CONSEIL DES ECOLES CATHOLIQUES DU CENTRE-EST

College Catholique Mer-Bleue
Transportation Impact Assessment

May 2023 – 22-5352

Certification

1. I have reviewed and have a sound understanding of the objectives, needs, and requirements of the City of Ottawa's Official Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the presentation of transportation impact assessment reports, including multimodal 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 or registered professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

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

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1.0 Screening

1.1 Description of Proposed Development

Municipal Address	6401 Renaud Rd, Ottawa, ON K1W 0H8
Description of Location	Collège Catholique Mer-Bleue is an existing high school offering a French Catholic education for pupils in Grade 7 to Grade 12. The school is located within the Orleans district.
Land Use Classification	I1A[2130] – Minor Institutional Zone: 1. permits a range of community uses, institutional accommodation and emergency service uses to locate in areas designated as General Urban Area or Central Area in the Official Plan; and 2. minimize the impact of these minor institutional uses located in close proximity to residential uses by ensuring that the such uses are of a scale and intensity that is compatible with neighbourhood character
Development Size	The CECCE is proposing to expand the school to provide an additional 13 classrooms, 2 science rooms and a technology room. In total, the school anticipates providing space for an additional 336 students.
Number of accesses and locations	The staff and student parking lot is accessed via Fern Casey Street with a bus loop providing access from Renaud Road, access modifications are not anticipated.
Phases of development	1
Build-out year	2024

1.2 Trip Generation Trigger

Land Use Type	Minimum Development Size	Yes	No
Single-family homes	40 units		X
Townhomes or apartments	90 units		X
Office	3,500 sq.m.		X
Industrial	5,000 sq.m.		X
Fast-food restaurant or coffee shop	100 sq.m.		X
Destination retail	1,000 sq.m.		X
Gas station or convenience market	75 sq.m.		X
Other	60 person trips or more during weekday peak hours	X	

1.3 Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		X

1.4 Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/h or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway 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)?		X
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

1.5 Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?		X

The development is anticipated to generate more than 60-person trips and therefore meets the Trip Generation Trigger and a traffic impact study is required. **Figure 1** illustrates the site location.

Figure 1: Site Location

Background image source: geoOttawa

2.0 Scoping

2.1 Existing and Planned Conditions

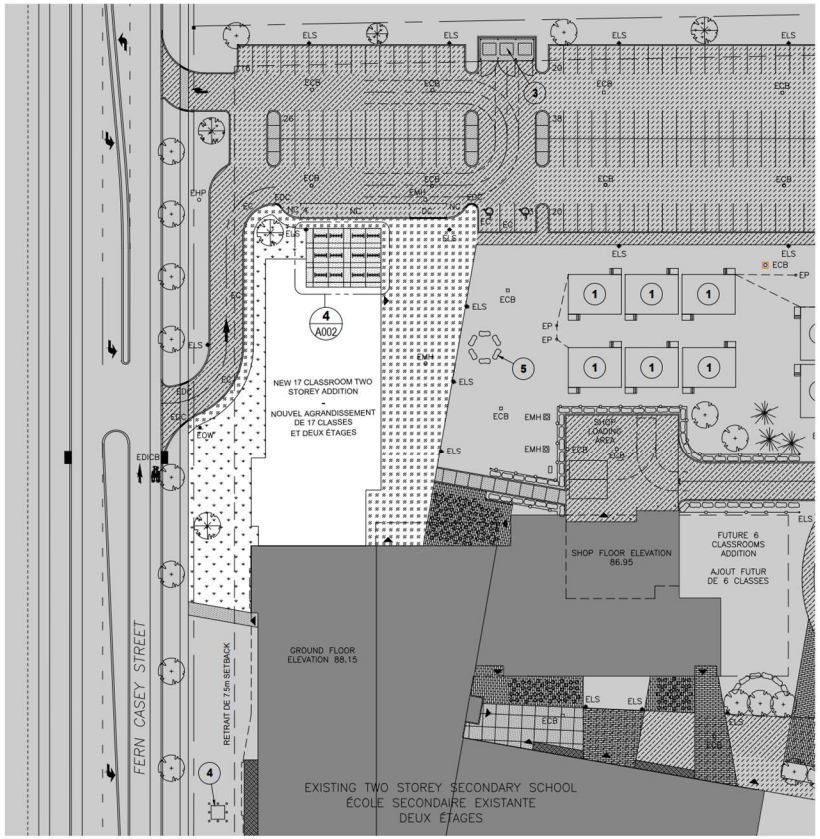
2.1.1 Proposed Development

Collège Catholique Mer-Bleue is an existing French Catholic high school that provides education for students in grades 7 to 12. The school currently accommodates 1200 students and 68 staff members.

