptions review for the future steps of the TIA process. City staff provided confirmation on November 10th to proceed with Step 3 – Forecasting Report.

The Forecasting Report was submitted on December 1st, 2017 to City of Ottawa staff for review and confirmation of the trip generation and assignment assumptions. No response has been received from the TPM at the time of the submission of this report.

The Screening Form and Correspondence are provided in Appendix A.

2. DESCRIPTION OF PROPOSED DEVELOPMENT

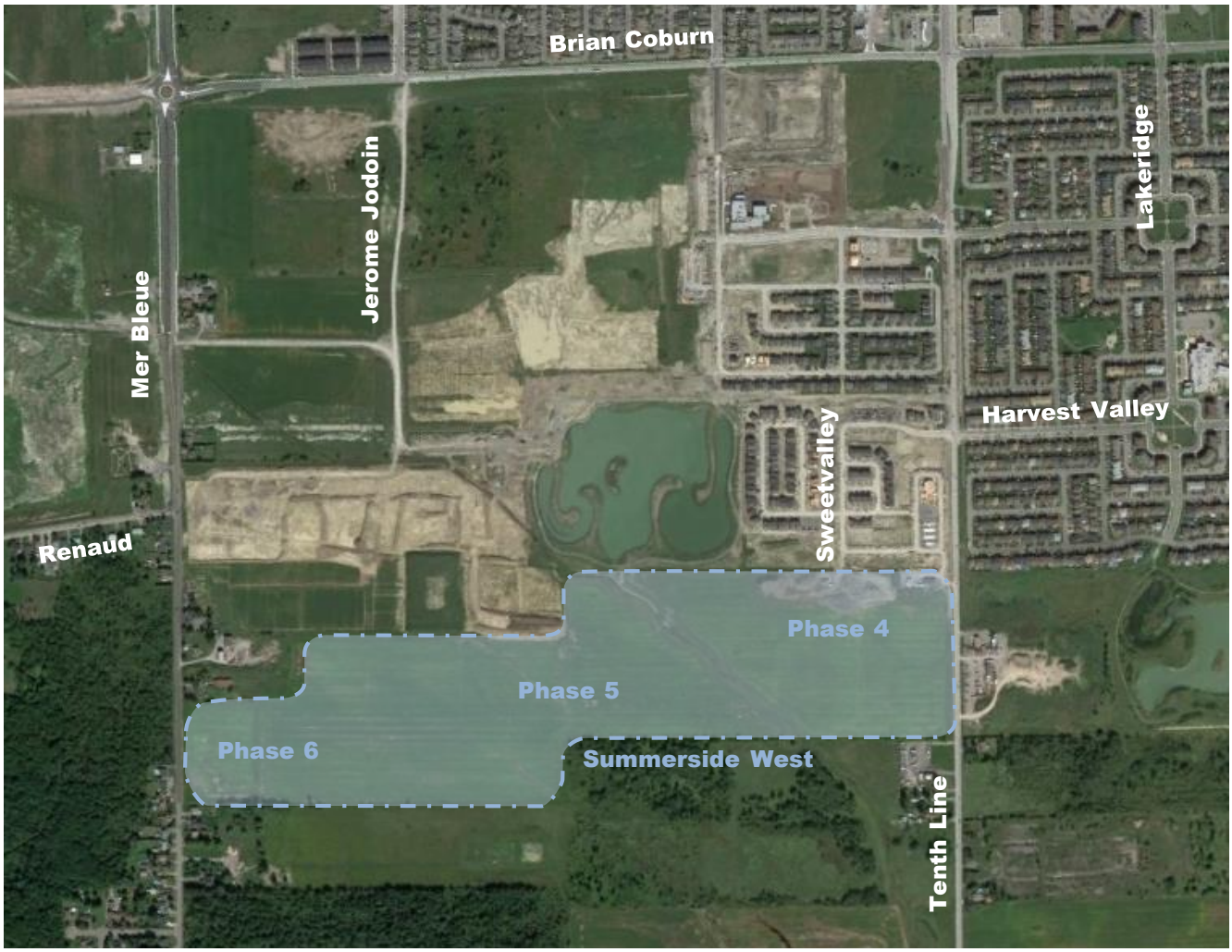
2.1. PROPOSED DEVELOPMENT

The proposed Summerside West Phases 4 to 6 (2564 Tenth Line) is a greenfield development located in south Orleans. The subdivision is in Ward 19 at Cumberland Concession 11 S Pt Lot 4. The site's local context is illustrated in Figure 1.

The development will include 738 units, consisting of 336 townhomes and 402 single family homes. Phase 4 consists of 145 townhomes and 100 single family homes; Phase 5 consists of 257 single family homes; Phase 6 consists of 236 townhomes. The subdivision will connect to the previous developed Summerside Phases to the north, accessing Tenth Line Road via Sweetvalley Drive and a new access on Tenth Line Road, and Mer Bleue via a new site access. The estimated date of occupancy is 2020 for Phase 4, 2024 for Phase 5, and 2024 for Phase 6.

Figure 2 illustrates the proposed site plan.

Figure 1: Local Context



Summerside West

Phases 4, 5 and 6

Coloured Plan

September 5th, 2018

Lot Types	PH4	PH5	PH6	TOTAL	%
21' BTB	*24*	*0*	*62*	*86*	*12*
21' TH	*76*	*0*	*174*	*250*	*34*
30' Single	*46*	*109*	*0*	*155*	*21*
30' Single C	*15*	*24*	*0*	*39*	*5*
36' Single	*67*	*84*	*0*	*151*	*20*
43' Single	*17*	*40*	*0*	*57*	*8*
TOTAL	*245*	*257*	*236*	*738*	*100%*

Legend

- Centre Line
- Maximum Potential Extent of Corridor
- 30m Offset From As-Built 2 YR Water Level
- Designed Top of Valley Slope (TOV)
- 15m Offset from Top of Valley slope
- 21' Village TH
- 21' Widelot TH
- Singles
- Open Space/ Parks

3. EXISTING CONDITIONS

3.1. AREA ROAD NETWORK

Tenth Line Road is a north-south arterial roadway, which extends north from Smith Road to Jeanne D'Arc Boulevard. Within the study area the cross-section consists of two travel lanes in each direction. The posted speed is 60km/h and the road is designated as a truck route.

Mer Bleue Road is a north-south arterial roadway that extends north from Navan Road to Innes Road. Within the study area the road has a cross-section consisting of a single travel lane in both directions and a posted speed of 60km/h. Approximately 200m north of Renaud Road, Mer Bleue Road widens to a divided 4-lane roadway and is a partial truck route north of Brian Coburn Boulevard.

Brian Coburn Boulevard is an east-west arterial roadway that extends east from Trim Road to Navan Road. Within the study area the road has a cross-section consisting of a single travel lane in both directions and a posted speed of 60km/h. Brian Coburn Boulevard is a partial truck route.

Renaud Road is an east-west collector roadway that extends east from Anderson Road to Mer Bleue Road. Within the study area the road has a cross-section consisting of a single travel lane in both directions and a posted speed of 50km/h.

Harvest Valley Avenue is an east-west local roadway that extends east from Tenth Line Road to Espirit Drive. The road cross-section consists of a single travel lane in both directions and parking provided on a single side of the roadway. The road has an unposted speed of 40km/h.

Sweetvalley Drive is an east-west local roadway that extends west from Tenth Line Road and loops south into Summerside Phase 2. The road cross-section consists of a single travel lane in both directions and parking provided on a single side of the roadway. The road has an unposted speed of 40km/h.

Willow Aster Road is a local roadway within the Summerside Phase 2 development that has an interim access to Mer Bleue Road. Willow Aster Road will have a shared left-through-right lane in the westbound direction and Mer Bleue Road will have a southbound left turn-lane and through lane in the southbound direction. The northbound approach will remain as a single lane.

3.2. PEDESTRIAN/CYCLING NETWORK

The existing cycling network is comprised of paved shoulders exist on Tenth Line Road before transitioning into bike lanes between Decoeur Drive and Brian Coburn Boulevard, sections of paved shoulder along Mer Bleue Road, bike lanes on Mer Bleue Road north of McKinnons Creek, and bike lanes on Brian Coburn Boulevard between Mer Bleue Road and Gerry Lalonde Drive.

According to the City's Cycling Plan, identifies Mer Bleue Road and Tenth Line Road as ultimately spine routes, Brian Coburn Boulevard and Renaud Road as a suggested cycling routes and a major pathway along McKinnons Creek and connecting to the east, north of Sweetvalley Drive.

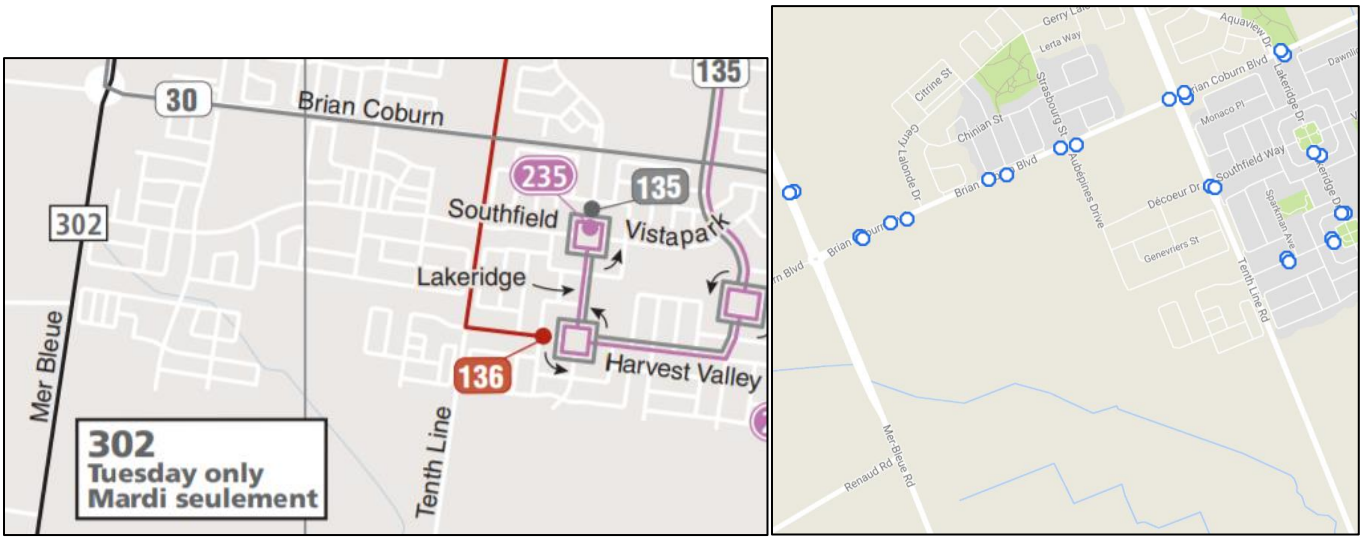
The existing pedestrian network consists of sidewalks provided on the adjacent subdivision's internal road network, with sidewalks located on parts of Tenth Line Road north of Harvest Valley Avenue and along the north side of Brian Coburn Boulevard. No future projects are noted within the Pedestrian Plan.

3.3. TRANSIT NETWORK

OC Transpo service is currently located along Lakeridge Drive, Harvest Valley Avenue, Tenth Line Road, and Brian Coburn Boulevard. The Routes in the area are # 30, #135, #136, and #235. Figure 3 illustrates the current system map and stop locations in the vicinity of the subject site. No stops are located within 400m of the centroid each Phase 4 – 6.

Of note, the Route #302 also operates along Mer Bleue Road, but only on Tuesdays as a free service for one trip during the AM peak.

Figure 3: Area Transit Network

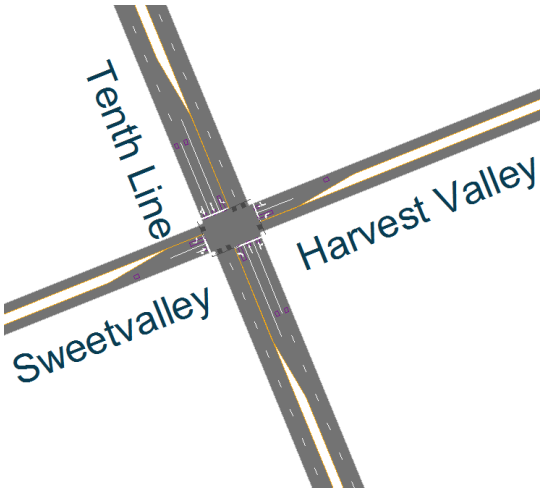


Retrieved on Oct. 19, 2017, http://www.octranspo.com

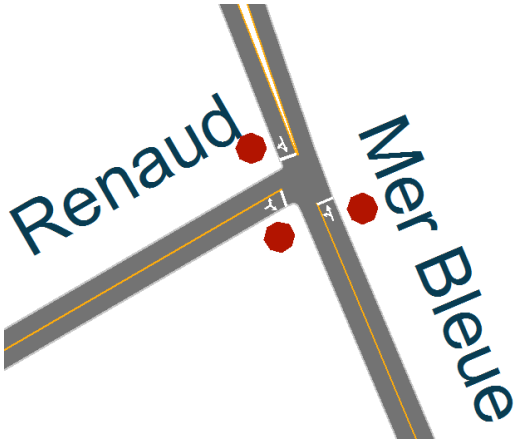
3.4. EXISTING STUDY AREA INTERSECTION

Tenth Line Road at Sweetvalley Drive/Harvest Valley Avenue

Tenth Line Road at Sweetvalley Drive/Harvest Valley Avenue is a signalized intersection. The cross-section of Tenth Line Road is composed of a left-turn lane, through lane and a through-right shared lane the north and south bound directions. Sweetvalley Drive and Harvest Valley Avenue both consist of a shared left-through lane and right-turn lane in the east and westbound direction.



Mer Bleue Road at Renaud Road
Mer Bleue Road at Renaud Road is a stop-controlled t-intersection. The cross-section of each approach is a single shared lane.

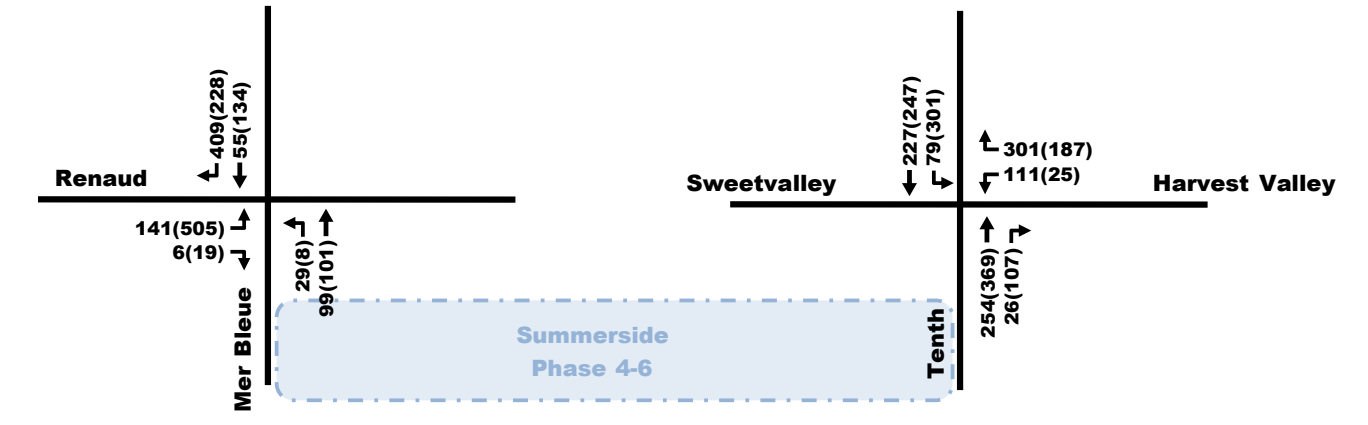


Mer Bleue Road at Willow Aster Road
Mer Bleue Road at Willow Aster Road is a stop-controlled t-intersection on the minor leg. The cross-section of each approach is a single shared lane. Currently, Willow Aster is used as a construction and emergency access.

3.5. EXISTING INTERSECTION VOLUMES

The existing peak hour traffic volumes (illustrated in Figure 4 below) were collected from City of Ottawa turning movement counts. The resulting peak hour and full traffic volume counts are included as Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes



3.6. EXISTING ROAD SAFETY CONDITIONS

Collision history for study area roads (2011 to 2015, inclusive) was obtained from the City of Ottawa, and the majority (80%) of collisions involved property damage, and the remaining (20%) collisions involved non-fatal injuries indicating low impact speeds.

Over the five-year period, these types of collisions were observed at the following locations:

- **Tenth Line Road at Harvest Valley Avenue –** The types of collisions cited by police included: rear end, angle, and single vehicle (other) (33%page 8
- each) type collisions
- **Tenth Line Road, between Southfield Way and Harvest Valley Avenue** – The types of collisions cited by police included: single vehicle (other) (75%) and rear end (25%) type collisions
- **Mer Bleue Road at Renaud Road** – The types of collisions cited by police included: rear end (67%) and single vehicle (other) (33%) type collisions
- **Mer Bleue, between Innes Road and Renaud Road** – The types of collisions cited by police included a single rear end and angle type collisions

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). The reported collision rate for each location are as follows:

- Tenth Line Road at Harvest Valley Avenue – 0.15 collisions/MEV
- Tenth Line Road, between Southfield Way and Harvest Valley Avenue –0.27 collisions/MEV
- Mer Bleue Road at Renaud Road –0.17 collisions/MEV
- Mer Bleue, between Innes Road and Renaud Road – 0.89 collisions/MEV

Based on the available data, there does not appear to be any prevailing safety issues at any of the study area intersections. The source collision data as provided by the City of Ottawa and related analysis is included as Appendix C.

4. PLANNED CONDITIONS

4.1. PLANNED STUDY AREA TRANSPORTATION NETWORK CHANGES

As outlined within the Ottawa Transportation Master Plan Affordable Network and the Ward 19 Planned Construction Projects map, the following projects are identified for south Orleans:

- Chapel Hill Park & Ride: A new park and ride facility is anticipated to be constructed during 2018 at Navan Road, on the north side of Brian Coburn Boulevard
- Brian Coburn Boulevard: Four-lane extension between Navan Road and Orleans Boulevard between 2018-2021, and an extension continuing to Innes Road is anticipated during Phase 2 (2020 and 2025)
- Tenth Line Road: Widening to 4-lanes will extend between Harvest Valley Road and the urban boundary (north of Wall Road) within Phase 2 (2020 and 2025)

4.2. OTHER AREA DEVELOPMENTS

4.2.1. MATTAMY – SUMMERSIDE PHASE 1-3

Mattamy Summerside West is located at 2405 Mer Bleue Road and 2496 Tenth Line Road, directly north of the subject Phases 4-6. Phase 4 will connect through Phase 1 to Tenth Line, and Phases 5-6 will connect through Phases 2-3 to Mer Bleue Road.

Currently, Phase 1 is predominantly completed along Tenth Line Road with residents occupying a significant portion of the development. Phase 2 is under construction adjacent to Mer Bleue Road and Phase 3 estimated to be completed by 2020. In total, Phases 1-3 will include 430 single family homes, 260 townhomes, and 120 low-rise apartment units.

4.2.2. MINTO – AVALON WEST PHASES 2-4

Located across 2333 Mer Bleue Road, 2336 Tenth Line Road, 3024-3100 Brian Coburn Boulevard, 600 – 639 Aubepines Drive, 215-375 Hepatica Way, and 800 Decoeur Drive, Minto Avalon West Phases 2-4 includes 590 residential units and 263,000 sq. ft. of commercial space in Phase 2, 620 residential units and institutional uses in Phase 3, and 320 residential units and 67,000 sq. ft. of commercial space in Phase 4. Currently, Phase 2 is predominantly complete and Phase 3 is under construction.

4.2.3. MINTO AVALON – ISGAR

East of Tenth Line Road (2605 Tenth Line Road), Minto Isgar is an extension of the Avalon community with a block proposed between the stormwater management pond and Tenth Line Road. Overall, the site is estimated to include 561 residential units in total. Approximately a third of these will be located along Tenth Line Road, with an access on Tenth Line Road and through the existing community along Lakeridge Drive.

4.2.4. MER BLEUE LAND LTD

A commercial retail and gas station development is proposed on the southeast quadrant (2075 Mer Bleue Road) of the Brian Coburn Boulevard and Mer Bleue Road. Two accesses are proposed along Mer Bleue Road and a single access along Brian Coburn Boulevard.

5. TIME PERIODS

The weekday morning and afternoon peak hours are considered the appropriate time periods for operational analysis for this residential development.

6. HORIZON YEARS

For the purposes of the operational analysis it is assumed that the subject development phases will be completed every 2 years. As such, and for simplicity of analysis, the following horizons are recommended for analysis if Steps 3 and 4 are required:

- Phase 4 – 2020
- Phase 5/6 – 2024
- +5 Year Horizon - 2029

7. EXEMPTIONS REVIEW

Based on the foregoing analysis and review of the existing conditions in Step 2, the Scoping Report, it is recommended that, if required, any future work within the context of this TIA excludes the following modules and elements summarized in Table 1.

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.2 Circulation and Access	Not required for applications involving plans of subdivision
4.2 Parking	-	Not required for applications involving plans of subdivision
4.5 Transportation Demand Management	-	Residential development with less than 60 students/employees
4.6 Neighbourhood Traffic Management	-	Collector road access within existing/developing residential lands, not anticipated to exceed ATM thresholds of 2,500-5,000 vehicles/day or 300-600 vehicles/peak hour.

8. DEVELOPMENT GENERATED TRAFFIC

8.1. TRIP GENERATION

8.1.1. TRIP GENERATION RATES

The trip generation rates for the proposed development were obtained from the City's 2009 TRANS Trip Generation for the residential units. Table 2 summarizes the trip generation rates.

Table 2: Vehicle Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Single Family Homes	TRANS	T = 0.70(x)	T = 0.90(x)
Townhomes	TRANS	T = 0.54(x)	T = 0.71(x)
Notes: *T = Average Vehicle Trip Ends* *X = Residential units*			

The TRANS vehicle trip generation rates were generated and are summarized in Table 3.

Table 3: Projected Vehicle Trip Generation – TRANS Model

Land Use	Source	Units	AM Peak (veh/h)			PM Peak (veh/h)		
			In	Out	Total	In	Out	Total
Phase 4 Single Family Homes	TRANS	145 du	29	73	102	81	50	131
Phase 4 Townhomes	TRANS	100 du	19	35	54	37	34	71
Phase 5 Single Family Homes	TRANS	257 du	52	128	180	143	88	231
Phase 6 Townhomes	TRANS	236 du	46	81	127	89	79	168
Total Vehicle Trips			**146**	**320**	**462**	**351**	**172**	**432**

8.1.2. MODE SHARES

The mode share percentages from the TRANS OD Survey for the 'Orleans' zone are summarized in Table 4 below.

Table 4: Study Area Mode Share Percentages – TRANS O-D

Travel Mode	Mode Share	
	AM	PM
Auto Passenger	55%	64%
Auto Driver	8%	21%
Transit	35%	12%
Non-Motorized	2%	3%

Using the mode shares for the study area, the total person trips and person trips by mode were estimated and summarized for each phase in Table 5, Table 6 and Table 7.

Table 5: Total Site Trip Generation – Phase 4

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	55/64%	48	108	156	118	84	202
Auto Passenger	8/21%	7	16	23	40	26	66
Transit	35/12%	31	68	99	22	16	38
Non-motorized	2/3%	1	5	6	5	4	9
Total Person Trips	100%	87	197	284	185	130	316
Total 'New' Auto Trips		**48**	**108**	**156**	**118**	**84**	**202**

Table 6: Total Site Trip Generation – Phase 5

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	55/64%	52	128	180	143	88	231
Auto Passenger	8/21%	8	18	26	46	29	75
Transit	35/12%	34	80	114	26	17	43
Non-motorized	2/3%	3	4	7	6	5	11
Total Person Trips	100%	96	230	325	220	139	359
Total 'New' Auto Trips		**52**	**128**	**180**	**143**	**88**	**231**

Table 7: Total Site Trip Generation – Phase 6

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	55/64%	46	81	127	89	79	168
Auto Passenger	8/21%	6	12	18	30	25	55
Transit	35/12%	29	52	81	16	16	32
Non-motorized	2/3%	1	4	5	4	4	8
Total Person Trips	100%	82	149	231	139	124	263
Total 'New' Auto Trips		**46**	**81**	**127**	**89**	**79**	**168**

As shown above, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 463 and 433 veh/h during the weekday morning and afternoon, respectively, upon full build-out of the development.

8.2. TRIP DISTRIBUTION

Traffic distribution was based on the site's connectivity to the existing road network and our knowledge of the surrounding area. The resultant distribution is outlined as follows:

- 55% to/from the north
- 40% to/from the west; and
- 5% to/from the east
- 100%

8.3. TRIP ASSIGNMENT

Based on these distributions, 'new' site-generated trips to/from the proposed development are assigned to study area intersections, and are illustrated as Figure 5 and Figure 6, and the total 'new' site generated trips upon full build-out are illustrated in Figure 7.