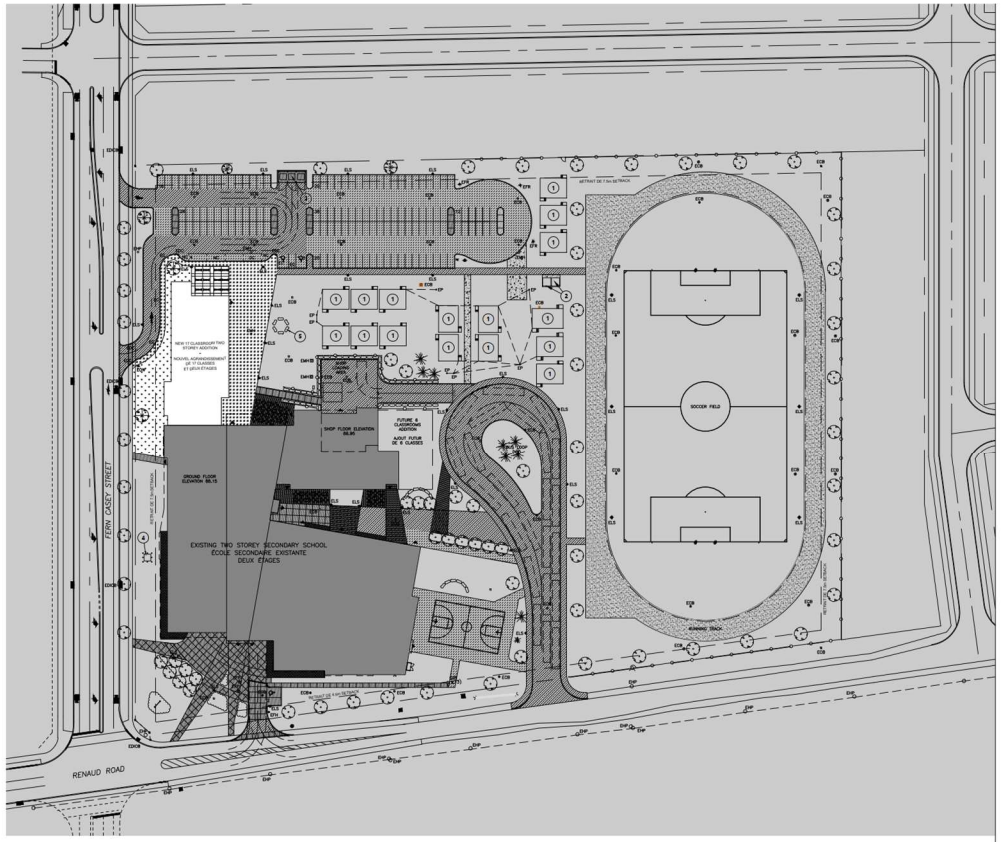
It operates from 8:00 AM to 2:15 PM each school day. The CECCE has plans to expand the school by adding 13 classrooms, 2 science labs, and a technology room. The expansion is anticipated to add 336 new students (expanding the student population by 28%) to the school, 13 teachers, and 4 administrative staff. The new students will be accommodated using seven (7) new buses and by two existing OC Transpo bus routes. The school's staff and student parking lot can be accessed from Fern Casey Street, and the school's bus loop can be accessed from Renaud Road. No changes to the school's current access driveways are anticipated.

The preliminary site plan is shown in **Figure 2**.

Figure 2: Site Plan



1 A001 SITE PLAN - ADDITION
1:500



2 A001 SITE PLAN - OVERALL
1:1000

The following intersections have been evaluated as part of this transportation analysis:

- Access Intersections:
  - Site Driveway and Fern Casey Street (unsignalized); and
  - Bus Loop and Renaud Road (unsignalized).
- Network Intersections:
  - Navan Road and Renaud Road (signalized);
  - Renaud Road and Fern Casey Street (unsignalized);
  - Renaud Road and Mer-Bleue Road (unsignalized); and
  - Brian Coburn Boulevard and Fern Casey Street (roundabout).