Figure 5: 'New' 2020 Site-Generated Traffic Volumes (Phase 4)

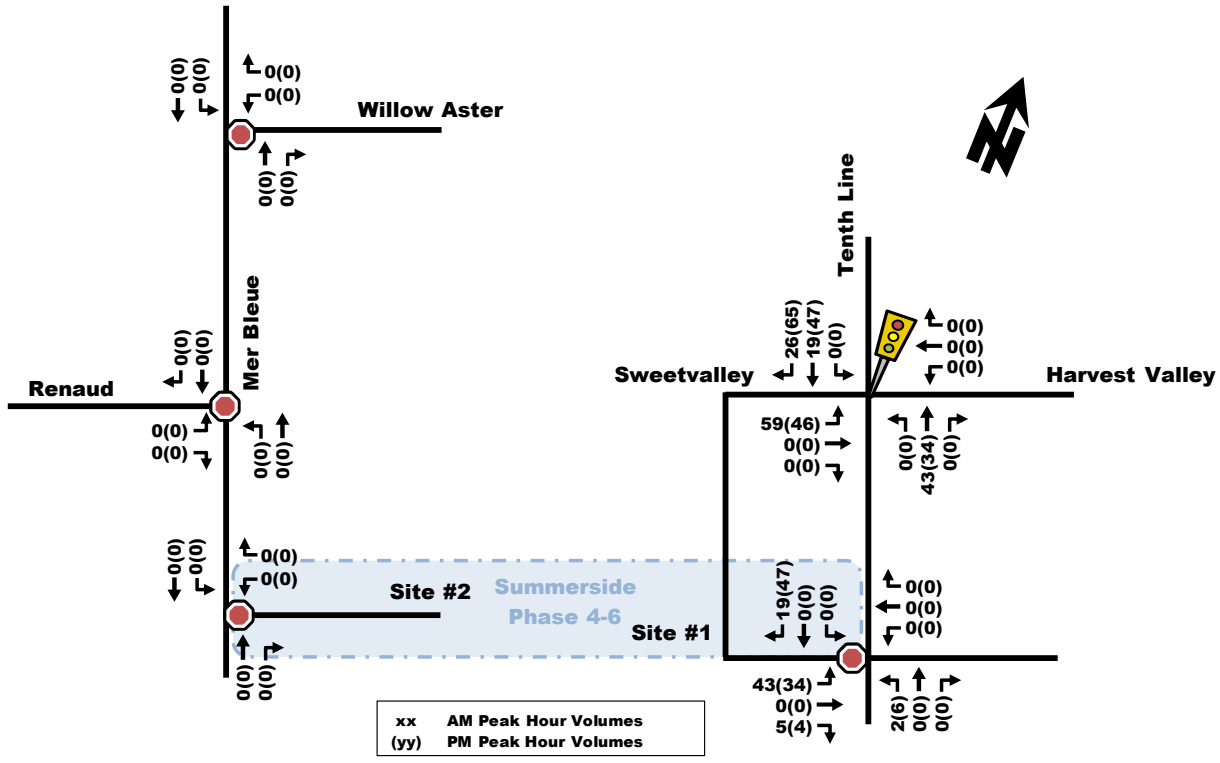


Figure 6: 'New' 2024 Site-Generated Traffic Volumes (Phase 5-6)

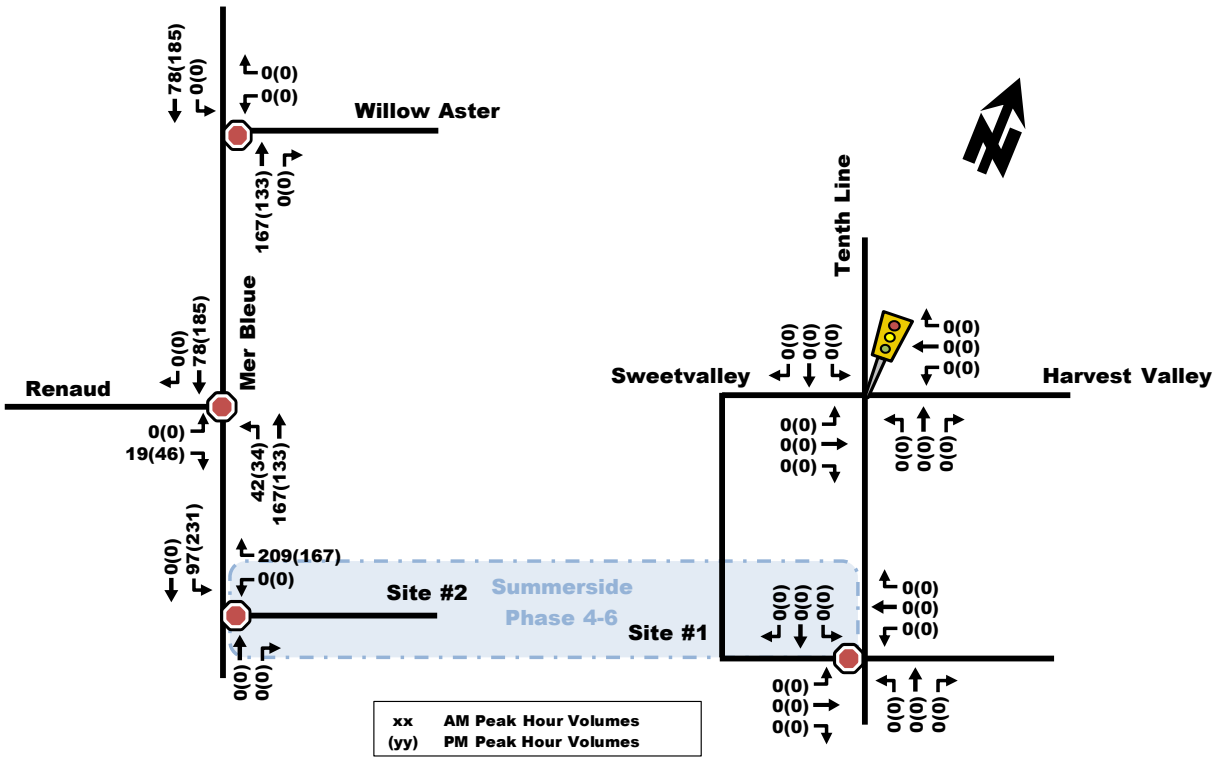
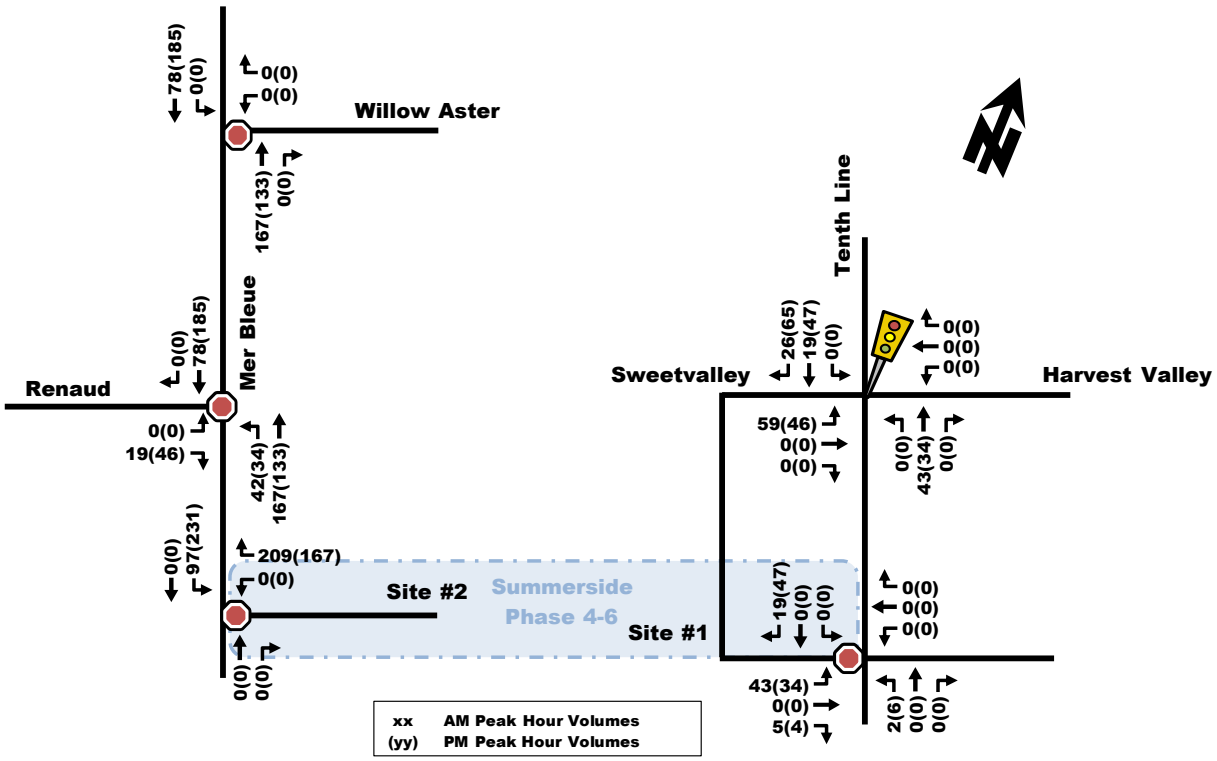


Figure 7: Total 'New' 2024 Site-Generated Traffic Volumes



9. BACKGROUND NETWORK TRAVEL DEMANDS

9.1. TRANSPORTATION NETWORK PLANS

As outlined within the Ottawa Transportation Master Plan Affordable Network and the Ward 19 Planned Construction Projects map, the following projects are identified for south Orleans:

- Chapel Hill Park & Ride: A new park and ride facility is anticipated to be constructed during 2018 at Navan Road, on the north side of Brian Coburn Boulevard;
- Brian Coburn Boulevard: Four-lane extension between Navan Road and Orleans Boulevard between 2018-2021, and an extension continuing to Innes Road is anticipated during Phase 2 (2020 and 2025); and
- Tenth Line Road: Widening to 4-lanes will extend between Harvest Valley Road and the urban boundary (north of Wall Road) within Phase 2 (2020 and 2025).
- Mer Bleue Road at Willow Aster Road: Mattamy has a southbound left turn lane approved through the RMA and functional design process for access into the current phases of Summerside West. It is assumed that this turn lane will be constructed by 2020.

9.2. BACKGROUND GROWTH RATES

The background traffic growth has been summarized in Table 8 for the study area based on historical traffic count data (2009 – 2013) at the Tenth Line/Brian Coburn intersection. Detailed background traffic growth analysis is included as Appendix D.

Table 8: **Tenth Line Historical Background Growth (2009 – 2013)**

Time Period	Percent Annual Change
	South Leg
8 hrs	6.7%
AM Peak	9.4%
PM Peak	8.9%

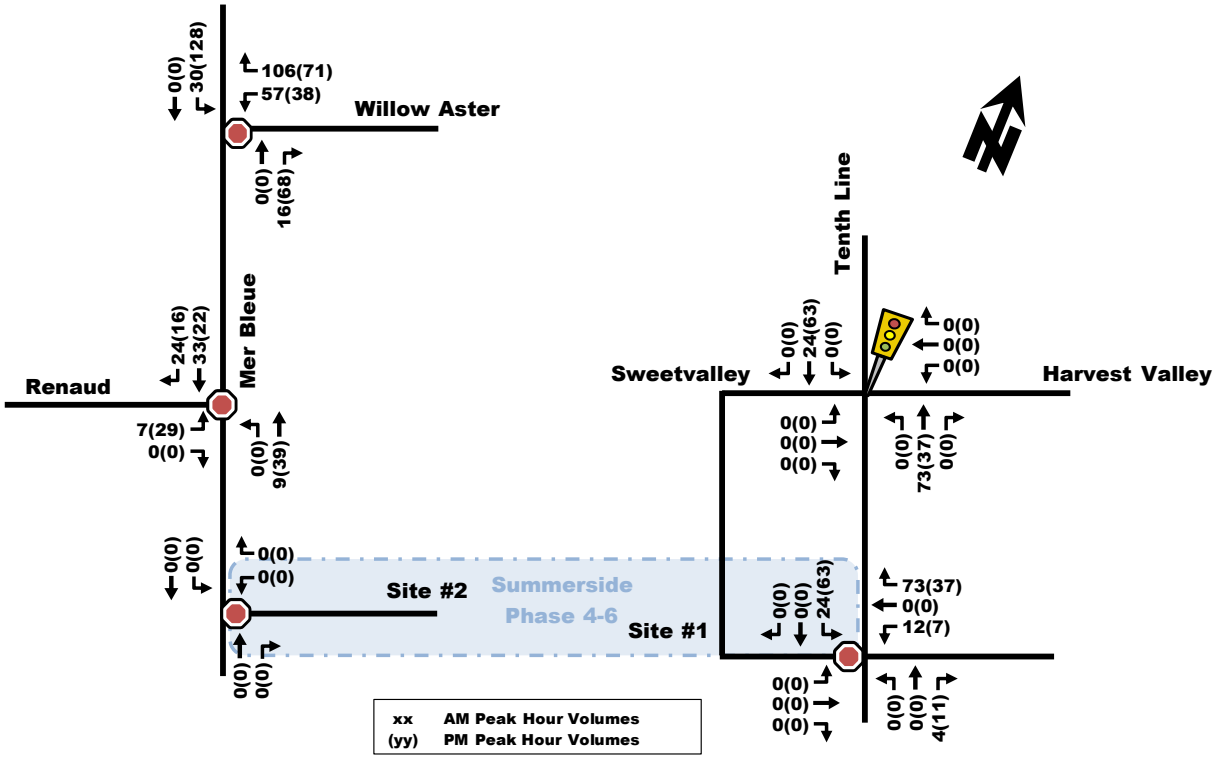
As shown in Table 8, the Tenth Line has experienced approximately 6.7% to 9.4% annual growth within recent years (calculated as a weighted average). The growth identified relates to the development between the urban boundary and Brian Coburn, and given the subject site is located at the urban boundary, a 1% growth rate was assumed for the build-out horizons, which will total over a 10% overall growth along Mer Bleue and Tenth Line by the 2029 horizon.

The resulting future background traffic for the horizon years 2020, 2024 and 2029 are depicted as Figure 9, Figure 10, and Figure 11, respectively.

9.3. OTHER AREA DEVELOPMENTS

The City of Ottawa's Development Applications webtool has been used to determine if there are proposed developments within the area of influence of the proposed development. These developments have been discussed in greater detail in Section 4.2 and only the remaining phases of Summerside 1 to 3 and the Minto Isgar development will have an impact on the study area intersections. Figure 8 illustrates the traffic impact of the developments on the study area intersections. These have been included below in Figure 9 through Figure 11.

Figure 8: Mattamy Summerside Phase 1 to 3 and Minto Isgar Traffic Volumes



10. DEMAND RATIONALIZATION

10.1. DESCRIPTION OF CAPACITY ISSUE(S)

10.1.1. 2020 BACKGROUND HORIZON – PHASE 4

The 2020 background peak hour traffic volumes (illustrated in Figure 9 below) have been generated from the existing turning movement counts and the application of the growth rates discussed in Section 9.2. The background operations are summarized in Table 9 and the detailed synchro worksheets are provided in Appendix E.

Figure 9: 2020 Background Peak Hour Traffic Volumes

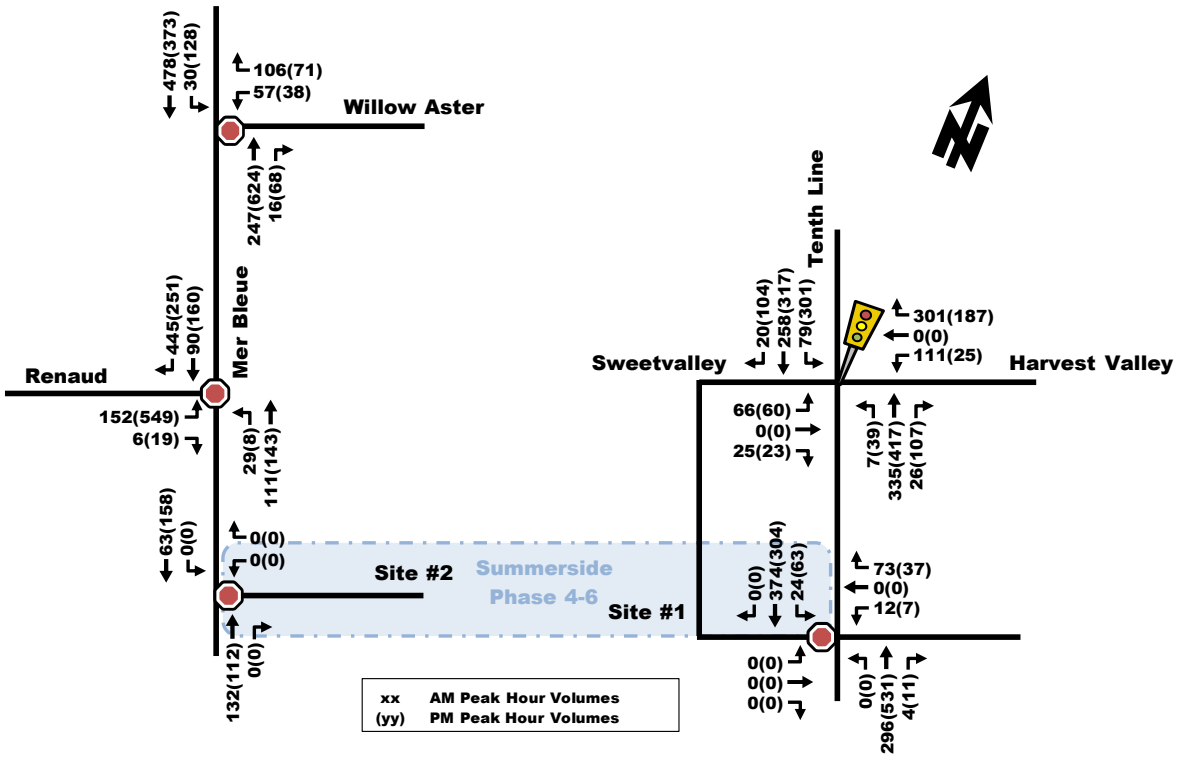


Table 9: 2020 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c / delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E(C)	0.92(0.71)	EBL(EBL)	14.0(7.5)	A(A)	0.34(0.37)
Stop-Controlled						
Mer Bleue/Renaud	C(F)	16.1(75.8)	SBR(EBL)	14.0(48.4)	B(E)	-
Mer Bleue/Willow Aster	C(E)	16.1(36.9)	WBR(WBR)	3.1(4.1)	A(A)	-
Notes: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 9, the signalized study area intersection 'as a whole' is projected to continue to operate at an acceptable LoS 'A' during both peak hours, with respect to the City of Ottawa operating standards of LoS 'D' or better (v/c ≤ 0.90). The critical movement (eastbound left) is noted to have a LoS 'E' during the AM peak hour and a LoS 'C' during the PM peak hour.

At the stop-controlled intersections, the intersections operate 'as a whole' at an acceptable LOS with respect to the City of Ottawa operating standards of LoS 'D' or better, with the exception of Mer Bleue/Renaud that operates at a LoS 'E' during the PM peak. During the PM peak hours, the critical movement at Mer Bleue/Renaud is noted to have a delay of over 75 seconds (LoS 'F') in the eastbound left movement. Signals are not warranted at Mer Bleue/Renaud (see Appendix F).

10.1.2. 2024 BACKGROUND HORIZON – PHASE 5 AND 6

The 2024 background peak hour traffic volumes (illustrated in Figure 10 below) have been generated from the existing turning movement counts and the application of the growth rates discussed in Section 9.2. The background operations are summarized in Table 10 and the detailed synchro worksheets are provided in Appendix E.

Figure 10: 2024 Background Peak Hour Traffic Volumes

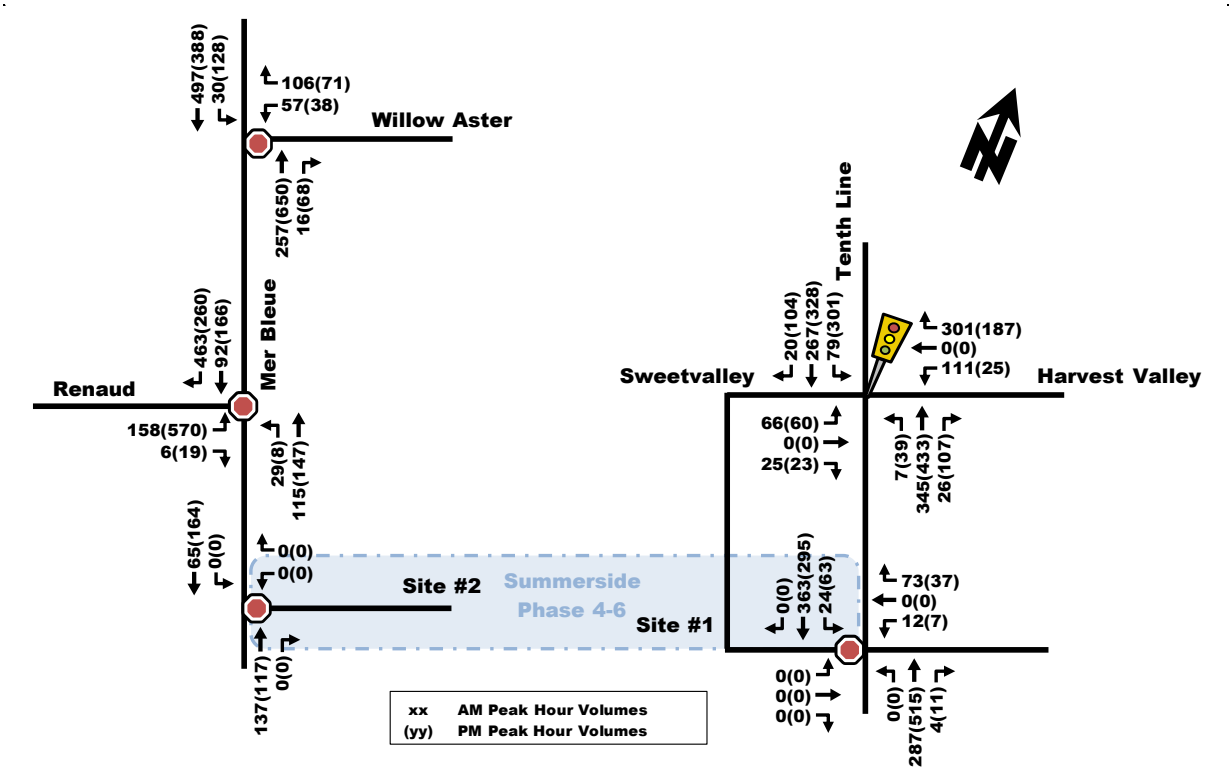


Table 10: 2024 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E(C)	0.94(0.71)	EBL(EBL)	14.0(7.5)	A(A)	0.34(0.37)
Stop-Controlled						
Mer Bleue/Renaud	C(F)	17.5(90.2)	SBR(EB)	15.0(56.3)	B(F)	-
Mer Bleue/Willow Aster	C(E)	16.7(40.9)	WB(WB)	3.1(4.3)	A(A)	-
Notes: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The study area intersections operate similarly to the 2020 horizon, with a slight increase in delays and LoS due to the background growth assumptions. Based on the projected background traffic volumes, signals aren't warranted at the Mer Bleue/Renaud and Mer Bleue/Willow Aster intersections (Appendix F).

10.1.3. 2029 BACKGROUND HORIZON – BUILD-OUT +5 YEARS

The 2029 background peak hour traffic volumes (illustrated in Figure 11 below) have been generated from the existing turning movement counts and the application of the growth rates discussed in Section 9.2. The background operations are summarized in Table 10 and the detailed synchro worksheets are provided in Appendix E.

Figure 11: 2029 Background Peak Hour Traffic Volumes

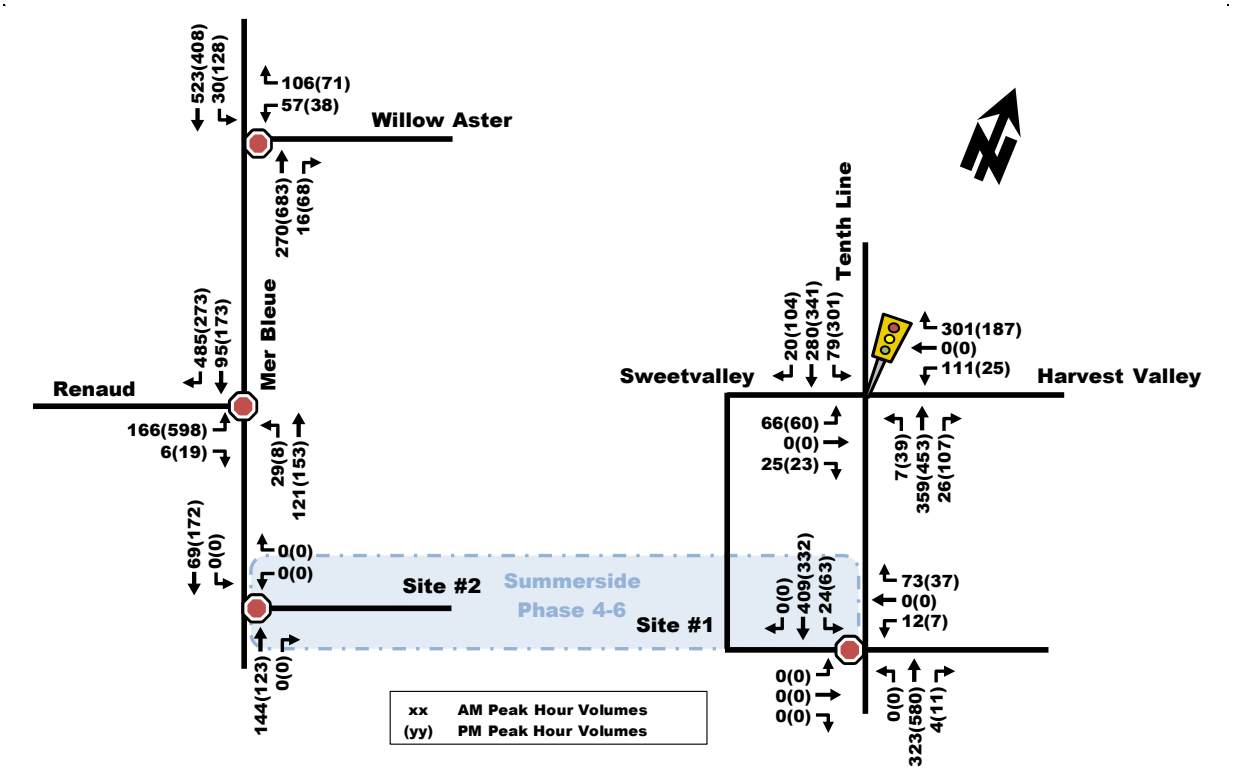


Table 11: 2029 Background Conditions Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E(C)	0.95(0.76)	EBL(EBL)	17.8(12.2)	A(A)	0.43(0.45)
Stop-Controlled						
Mer Bleue/Renaud	C(F)	19.9(115.1)	SBR(EBL)	16.7(70.2)	C(F)	-
Mer Bleue/Willow Aster	C(E)	17.5(47.0)	WBR(WBR)	3.1(4.6)	A(A)	-
Notes: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The study area intersections operate similarly to the 2020 and 2024 horizon, with a slight increase in delays and LoS due to the background growth assumptions. Based on the projected background traffic volumes, signals aren't warranted at the Mer Bleue/Renaud and Mer Bleue/Willow Aster intersections (Appendix F).

11. DEVELOPMENT DESIGN

11.1. NEW STREETS NETWORK

The planned network street design is consistent with the *Building Better and Smarter Suburbs* philosophy. The network design is consistent with road classification and anticipated usage within the community. Furthermore, pathways and cycling facilities have been integrated into the design to encourage travel by sustainable modes. Figure 12 and Figure 13 show the preferred demonstration plan and pathways in the Mer Bleue Expansion Area Community Design Plan (CDP), respectively.

Figure 12: Mer Bleue Expansion Demonstration Plan

FIGURE 4: Demonstration Plan

Source: Mer Bleue Expansion Area Community Design Plan (June 2017)

Figure 13: Mer Bleue Expansion Parks and Pathway Plan

Source: Mer Bleue Expansion Area Community Design Plan (June 2017)

Note that prior to full build-out out of the Mer Bleue Expansion Area, interim accesses have been proposed for Phases 4 on Tenth Line at Sweetvalley and for Phase 5 and 6 on Mer Bleue at Willow Aster. As the development of the site is anticipated to occur before the lands to the south are initiated and Mer Bleue is realigned, a secondary emergency access/egress will be required once the development reaches a total of 200 units.

12. BOUNDARY STREET DESIGN

The City has recently completed the street plan for Tenth Line Road from Brian Coburn to south of Harvest Valley. This construction accommodates future traffic demands, new housing developments and provide active mode facilities that will allow access and improve safety concerns. The plan included the following features:

- Widening Tenth Line Road from 2 to 4 lanes south of Brian Coburn to south of Harvest Valley;
- A multi-use pathway (MUP) on the west side of Tenth Line Road;
- A concrete sidewalk on the east side of Tenth Line Road; and
- New street lighting.

Mer Bleue is identified in the TMP as a part of the 2031 Affordable Network and 2031 Network Concept Plan. It is planned to be widened from 2 to 4 lanes between Brian Coburn and Renaud (Affordable) and realigned west of the existing Mer Bleue, between Renaud and Navan (Concept), continuing the 4-lane cross-section.

Currently, Mer Bleue does not meet the required MMLOS targets however, it is identified to be widened in the TMP. As such, the redesign of these roads should incorporate design elements to better cater to the needs of different modes of travel (e.g. transit, cycling, walking, etc.). The future Renaud realignment south of the development is anticipated to meet the MMLOS targets. The target MMLOS for the boundary streets are described in Table 12 below. Based on the MMLOS Guidelines, the elements suggested within the guidelines to achieve the targets are identified in Table 13. These elements

are not a recommendation of elements to be implemented but are only provided as a reference to the extent of modifications required to reach the targets.

Table 12: MMLOS Targets for Boundary Streets

OP Designation / Policy Area	Road Class	Pedestrian LOS	Bicycle LOS	Transit LOS	Truck LOS	Auto LOS
General Urban Area	Tenth Line	C	D	No Target	D	D
	Mer Bleue	C	C	No Target	E	D
	Renaud	C	C	No Target	No Target	D
Within 300m of a school	Mer Bleue*	A	C	No Target	E	E
	Renaud*	A	B	No Target	No Target	E
Note: The Mer Bleue/Renaud intersection is within 300m of a school and not mid block along each road						

Table 13: Minimum Required Elements Suggested by MMLOS Analysis

Mode	Elements
Pedestrian	PLOS "A" – intersection evaluation • Smart channel right-turn • Protected-permissive conflicting left-turns • 0 – 2 lanes crossed • Pedestrian delay less than 10s per intersection leg PLOS "C" – segment evaluation • Sidewalk width greater than 2 m • Boulevard width greater than 2 m • Operating speed between 50 – 60 km/h

Bicycle	BLOS "B" – intersection evaluation
	• For a pocket bike lane:
	  ○ Right-turn lane introduced to the right of the bike lane and ≤ 50 m long, turning speed ≤ 25 km/h (based on curb radii and angle of intersection)
	  ○ To make a left turn:
	  ▪ Two-stage, left-turn bike box; ≤ 50 km/h,
	  ▪ No lane crossed, ≤ 50 km/h; or
	  ▪ 1 lane crossed, ≤ 40 km/h
	• Note: A BLOS "A" is achieved if a physically separated bike lane is provided at an intersection
	BLOS "C" – segment evaluation
	• Bike lane not adjacent to parking:
	  ○ 2 travel lanes in each direction without a separating median;
	  ○ ≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width); and
	  ○ 60 km/h operating speed.
	• Note: A BLOS "A" is achieved if a physically separated bike lane is provided at an intersection

Truck	TkLOS "E" – intersection evaluation • Effective corner radius 10 to 15 m with at least one receiving lane on departure from intersection

Mode	Elements
	TkLOS "D" – segment evaluation • With two-lane cross section: curb lane width ≤ 3.3 m • More than two travel lanes: curb lane width ≤ 3.2 m
Auto	LOS "D" – intersection evaluation • v/c = 0.81 to 0.90

13. ACCESS INTERSECTION DESIGN

13.1. LOCATION AND DESIGN OF ACCESS

Tenth Line Road Access
The vehicle access for the Phase 4 development is proposed via Tenth Line Road at the Tenth Line/Sweetvalley intersection and at a new access at the south end of the site. The intersections are located approximately 350m and 905m south of the closest signalized intersection (Tenth Line/Southfield).

Mer Bleue Road Access
The primary vehicle access for the Phase 5 and 6 developments is proposed via Mer Bleue Road, with a new driveway connection recommended on Mer Bleue Road. The new intersection would be temporary based on the realignment of Mer Bleue Road and extension of Renaud Road. At that time, the new design will be able to be properly accommodated.

The Mer Bleue/Willow Aster intersection would be used as a secondary access. The proposed Mer Bleue/Site intersection is located directly west of the development, and the Mer Bleue/Willow Aster intersection is approximately 55m north of the Mer Bleue/Renaud intersection.

13.2. INTERSECTION CONTROL

Tenth Line/Sweetvalley Intersection
The Tenth Line/Sweetvalley intersection is currently a full traffic control signal (TCS).

Tenth Line/Proposed Site Access #1
Based on the projected vehicle volumes, STOP control on the minor approach (site) only is recommended.

Mer Bleue/Willow Aster Intersection
Based on the projected vehicle volumes, STOP control on the minor approach (site) only is recommended.

Mer Bleue/Proposed Site Access #2
Based on the projected vehicle volumes, STOP control on the minor approach (site) only is recommended.

13.3. INTERSECTION DESIGN

Tenth Line/Sweetvalley Intersection
The existing cross-section of Tenth Line Road is composed of a left-turn lane, through lane and a through-right shared lane the north and south bound directions. Sweetvalley Drive and Harvest Valley Avenue both currently consist of a shared left-through lane and right-turn lane in the east and westbound direction. No additional changes are required.

Tenth Line/Proposed Site Access #1
This intersection is proposed as a stop-controlled t-intersection on the minor leg (site). The existing cross-section of each approach is a single shared lane.

Mer Bleue/Willow Aster Intersection
Mer Bleue Road at Willow Aster Road is a stop-controlled t-intersection on the minor leg (Willow Aster). The existing cross-section of each approach is a single shared lane. Currently, Willow Aster is used as a construction and emergency access. A 75m southbound left-turn lane is currently proposed for this intersection to accommodate projected vehicle traffic. No additional changes are required.

Mer Bleue/Proposed Site Access #2
This intersection is proposed as a stop-controlled t-intersection on the minor leg (site). The existing cross-section of each approach is a single shared lane. A minimum 45m southbound left-turn lane is recommended for this intersection to accommodate projected vehicle traffic (approximately 200 veh/h in the afternoon peak hour). See Appendix F for the Left-Turn Lane Warrant and storage length calculations for this intersection.

14. TRANSIT

Total “new” two-way transit trips for Phase 4 are approximately 99 (31 in, 68 out) and 38 (22 in, 16 out) persons/h in the AM and PM peaks, respectively. During the AM peak, this represents approximately 56-123% of a single bus (55 passengers), approximately 28-91% of an articulated bus (75 passengers), and approximately 34-76% of a double decker bus (90 passengers).

Total “new” two-way transit trips for Phases 5 and 6 are approximately 195 (63 in, 132 out) and 75 (42 in, 33 out) persons/h in the AM and PM peaks, respectively. During the AM peak, this represents approximately 115-240% of a single bus (55 passengers), approximately 84-176% of an articulated bus (75 passengers), and approximately 70-147% of a double decker bus (90 passengers).

The implementation of Chapel Hill Park & Ride within close proximity to the proposed site will be able to accommodate the increase in transit ridership associated with this development. The proposed changes to the road network adjacent to the site will facilitate the movement of persons to/from this BRT station.

15. INTERSECTION DESIGN

15.1. TOTAL PROJECTED 2020 CONDITIONS

The total projected 2020 traffic volumes were derived by superimposing the 2020 site-generated traffic volumes on background 2020 traffic volumes (as per the Forecasting Report). The resulting total projected 2020 traffic volumes are illustrated in Figure 14. Table 14 provides a summary of the total projected 2020 operations at the study area intersections The SYNCHRO model output of total projected 2020 conditions is provided within Appendix G.

Figure 14: Total Projected 2020 Traffic Volumes

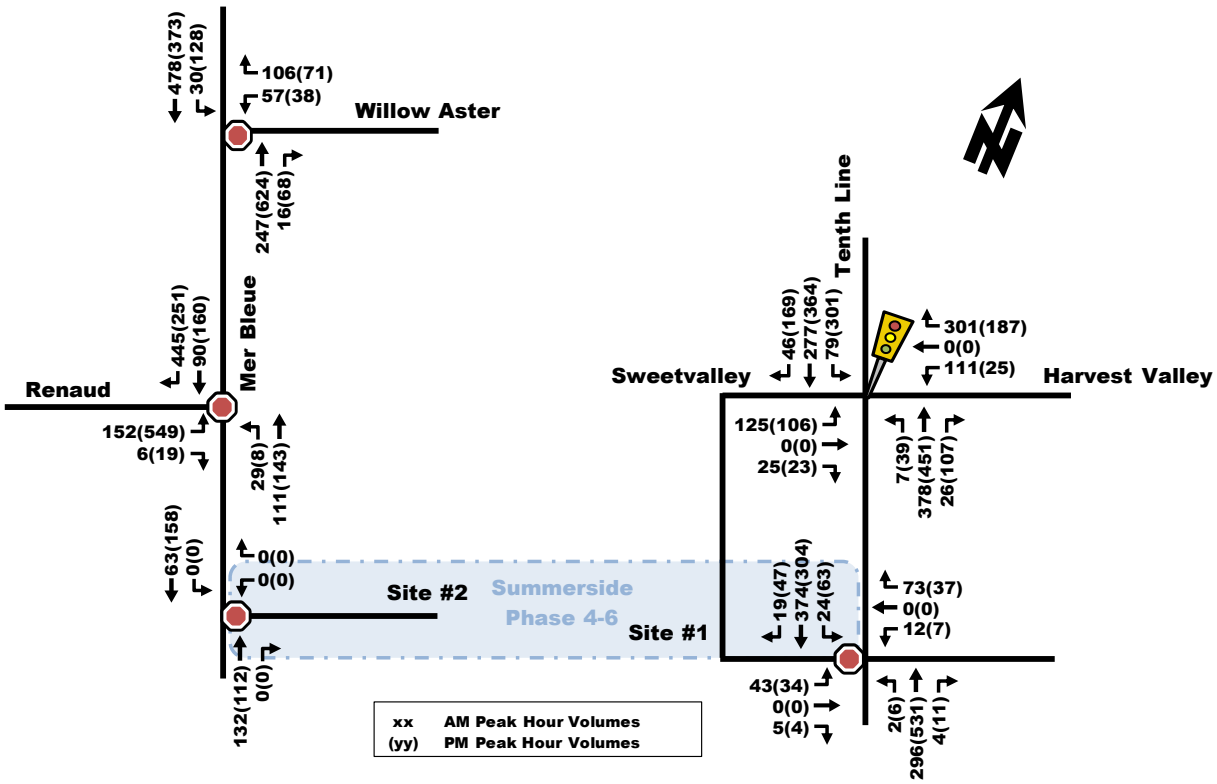


Table 14: Total Projected 2020 Performance at Study Area Intersection

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E (C)	0.98 (0.71)	EBL (EBL)	16.9 (10.2)	A (A)	0.40 (0.43)
Stop-Controlled						
Tenth Line/Site Access #1	C (D)	23.9 (34.8)	EB (EB)	2.9 (2.8)	A (A)	-
Mer Bleue/Renaud	C (F)	16.1 (75.8)	SBR (EBL)	14.0 (48.4)	B (E)	-
Mer Bleue/Willow Aster	C (E)	16.1 (36.9)	WB (WB)	3.2 (4.1)	A (A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As the development of phasing for 2020 is assumed to be Phase 4, adjacent to Tenth Line Road. Therefore, the stop-controlled intersections along Mer Bleue will operate similarly to the forecasted background conditions in 2020.

As shown in Table 5, the Tenth Line/Sweetvalley intersection 'as a whole' is projected to operate at acceptable levels of service LoS 'A' during both peak hours. During the AM peak hour, the eastbound left turn will have a LoS 'E' similar to the forecasted background 2020 conditions. The new proposed Tenth Line Access intersection performs with an acceptable LoS 'D' or better with regards to critical movements and with an excellent LoS 'A' as a whole.

15.2. TOTAL PROJECTED 2024 CONDITIONS

The total projected 2024 traffic volumes were derived by superimposing the 2024 site-generated traffic volumes on background 2024 traffic volumes (as per the Forecasting Report). The resulting total projected 2024 traffic volumes are

illustrated in Figure 15. Table 15 provides a summary of the total projected 2024 operations at the study area intersections. The SYNCHRO model output of total projected 2024 conditions is provided within Appendix G.

Figure 15: Total Projected 2024 Traffic Volumes

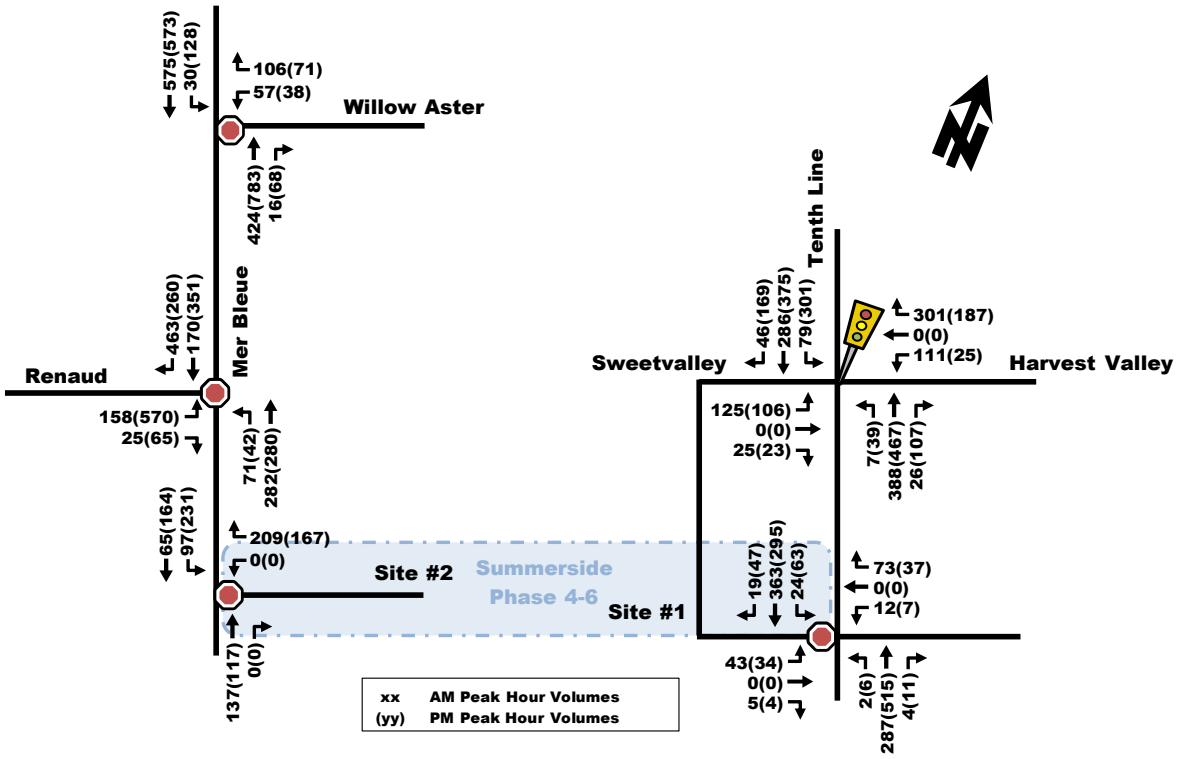


Table 15: Total Projected 2024 Performance at Study Area Intersection

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E (C)	0.98 (0.71)	EBL (EBL)	16.9 (10.4)	A (A)	0.40 (0.43)
Stop Controlled						
Tenth Line/Site Access #1	C (D)	23.0 (33.0)	EB (EB)	2.9 (2.8)	A (A)	-
Mer Bleue/Renaud	E (F)	41.2 (180.5)	SB (EB)	29.6 (128.3)	D (F)	-
Mer Bleue/Willow Aster	D (F)	25.3 (100.9)	WB (WB)	3.6 (7.5)	A (A)	-
Mer Bleue/Site Access #2	B (A)	10.4 (9.9)	WBR (WBR)	5.7 (5.1)	A (A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The development phasing for 2024 is assumed to be Phase 5 and 6, adjacent to Mer Bleue. Therefore, the signalized intersection along Tenth Line and Tenth Line Access will operate similarly to the forecasted total conditions in 2020 with a slight increase in delays and LoS due to the background growth assumptions.

As shown in Table 5, the stop-controlled intersections, the intersections operate 'as a whole' at an acceptable LOS with respect to the City of Ottawa operating standards of LoS 'D' or better, with the exception of Mer Bleue/Renaud that operates at a LoS 'F' during the PM peak. During the PM peak hours, the critical movement at Mer Bleue/Renaud is noted to have a delay of over 175 seconds (LoS 'F') in the eastbound left movement, an approximate 100 second increase. A signal warrant was completed for the intersection and is it not warranted for the Mer Bleue/Renaud (see Appendix F).

With regard to the Mer Bleue/Willow Aster intersection, the critical movement is the westbound movement with a LOS 'F' and delays over 100 seconds. It would be beneficial to provide line painting on the westbound lanes to provide a slip-around for the right-turn movement as 80-90% of westbound traffic is turning right.

15.3. TOTAL PROJECTED 2029 CONDITIONS

The total projected 2029 traffic volumes were derived by superimposing the 2029 site-generated traffic volumes on background 2029 traffic volumes (as per the Forecasting Report). The resulting total projected 2029 traffic volumes are illustrated in Figure 16. Table 16 provides a summary of the total projected 2029 operations at the study area intersection. The SYNCHRO model output of total projected 2029 conditions is provided within Appendix G.

Figure 16: Total Projected 2029 Traffic Volumes

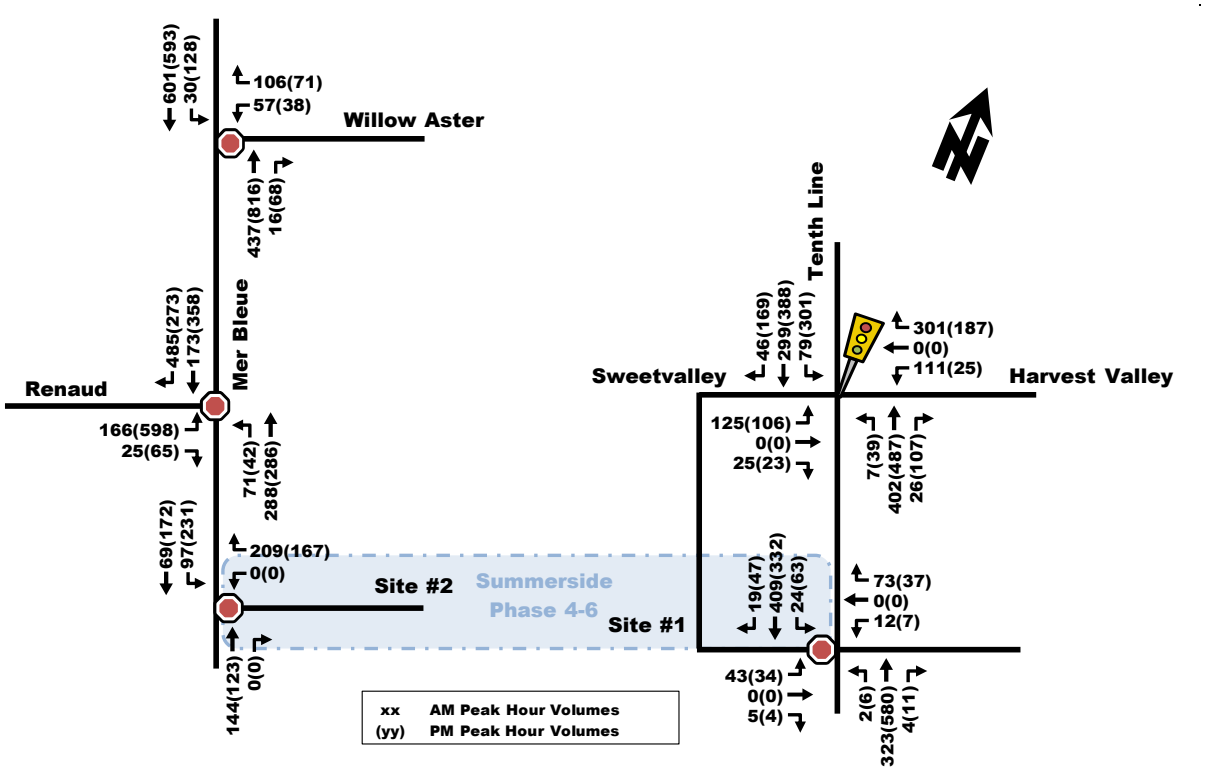


Table 16: Total Projected 2029 Performance at Study Area Intersection

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Signalized						
Tenth Line/Sweetvalley	E (C)	0.98 (0.71)	EBL (EBL)	16.8 (10.6)	A (A)	0.40 (0.44)
Stop Controlled						
Tenth Line/Site Access #1	D (E)	26.7 (41.1)	EB (EB)	3.1 (3.0)	A (A)	-
Mer Bleue/Renaud	F (F)	52.1 (206.5)	SBR (EB)	35.9 (145.6)	E (F)	-
Mer Bleue/Willow Aster	D (F)	27.1 (123.3)	WB (WB)	3.8 (8.7)	A (A)	-
Mer Bleue/Site Access #2	B (A)	10.5 (9.9)	WB (WB)	5.6 (5.0)	A (A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The development phasing for 2024 is assumed to be Phase 5 and 6, adjacent to Mer Bleue. Therefore, the signalized intersection along Tenth Line and Tenth Line Access will operate similarly to the forecasted total conditions in 2020 with a slight increase in delays and LoS due to the background growth assumptions.

As shown in Table 5, the stop-controlled intersections operate similarly to the 2024 horizon, with a slight increase in delays and LoS due to the background growth assumptions. Mer Bleue/Renaud critical movements continue to experience increased delays, with the AM peak hour southbound right movement becoming a LoS 'F' with over 50 seconds of delay. The overall intersection operates acceptably during the AM peak hour. The 2029 volumes do not warrant signalization (see Appendix F).

16. CONCLUSIONS

Based on the results summarized herein the following conclusions are offered:

Proposed Site

- The development will include 738 units, consisting of 336 townhomes and 402 single family homes. The subdivision will connect to the previous developed Summerside Phases to the north.
- The proposed development will consist of three (3) phases, continuing from the previous Summerside development, with Phase 4 completed by 2020 and Phases 5 and 6 completed by 2024.
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 156 and 202 trips from Phase 4 to Tenth Line Road, and 307 and 399 trips to Mer Bleue from Phases 5 and 6, during the weekday morning and afternoon peak hours.
- The accesses to the development are proposed at a proposed new connection to Mer Bleue Road and at Tenth Line Road via Sweetvalley Drive and a proposed new connection.
- The new connection to Mer Bleue Road may be a temporary access road or the ultimate extension of the minor collector road from the East Urban Community Phase 2 lands.

Background Conditions

- Overall, the intersection of Tenth Line Road and Sweetvalley Drive will operate well during the projected background horizons, with the eastbound left-turn movement operating at a level of service 'E' during the AM peak from 2020 onward.
- The background conditions at Mer Bleue Road and Renaud Road are projected to experience long delays (>70 seconds) during the PM peak in the 2020 horizon. Similarly, this delay is noted to increase to over 90 seconds by the 2024 horizon and 115 seconds by 2029 horizon.

- The overall intersection of Mer Bleue Road and Renaud Road will operate at a level of service 'E' during the PM peak in the 2020 horizon, dropping to a level of service 'F' during the 2024 and 2029 horizons.
- While beyond the study horizon, the widening and re-alignment of Mer Bleue Road will ultimately signalize/roundabout this intersection and improve operations in the eastbound direction.

Projected Conditions

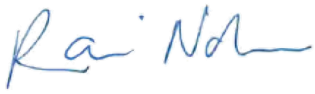
- The intersection of Tenth Line Road and Sweetvalley Drive, including the build-out of Phase 4 at the 2020 horizon, is projected to operate similarly to the background conditions. No improvements required to facilitate the Phase 4 at this intersection.
- The new proposed Tenth Line Access intersection is projected to operate as 'a whole' with a LoS 'A' throughout the horizon years 2020, 2024 and 2029.
- The addition of Phase 5 and 6 trips during the 2024 horizon will exacerbate the intersection operations of Mer Bleue Road and Renaud Road, specifically the eastbound left-turn during the PM peak. The delays may double over the background conditions for this movement.
- During the 2029 horizon, the Mer Bleue Road and Tenth Line Road will continue to experience high delays in the eastbound left-turn movement.
- Due to the future widening and re-alignment of Mer Bleue Road, no improvements are recommended during the interim as the ultimate design will likely signalize/roundabout this intersection and improve operations in the eastbound direction.
- The intersection of Willow Aster Circle and Mer Bleue Road is projected to experience increasing delays on the westbound approach as Phase 5 and 6 are developed, with a level of service 'F' during the 2024 and 2029 horizons. No improvements are recommended for this interim access location for Phase 1 to 3.

Site Plan

- Cycling facilities will be required along the collector roads within the development, and along the boundary roads of Mer Bleue Road, Tenth Line Road and Renaud Road. These facilities may be on-street facilities but will need separation from on-street parking.
- Pedestrian facilities will include a single sidewalk along local roads, and two sidewalks on collector roads.

Based on the foregoing conclusions, the proposed development is recommended to proceed form a transportation perspective.

Prepared By:



Rani Nahas, E.I.T.
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Reviewed By:

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Transportation Engineer/Project Manager

Appendix A

Screening Form and Correspondence

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City of Ottawa 2017 TIA Guidelines
TIA Screening Form

Date 7-Sep-17
Project Summerside West Ph 4-6
Project Number 476237

Results of Screening	Yes/No
Development Satisfies the Trip Generation Trigger	Yes
Development Satisfies the Location Trigger	Yes
Development Satisfies the Safety Trigger	No

Module 1.1 - Description of Proposed Development		
Municipal Address	2564 Tenth Line Rd	
Description of location	Ward 19 - CUMBERLAND CON 11 S PT LOT 4; PART 1 & 2	
Land Use	Residential	
Development Size	374 Townhomes, 404 Single Homes	
Number of Accesses and Locations	Connections through existing lands	
Development Phasing	Two Phases	
Buildout Year	2022	
Sketch Plan / Site Plan	See attached	

Module 1.2 - Trip Generation Trigger		
Land Use Type	Single-Family Homes	
Development Size	778	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers		
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	Yes	Tenth Line & Mer Bleue - Spine Route
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	No	
Location Trigger Met?	Yes	

Module 1.4 - Safety Triggers		
Posted Speed Limit on any boundary road	<60	km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No	
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	No	
A proposed driveway makes use of an existing median break that serves an existing site	No	
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No	
The development includes a drive-thru facility	No	
Safety Trigger Met?	No	

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering ☐ or transportation planning ☐.

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at Ottawa (City) this 14 day of September, 2018.

Name: Andrew Harte
(Please Print)

Professional Title: Transportation Engineer

Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 1223 Michael Street North, Suite 100
City / Postal Code: Ottawa, Ontario, K1J 7T2
Telephone / Extension: 613-738-4160
E-Mail Address: Andrew.harte@parsons.com

Appendix B

City of Ottawa Traffic Volumes

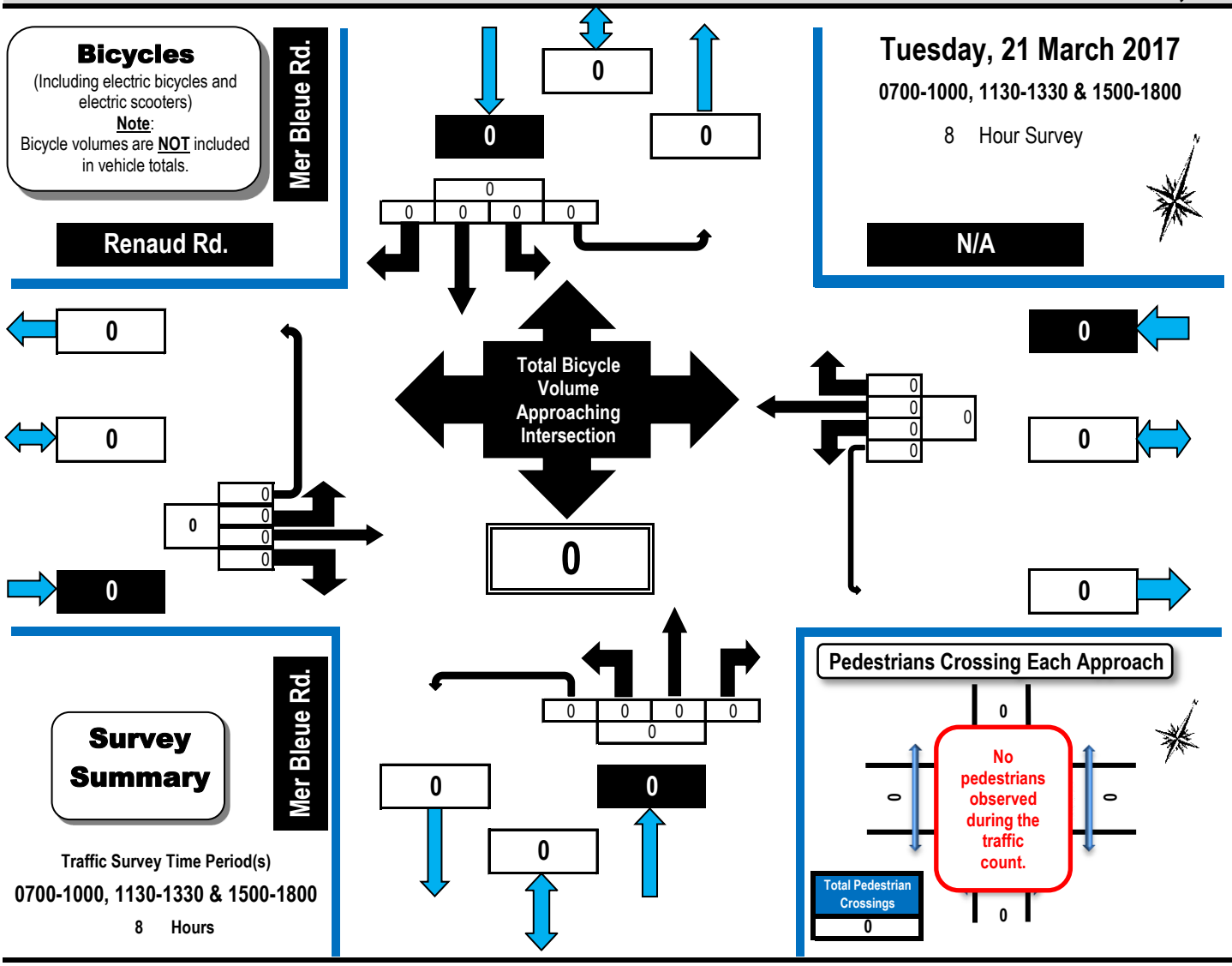
ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Bicycle Summary
Flow Diagram

Bicycles, Electric Bicycles, and Electric Scooters

Mer Bleue Road & Renaud Road — Orléans, ON

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.



Tuesday, 21 March 2017
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey

Survey Summary

Traffic Survey Time Period(s)
0700-1000, 1130-1330 & 1500-1800
8 Hours

Pedestrians Crossing Each Approach

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700
Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd.					N/A					Mer Bleue Rd.					Mer Bleue Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0													0	0	0	0	0	0
1130-1230	0	0	0													0	0	0	0	0	0
1230-1330	0	0	0													0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

No bicycles observed during the traffic count.

ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Ward: 2

Mer Bleue Rd.