2.1.2 Existing Conditions

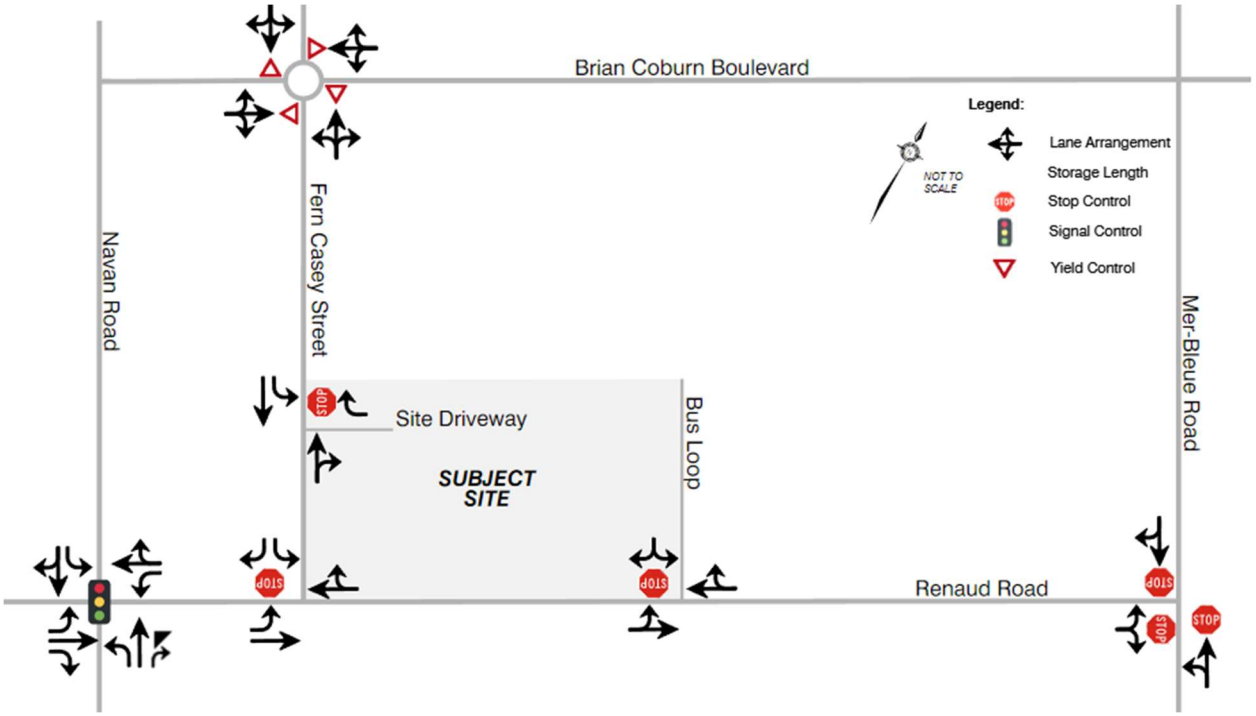
2.1.2.1 Roads and Traffic Control

The study area roadways are described as follows:

Study Area Roadway	Description
Fern Casey Street	Fern Casey Street is a two-lane municipally-owned Major Collector roadway located to the west of the development. Fern Casey Street runs north-south and connects Brian Coburn Boulevard to Renaud Road. Fern Casey Street has a posted speed limit of 60 km/h in the vicinity of the site.
Navan Road	Navan Road is a two-lane municipally-owned Arterial roadway located west of the development. Navan Road runs southeast from the Blackburn Hamlet Bypass to Trim Road. Navan Road has a posted speed limit of 60 km/h in the vicinity of the site.
Renaud Road	Renaud Road is a two-lane municipally-owned Collector roadway located on the south edge of the development. Renaud Road runs east from Anderson Road in the west to Mer-Bleue Road in the east. Renaud Road has a posted speed limit of 50 km/h in the vicinity of the site.
Mer-Bleue Road	Mer-Bleue Road is generally a four-lane, divided, municipally-owned Arterial roadway located approximately 900 metres east of the school. Mer-Bleue Road runs north from Navan Road in the south and turns into Jeanne D'Arc Boulevard at Innes Road to the north. Mer-Bleue Road has a posted speed limit of 60 km/h and a two-lane cross-section in the vicinity of the Renaud Road.
Brian Coburn Boulevard	Brian Coburn Boulevard is a two-lane municipally-owned Arterial roadway located north of the development. Brian Coburn Boulevard runs northeast from Navan Road in the west to Trim Road in the east. Brian Coburn Boulevard has a posted speed limit of 70 km/h in the vicinity of the site.

The existing lane geometry and traffic control for the study area intersections is shown in **Figure 3**.

Figure 3: Lane Geometry and Traffic Control



2.1.2.2 Walking and Cycling

Figure 4 illustrates the existing pedestrian and cycling facilities in the vicinity of the development, bounded by the study area intersections, as documented by geoOttawa. It should be noted that the geoOttawa database has not been updated, as sidewalks are now present along:

- Renaud Road (both sides) from Navan Road to approximately 260 metres east of Fern Casey Street;
- Fern Casey Street (both sides); and
- Mer-Bleue Road (both sides) to the north of Promenade Decoeur (335 metres north of Renaud Road) in the reconstructed four-lane portion of the roadway. To the south of Promenade Decoeur, the roadway has yet to be urbanized.