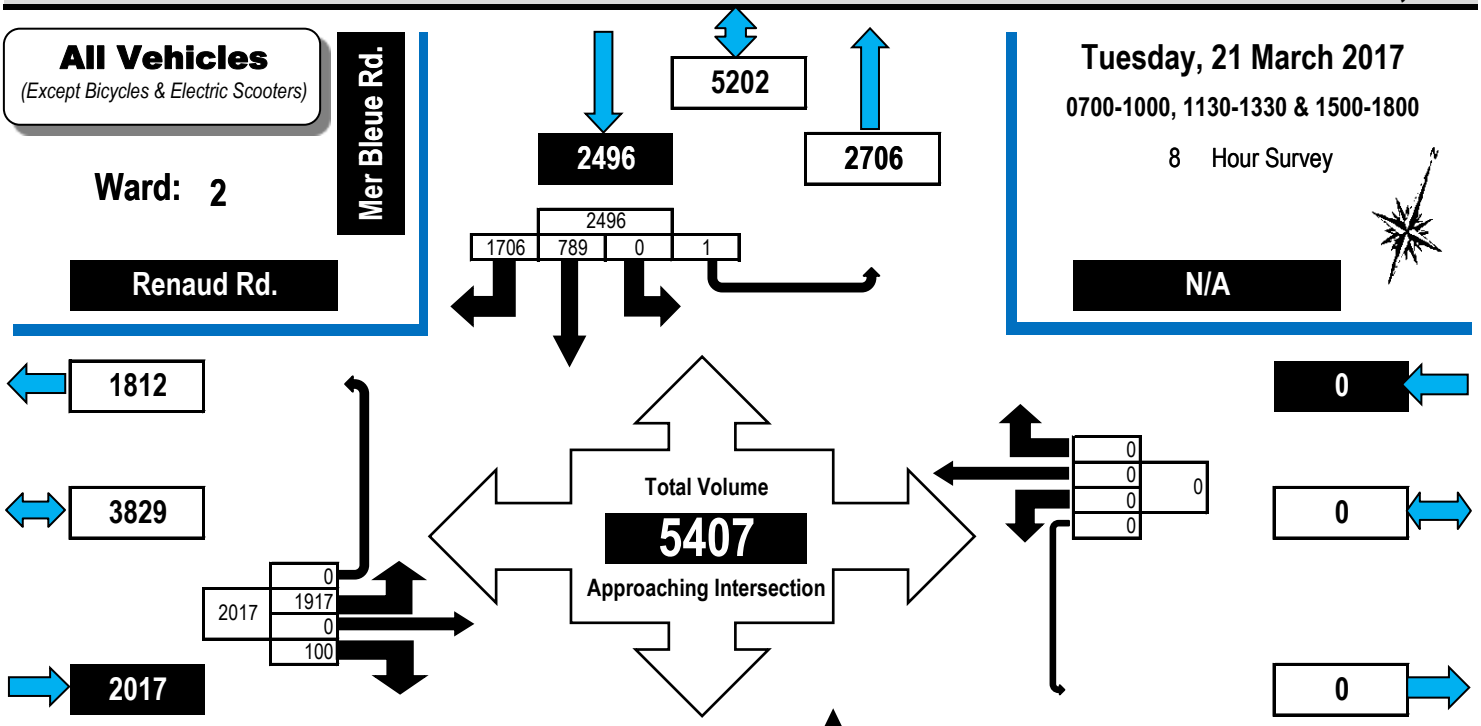
Renaud Rd.

Tuesday, 21 March 2017

0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

N/A



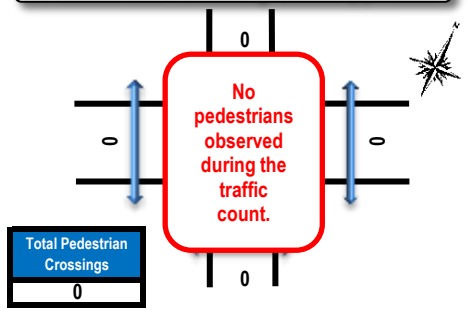
Survey Summary

Traffic Survey Time Period(s)

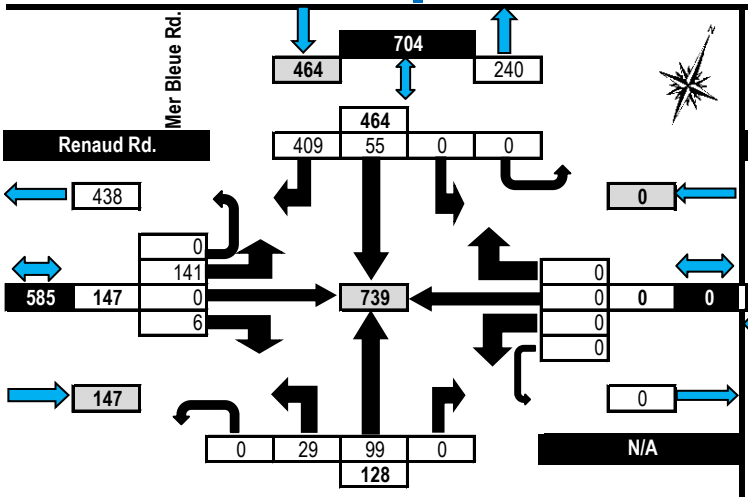
0700-1000, 1130-1330 & 1500-1800

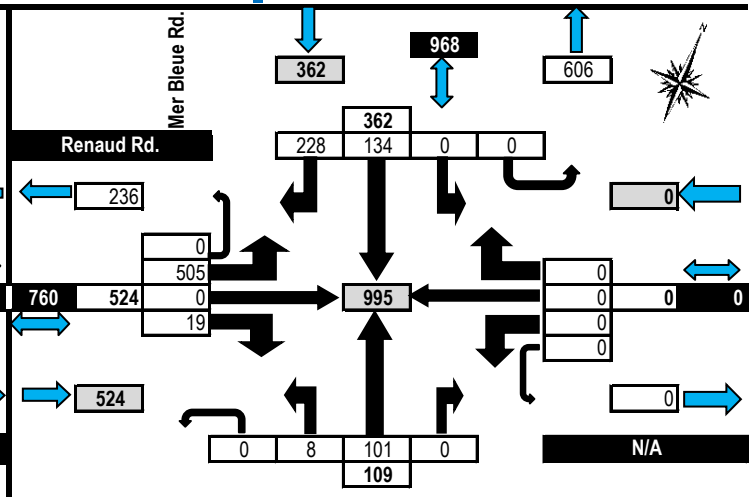
8 Hours

Pedestrians Crossing Each Approach



Total Pedestrian Crossings: 0



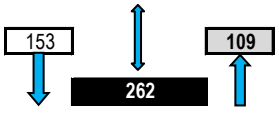


AM Peak Hour Summary

Mer Bleue Rd.

Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	739
% of Total	13.7%
PHF	0.90

PM Peak Hour Summary



Mer Bleue Rd.

Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	995
% of Total	18.4%
PHF	0.95

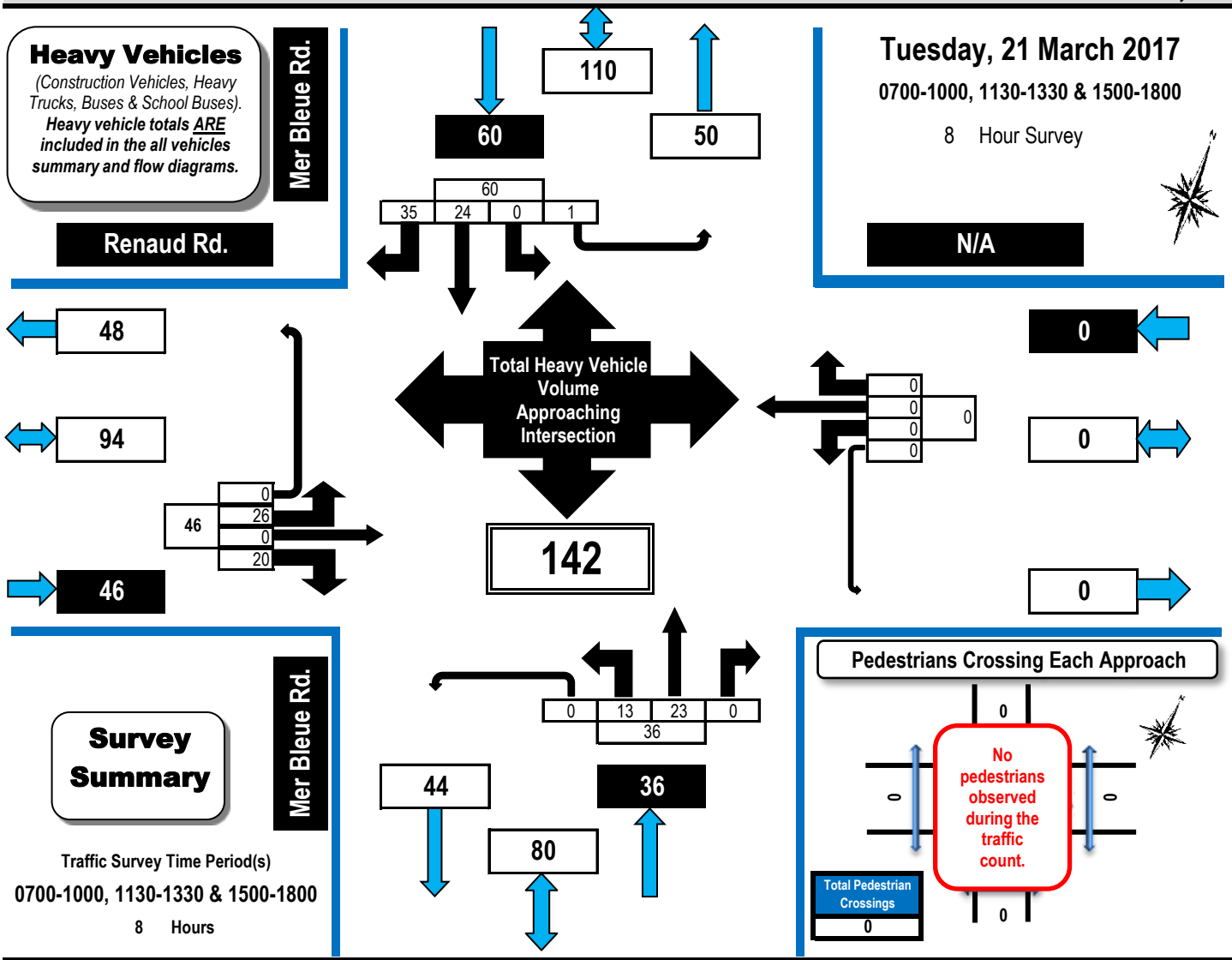
Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, 21 March 2017
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey



Survey Summary

Traffic Survey Time Period(s)
0700-1000, 1130-1330 & 1500-1800
8 Hours

Pedestrians Crossing Each Approach

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700
Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd.					N/A					Mer Bleue Rd.					Mer Bleue Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	7	0	1	0	8	0	0	0	0	0	8	5	0	0	13	0	0	7	0	7	28
0800-0900	6	0	3	0	9	0	0	0	0	0	3	7	0	0	10	0	6	11	0	17	36
0900-1000	2	0	1	0	3	0	0	0	0	0	0	5	0	0	5	0	3	3	0	6	14
1130-1230	4	0	0	0	4	0	0	0	0	0	0	2	0	0	2	0	3	4	0	7	13
1230-1330	2	0	3	0	5	0	0	0	0	0	0	1	0	0	1	0	1	5	1	7	13
1500-1600	1	0	2	0	3	0	0	0	0	0	0	2	0	0	2	0	5	4	0	9	14
1600-1700	2	0	7	0	9	0	0	0	0	0	1	1	0	0	2	0	5	0	0	5	16
1700-1800	2	0	3	0	5	0	0	0	0	0	1	0	0	0	1	0	1	1	0	2	8
Totals	**26**	**0**	**20**	**0**	**46**	**0**	**0**	**0**	**0**	**0**	**13**	**23**	**0**	**0**	**36**	**0**	**24**	**35**	**1**	**60**	**142**

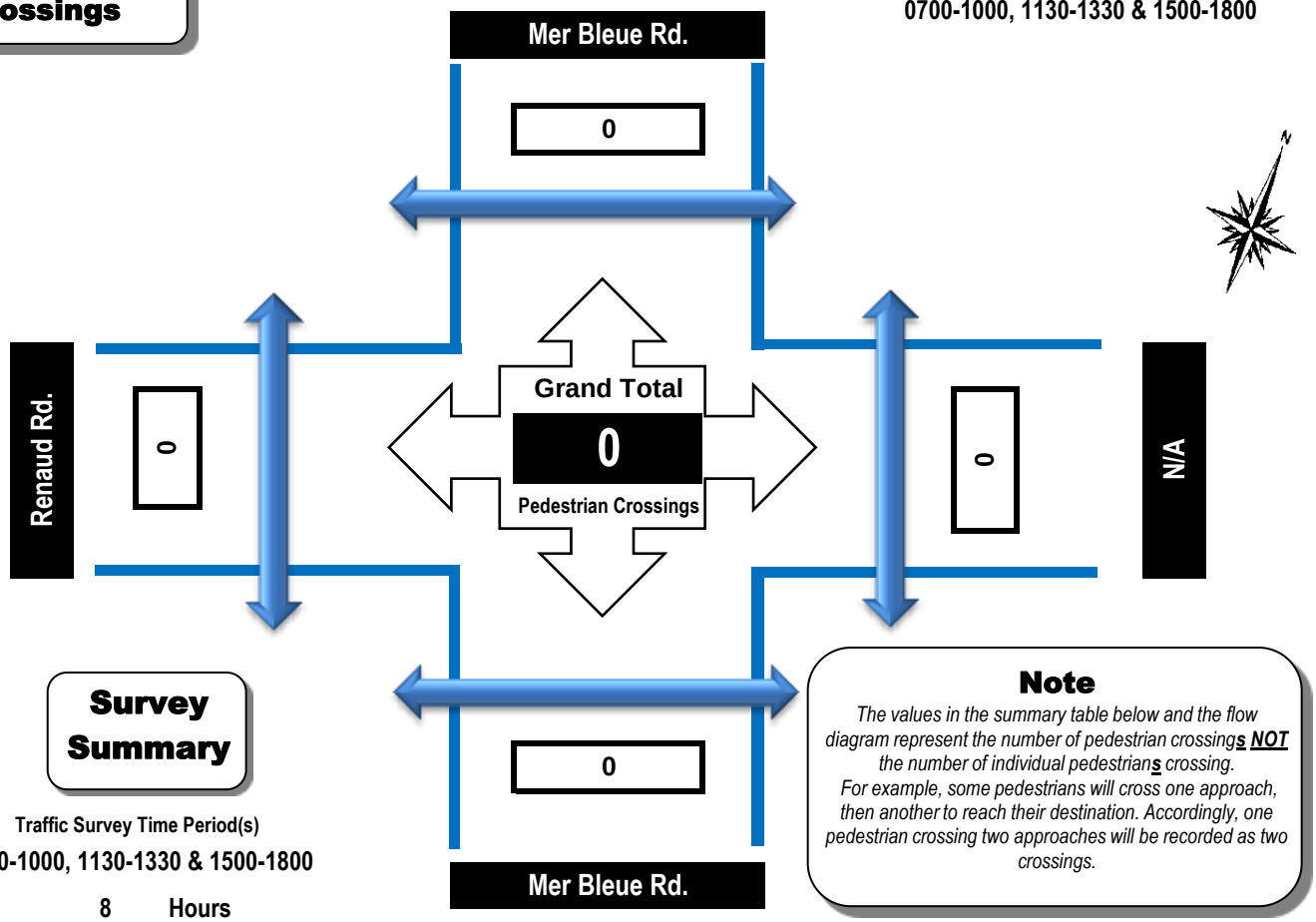
Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Mer Bleue Road & Renaud Road — Orléans, ON

Pedestrian Crossings

Tuesday, 21 March 2017

0700-1000, 1130-1330 & 1500-1800



Survey Summary

Traffic Survey Time Period(s)

0700-1000, 1130-1330 & 1500-1800

8 Hours

Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700

Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

Time Period	West Side Crossing Renaud Rd.	East Side Crossing N/A	Street Total	South Side Crossing Mer Bleue Rd.	North Side Crossing Mer Bleue Rd.	Street Total	Grand Total
0700-0800	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0
0900-1000	0					0	0
1130-1230	0					0	0
1230-1330	0					0	0
1500-1600	0					0	0
1600-1700	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0

No pedestrians observed during the traffic count.

Turning Movement Count

Summary Report Including AM/PM Peak Hours, PHF, AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700 **AADT Factor:** 1.0

Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd. (Eastbound)					N/A (Westbound)						Mer Bleue Rd. (Northbound)					Mer Bleue Rd. (Southbound)						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	141	0	6	0	**147**	0	0	0	0	**0**	**147**	29	99	0	0	**128**	0	55	409	0	**464**	**592**	**739**
0800-0900	134	0	6	0	**140**	0	0	0	0	**0**	**140**	21	130	0	0	**151**	0	76	270	0	**346**	**497**	**637**
0900-1000	145	0	9	0	**154**	0	0	0	0	**0**	**154**	12	90	0	0	**102**	0	60	147	0	**207**	**309**	**463**
1130-1230	139	0	11	0	**150**	0	0	0	0	**0**	**150**	11	86	0	0	**97**	0	87	119	0	**206**	**303**	**453**
1230-1330	134	0	5	0	**139**	0	0	0	0	**0**	**139**	7	80	0	0	**87**	0	102	142	1	**245**	**332**	**471**
1500-1600	323	0	15	0	**338**	0	0	0	0	**0**	**338**	10	109	0	0	**119**	0	138	175	0	**313**	**432**	**770**
1600-1700	487	0	26	0	**513**	0	0	0	0	**0**	**513**	9	106	0	0	**115**	0	141	208	0	**349**	**464**	**977**
1700-1800	414	0	22	0	**436**	0	0	0	0	**0**	**436**	7	88	0	0	**95**	0	130	236	0	**366**	**461**	**897**
Totals	**1917**	**0**	**100**	**0**	**2017**	**0**	**0**	**0**	**0**	**0**	**2017**	**106**	**788**	**0**	**0**	**894**	**0**	**789**	**1706**	**1**	**2496**	**3390**	**5407**

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

➡ **Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts** ⬅

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	2665	0	139	0	**2804**	0	0	0	0	**0**	**2804**	147	1095	0	0	**1243**	0	1097	2371	1	**3469**	**4712**	**7516**

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 1.0

AADT 12-hr	2665	0	139	0	**2804**	0	0	0	0	**0**	**2804**	147	1095	0	0	**1243**	0	1097	2371	1	**3469**	**4712**	**7516**

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	3491	0	182	0	**3673**	0	0	0	0	**0**	**3673**	193	1435	0	0	**1628**	0	1437	3106	2	**4545**	**6173**	**9846**

AM Peak Hour Factor ➡ 0.90

AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
0700-0800	141	0	6	0	**147**	0	0	0	0	**0**	**147**	29	99	0	0	**128**	0	55	409	0	**464**	**592**	**739**

PM Peak Hour Factor ➡ 0.95

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
1630-1730	505	0	19	0	**524**	0	0	0	0	**0**	**524**	8	101	0	0	**109**	0	134	228	0	**362**	**471**	**995**

Comments

Notes:

1. Includes all vehicle types except bicycles and electric scooters.
2. Expansion factors are not applied to turning movement counts if they are less than 8-hours in duration.
3. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Disclaimer:

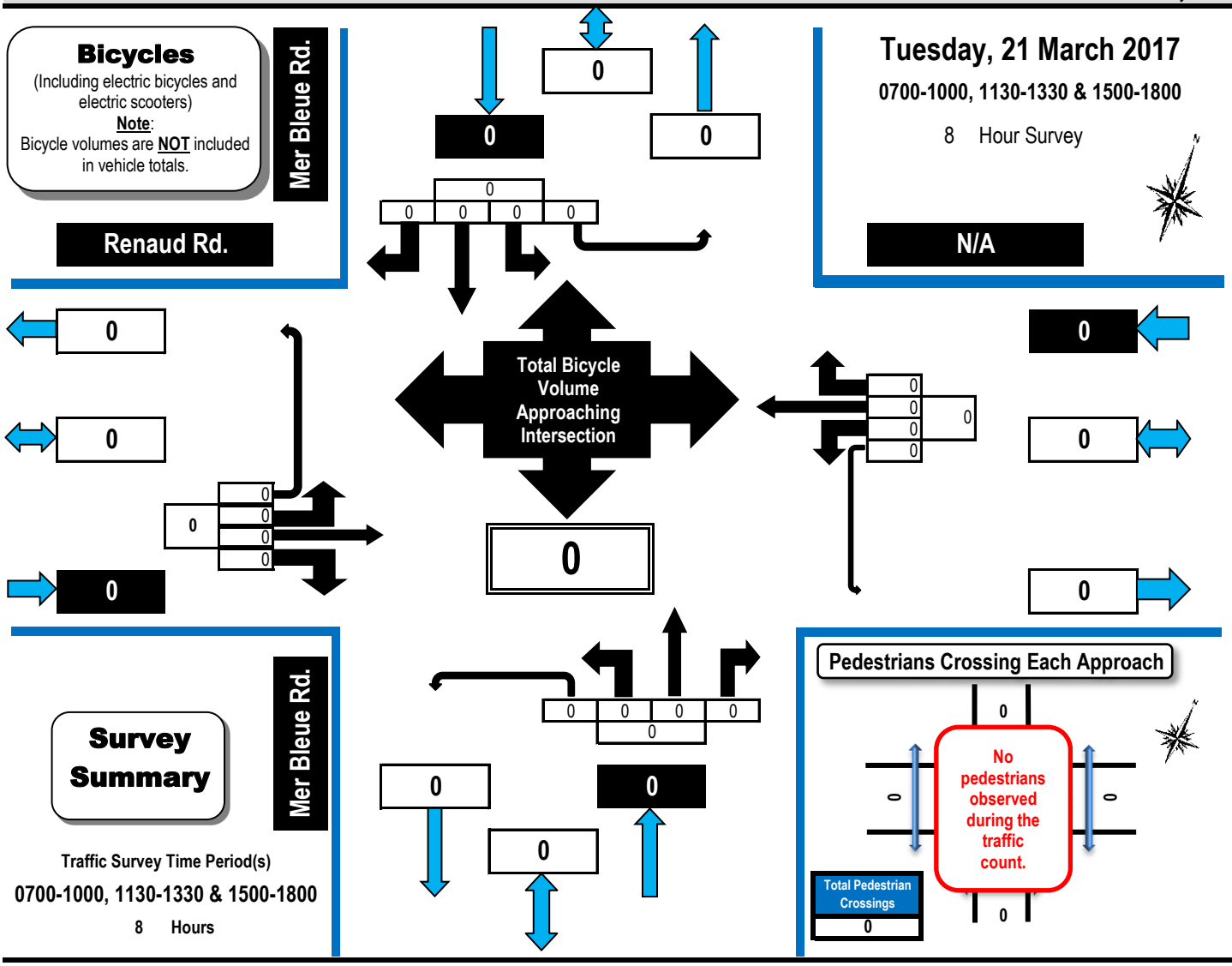
ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Bicycle Summary
Flow Diagram

Bicycles, Electric Bicycles, and Electric Scooters

Mer Bleue Road & Renaud Road — Orléans, ON

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.



Tuesday, 21 March 2017
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey

Survey Summary

Traffic Survey Time Period(s)
0700-1000, 1130-1330 & 1500-1800
8 Hours

Pedestrians Crossing Each Approach

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700
Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd.					N/A					Mer Bleue Rd.					Mer Bleue Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0													0	0	0	0	0	0
1130-1230	0	0	0													0	0	0	0	0	0
1230-1330	0	0	0													0	0	0	0	0	0
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

No bicycles observed during the traffic count.

ACCURATE TRUSTED TRAFFIC DATA

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Ward: 2

Mer Bleue Rd.

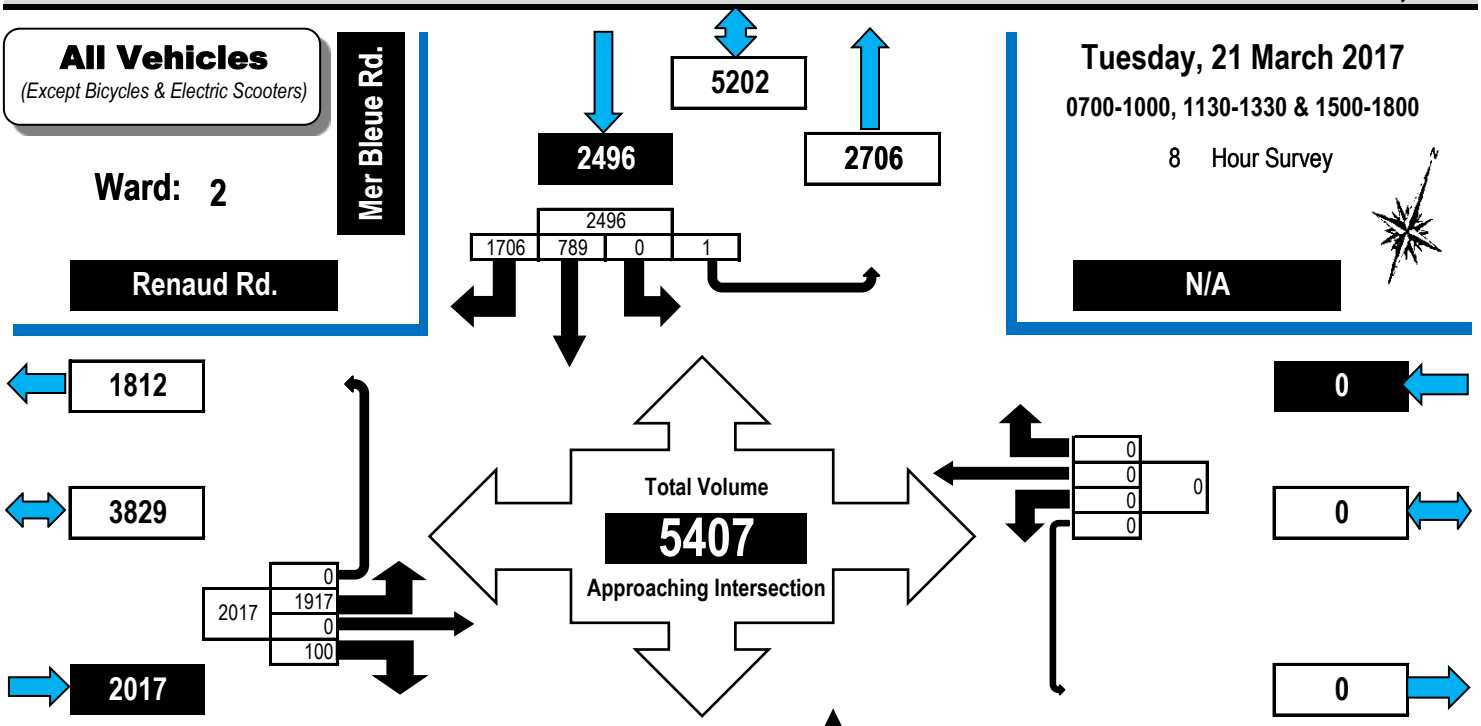
Renaud Rd.

Tuesday, 21 March 2017

0700-1000, 1130-1330 & 1500-1800

8 Hour Survey

N/A



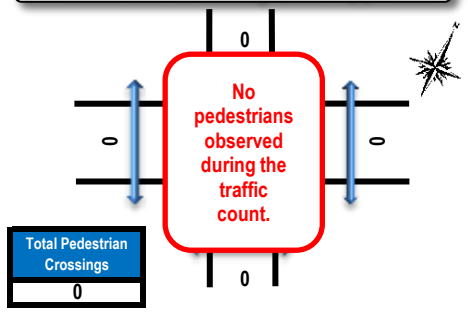
Survey Summary

Traffic Survey Time Period(s)

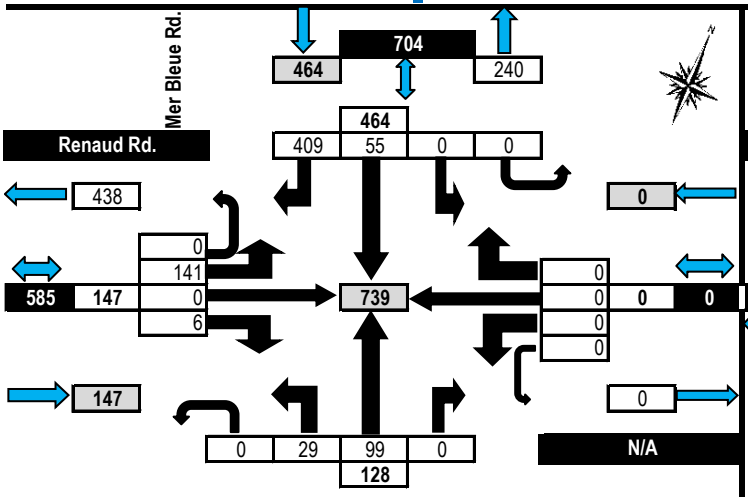
0700-1000, 1130-1330 & 1500-1800

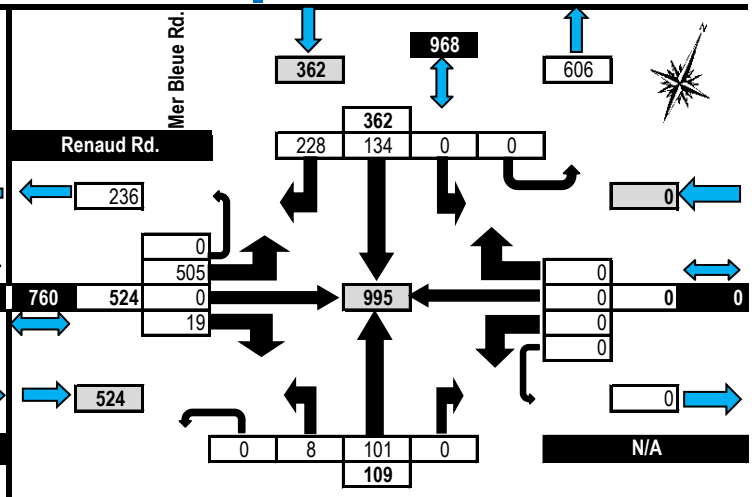
8 Hours

Pedestrians Crossing Each Approach



Total Pedestrian Crossings: 0



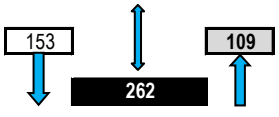


AM Peak Hour Summary

Mer Bleue Rd.

Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	739
% of Total	13.7%
PHF	0.90

PM Peak Hour Summary



Mer Bleue Rd.

Summary - PM Peak Hr.	
Peak Hr.	1630-1730
Volume	995
% of Total	18.4%
PHF	0.95

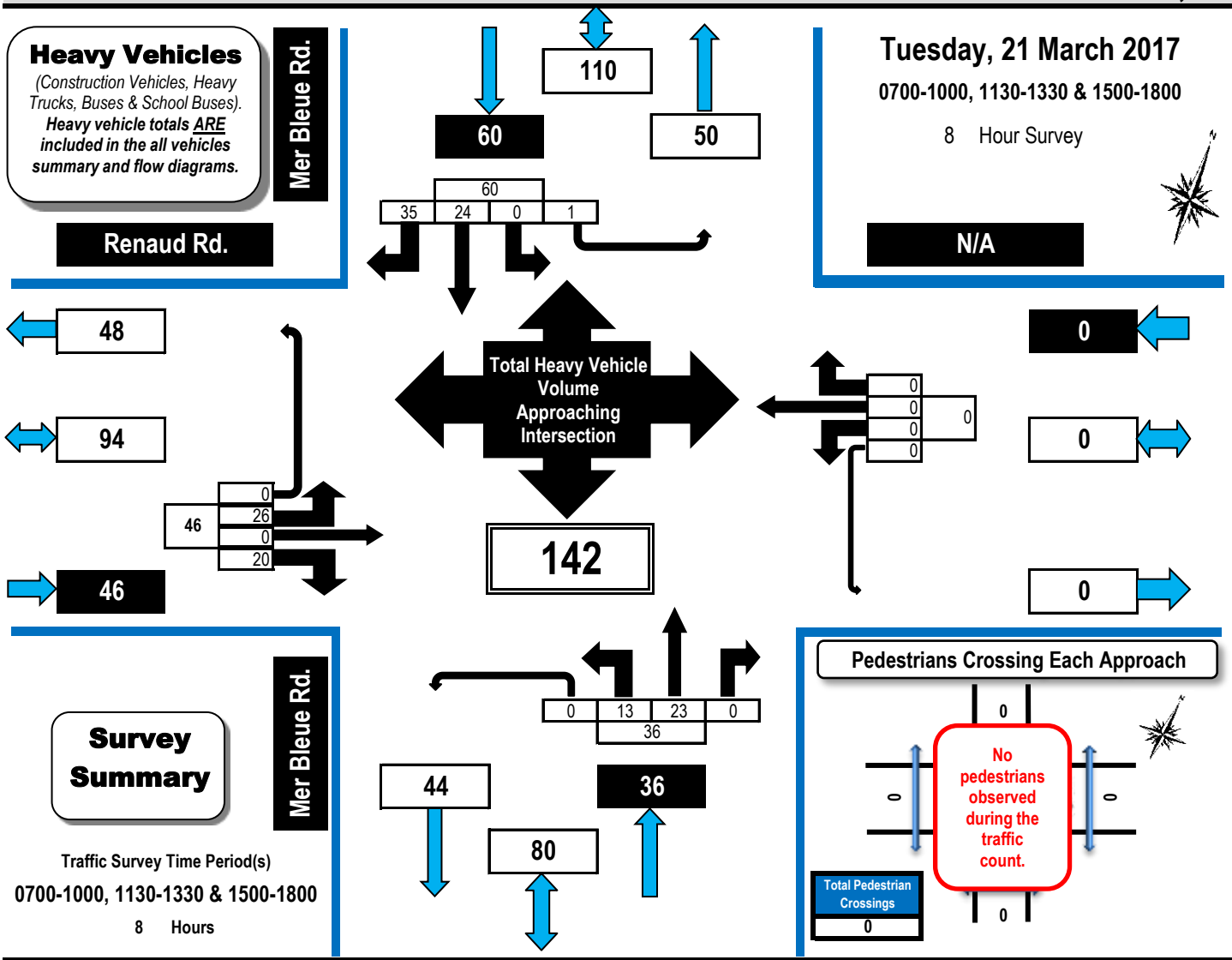
Turning Movement Count
Heavy Vehicle Summary
Flow Diagram

Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Tuesday, 21 March 2017
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey



Survey Summary

Traffic Survey Time Period(s)
0700-1000, 1130-1330 & 1500-1800
8 Hours

Pedestrians Crossing Each Approach

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700
Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd.					N/A					Mer Bleue Rd.					Mer Bleue Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	LT	ST	RT	UT	S. Tot	G.Tot.
0700-0800	7	0	1	0	8	0	0	0	0	0	8	5	0	0	13	0	0	7	0	7	28
0800-0900	6	0	3	0	9	0	0	0	0	0	3	7	0	0	10	0	6	11	0	17	36
0900-1000	2	0	1	0	3	0	0	0	0	0	0	5	0	0	5	0	3	3	0	6	14
1130-1230	4	0	0	0	4	0	0	0	0	0	0	2	0	0	2	0	3	4	0	7	13
1230-1330	2	0	3	0	5	0	0	0	0	0	0	1	0	0	1	0	1	5	1	7	13
1500-1600	1	0	2	0	3	0	0	0	0	0	0	2	0	0	2	0	5	4	0	9	14
1600-1700	2	0	7	0	9	0	0	0	0	0	1	1	0	0	2	0	5	0	0	5	16
1700-1800	2	0	3	0	5	0	0	0	0	0	1	0	0	0	1	0	1	1	0	2	8
Totals	**26**	**0**	**20**	**0**	**46**	**0**	**0**	**0**	**0**	**0**	**13**	**23**	**0**	**0**	**36**	**0**	**24**	**35**	**1**	**60**	**142**

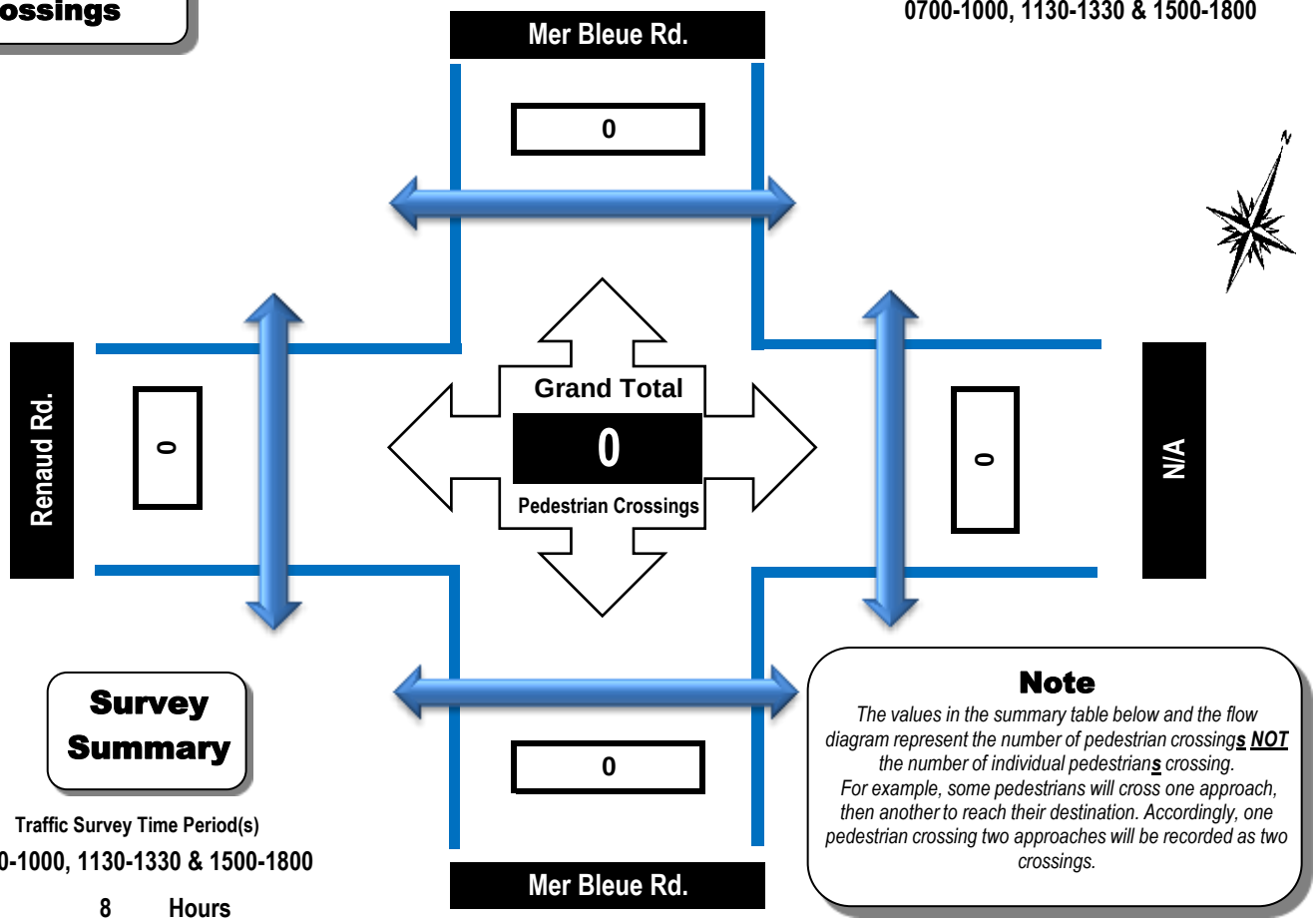
Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Mer Bleue Road & Renaud Road — Orléans, ON

Pedestrian Crossings

Tuesday, 21 March 2017

0700-1000, 1130-1330 & 1500-1800



Survey Summary

Traffic Survey Time Period(s)

0700-1000, 1130-1330 & 1500-1800

8 Hours

Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700

Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

Time Period	West Side Crossing Renaud Rd.	East Side Crossing N/A	Street Total	South Side Crossing Mer Bleue Rd.	North Side Crossing Mer Bleue Rd.	Street Total	Grand Total
0700-0800	0	0	0	0	0	0	0
0800-0900	0	0	0	0	0	0	0
0900-1000	0					0	0
1130-1230	0					0	0
1230-1330	0					0	0
1500-1600	0					0	0
1600-1700	0	0	0	0	0	0	0
1700-1800	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0

No pedestrians observed during the traffic count.

Turning Movement Count

Summary Report Including AM/PM Peak Hours, PHF, AADT and Expansion Factors

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

Mer Bleue Road & Renaud Road — Orléans, ON

Survey Date: Tuesday, 21 March 2017 **Start Time:** 0700 **AADT Factor:** 1.0

Weather: Light Rain - AM & Partly Cloudy - PM **Survey Duration:** 8 Hrs. **Survey Hours:** 0700-1000, 1130-1330 & 1500-1800

	Renaud Rd. (Eastbound)					N/A (Westbound)						Mer Bleue Rd. (Northbound)					Mer Bleue Rd. (Southbound)						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	141	0	6	0	**147**	0	0	0	0	**0**	**147**	29	99	0	0	**128**	0	55	409	0	**464**	**592**	**739**
0800-0900	134	0	6	0	**140**	0	0	0	0	**0**	**140**	21	130	0	0	**151**	0	76	270	0	**346**	**497**	**637**
0900-1000	145	0	9	0	**154**	0	0	0	0	**0**	**154**	12	90	0	0	**102**	0	60	147	0	**207**	**309**	**463**
1130-1230	139	0	11	0	**150**	0	0	0	0	**0**	**150**	11	86	0	0	**97**	0	87	119	0	**206**	**303**	**453**
1230-1330	134	0	5	0	**139**	0	0	0	0	**0**	**139**	7	80	0	0	**87**	0	102	142	1	**245**	**332**	**471**
1500-1600	323	0	15	0	**338**	0	0	0	0	**0**	**338**	10	109	0	0	**119**	0	138	175	0	**313**	**432**	**770**
1600-1700	487	0	26	0	**513**	0	0	0	0	**0**	**513**	9	106	0	0	**115**	0	141	208	0	**349**	**464**	**977**
1700-1800	414	0	22	0	**436**	0	0	0	0	**0**	**436**	7	88	0	0	**95**	0	130	236	0	**366**	**461**	**897**
Totals	**1917**	**0**	**100**	**0**	**2017**	**0**	**0**	**0**	**0**	**0**	**2017**	**106**	**788**	**0**	**0**	**894**	**0**	**789**	**1706**	**1**	**2496**	**3390**	**5407**

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

➡ **Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts** ⬅

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	2665	0	139	0	**2804**	0	0	0	0	**0**	**2804**	147	1095	0	0	**1243**	0	1097	2371	1	**3469**	**4712**	**7516**

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 1.0

AADT 12-hr	2665	0	139	0	**2804**	0	0	0	0	**0**	**2804**	147	1095	0	0	**1243**	0	1097	2371	1	**3469**	**4712**	**7516**

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	3491	0	182	0	**3673**	0	0	0	0	**0**	**3673**	193	1435	0	0	**1628**	0	1437	3106	2	**4545**	**6173**	**9846**

AM Peak Hour Factor ➡ 0.90

AM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
0700-0800	141	0	6	0	**147**	0	0	0	0	**0**	**147**	29	99	0	0	**128**	0	55	409	0	**464**	**592**	**739**

PM Peak Hour Factor ➡ 0.95

PM Peak Hr	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	LT	ST	RT	UT	TOT	LT	ST	RT	UT	TOT	S.TOT	G.TOT
1630-1730	505	0	19	0	**524**	0	0	0	0	**0**	**524**	8	101	0	0	**109**	0	134	228	0	**362**	**471**	**995**

Comments

Notes:

1. Includes all vehicle types except bicycles and electric scooters.
2. Expansion factors are not applied to turning movement counts if they are less than 8-hours in duration.
3. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

Disclaimer:

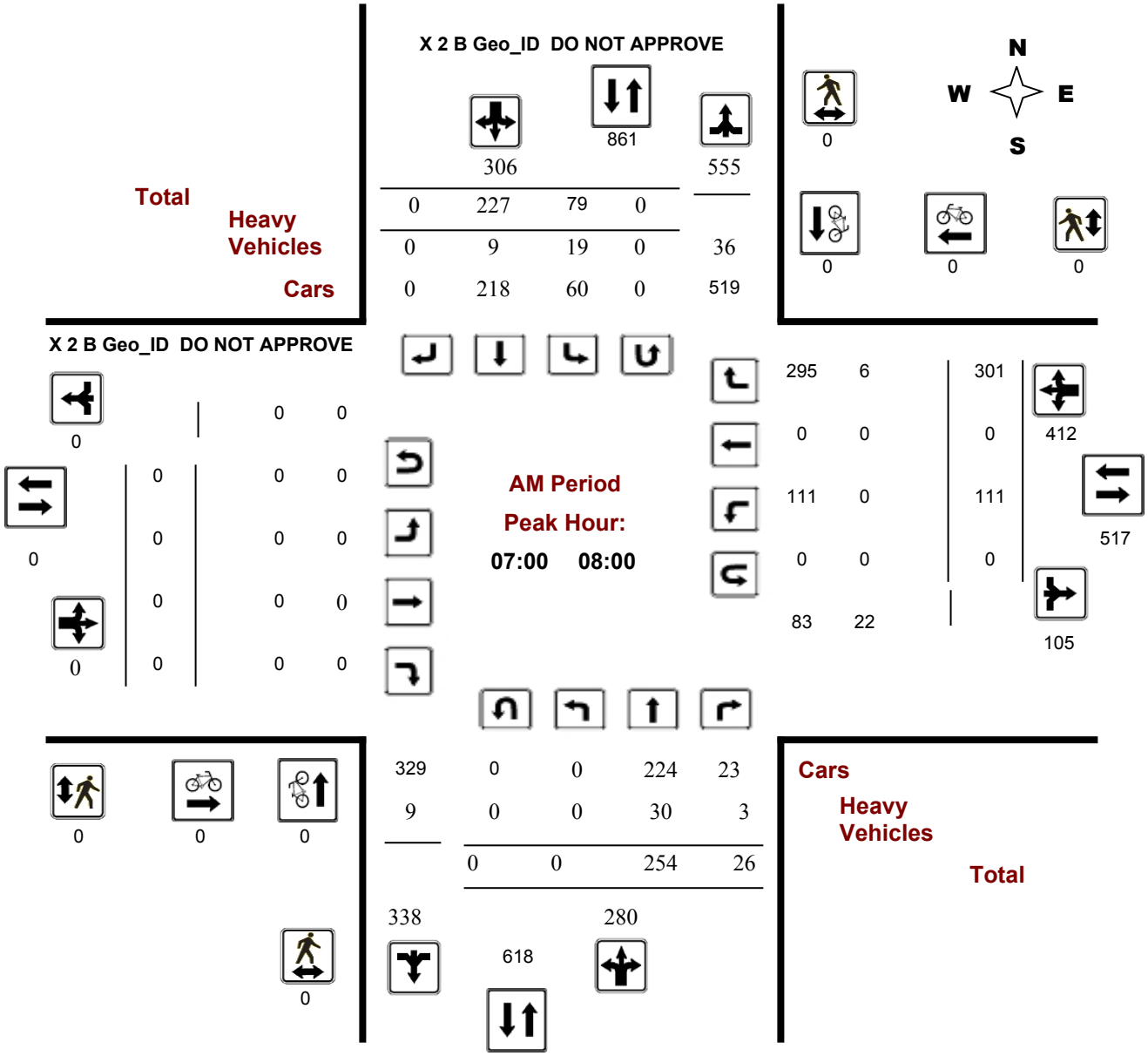
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015 **WO No:** 36714

Start Time: 07:00 **Device:** Miovision



Comments Intersection of Harvest Valley and Tenth Line Rd

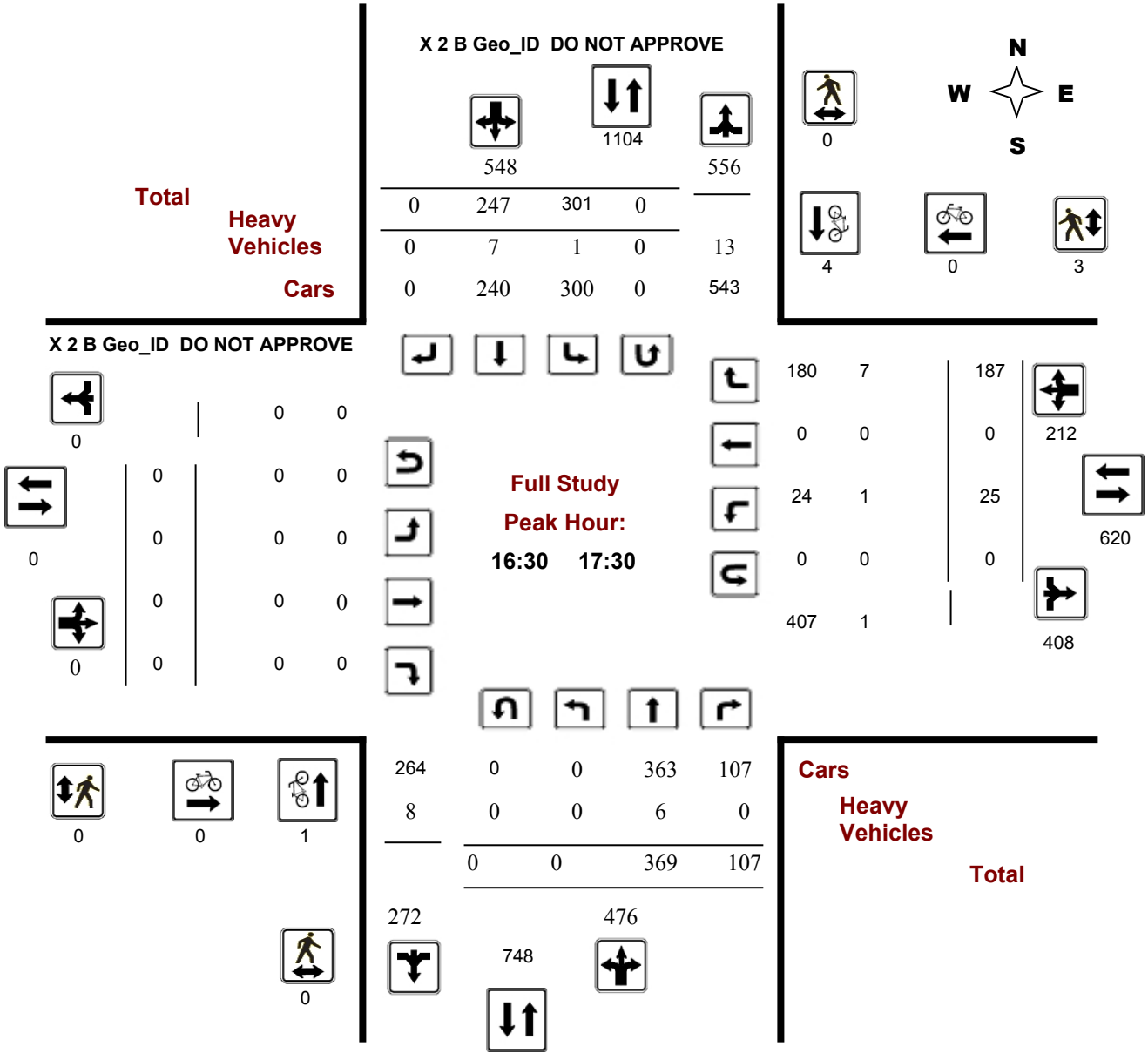
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015 **WO No:** 36714

Start Time: 07:00 **Device:** Miovision



Comments Intersection of Harvest Valley and Tenth Line Rd

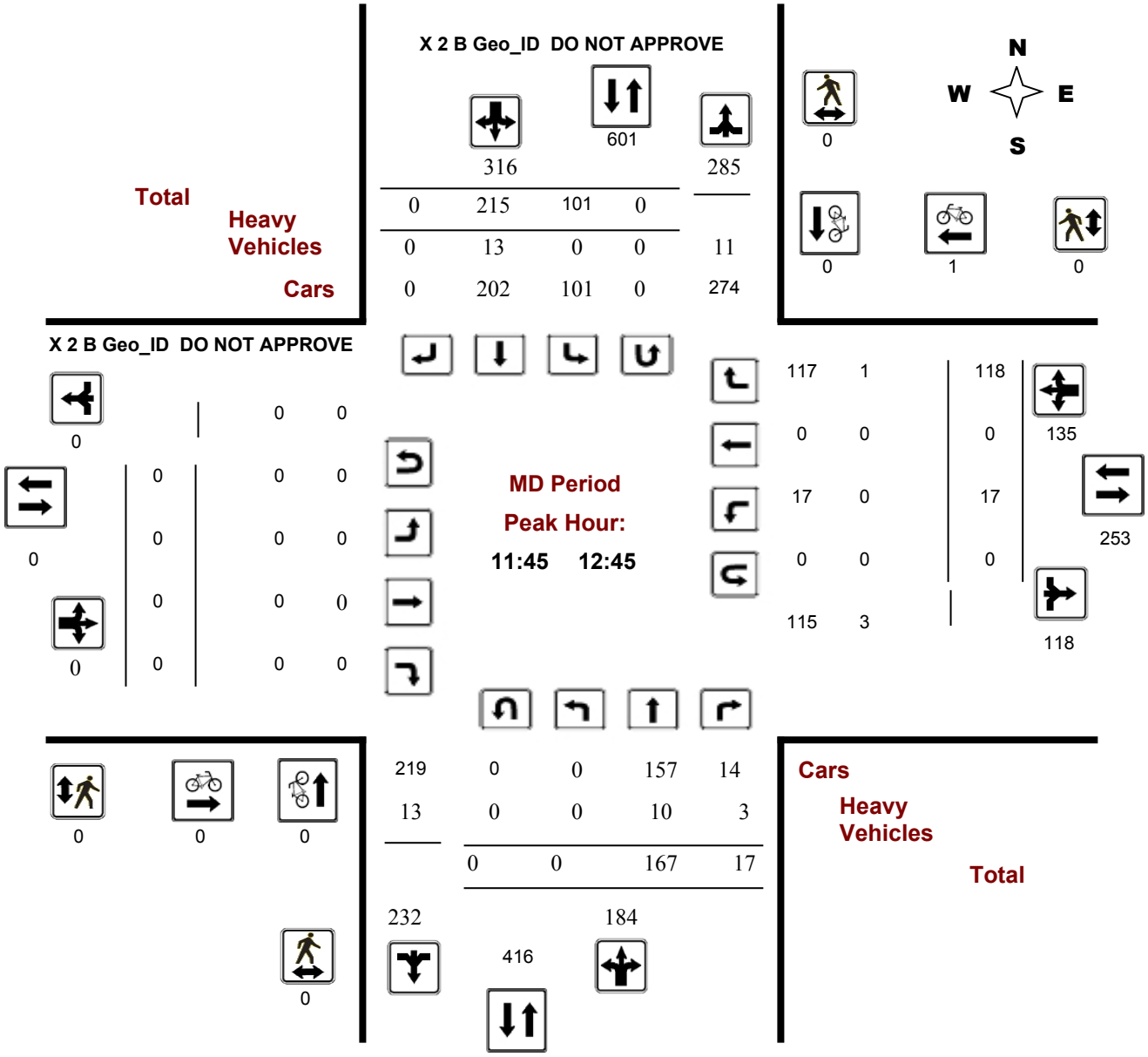
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015 **WO No:** 36714