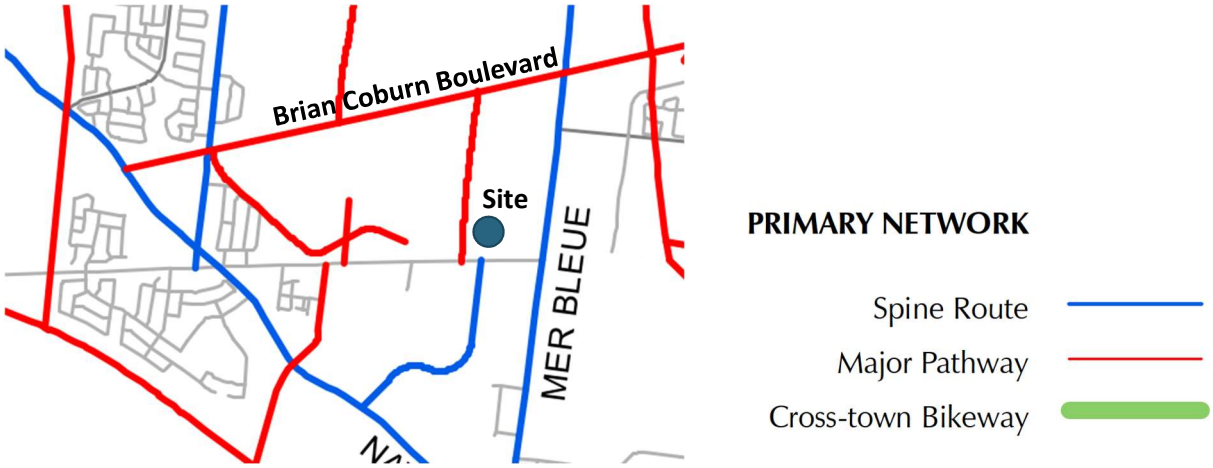
A Multi-Use Pathway is present along Brian Coburn Boulevard, which, along with Fern Casey Street is designated as a Major Pathway in the City's 2013 Transportation Master Plan (TMP). There is also a painted bike lane fronting the school on the east side of Fern Casey Street and on Renaud Road to the east of Fern Casey Street.

Mer-Bleue Road is designated as a Cycling Spine Route as illustrated in **Figure 5**, with on-street cycling lanes initiating approximately 335 metres north of Renaud Road. A paved shoulder is present on Navan Road for cyclists to utilize.

Figure 4: Existing Walking and Cycling Facilities

Source: geoOttawa, accessed January 16, 2023

Figure 5: City of Ottawa TMP Cycling Network



Source: City of Ottawa TMP (2013)

2.1.2.3 Transit

Figure 6 shows the existing transit service near the proposed development as depicted on OC Transpo.

Route 34 is a local route that operates at 30-minute headways along Navan Road and Renaud Road to the west of the development. Service is provided Monday to Friday from 5:44 AM to 10:27 PM, Saturday from 6:39 AM to 8:33 PM, and on Sunday from 7:36 AM to 7:24 PM.

Route 32 provides direct service to the school site and is a local route that operates at 30-minute headways connecting Navan Road to Mer-Bleue Road via Renaud Road, Fern Casey Street and Brian Coburn Boulevard. Service is provided Tuesday to Friday from 5:22 AM to 2:52 PM. No weekend service is provided within the study area portion of Route 32. A Park and Ride service is provided at the Chapel Hill Station.

Route 634 provides service from Place d'Orleans directly to the Collège Catholique Mer-Bleue, travelling one-way to the school, arriving at 7:38 AM, and departing the school 2:23 PM. These route times coincide with school arrival and departure times as this route primarily serves current students of the school. The route map is depicted in **Figure 7.**