Start Time: 07:00 **Device:** Miovision



Comments Intersection of Harvest Valley and Tenth Line Rd

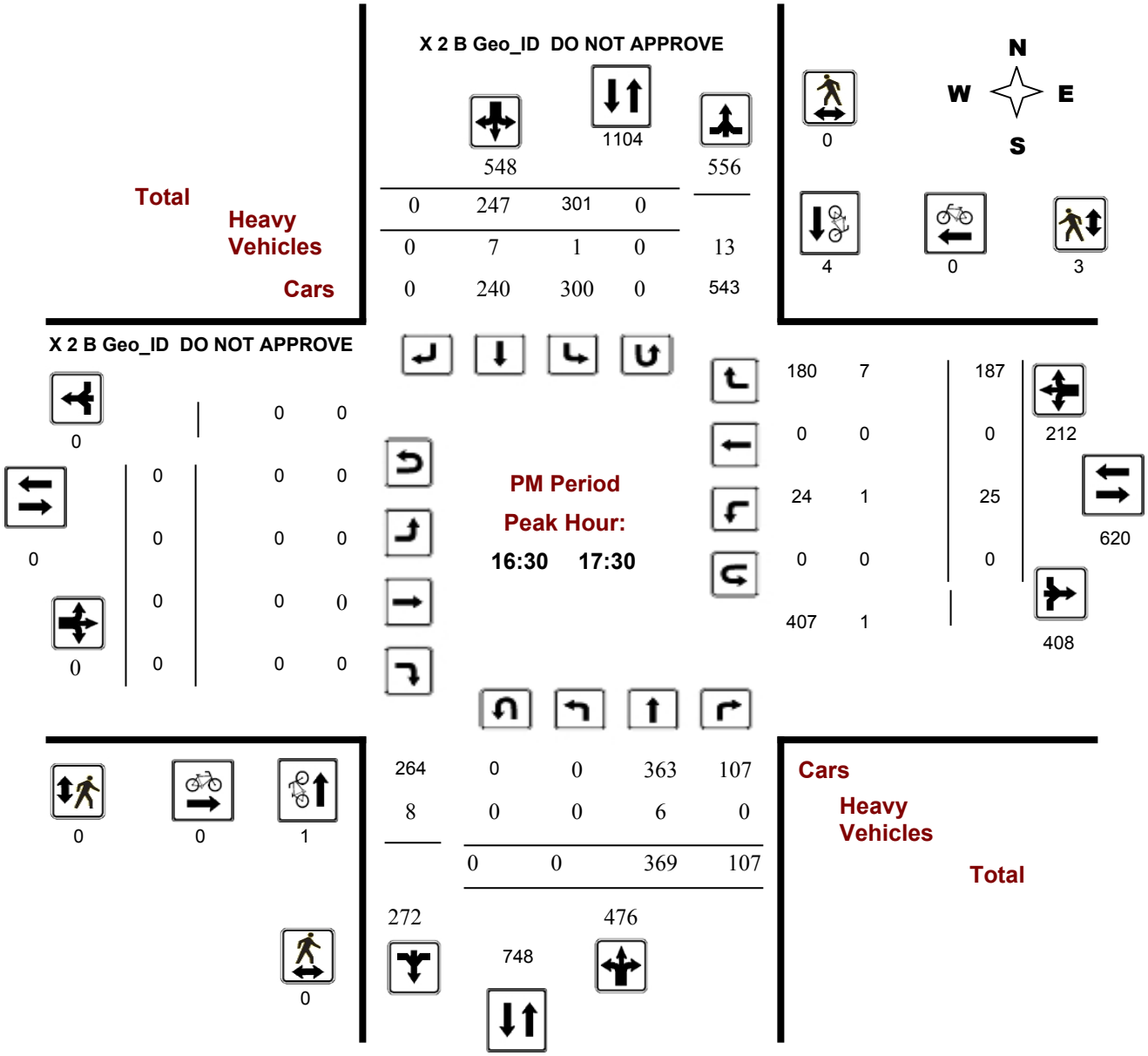
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015 **WO No:** 36714

Start Time: 07:00 **Device:** Miovision



Comments Intersection of Harvest Valley and Tenth Line Rd

Transportation Services - Traffic Services

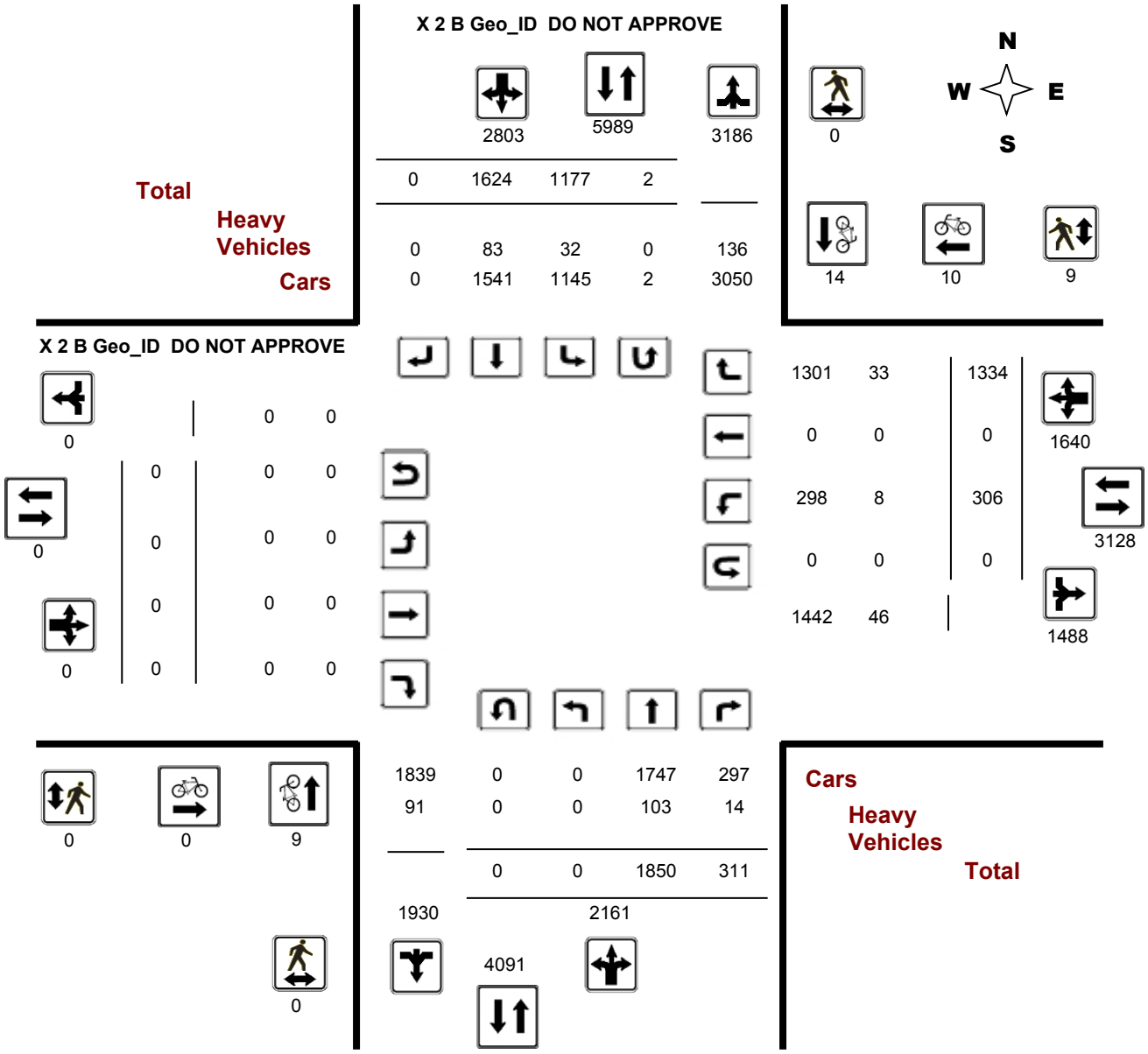
Turning Movement Count - Full Study Diagram

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015

WO#: 36714

Device: Miovision



Comments Intersection of Harvest Valley and Tenth Line Rd

Transportation Services - Traffic Services

Work Order
36714

Turning Movement Count - Full Study Summary Report

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 0 Westbound: 0

AADT Factor

.90

Full Study

	X 2 B Geo_ID DO NOT APPROVE									X 2 B Geo_ID DO NOT APPROVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	254	26	**280**	79	227	0	**306**	**586**	0	0	0	**0**	111	0	301	**412**	**412**	**998**
08:00 09:00	0	203	14	**217**	84	165	0	**249**	**466**	0	0	0	**0**	65	0	192	**257**	**257**	**723**
09:00 10:00	0	170	14	**184**	68	136	0	**204**	**388**	0	0	0	**0**	20	0	150	**170**	**170**	**558**
11:30 12:30	0	176	15	**191**	105	187	0	**292**	**483**	0	0	0	**0**	17	0	115	**132**	**132**	**615**
12:30 13:30	0	176	11	**187**	80	191	0	**271**	**458**	0	0	0	**0**	8	0	100	**108**	**108**	**566**
15:00 16:00	0	209	44	**253**	190	245	0	**435**	**688**	0	0	0	**0**	29	0	118	**147**	**147**	**835**
16:00 17:00	0	352	89	**441**	251	250	0	**501**	**942**	0	0	0	**0**	31	0	174	**205**	**205**	**1147**
17:00 18:00	0	310	98	**408**	320	223	0	**543**	**951**	0	0	0	**0**	25	0	184	**209**	**209**	**1160**
Sub Total	0	1850	311	**2161**	1177	1624	0	**2801**	**4962**	0	0	0	**0**	306	0	1334	**1640**	**1640**	**6602**
U Turns				**0**				**2**	**2**				**0**				**0**	**0**	**2**
Total	0	1850	311	**2161**	1177	1624	0	**2803**	**4964**	0	0	0	**0**	306	0	1334	**1640**	**1640**	**6604**
EQ 12Hr	0	2572	432	**3004**	1636	2257	0	**3896**	**6900**	0	0	0	**0**	425	0	1854	**2280**	**2280**	**9180**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	0	2314	389	**2703**	1472	2032	0	**3507**	**6210**	0	0	0	**0**	383	0	1669	**2052**	**2052**	**8262**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	0	3032	510	**3541**	1929	2661	0	**4594**	**8135**	0	0	0	**0**	501	0	2186	**2688**	**2688**	**10823**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments: Intersection of Harvest Valley and Tenth Line Rd

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

W.O. 36714

Turning Movement Count - 15 Minute Summary Report

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 2

Eastbound: 0 Westbound: 0

		X 2 B Geo_ID DO NOT APPROVE									X 2 B Geo_ID DO NOT APPROVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	49	7	**56**	19	58	0	**77**	**133**	0	0	0	**0**	39	0	67	**106**	**106**	**239**
07:15	07:30	0	73	5	**78**	19	74	0	**93**	**171**	0	0	0	**0**	29	0	92	**121**	**121**	**292**
07:30	07:45	0	63	7	**70**	20	48	0	**68**	**138**	0	0	0	**0**	22	0	55	**77**	**77**	**215**
07:45	08:00	0	69	7	**76**	21	47	0	**68**	**144**	0	0	0	**0**	21	0	87	**108**	**108**	**252**
08:00	08:15	0	42	8	**50**	20	63	0	**83**	**133**	0	0	0	**0**	17	0	55	**72**	**72**	**205**
08:15	08:30	0	52	3	**55**	28	39	0	**67**	**122**	0	0	0	**0**	18	0	52	**70**	**70**	**192**
08:30	08:45	0	55	3	**58**	22	28	0	**50**	**108**	0	0	0	**0**	21	0	54	**75**	**75**	**183**
08:45	09:00	0	54	0	**54**	14	35	0	**49**	**103**	0	0	0	**0**	9	0	31	**40**	**40**	**143**
09:00	09:15	0	46	5	**51**	19	42	0	**61**	**112**	0	0	0	**0**	3	0	31	**34**	**34**	**146**
09:15	09:30	0	37	1	**38**	19	24	0	**43**	**81**	0	0	0	**0**	5	0	50	**55**	**55**	**136**
09:30	09:45	0	38	5	**43**	11	40	0	**51**	**94**	0	0	0	**0**	7	0	40	**47**	**47**	**141**
09:45	10:00	0	49	3	**52**	19	30	0	**49**	**101**	0	0	0	**0**	5	0	29	**34**	**34**	**135**
11:30	11:45	0	51	2	**53**	21	25	0	**46**	**99**	0	0	0	**0**	4	0	21	**25**	**25**	**124**
11:45	12:00	0	39	4	**43**	25	64	0	**89**	**132**	0	0	0	**0**	5	0	30	**35**	**35**	**167**
12:00	12:15	0	39	5	**44**	39	42	0	**81**	**125**	0	0	0	**0**	4	0	37	**41**	**41**	**166**
12:15	12:30	0	47	4	**51**	20	56	0	**76**	**127**	0	0	0	**0**	4	0	27	**31**	**31**	**158**
12:30	12:45	0	42	4	**46**	17	53	0	**70**	**116**	0	0	0	**0**	4	0	24	**28**	**28**	**144**
12:45	13:00	0	52	2	**54**	20	45	0	**65**	**119**	0	0	0	**0**	1	0	27	**28**	**28**	**147**
13:00	13:15	0	37	3	**40**	27	49	0	**77**	**117**	0	0	0	**0**	1	0	19	**20**	**20**	**137**
13:15	13:30	0	45	2	**47**	16	44	0	**61**	**108**	0	0	0	**0**	2	0	30	**32**	**32**	**140**
15:00	15:15	0	41	11	**52**	44	60	0	**104**	**156**	0	0	0	**0**	5	0	31	**36**	**36**	**192**
15:15	15:30	0	49	7	**56**	44	66	0	**110**	**166**	0	0	0	**0**	8	0	27	**35**	**35**	**201**
15:30	15:45	0	56	14	**70**	50	62	0	**112**	**182**	0	0	0	**0**	7	0	26	**33**	**33**	**215**
15:45	16:00	0	63	12	**75**	52	57	0	**109**	**184**	0	0	0	**0**	9	0	34	**43**	**43**	**227**
16:00	16:15	0	69	23	**92**	56	59	0	**115**	**207**	0	0	0	**0**	9	0	42	**51**	**51**	**258**
16:15	16:30	0	84	18	**102**	59	58	0	**117**	**219**	0	0	0	**0**	9	0	31	**40**	**40**	**259**
16:30	16:45	0	96	25	**121**	70	67	0	**137**	**258**	0	0	0	**0**	5	0	46	**51**	**51**	**309**
16:45	17:00	0	103	23	**126**	66	66	0	**132**	**258**	0	0	0	**0**	8	0	55	**63**	**63**	**321**
17:00	17:15	0	90	34	**124**	78	58	0	**136**	**260**	0	0	0	**0**	6	0	48	**54**	**54**	**314**
17:15	17:30	0	80	25	**105**	87	56	0	**143**	**248**	0	0	0	**0**	6	0	38	**44**	**44**	**292**
17:30	17:45	0	79	24	**103**	85	55	0	**140**	**243**	0	0	0	**0**	4	0	51	**55**	**55**	**298**
17:45	18:00	0	61	15	**76**	70	54	0	**124**	**200**	0	0	0	**0**	9	0	47	**56**	**56**	**256**
TOTAL:		0	1850	311	**2161**	1177	1624	0	**2803**	**4964**	0	0	0	**0**	306	0	1334	**1640**	**1640**	**6604**

Note: U-Turns are included in Totals.

Comment: **Intersection of Harvest Valley and Tenth Line Rd**

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
36714

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Count Date: Wednesday, May 06, 2015 **Start Time:** 07:00

	X 2 B Geo_ID DO NOT APPROVE			X 2 B Geo_ID DO NOT APPROVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	5	10	**15**	0	7	**7**	**22**
09:00 10:00	2	0	**2**	0	0	**0**	**2**
11:30 12:30	0	0	**0**	0	0	**0**	**0**
12:30 13:30	0	0	**0**	0	3	**3**	**3**
15:00 16:00	1	0	**1**	0	0	**0**	**1**
16:00 17:00	0	3	**3**	0	0	**0**	**3**
17:00 18:00	1	1	**2**	0	0	**0**	**2**
Total	9	14	**23**	0	10	**10**	**33**

Comment: Intersection of Harvest Valley and Tenth Line Rd

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 36714

Turning Movement Count - Heavy Vehicle Report

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015

		X 2 B Geo_ID DO NOT APPROVE									X 2 B Geo_ID DO NOT APPROVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00	08:00	0	30	3	**33**	19	9	0	**28**	**61**	0	0	0	**0**	0	0	6	**6**	**6**	**67**
08:00	09:00	0	16	1	**17**	7	9	0	**16**	**33**	0	0	0	**0**	0	0	1	**1**	**1**	**34**
09:00	10:00	0	8	5	**13**	1	12	0	**13**	**26**	0	0	0	**0**	1	0	0	**1**	**1**	**27**
11:30	12:30	0	11	3	**14**	0	15	0	**15**	**29**	0	0	0	**0**	2	0	1	**3**	**3**	**32**
12:30	13:30	0	17	1	**18**	1	12	0	**13**	**31**	0	0	0	**0**	0	0	0	**0**	**0**	**31**
15:00	16:00	0	10	0	**10**	2	14	0	**16**	**26**	0	0	0	**0**	3	0	8	**11**	**11**	**37**
16:00	17:00	0	8	0	**8**	1	7	0	**8**	**16**	0	0	0	**0**	2	0	10	**12**	**12**	**28**
17:00	18:00	0	3	1	**4**	1	5	0	**6**	**10**	0	0	0	**0**	0	0	7	**7**	**7**	**17**
Sub Total		0	103	14	**117**	32	83	0	**115**	**232**	0	0	0	**0**	8	0	33	**41**	**41**	**273**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total		0	103	14	**0**	32	83	0	**115**	**232**	0	0	0	**0**	8	0	33	**41**	**41**	**273**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order
36714

Turning Movement Count - Pedestrian Volume Report

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Count Date: Wednesday, May 06, 2015 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
07:00 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
08:00 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
09:00 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
11:30 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
12:30 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	1	1	1
15:15 15:30	0	0	0	0	2	2	2
15:30 15:45	0	0	0	0	1	1	1
15:45 16:00	0	0	0	0	1	1	1
15:00 16:00	0	0	0	0	5	5	5
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	1	1	1
16:30 16:45	0	0	0	0	1	1	1
16:45 17:00	0	0	0	0	0	0	0
16:00 17:00	0	0	0	0	2	2	2
17:00 17:15	0	0	0	0	2	2	2
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
17:00 18:00	0	0	0	0	2	2	2
Total	0	0	0	0	9	9	9

Comment: Intersection of Harvest Valley and Tenth Line Rd

Transportation Services - Traffic Services

Work Order
36714

Turning Movement Count - 15 Min U-Turn Total Report

X 2 B Geo_ID DO NOT APPROVE @ X 2 B Geo_ID DO NOT APPROVE

Survey Date: Wednesday, May 06, 2015

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	1	0	0	1
13:15	13:30	0	1	0	0	1
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	2	0	0	2

Appendix C

Collision Data and Analysis

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	3	0	2	2	0	8	0	1	16	80%
Non-fatal injury	2	0	0	1	0	1	0	0	4	20%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**5**	**0**	**2**	**3**	**0**	**9**	**0**	**1**	**20**	100%
	#2 or 25%	#6 or 0%	#4 or 10%	#3 or 15%	#6 or 0%	#1 or 45%	#6 or 0%	#5 or 5%		

MER BLEUE RD, INNES RD to RENAUD RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2011-2015	10	6,180	1825	**0.89**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	2	1	0	4	0	1	9	90%
Non-fatal injury	0	0	0	1	0	0	0	0	1	10%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**2**	**2**	**0**	**4**	**0**	**1**	**10**	100%
	10%	0%	20%	20%	0%	40%	0%	10%		

MER BLEUE RD / RENAUD RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2011-2015	3	9,850	1825	**0.17**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	0	0	0	1	0	0	2	67%
Non-fatal injury	1	0	0	0	0	0	0	0	1	33%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	100%
	67%	0%	0%	0%	0%	33%	0%	0%		

TENTH LINE RD / HARVEST VALLEY AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2011-2015	3	10,850	1825	**0.15**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	0	0	0	1	0	1	0	0	2	67%
Non-fatal injury	1	0	0	0	0	0	0	0	1	33%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**3**	100%
	33%	0%	0%	33%	0%	33%	0%	0%		

TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2011-2015	4	8,135	1825	**0.27**

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	Single Vehicle (other)	Single vehicle (Unattended vehicle)	Other	Total	
P.D. only	1	0	0	0	0	2	0	0	3	75%
Non-fatal injury	0	0	0	0	0	1	0	0	1	25%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**1**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**4**	100%
	25%	0%	0%	0%	0%	75%	0%	0%		

	Date	Time	ImpactType	Environment1	Light	TrafficControl	ClassificationofAccident	DayOfTheWeek	Municipality	NumberOfVehicles	NumberOfInjured	NumberOfPedestrians	STREET1	STREET2	STREET3	Intersection/Road Segment	Unique Values for Intersections/Road Segments
42060	2015-02-25	18:36	Rear End	Clear	Dark	No control	P.D. only	Wednesday		2	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	MER BLEUE RD/RENAUD RD
42118	2015-04-24	17:56	Single vehicle (other)	Clear	Daylight	No control	P.D. only	Friday		1	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	BRIAN COBURN BLVD/TENTH LINE RD
42296	2015-10-19	14:43	Angle	Clear	Daylight	No control	P.D. only	Monday		2	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	TENTH LINE RD/SOUTHFIELD WAY
41905	2014-09-23	20:57	Single vehicle (other)	Fog	Dark	No control	P.D. only	Tuesday		1	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	TENTH LINE RD/HARVEST VALLEY AVE
42061	2015-02-26	17:06	Sideswipe	Clear	Dark	No control	P.D. only	Thursday		2	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE
41947	2014-11-04	2:18	Single vehicle (other)	Clear	Dark	No control	P.D. only	Tuesday		1	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	
42043	2015-02-08	10:53	Other	Snow	Daylight	No control	P.D. only	Sunday		2	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	
40900	2011-12-23	3:33	Single vehicle (other)	Snow	Dark	No control	P.D. only	Friday		1	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	
40928	2012-01-20	9:26	Angle	Clear	Daylight	No control	Non-fatal injury	Friday		2	1	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	
41286	2013-01-12	17:00	Sideswipe	Clear	Dusk	No control	P.D. only	Saturday		2	0	0	MER BLEUE RD	INNES RD	RENAUD RD	MER BLEUE RD, INNES RD to RENAUD RD	
40764	2011-08-09	18:00	Rear End	Clear	Daylight	Stop Sign	P.D. only	Tuesday		2	0	0	MER BLEUE RD	RENAUD RD		MER BLEUE RD/RENAUD RD	
40947	2012-02-08	17:07	Rear End	Clear	Dark	Stop Sign	Non-fatal injury	Wednesday		2	1	0	MER BLEUE RD	RENAUD RD		MER BLEUE RD/RENAUD RD	
41278	2013-01-04	21:45	Single vehicle (other)	Clear	Dark	Stop Sign	P.D. only	Monday		1	0	0	MER BLEUE RD	RENAUD RD		MER BLEUE RD/RENAUD RD	
41099	2012-07-09	16:54	Single vehicle (other)	Clear	Daylight	Traffic signal	P.D. only	Monday		1	0	0	TENTH LINE RD	HARVEST VALLEY AVE		TENTH LINE RD/HARVEST VALLEY AVE	
40544	2011-01-01	18:15	Single vehicle (other)	Rain	Dark	No control	P.D. only	Saturday		1	0	0	TENTH LINE RD	SOUTHFIELD WAY	HARVEST VALLEY AVE	TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE	
40687	2011-05-24	7:45	Rear End	Clear	Daylight	No control	P.D. only	Tuesday		2	0	0	TENTH LINE RD	SOUTHFIELD WAY	HARVEST VALLEY AVE	TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE	
40920	2012-01-12	14:05	Single vehicle (other)	Snow	Daylight	No control	Non-fatal injury	Thursday		1	1	0	TENTH LINE RD	SOUTHFIELD WAY	HARVEST VALLEY AVE	TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE	
42063	2015-02-28	9:46	Rear End	Clear	Daylight	Stop Sign	Non-fatal injury	Saturday		2	1	0	TENTH LINE RD	HARVEST VALLEY AVE		TENTH LINE RD/HARVEST VALLEY AVE	
42354	2015-12-16	6:50	Angle	Clear	Dark	Stop Sign	P.D. only	Wednesday		2	0	0	TENTH LINE RD	HARVEST VALLEY AVE		TENTH LINE RD/HARVEST VALLEY AVE	
41832	2014-07-12	13:46	Single vehicle (other)	Clear	Daylight	No control	P.D. only	Saturday		1	0	0	TENTH LINE RD	SOUTHFIELD WAY	HARVEST VALLEY AVE	TENTH LINE RD, SOUTHFIELD WAY to HARVEST VALLEY AVE	

Appendix D

Background Traffic Growth

Innes / Mer Bleue
8 hrs

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2006	Thursday 24 Aug	3247	2786	1197	1188	8826	8503	7385	7176	40308
2007	Friday 15 June	3590	3258	1535	1449	10230	10789	8096	7964	46911
2009	Friday 5 June	4012	3955	2877	2941	11837	11785	8212	8267	53886

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	2786	3247	6033	40308				
2007	3258	3590	6848	46911	16.9%	10.6%	13.5%	16.4%
2009	3955	4012	7967	53886	21.4%	11.8%	16.3%	14.9%

Regression Estimate	2006	2821	3285	6106
Regression Estimate	2009	3973	4031	8004
Average Annual Change		**12.08%**	**7.06%**	**9.44%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	7385	7176	14561	40308				
2007	8096	7964	16060	46911	9.6%	11.0%	10.3%	16.4%
2009	8212	8267	16479	53886	1.4%	3.8%	2.6%	14.9%

Regression Estimate	2006	7572	7358	14929
Regression Estimate	2009	8305	8358	16663
Average Annual Change		**3.13%**	**4.34%**	**3.73%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	8503	8826	17329	40308				
2007	10789	10230	21019	46911	26.9%	15.9%	21.3%	16.4%
2009	11785	11837	23622	53886	9.2%	15.7%	12.4%	14.9%

Regression Estimate	2006	9014	8998	18011
Regression Estimate	2009	12040	11923	23963
Average Annual Change		**10.13%**	**9.84%**	**9.98%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	1197	1188	2385	40308				
2007	1535	1449	2984	46911	28.2%	22.0%	25.1%	16.4%
2009	2877	2941	5818	53886	87.4%	103.0%	95.0%	14.9%

Regression Estimate	2006	1102	1049	2151
Regression Estimate	2009	2829	2872	5701
Average Annual Change		**36.94%**	**39.87%**	**38.38%**

Innes/Mer Bleue
AM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2006	Thursday 24 Aug	264	299	113	183	1289	566	458	1072	4244
2007	Friday 15 June	198	454	126	190	1748	577	463	1312	5068
2009	Friday 5 June	303	523	142	367	2058	670	529	1472	6064

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	299	264	563	4244				
2007	454	198	652	5068	51.8%	-25.0%	15.8%	19.4%
2009	523	303	826	6064	15.2%	53.0%	26.7%	19.7%

Regression Estimate	2006	333	230	564
Regression Estimate	2009	540	286	826
Average Annual Change		**17.45%**	**7.52%**	**13.60%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	458	1072	1530	4244				
2007	463	1312	1775	5068	1.1%	22.4%	16.0%	19.4%
2009	529	1472	2001	6064	14.3%	12.2%	12.7%	19.7%

Regression Estimate	2006	450	1118	1568
Regression Estimate	2009	525	1495	2020
Average Annual Change		**5.27%**	**10.18%**	**8.81%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	566	1289	1855	4244				
2007	577	1748	2325	5068	1.9%	35.6%	25.3%	19.4%
2009	670	2058	2728	6064	16.1%	17.7%	17.3%	19.7%

Regression Estimate	2006	556	1376	1932
Regression Estimate	2009	665	2101	2766
Average Annual Change		**6.15%**	**15.16%**	**12.72%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	113	183	296	4244				
2007	126	190	316	5068	11.5%	3.8%	6.8%	19.4%
2009	142	367	509	6064	12.7%	93.2%	61.1%	19.7%

Regression Estimate	2006	114	160	274
Regression Estimate	2009	143	355	498
Average Annual Change		**7.64%**	**30.55%**	**22.02%**

Innes / Mer Bleue
PM Peak

Year	Date	North Leg		South Leg		East Leg		West Leg		Total
		SB	NB	NB	SB	WB	EB	EB	WB	
2006	Thursday 24 Aug	624	468	306	224	1192	2071	1568	927	7380
2007	Friday 15 June	679	523	354	213	1329	1704	1704	999	7505
2009	Friday 5 June	747	669	704	429	1443	2473	1613	936	9014

North Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	468	624	1092	7380				
2007	523	679	1202	7505	11.8%	8.8%	10.1%	1.7%
2009	669	747	1416	9014	27.9%	10.0%	17.8%	20.1%

Regression Estimate	2006	463	630	1093
Regression Estimate	2009	666	750	1416
Average Annual Change		**12.92%**	**5.98%**	**9.03%**

West Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	1568	927	2495	7380				
2007	1704	999	2703	7505	8.7%	7.8%	8.3%	1.7%
2009	1613	936	2549	9014	-5.3%	-6.3%	-5.7%	20.1%

Regression Estimate	2006	1620	957	2576
Regression Estimate	2009	1639	951	2590
Average Annual Change		**0.39%**	**-0.20%**	**0.17%**

East Leg

Year	Counts				% Change			
	EB	*WB*	*EB+WB*	*INT*	*EB*	*WB*	*EB+WB*	*INT*
2006	2071	1192	3263	7380				
2007	1704	1329	3033	7505	-17.7%	11.5%	-7.0%	1.7%
2009	2473	1443	3916	9014	45.1%	8.6%	29.1%	20.1%

Regression Estimate	2006	1856	1215	3071
Regression Estimate	2009	2366	1454	3820
Average Annual Change		**8.42%**	**6.18%**	**7.55%**

South Leg

Year	Counts				% Change			
	NB	*SB*	*NB+SB*	*INT*	*NB*	*SB*	*NB+SB*	*INT*
2006	306	224	530	7380				
2007	354	213	567	7505	15.7%	-4.9%	7.0%	1.7%
2009	704	429	1133	9014	98.9%	101.4%	99.8%	20.1%

Regression Estimate	2006	270	190	460
Regression Estimate	2009	686	412	1098
Average Annual Change		**36.49%**	**29.43%**	**33.67%**

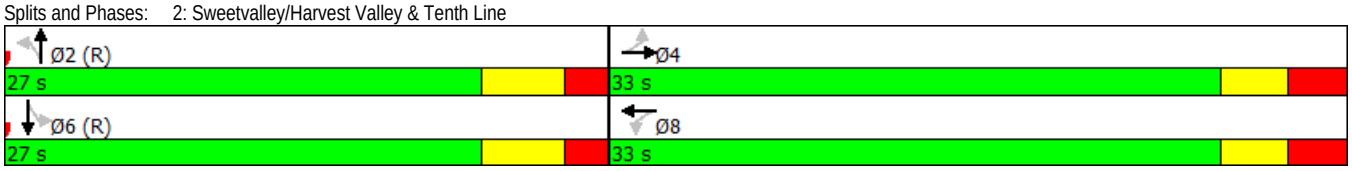
Appendix E

SYNCHRO Background Traffic Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	66	0	111	0	7	262	79	234
Future Volume (vph)	66	0	111	0	7	262	79	234
Lane Group Flow (vph)	73	28	123	334	8	320	88	282
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	14.5	14.5	14.5	14.5	37.5	37.5	37.5	37.5
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.62	0.62	0.62	0.62
v/c Ratio	0.54	0.04	0.39	0.49	0.01	0.15	0.14	0.13
Control Delay	34.3	0.1	21.7	3.5	5.9	5.2	6.5	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	0.1	21.7	3.5	5.9	5.2	6.5	5.2
LOS	C	A	C	A	A	A	A	A
Approach Delay		24.8		8.4		5.2		5.5
Approach LOS		C		A		A		A
Queue Length 50th (m)	7.2	0.0	11.6	0.0	0.3	5.6	3.2	4.9
Queue Length 95th (m)	16.7	0.0	20.8	7.7	2.0	13.5	10.8	12.1
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	270	968	637	945	645	2095	622	2099
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	0.27	0.03	0.19	0.35	0.01	0.15	0.14	0.13

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Sweetvalley/Harvest Valley & Tenth Line



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	152	6	29	111	90	445
Future Volume (vph)	152	6	29	111	90	445
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	169	7	32	123	100	494

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	176	155	594
Volume Left (vph)	169	32	0
Volume Right (vph)	7	0	494
Hadj (s)	0.20	0.08	-0.46
Departure Headway (s)	5.8	5.2	4.2
Degree Utilization, x	0.28	0.22	0.69
Capacity (veh/h)	567	656	837
Control Delay (s)	11.0	9.7	16.1
Approach Delay (s)	11.0	9.7	16.1
Approach LOS	B	A	C

Intersection Summary			
Delay	14.0		
Level of Service	B		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	247	16	30	478
Future Volume (Veh/h)	57	106	247	16	30	478
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	274	18	33	531
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	880	283			292	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	880	283			292	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	84			97	
cM capacity (veh/h)	309	756			1270	

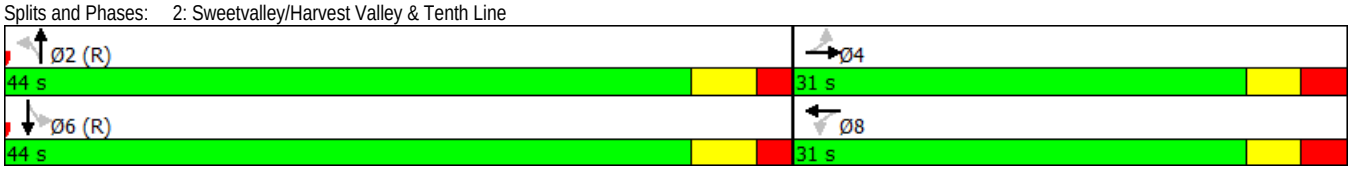
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	181	292	564
Volume Left	63	0	33
Volume Right	118	18	0
cSH	503	1700	1270
Volume to Capacity	0.36	0.17	0.03
Queue Length 95th (m)	12.3	0.0	0.6
Control Delay (s)	16.1	0.0	0.7
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	0.7
Approach LOS	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	60	0	25	0	39	380	301	254
Future Volume (vph)	60	0	25	0	39	380	301	254
Lane Group Flow (vph)	67	26	28	208	43	541	334	398
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	31.0	31.0	31.0	31.0	44.0	44.0	44.0	44.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	58.7%	58.7%	58.7%	58.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.5	12.5	12.5	12.5	54.5	54.5	54.5	54.5
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.73	0.73	0.73	0.73
v/c Ratio	0.54	0.04	0.13	0.36	0.06	0.23	0.57	0.17
Control Delay	45.5	0.1	27.6	1.7	3.5	3.2	9.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	0.1	27.6	1.7	3.5	3.2	9.9	2.5
LOS	D	A	C	A	A	A	A	A
Approach Delay		32.8		4.8		3.2		5.9
Approach LOS		C		A		A		A
Queue Length 50th (m)	8.9	0.0	3.5	0.0	1.3	8.2	16.6	4.7
Queue Length 95th (m)	20.4	0.0	9.6	0.0	4.2	15.2	44.3	9.7
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	268	900	475	797	670	2403	584	2388
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	0.25	0.03	0.06	0.26	0.06	0.23	0.57	0.17

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 66.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Sweetvalley/Harvest Valley & Tenth Line



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	549	19	8	143	160	251
Future Volume (vph)	549	19	8	143	160	251
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	610	21	9	159	178	279

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	631	168	457
Volume Left (vph)	610	9	0
Volume Right (vph)	21	0	279
Hadj (s)	0.21	0.04	-0.33
Departure Headway (s)	6.0	6.7	5.8
Degree Utilization, x	1.05	0.31	0.74
Capacity (veh/h)	596	521	611
Control Delay (s)	75.8	12.8	23.6
Approach Delay (s)	75.8	12.8	23.6
Approach LOS	F	B	C

Intersection Summary			
Delay	48.4		
Level of Service	E		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	624	68	128	373
Future Volume (Veh/h)	38	71	624	68	128	373
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	693	76	142	414
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	1429	731			769	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1429	731			769	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	81			83	
cM capacity (veh/h)	124	422			845	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	121	769	556
Volume Left	42	0	142
Volume Right	79	76	0
cSH	229	1700	845
Volume to Capacity	0.53	0.45	0.17
Queue Length 95th (m)	21.1	0.0	4.6
Control Delay (s)	36.9	0.0	4.3
Lane LOS	E		A
Approach Delay (s)	36.9	0.0	4.3
Approach LOS	E		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	158	6	29	115	92	463
Future Volume (vph)	158	6	29	115	92	463
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	176	7	32	128	102	514

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	183	160	616
Volume Left (vph)	176	32	0
Volume Right (vph)	7	0	514
Hadj (s)	0.20	0.07	-0.47
Departure Headway (s)	5.8	5.2	4.2
Degree Utilization, x	0.30	0.23	0.72
Capacity (veh/h)	560	647	831
Control Delay (s)	11.3	9.8	17.5
Approach Delay (s)	11.3	9.8	17.5
Approach LOS	B	A	C

Intersection Summary			
Delay	15.0		
Level of Service	C		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	257	16	30	497
Future Volume (Veh/h)	57	106	257	16	30	497
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	286	18	33	552
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	913	295			304	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	913	295			304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	84			97	
cM capacity (veh/h)	296	744			1257	

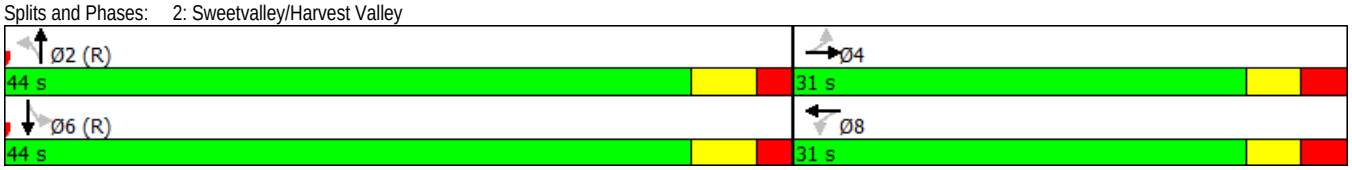
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	181	304	585
Volume Left	63	0	33
Volume Right	118	18	0
cSH	487	1700	1257
Volume to Capacity	0.37	0.18	0.03
Queue Length 95th (m)	12.9	0.0	0.6
Control Delay (s)	16.7	0.0	0.7
Lane LOS	C		A
Approach Delay (s)	16.7	0.0	0.7
Approach LOS	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	60	0	25	0	39	396	301	265
Future Volume (vph)	60	0	25	0	39	396	301	265
Lane Group Flow (vph)	67	26	28	208	43	559	334	410
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	31.0	31.0	31.0	31.0	44.0	44.0	44.0	44.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	58.7%	58.7%	58.7%	58.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	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)	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.8	10.8	10.8	10.8	52.8	52.8	52.8	52.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.70	0.70	0.70	0.70
v/c Ratio	0.56	0.04	0.15	0.40	0.07	0.24	0.60	0.18
Control Delay	48.0	0.1	29.5	2.2	4.1	3.8	11.7	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	0.1	29.5	2.2	4.1	3.8	11.7	2.9
LOS	D	A	C	A	A	A	B	A
Approach Delay		34.6		5.5		3.8		6.9
Approach LOS		C		A		A		A
Queue Length 50th (m)	9.1	0.0	3.6	0.0	1.5	9.9	18.9	5.5
Queue Length 95th (m)	20.6	0.0	9.9	0.0	4.7	17.5	50.1	11.1
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	283	856	445	748	642	2331	555	2321
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	0.24	0.03	0.06	0.28	0.07	0.24	0.60	0.18

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 72.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	570	19	8	147	166	260
Future Volume (vph)	570	19	8	147	166	260
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	633	21	9	163	184	289

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	654	172	473
Volume Left (vph)	633	9	0
Volume Right (vph)	21	0	289
Hadj (s)	0.21	0.04	-0.33
Departure Headway (s)	6.0	6.8	5.8
Degree Utilization, x	1.10	0.32	0.77
Capacity (veh/h)	582	519	610
Control Delay (s)	90.2	12.9	25.4
Approach Delay (s)	90.2	12.9	25.4
Approach LOS	F	B	D

Intersection Summary			
Delay	56.3		
Level of Service	F		
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	650	68	128	388
Future Volume (Veh/h)	38	71	650	68	128	388
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	722	76	142	431
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	1475	760			798	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1475	760			798	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	81			83	
cM capacity (veh/h)	115	406			824	

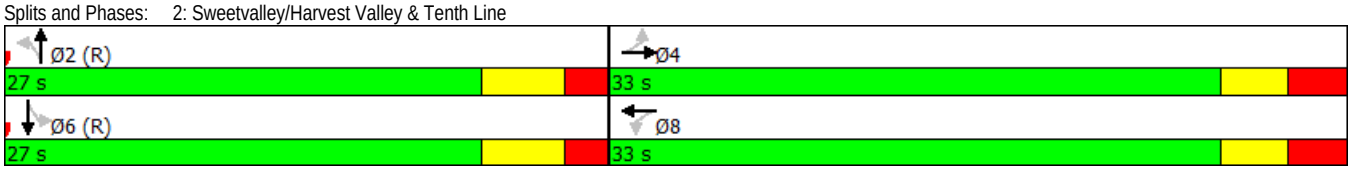
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	121	798	573
Volume Left	42	0	142
Volume Right	79	76	0
cSH	216	1700	824
Volume to Capacity	0.56	0.47	0.17
Queue Length 95th (m)	23.1	0.0	4.7
Control Delay (s)	40.9	0.0	4.3
Lane LOS	E		A
Approach Delay (s)	40.9	0.0	4.3
Approach LOS	E		

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	66	0	111	0	7	272	79	243
Future Volume (vph)	66	0	111	0	7	272	79	243
Lane Group Flow (vph)	73	28	123	334	8	331	88	292
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	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)	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.8	12.8	12.8	12.8	35.8	35.8	35.8	35.8
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.60	0.60	0.60	0.60
v/c Ratio	0.57	0.04	0.44	0.55	0.01	0.17	0.15	0.15
Control Delay	37.8	0.1	24.6	5.5	6.6	6.0	7.4	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	0.1	24.6	5.5	6.6	6.0	7.4	5.9
LOS	D	A	C	A	A	A	A	A
Approach Delay		27.3		10.7		6.0		6.3
Approach LOS		C		B		A		A
Queue Length 50th (m)	7.4	0.0	12.1	0.0	0.3	6.6	3.5	5.7
Queue Length 95th (m)	16.9	0.0	21.8	12.3	2.1	15.1	11.6	13.5
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	275	913	600	888	609	2003	587	2005
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	0.27	0.03	0.20	0.38	0.01	0.17	0.15	0.15

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

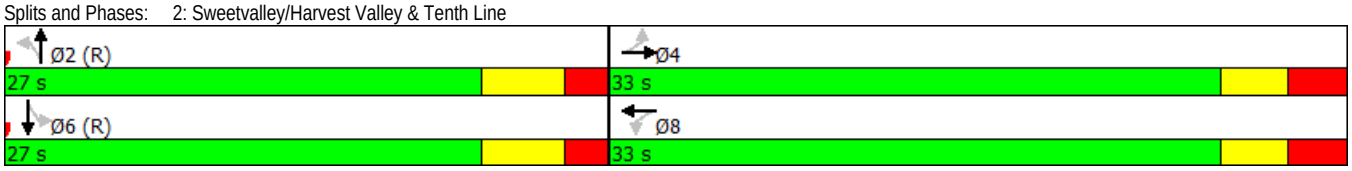
Splits and Phases: 2: Sweetvalley/Harvest Valley & Tenth Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	66	0	111	0	7	286	79	256
Future Volume (vph)	66	0	111	0	7	286	79	256
Lane Group Flow (vph)	73	28	123	334	8	347	88	306
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	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)	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.8	12.8	12.8	12.8	35.8	35.8	35.8	35.8
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.60	0.60	0.60	0.60
v/c Ratio	0.57	0.04	0.44	0.56	0.01	0.17	0.15	0.15
Control Delay	37.8	0.1	24.6	6.3	6.6	6.1	7.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	0.1	24.6	6.3	6.6	6.1	7.4	6.0
LOS	D	A	C	A	A	A	A	A
Approach Delay		27.3		11.2		6.1		6.3
Approach LOS		C		B		A		A
Queue Length 50th (m)	7.4	0.0	12.1	0.0	0.3	7.0	3.5	6.1
Queue Length 95th (m)	16.9	0.0	21.8	14.2	2.1	15.8	11.7	14.1
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	275	901	600	876	601	2002	578	2005
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	0.27	0.03	0.20	0.38	0.01	0.17	0.15	0.15

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 64.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Sweetvalley/Harvest Valley & Tenth Line



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	166	6	29	121	95	485
Future Volume (vph)	166	6	29	121	95	485
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	184	7	32	134	106	539

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	191	166	645
Volume Left (vph)	184	32	0
Volume Right (vph)	7	0	539
Hadj (s)	0.20	0.07	-0.47
Departure Headway (s)	5.9	5.3	4.3
Degree Utilization, x	0.31	0.25	0.77
Capacity (veh/h)	559	637	824
Control Delay (s)	11.6	10.1	19.9
Approach Delay (s)	11.6	10.1	19.9
Approach LOS	B	B	C

Intersection Summary			
Delay	16.7		
Level of Service	C		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	270	16	30	523
Future Volume (Veh/h)	57	106	270	16	30	523
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	300	18	33	581
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	956	309			318	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	956	309			318	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	84			97	
cM capacity (veh/h)	279	731			1242	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	181	318	614
Volume Left	63	0	33
Volume Right	118	18	0
cSH	467	1700	1242
Volume to Capacity	0.39	0.19	0.03
Queue Length 95th (m)	13.7	0.0	0.6
Control Delay (s)	17.5	0.0	0.7
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	0.7
Approach LOS	C		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	60	0	25	0	39	416	301	278
Future Volume (vph)	60	0	25	0	39	416	301	278
Lane Group Flow (vph)	67	26	28	208	43	581	334	425
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.7	30.7	30.7	30.7	24.4	24.4	24.4	24.4
Total Split (s)	30.7	30.7	30.7	30.7	49.3	49.3	49.3	49.3
Total Split (%)	38.4%	38.4%	38.4%	38.4%	61.6%	61.6%	61.6%	61.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.7	2.7	2.7	2.7	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)	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	10.9	10.9	10.9	10.9	57.7	57.7	57.7	57.7
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.72	0.72	0.72	0.72
v/c Ratio	0.64	0.04	0.16	0.40	0.07	0.24	0.60	0.18
Control Delay	59.7	0.1	32.1	2.3	3.9	3.7	11.4	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	0.1	32.1	2.3	3.9	3.7	11.4	2.9
LOS	E	A	C	A	A	A	B	A
Approach Delay		43.0		5.8		3.7		6.7
Approach LOS		D		A		A		A
Queue Length 50th (m)	9.9	0.0	3.9	0.0	1.5	10.5	19.2	6.1
Queue Length 95th (m)	#24.4	0.0	10.5	0.0	4.7	18.5	50.9	11.7
Internal Link Dist (m)		161.9		264.6		371.3		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	243	836	412	724	648	2387	557	2375
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	0.28	0.03	0.07	0.29	0.07	0.24	0.60	0.18

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 72.9%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Sweetvalley/Harvest Valley

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	598	19	8	153	173	273
Future Volume (vph)	598	19	8	153	173	273
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	664	21	9	170	192	303

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	685	179	495
Volume Left (vph)	664	9	0
Volume Right (vph)	21	0	303
Hadj (s)	0.21	0.04	-0.33
Departure Headway (s)	6.1	6.8	5.9
Degree Utilization, x	1.17	0.34	0.80
Capacity (veh/h)	589	516	609
Control Delay (s)	115.1	13.2	28.6
Approach Delay (s)	115.1	13.2	28.6
Approach LOS	F	B	D

Intersection Summary			
Delay	70.2		
Level of Service	F		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	683	68	128	408
Future Volume (Veh/h)	38	71	683	68	128	408
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	759	76	142	453
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	1534	797			835	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1534	797			835	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	80			82	
cM capacity (veh/h)	105	387			798	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	121	835	595
Volume Left	42	0	142
Volume Right	79	76	0
cSH	201	1700	798
Volume to Capacity	0.60	0.49	0.18
Queue Length 95th (m)	25.8	0.0	4.9
Control Delay (s)	47.0	0.0	4.4
Lane LOS	E		A
Approach Delay (s)	47.0	0.0	4.4
Approach LOS	E		

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

Appendix F

Signal Warrant Analysis

Mer Bleue/Site - (peak hour signal warrant), Total Projected Site Traffic 2029

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	25%	25%	**25% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	38%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	12%	0%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	0%		

Notes

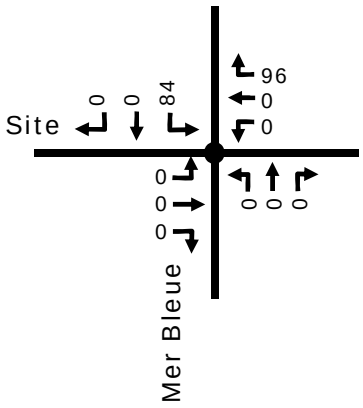
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

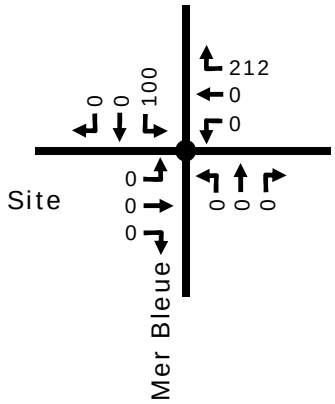
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

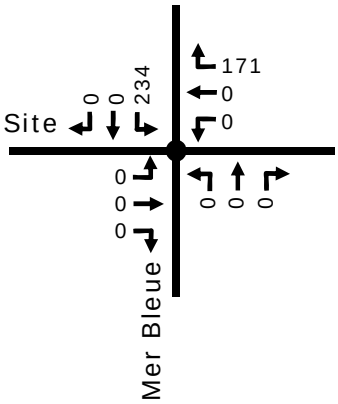
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Mer Bleue/Renaud - (peak hour signal warrant), Background 2020

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	68%	68%	**68% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	71%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	43%	43%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	233%		

Notes

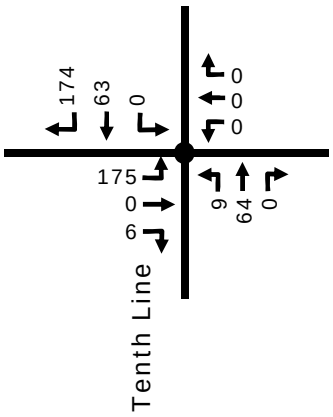
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

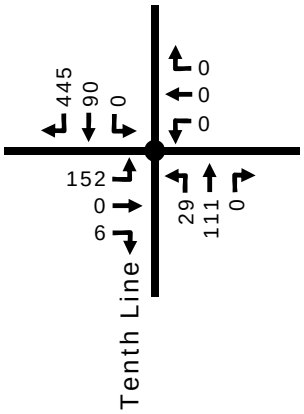
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

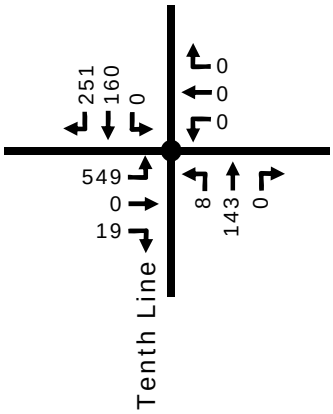
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Mer Bleue/Renaud - (peak hour signal warrant), Background 2024

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	71%	71%	**71% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	74%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	45%	45%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	243%		

Notes

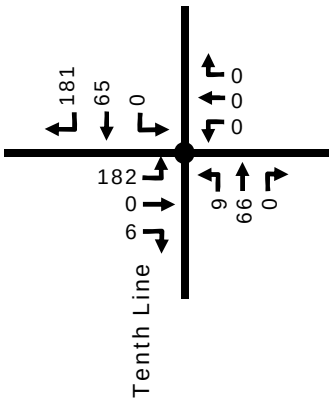
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

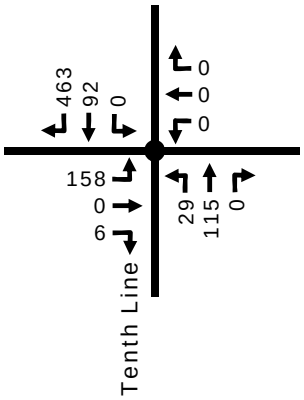
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

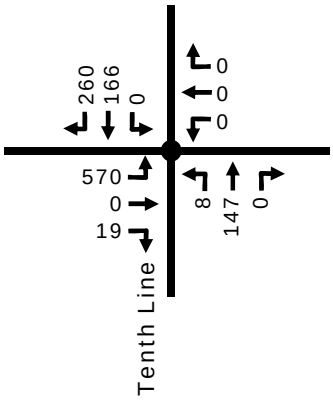
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Mer Bleue/Renaud - (peak hour signal warrant), Background 2029

Signal Warrant			Description	Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	74%	74%	**74% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	77%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	47%	47%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	255%		

Notes

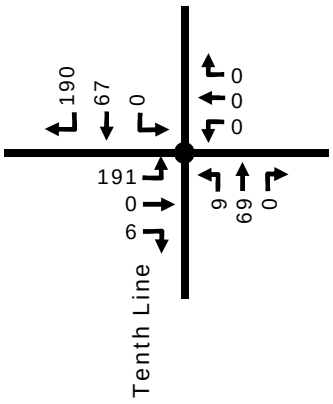
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

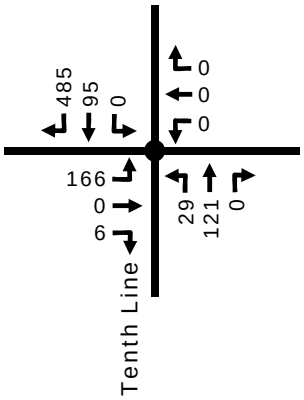
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

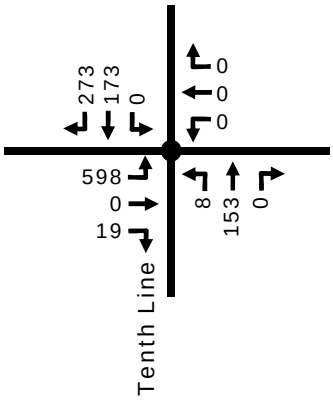
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Mer Bleue/Renaud - (peak hour signal warrant), Total Projected Site Traffic 2024

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	96%	80%	**80% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	80%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	67%	67%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	243%		

Notes

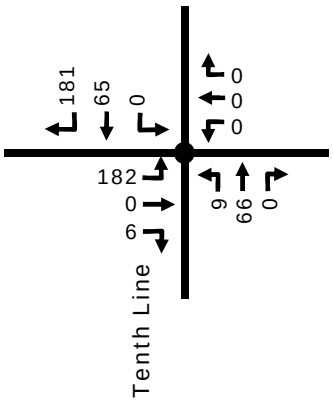
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

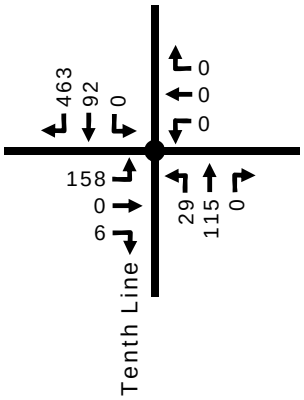
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

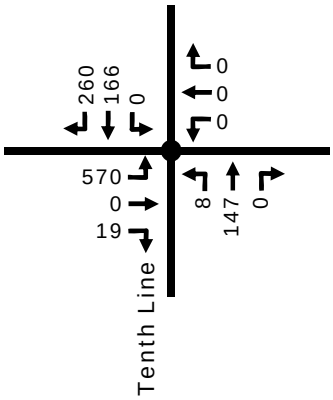
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



Mer Bleue/Renaud - (peak hour signal warrant), Total Projected Site Traffic 2029

Signal Warrant		Description		Minimum Requirement for Two Lane Roadways	Compliance		
				Restricted Flow - Operating Speed Less Than 70 km/h	Sectional %	Entire %	Warrant
Intersection	1. Minimum Vehicular Volume	(1) A	Vehicle Volume, All Approaches for Each of the Heaviest 8 Hours of on Average Day, and	720	99%	84%	**84% No**
		(4) B	Vehicle Volume, Along Minor Streets for Each of the Same 8 Hours	255	84%		
	2. Delay to Cross Traffic	(1) A	Vehicle Volume, Along Major Street for Each of the Heaviest 8 Hours of an Average Day, and	720	69%	69%	
		(2) B	Combined Vehicle and Pedestrian Volume Crossing the Major Street for Each of the Same 8 Hours	75	255%		

Notes

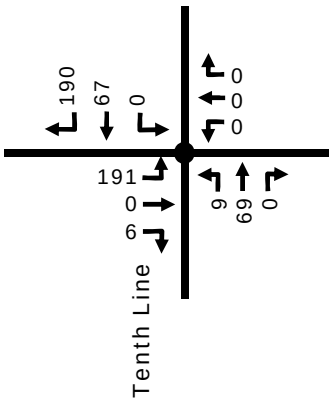
1 *Vehicle Volume Warrants (1A), (2A) and (5B) for Roadways Having Two or More Moving Lanes in one Direction Should Be 25% Higher Than Values Given Above* **No**

2 *For Definition of Crossing Volume Refer to Note 4 on the Signal Warrant Analysis Form B2.03.08*

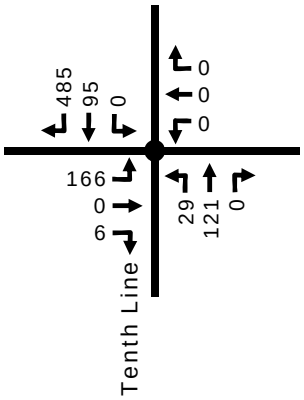
3 *The Lowest Sectional Percentage Governs the Entire Warrant*

4 *For "T" Intersections the Warrant Values for Minor Street Should be Increased by 50% (Warrant 1B only)* **Yes**