Figure 6: Existing Transit Service

Source: OC Transpo, accessed January 12, 2023

Figure 7: OC Transpo Route 634

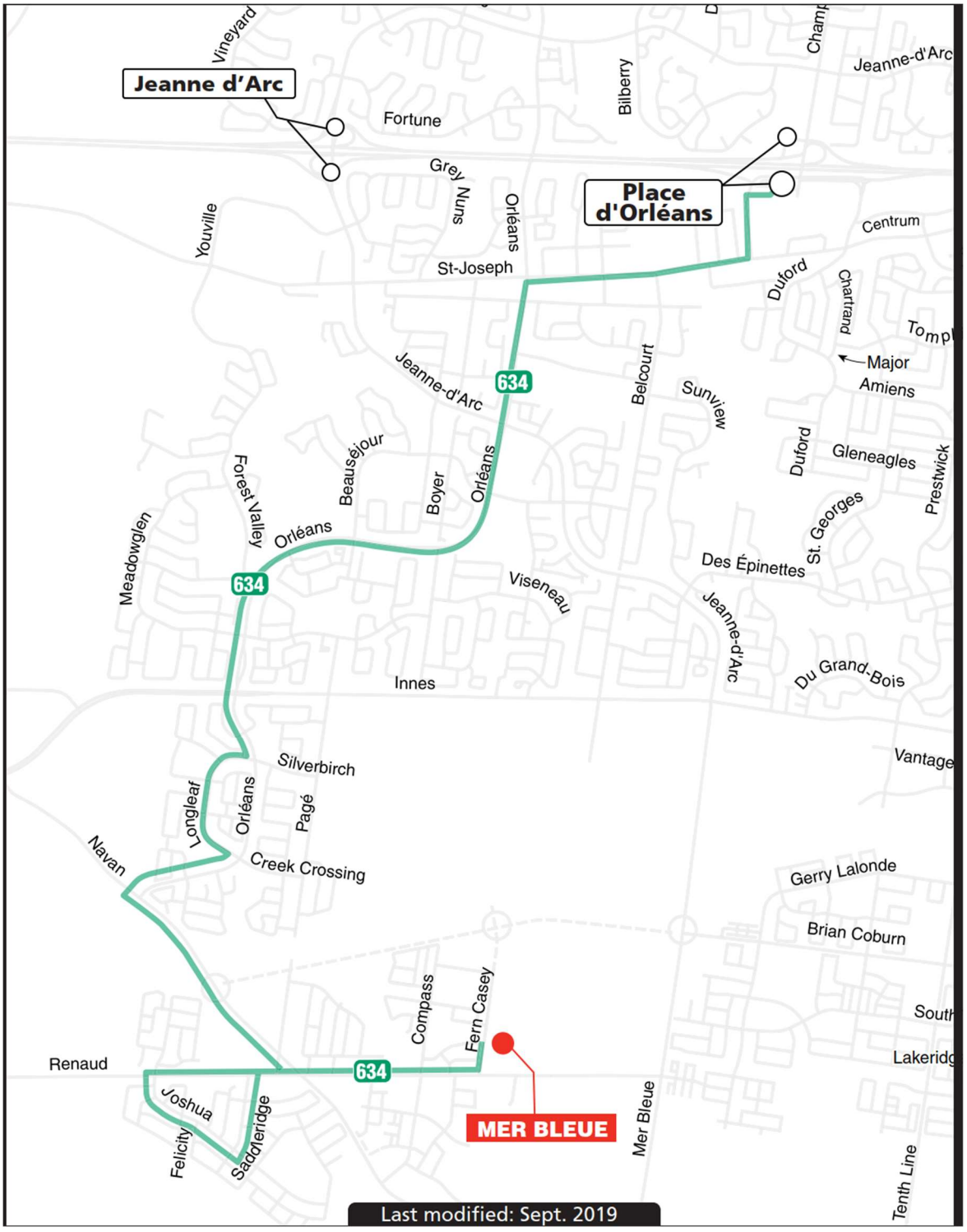
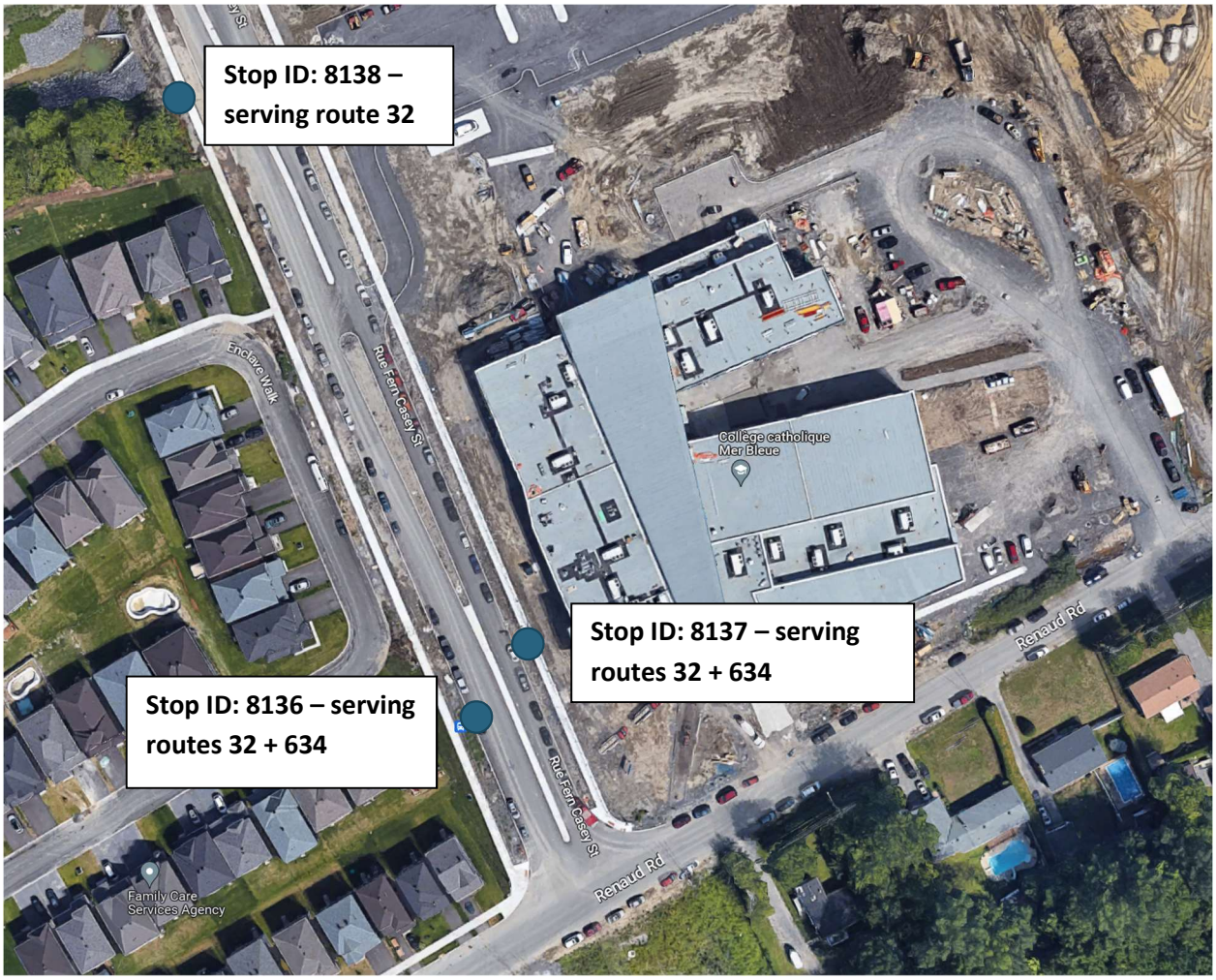


Image source: OC Transpo, accessed February 15, 2023

Bus stops 8136, 8137 and 8138 are provided on Fern Casey Street close to the school, as depicted in **Figure 8**.

Figure 8: OC Transpo Stop Locations



OC Transpo has provided boarding and alighting data for Route 634 and Route 32 at the two bus stops on Fern Casey Street that serve the school directly. This information, shown in **Table 1** and **Table 2**, indicates the number of passengers boarding and alighting during the school arrival period and afternoon school dismissal period. It is anticipated that the vast majority of these boardings and alighting's during these periods would be associated with student/staff at the school.

Table 1: Route 634 Boarding and Alighting Data

Stop	Location	Route	Dir	Ons	Offs	Ons	Offs
8136	FERN CASEY / RENAUD	634	NBND			24	2
8137	FERN CASEY / RENAUD	634	SBND	0	22		

Notes:
Stop 8136 is in use for the PM run, with an arrival time of 14h30
Stop 8137 is in use for the AM run, with an arrival time of 7h38
Stop 8137 is the last stop of the run
Data is daily average for the Fall booking period, Sept 4 - Dec 24 2022
Absence of data does not indicate zeros

Table 2: Route 32 Boarding and Alighting Data

Stop	Location	Route	Dir	Ons	Offs	Ons	Offs
8136	FERN CASEY / RENAUD	32	SBND			0	1
8137	FERN CASEY / RENAUD	32	NBND	3	0	22	0

Notes:
AM Data is weekday daily average total activity between 7h00-8h00.
PM Data is weekday daily average total activity between 14h00-15h00
Data is weekday daily average for the Fall booking period, Sept 4 - Dec 24 2022
Absence of data does not indicate zeros

Table 5, from the *Trans Trip Generation Manual Summary Report*, 2020, indicates that 28% of residential trips to/from the Orleans district, use transit during the AM peak hour, while 22% use transit during the PM peak hour. Note that these mode shares do not correspond to school mode shares, which are further detailed in **Section 3.1.1.1**.

2.1.2.4 Traffic Management Measures

Fern Casey Street features a raised median designed to regulate turning movements and create a perception of a narrower roadway among motorists, with the aim of decreasing traffic speed.

A school crossing sign is located at the intersection of Locust Ridge and Fern Casey Street. Two traffic calming signs that depict children, along with the words 'Slow Down for Us' are also present at this location.

2.1.2.5 Traffic Volumes

Existing traffic volume data is based on a combination of turning movement counts undertaken by the City of Ottawa. **Table 3** summarizes the traffic counts used for this study. **Appendix A** contains the traffic count data.