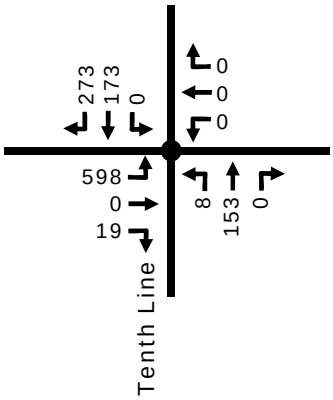
Average 8 Hour Volumes



AM Peak Hour Volumes



PM Peak Hour Volumes



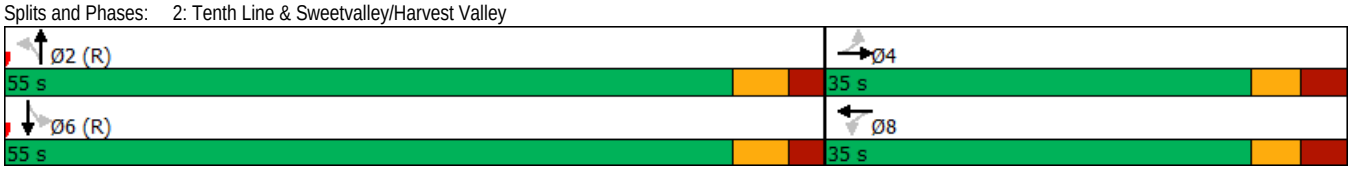
Appendix G

SYNCHRO Future Traffic Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	0	111	0	7	378	79	277
Future Volume (vph)	125	0	111	0	7	378	79	277
Lane Group Flow (vph)	139	28	123	334	8	449	88	359
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	34.5	34.5	34.5	34.5	29.2	29.2	29.2	29.2
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	23.3	23.3	23.3	23.3	57.4	57.4	57.4	57.4
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.64	0.64	0.64	0.64
v/c Ratio	0.98	0.04	0.36	0.48	0.01	0.21	0.16	0.17
Control Delay	102.7	0.1	28.4	3.2	8.4	7.9	9.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	0.1	28.4	3.2	8.4	7.9	9.3	7.2
LOS	F	A	C	A	A	A	A	A
Approach Delay		85.5		10.0		7.9		7.6
Approach LOS		F		A		A		A
Queue Length 50th (m)	23.3	0.0	17.0	0.0	0.5	15.5	5.8	11.1
Queue Length 95th (m)	#52.0	0.0	29.0	6.8	2.4	26.6	14.6	20.1
Internal Link Dist (m)		161.9		264.6		214.2		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	185	867	442	784	611	2146	557	2130
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	0.75	0.03	0.28	0.43	0.01	0.21	0.16	0.17

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 63.7%	ICU Level of Service B
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	152	6	29	111	90	445
Future Volume (vph)	152	6	29	111	90	445
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	169	7	32	123	100	494

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	176	155	594
Volume Left (vph)	169	32	0
Volume Right (vph)	7	0	494
Hadj (s)	0.20	0.08	-0.46
Departure Headway (s)	5.8	5.2	4.2
Degree Utilization, x	0.28	0.22	0.69
Capacity (veh/h)	567	656	837
Control Delay (s)	11.0	9.7	16.1
Approach Delay (s)	11.0	9.7	16.1
Approach LOS	B	A	C

Intersection Summary			
Delay	14.0		
Level of Service	B		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	247	16	30	478
Future Volume (Veh/h)	57	106	247	16	30	478
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	274	18	33	531
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	880	283			292	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	880	283			292	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	84			97	
cM capacity (veh/h)	309	756			1270	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	181	292	564
Volume Left	63	0	33
Volume Right	118	18	0
cSH	503	1700	1270
Volume to Capacity	0.36	0.17	0.03
Queue Length 95th (m)	12.3	0.0	0.6
Control Delay (s)	16.1	0.0	0.7
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	0.7
Approach LOS	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	0	5	12	0	73	2	296	4	24	374	19
Future Volume (Veh/h)	43	0	5	12	0	73	2	296	4	24	374	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	0	6	13	0	81	2	329	4	27	416	21
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	896	818	426	822	826	331	437			333		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	896	818	426	822	826	331	437			333		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	100	99	95	100	89	100			98		
cM capacity (veh/h)	227	303	628	285	300	711	1123			1226		

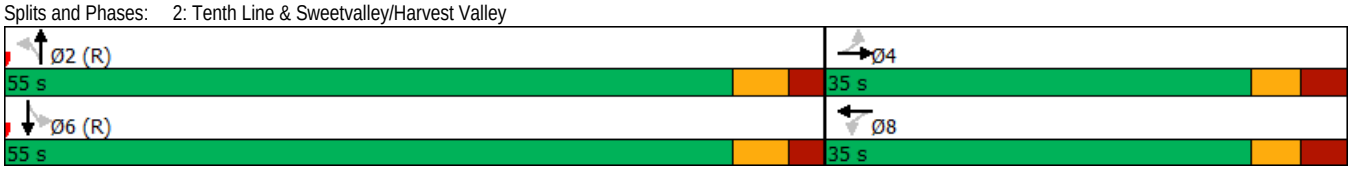
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	94	335	464
Volume Left	48	13	2	27
Volume Right	6	81	4	21
cSH	244	589	1123	1226
Volume to Capacity	0.22	0.16	0.00	0.02
Queue Length 95th (m)	6.3	4.3	0.0	0.5
Control Delay (s)	23.9	12.3	0.1	0.7
Lane LOS	C	B	A	A
Approach Delay (s)	23.9	12.3	0.1	0.7
Approach LOS	C	B		

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	55.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	106	0	25	0	39	451	301	364
Future Volume (vph)	106	0	25	0	39	451	301	364
Lane Group Flow (vph)	118	26	28	208	43	620	334	592
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.5	31.5	31.5	31.5	24.4	24.4	24.4	24.4
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	18.0	18.0	18.0	18.0	62.7	62.7	62.7	62.7
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.71	0.04	0.11	0.36	0.08	0.27	0.66	0.26
Control Delay	55.6	0.1	27.6	1.7	6.3	5.6	17.8	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	0.1	27.6	1.7	6.3	5.6	17.8	4.6
LOS	E	A	C	A	A	A	B	A
Approach Delay		45.5		4.8		5.6		9.4
Approach LOS		D		A		A		A
Queue Length 50th (m)	19.3	0.0	4.0	0.0	2.0	16.0	27.4	12.2
Queue Length 95th (m)	34.4	0.0	9.9	0.0	7.0	30.4	#90.3	24.7
Internal Link Dist (m)		161.9		264.6		210.2		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	279	795	442	736	522	2310	506	2291
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	0.42	0.03	0.06	0.28	0.08	0.27	0.66	0.26

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	549	19	8	143	160	251
Future Volume (vph)	549	19	8	143	160	251
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	610	21	9	159	178	279

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	631	168	457
Volume Left (vph)	610	9	0
Volume Right (vph)	21	0	279
Hadj (s)	0.21	0.04	-0.33
Departure Headway (s)	6.0	6.7	5.8
Degree Utilization, x	1.05	0.31	0.74
Capacity (veh/h)	596	521	611
Control Delay (s)	75.8	12.8	23.6
Approach Delay (s)	75.8	12.8	23.6
Approach LOS	F	B	C

Intersection Summary			
Delay	48.4		
Level of Service	E		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	624	68	128	373
Future Volume (Veh/h)	38	71	624	68	128	373
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	693	76	142	414
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	1429	731			769	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1429	731			769	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	81			83	
cM capacity (veh/h)	124	422			845	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	121	769	142	414
Volume Left	42	0	142	0
Volume Right	79	76	0	0
cSH	229	1700	845	1700
Volume to Capacity	0.53	0.45	0.17	0.24
Queue Length 95th (m)	21.1	0.0	4.6	0.0
Control Delay (s)	36.9	0.0	10.1	0.0
Lane LOS	E		B	
Approach Delay (s)	36.9	0.0	2.6	
Approach LOS	E			

Intersection Summary				
Average Delay			4.1	
Intersection Capacity Utilization			63.3%	ICU Level of Service B
Analysis Period (min)			15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	0	4	7	0	37	6	531	11	63	304	47
Future Volume (Veh/h)	34	0	4	7	0	37	6	531	11	63	304	47
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	0	4	8	0	41	7	590	12	70	338	52
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	1155	1120	364	1118	1140	596	390			602		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1155	1120	364	1118	1140	596	390			602		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	100	99	95	100	92	99			93		
cM capacity (veh/h)	150	191	681	172	185	504	1169			975		

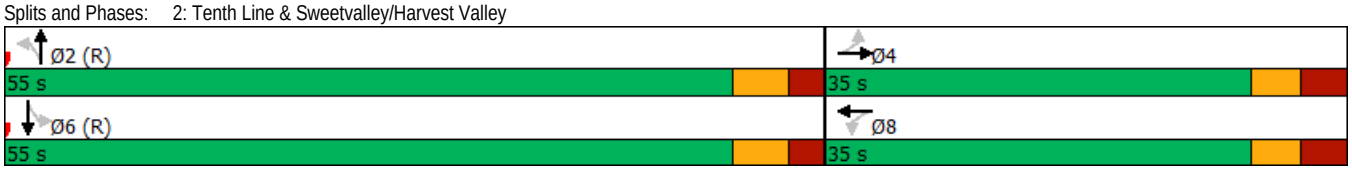
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	49	609	460
Volume Left	38	8	7	70
Volume Right	4	41	12	52
cSH	162	383	1169	975
Volume to Capacity	0.26	0.13	0.01	0.07
Queue Length 95th (m)	7.5	3.3	0.1	1.8
Control Delay (s)	34.8	15.8	0.2	2.1
Lane LOS	D	C	A	A
Approach Delay (s)	34.8	15.8	0.2	2.1
Approach LOS	D	C		

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	0	111	0	7	388	79	286
Future Volume (vph)	125	0	111	0	7	388	79	286
Lane Group Flow (vph)	139	28	123	334	8	460	88	369
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	34.5	34.5	34.5	34.5	29.2	29.2	29.2	29.2
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	23.3	23.3	23.3	23.3	57.4	57.4	57.4	57.4
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.64	0.64	0.64	0.64
v/c Ratio	0.98	0.04	0.36	0.48	0.01	0.21	0.16	0.17
Control Delay	102.7	0.1	28.4	3.4	8.4	7.9	9.3	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	0.1	28.4	3.4	8.4	7.9	9.3	7.2
LOS	F	A	C	A	A	A	A	A
Approach Delay		85.5		10.1		8.0		7.6
Approach LOS		F		B		A		A
Queue Length 50th (m)	23.3	0.0	17.0	0.0	0.5	16.0	5.8	11.5
Queue Length 95th (m)	#52.0	0.0	29.0	8.0	2.4	27.4	14.7	20.8
Internal Link Dist (m)		161.9		264.6		218.2		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	185	859	442	778	605	2148	548	2130
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	0.75	0.03	0.28	0.43	0.01	0.21	0.16	0.17

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 64.0%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	158	25	70	279	169	463
Future Volume (vph)	158	25	70	279	169	463
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	176	28	78	310	188	514

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	204	388	702
Volume Left (vph)	176	78	0
Volume Right (vph)	28	0	514
Hadj (s)	0.12	0.07	-0.41
Departure Headway (s)	6.6	5.6	4.8
Degree Utilization, x	0.38	0.61	0.94
Capacity (veh/h)	524	627	733
Control Delay (s)	13.5	16.9	41.2
Approach Delay (s)	13.5	16.9	41.2
Approach LOS	B	C	E

Intersection Summary			
Delay	29.6		
Level of Service	D		
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	421	16	30	574
Future Volume (Veh/h)	57	106	421	16	30	574
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	468	18	33	638
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	1181	477			486	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1181	477			486	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	80			97	
cM capacity (veh/h)	204	588			1077	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	181	486	33	638
Volume Left	63	0	33	0
Volume Right	118	18	0	0
cSH	355	1700	1077	1700
Volume to Capacity	0.51	0.29	0.03	0.38
Queue Length 95th (m)	21.1	0.0	0.7	0.0
Control Delay (s)	25.3	0.0	8.4	0.0
Lane LOS	D		A	
Approach Delay (s)	25.3	0.0	0.4	
Approach LOS	D			

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	205	137	0	96	65
Future Volume (Veh/h)	0	205	137	0	96	65
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	228	152	0	107	72
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	438	152			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	438	152			152	
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	75			93	
cM capacity (veh/h)	533	894			1429	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	228	152	107	72
Volume Left	0	0	107	0
Volume Right	228	0	0	0
cSH	894	1700	1429	1700
Volume to Capacity	0.25	0.09	0.07	0.04
Queue Length 95th (m)	7.7	0.0	1.8	0.0
Control Delay (s)	10.4	0.0	7.7	0.0
Lane LOS	B		A	
Approach Delay (s)	10.4	0.0	4.6	
Approach LOS	B			

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	36.6%	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)	43	0	5	12	0	73	2	287	4	24	363	19
Future Volume (Veh/h)	43	0	5	12	0	73	2	287	4	24	363	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	0	6	13	0	81	2	319	4	27	403	21
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	874	794	414	798	803	321	424			323		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874	794	414	798	803	321	424			323		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	100	99	96	100	89	100			98		
cM capacity (veh/h)	236	313	639	296	309	720	1135			1237		

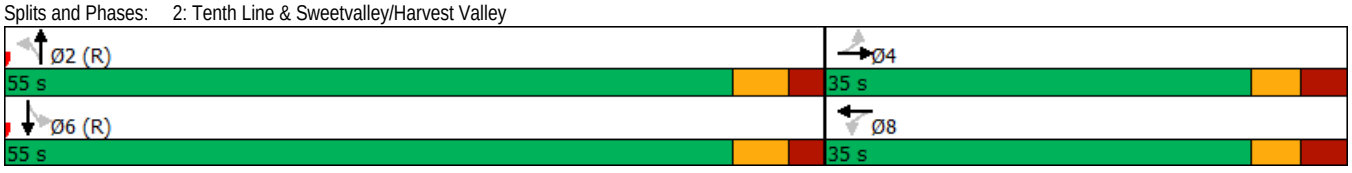
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	94	325	451
Volume Left	48	13	2	27
Volume Right	6	81	4	21
cSH	253	601	1135	1237
Volume to Capacity	0.21	0.16	0.00	0.02
Queue Length 95th (m)	6.0	4.2	0.0	0.5
Control Delay (s)	23.0	12.1	0.1	0.7
Lane LOS	C	B	A	A
Approach Delay (s)	23.0	12.1	0.1	0.7
Approach LOS	C	B		

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	106	0	25	0	39	467	301	375
Future Volume (vph)	106	0	25	0	39	467	301	375
Lane Group Flow (vph)	118	26	28	208	43	638	334	605
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.5	31.5	31.5	31.5	24.4	24.4	24.4	24.4
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	18.0	18.0	18.0	18.0	62.7	62.7	62.7	62.7
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.71	0.04	0.11	0.37	0.08	0.28	0.67	0.26
Control Delay	55.6	0.1	27.6	1.8	6.3	5.6	18.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	0.1	27.6	1.8	6.3	5.6	18.7	4.7
LOS	E	A	C	A	A	A	B	A
Approach Delay		45.5		4.9		5.7		9.7
Approach LOS		D		A		A		A
Queue Length 50th (m)	19.3	0.0	4.0	0.0	2.0	16.6	27.8	12.8
Queue Length 95th (m)	34.4	0.0	9.9	0.0	7.0	31.6	#92.1	25.7
Internal Link Dist (m)		161.9		264.6		227.2		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	279	786	442	727	515	2312	495	2292
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	0.42	0.03	0.06	0.29	0.08	0.28	0.67	0.26

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 74 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 70.9%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	570	65	41	279	347	260
Future Volume (vph)	570	65	41	279	347	260
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	633	72	46	310	386	289

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	705	356	675
Volume Left (vph)	633	46	0
Volume Right (vph)	72	0	289
Hadj (s)	0.15	0.06	-0.22
Departure Headway (s)	6.8	7.0	6.4
Degree Utilization, x	1.33	0.70	1.20
Capacity (veh/h)	542	501	569
Control Delay (s)	180.5	24.7	128.5
Approach Delay (s)	180.5	24.7	128.5
Approach LOS	F	C	F

Intersection Summary			
Delay	128.3		
Level of Service	F		
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	782	68	128	569
Future Volume (Veh/h)	38	71	782	68	128	569
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	869	76	142	632
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	1823	907			945	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1823	907			945	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	39	76			80	
cM capacity (veh/h)	68	334			726	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	121	945	142	632
Volume Left	42	0	142	0
Volume Right	79	76	0	0
cSH	142	1700	726	1700
Volume to Capacity	0.85	0.56	0.20	0.37
Queue Length 95th (m)	42.1	0.0	5.5	0.0
Control Delay (s)	100.9	0.0	11.2	0.0
Lane LOS	F		B	
Approach Delay (s)	100.9	0.0	2.0	
Approach LOS	F			

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	165	117	0	227	164
Future Volume (Veh/h)	0	165	117	0	227	164
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	183	130	0	252	182
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	816	130			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816	130			130	
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	80			83	
cM capacity (veh/h)	287	920			1455	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	183	130	252	182
Volume Left	0	0	252	0
Volume Right	183	0	0	0
cSH	920	1700	1455	1700
Volume to Capacity	0.20	0.08	0.17	0.11
Queue Length 95th (m)	5.6	0.0	4.8	0.0
Control Delay (s)	9.9	0.0	8.0	0.0
Lane LOS	A		A	
Approach Delay (s)	9.9	0.0	4.6	
Approach LOS	A			

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	37.4%	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)	34	0	4	7	0	37	6	515	11	63	295	47
Future Volume (Veh/h)	34	0	4	7	0	37	6	515	11	63	295	47
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	0	4	8	0	41	7	572	12	70	328	52
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	1127	1092	354	1090	1112	578	380			584		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1127	1092	354	1090	1112	578	380			584		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	100	99	96	100	92	99			93		
cM capacity (veh/h)	158	198	690	180	193	516	1178			991		

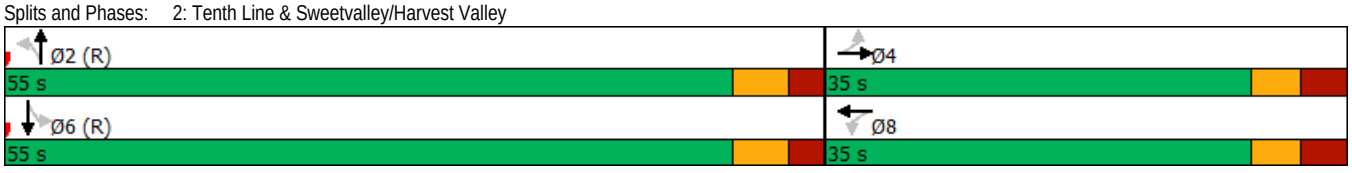
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	49	591	450
Volume Left	38	8	7	70
Volume Right	4	41	12	52
cSH	170	396	1178	991
Volume to Capacity	0.25	0.12	0.01	0.07
Queue Length 95th (m)	7.1	3.2	0.1	1.7
Control Delay (s)	33.0	15.4	0.2	2.1
Lane LOS	D	C	A	A
Approach Delay (s)	33.0	15.4	0.2	2.1
Approach LOS	D	C		

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	0	111	0	7	402	79	299
Future Volume (vph)	125	0	111	0	7	402	79	299
Lane Group Flow (vph)	139	28	123	334	8	476	88	383
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)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	34.5	34.5	34.5	34.5	29.2	29.2	29.2	29.2
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	23.3	23.3	23.3	23.3	57.4	57.4	57.4	57.4
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.64	0.64	0.64	0.64
v/c Ratio	0.98	0.04	0.36	0.49	0.01	0.22	0.16	0.18
Control Delay	102.7	0.1	28.4	3.8	8.4	8.0	9.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	0.1	28.4	3.8	8.4	8.0	9.4	7.3
LOS	F	A	C	A	A	A	A	A
Approach Delay		85.5		10.4		8.0		7.7
Approach LOS		F		B		A		A
Queue Length 50th (m)	23.3	0.0	17.0	0.0	0.5	16.6	5.8	12.2
Queue Length 95th (m)	#52.0	0.0	29.0	9.8	2.4	28.3	14.7	21.7
Internal Link Dist (m)		161.9		264.6		221.8		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	185	847	442	768	598	2148	538	2131
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	0.75	0.03	0.28	0.43	0.01	0.22	0.16	0.18

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	166	25	70	285	172	485
Future Volume (vph)	166	25	70	285	172	485
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	184	28	78	317	191	539

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	212	395	730
Volume Left (vph)	184	78	0
Volume Right (vph)	28	0	539
Hadj (s)	0.13	0.07	-0.41
Departure Headway (s)	6.7	5.7	4.9
Degree Utilization, x	0.40	0.63	0.99
Capacity (veh/h)	523	625	729
Control Delay (s)	14.1	17.9	52.1
Approach Delay (s)	14.1	17.9	52.1
Approach LOS	B	C	F

Intersection Summary			
Delay	35.9		
Level of Service	E		
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	106	434	16	30	600
Future Volume (Veh/h)	57	106	434	16	30	600
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	63	118	482	18	33	667
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	1224	491			500	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1224	491			500	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	80			97	
cM capacity (veh/h)	192	578			1064	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	181	500	33	667
Volume Left	63	0	33	0
Volume Right	118	18	0	0
cSH	340	1700	1064	1700
Volume to Capacity	0.53	0.29	0.03	0.39
Queue Length 95th (m)	22.6	0.0	0.7	0.0
Control Delay (s)	27.1	0.0	8.5	0.0
Lane LOS	D		A	
Approach Delay (s)	27.1	0.0	0.4	
Approach LOS	D			

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	205	144	0	96	69
Future Volume (Veh/h)	0	205	144	0	96	69
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	228	160	0	107	77
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	451	160			160	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	451	160			160	
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	74			92	
cM capacity (veh/h)	523	885			1419	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	228	160	107	77
Volume Left	0	0	107	0
Volume Right	228	0	0	0
cSH	885	1700	1419	1700
Volume to Capacity	0.26	0.09	0.08	0.05
Queue Length 95th (m)	7.8	0.0	1.9	0.0
Control Delay (s)	10.5	0.0	7.7	0.0
Lane LOS	B		A	
Approach Delay (s)	10.5	0.0	4.5	
Approach LOS	B			

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Projected 2029 AM
5: Tenth Line & Site Access #1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	0	5	12	0	73	2	323	4	24	409	19
Future Volume (Veh/h)	43	0	5	12	0	73	2	323	4	24	409	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	48	0	6	13	0	81	2	359	4	27	454	21
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	964	886	464	890	894	361	475			363		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	964	886	464	890	894	361	475			363		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	100	99	95	100	88	100			98		
cM capacity (veh/h)	203	277	598	256	274	684	1087			1196		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	54	94	365	502
Volume Left	48	13	2	27
Volume Right	6	81	4	21
cSH	219	555	1087	1196
Volume to Capacity	0.25	0.17	0.00	0.02
Queue Length 95th (m)	7.1	4.6	0.0	0.5
Control Delay (s)	26.7	12.8	0.1	0.7
Lane LOS	D	B	A	A
Approach Delay (s)	26.7	12.8	0.1	0.7
Approach LOS	D	B		

Intersection Summary					
Average Delay	3.0				
Intersection Capacity Utilization	Err%	ICU Level of Service		H	
Analysis Period (min)	15				

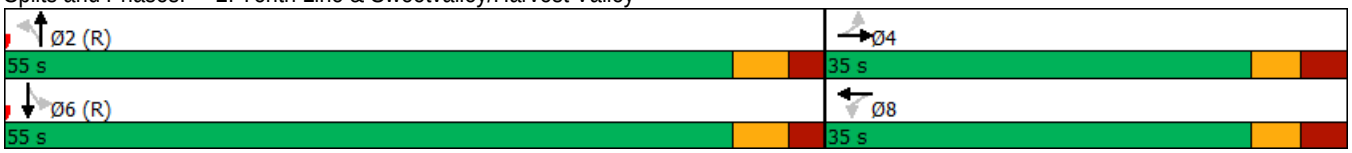
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	106	0	25	0	39	487	301	388
Future Volume (vph)	106	0	25	0	39	487	301	388
Lane Group Flow (vph)	118	26	28	208	43	660	334	619
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.5	31.5	31.5	31.5	24.4	24.4	24.4	24.4
Total Split (s)	35.0	35.0	35.0	35.0	55.0	55.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	38.9%	61.1%	61.1%	61.1%	61.1%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7
All-Red Time (s)	3.2	3.2	3.2	3.2	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Total Lost Time (s)	4.8	4.8	4.8	4.8	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	18.0	18.0	18.0	18.0	62.7	62.7	62.7	62.7
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.71	0.04	0.11	0.38	0.08	0.29	0.69	0.27
Control Delay	55.6	0.1	27.6	2.3	6.3	5.7	20.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	0.1	27.6	2.3	6.3	5.7	20.0	4.9
LOS	E	A	C	A	A	A	B	A
Approach Delay		45.5		5.3		5.8		10.2
Approach LOS		D		A		A		B
Queue Length 50th (m)	19.3	0.0	4.0	0.0	2.0	17.5	28.5	13.5
Queue Length 95th (m)	34.4	0.0	9.9	1.3	7.0	33.0	#94.1	26.9
Internal Link Dist (m)		161.9		264.6		218.0		328.9
Turn Bay Length (m)	15.0		15.0		40.0		40.0	
Base Capacity (vph)	279	778	442	716	506	2314	482	2292
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	0.42	0.03	0.06	0.29	0.08	0.29	0.69	0.27

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 71.5%	ICU Level of Service C
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Tenth Line & Sweetvalley/Harvest Valley



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	598	65	41	285	354	273
Future Volume (vph)	598	65	41	285	354	273
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	664	72	46	317	393	303

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	736	363	696
Volume Left (vph)	664	46	0
Volume Right (vph)	72	0	303
Hadj (s)	0.16	0.06	-0.23
Departure Headway (s)	6.8	7.0	6.4
Degree Utilization, x	1.39	0.71	1.24
Capacity (veh/h)	543	502	574
Control Delay (s)	206.5	25.5	143.9
Approach Delay (s)	206.5	25.5	143.9
Approach LOS	F	D	F

Intersection Summary			
Delay	145.6		
Level of Service	F		
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	71	815	68	128	589
Future Volume (Veh/h)	38	71	815	68	128	589
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	79	906	76	142	654
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	1882	944			982	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1882	944			982	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	33	75			80	
cM capacity (veh/h)	62	318			703	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	121	982	142	654
Volume Left	42	0	142	0
Volume Right	79	76	0	0
cSH	131	1700	703	1700
Volume to Capacity	0.92	0.58	0.20	0.38
Queue Length 95th (m)	46.6	0.0	5.7	0.0
Control Delay (s)	123.3	0.0	11.4	0.0
Lane LOS	F		B	
Approach Delay (s)	123.3	0.0	2.0	
Approach LOS	F			

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	165	123	0	227	172
Future Volume (Veh/h)	0	165	123	0	227	172
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	183	137	0	252	191
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	832	137			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	832	137			137	
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	80			83	
cM capacity (veh/h)	280	911			1447	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	183	137	252	191
Volume Left	0	0	252	0
Volume Right	183	0	0	0
cSH	911	1700	1447	1700
Volume to Capacity	0.20	0.08	0.17	0.11
Queue Length 95th (m)	5.7	0.0	4.8	0.0
Control Delay (s)	9.9	0.0	8.0	0.0
Lane LOS	A		A	
Approach Delay (s)	9.9	0.0	4.6	
Approach LOS	A			

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	40.9%	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)	34	0	4	7	0	37	6	580	11	63	332	47
Future Volume (Veh/h)	34	0	4	7	0	37	6	580	11	63	332	47
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	0	4	8	0	41	7	644	12	70	369	52
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	1240	1205	395	1203	1225	650	421			656		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1240	1205	395	1203	1225	650	421			656		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	100	99	95	100	91	99			92		
cM capacity (veh/h)	130	169	654	150	164	469	1138			931		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	49	663	491
Volume Left	38	8	7	70
Volume Right	4	41	12	52
cSH	141	348	1138	931
Volume to Capacity	0.30	0.14	0.01	0.08
Queue Length 95th (m)	8.9	3.7	0.1	1.8
Control Delay (s)	41.1	17.0	0.2	2.1
Lane LOS	E	C	A	A
Approach Delay (s)	41.1	17.0	0.2	2.1
Approach LOS	E	C		

Intersection Summary					
Average Delay	3.0				
Intersection Capacity Utilization	Err%	ICU Level of Service		H	
Analysis Period (min)	15				