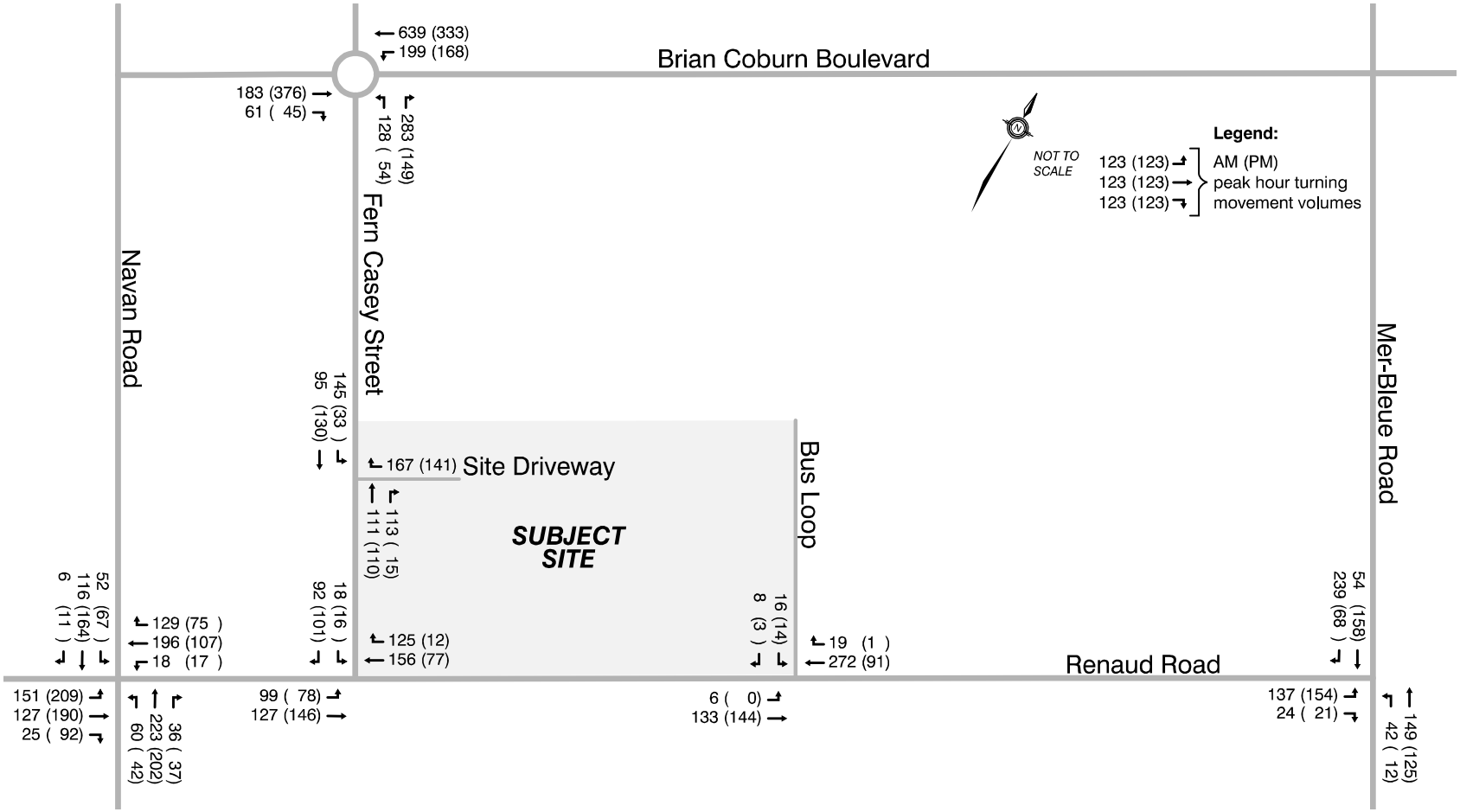
Table 3: Traffic Counts

Intersection	Date	Source
1. Navan Road and Renaud Road;	September 22, 2022 & October 19, 2021	City of Ottawa
2. Renaud Road and Fern Casey Street;	December 20, 2022	City of Ottawa
3. Renaud Road and Mer-Bleue Road	December 20, 2022	City of Ottawa
4. Brian Coburn Blvd and Fern Casey Street (roundabout);	January 11, 2023	City of Ottawa
5. Site Driveway and Fern Casey Street; and,	December 20, 2022	City of Ottawa
6. Bus Loop and Renaud Road.	December 20, 2022	City of Ottawa

As the site is an operating school, the time periods used within this study are the weekday AM commuter hour and the PM (2:30 PM to 3:30 PM) school peak hours, which align with the school bell times, and will govern the subsequent traffic capacity analysis. For the Renaud Road and Navan Road intersection, 3:00 PM to 4:00 PM traffic volumes were used as traffic data was not available for 2:30 PM to 3:30 PM.

Figure 9 illustrates the existing study area traffic volumes.

Figure 9: Existing (2023) Traffic Volumes



It is noted that traffic volumes were incomplete for the count at the intersection of Navan Road and Renaud Road on September 22, 2022 – traffic volumes from October 19, 2021 were used to account for the northbound vehicle volumes, which were not counted in September 2022. No other adjustments or balancing has been made to the vehicle volumes.

2.1.2.6 Collision History

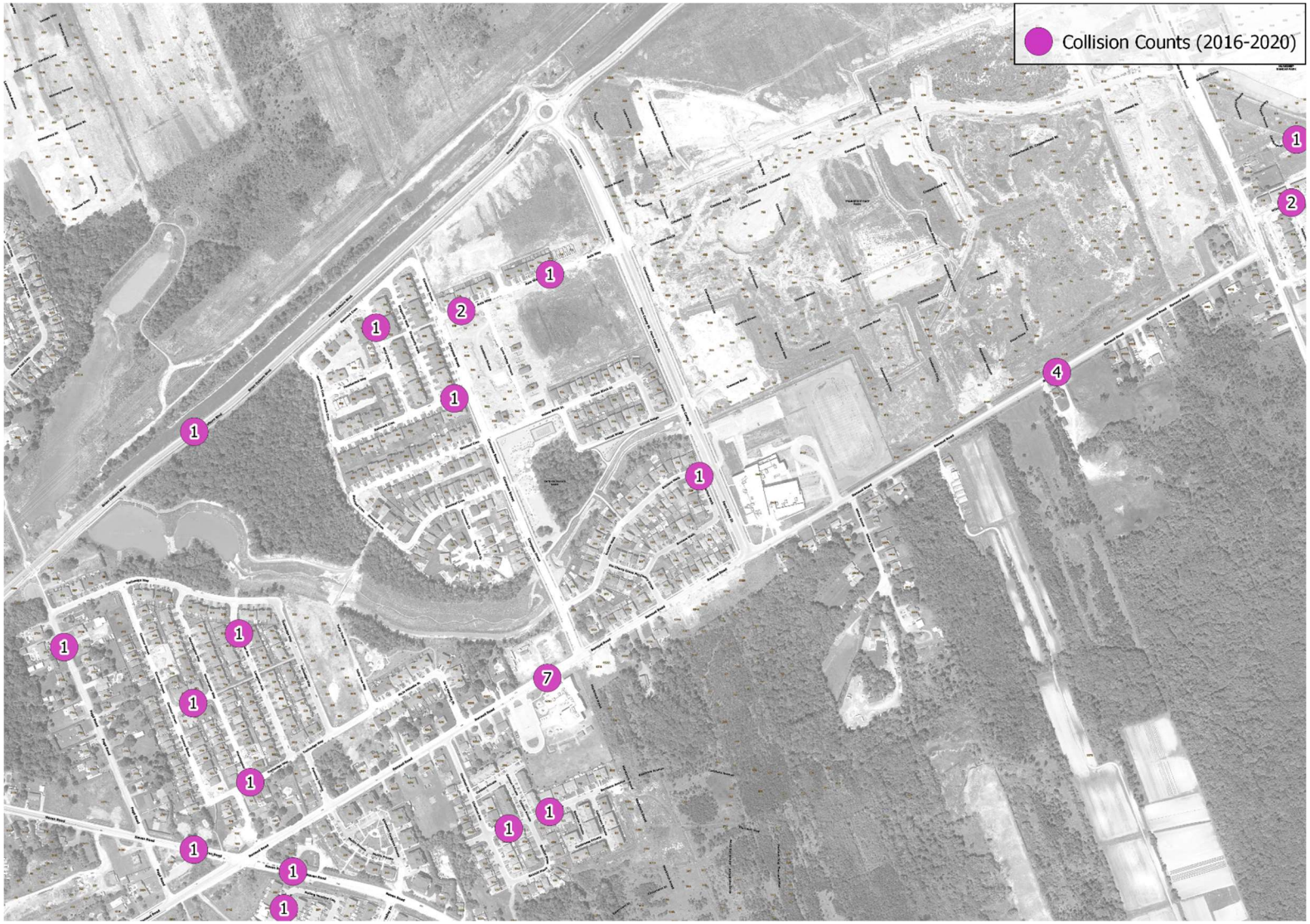
Figure 10 illustrates the location and number of collisions in the study area from 2016 to 2020 at the study area intersections. **Figure 11** illustrates the location and number of collisions in the study area from 2016 to 2020 at midblock locations.

There are generally between five and 30 collisions per year at major intersections. The majority of these collisions are rear-end collisions and most resulted in property damage only. The 2020 Ottawa Road Safety Report indicates that none of the study area intersections are within the top 10 intersection collision areas. The intersection (location) with the highest number of collisions within the study area is the signalized intersection of Navan Road and Renaud Road with 16 collisions recorded over the five-year period, equating to an average of 3.2 collisions per year.

Figure 10: Intersection Collisions (2015 to 2019)

Source: City of Ottawa Open Data Portal, accessed January 16, 2023.

Figure 11: Midblock Collisions (2015 to 2019)



Source: City of Ottawa Open Data Portal, accessed January 16, 2023.

2.1.3 Planned Conditions

2.1.3.1 Road and Transit Network Modifications

The City of Ottawa has completed the preliminary and detailed design of the extension of Brian Coburn Boulevard from Mer-Bleue Road southwest to Navan Road, and the widening of Mer-Bleue Road, from the previous widening limits at the Hydro One corridor (south of Innes Road) to Renaud Road.

- The Mer-Bleue Road work included construction of a 1 km section of the existing Mer-Bleue Road corridor from a two-lane rural cross-section to a four-lane urban arterial cross-section, complete with pedestrian facilities and dedicated cycle lanes, this work is generally complete at this time, however work stopped short approximately 330 metres north of Renaud Road;
- The Brian Coburn Boulevard design included the ultimate four-lane cross-section and the design and construction of the interim two-lane cross-section for the new 3.2km Brian Coburn Boulevard corridor, including on-road and off-road cycling facilities. Both roadways included construction of roundabouts at all intersections. Brian Coburn Boulevard has been constructed with a two-lane cross-section and roundabouts at most intersections; and
- The construction projects included a roundabout at the following intersections:
  - Mer-Bleue Road and Brian Coburn Boulevard; and
  - Brian Coburn Boulevard and Fern Casey Boulevard.

The 2013 Transportation Master Plan (TMP), 2031 Affordable Road Network identifies the following projects road widening projects:

- widen Brian Coburn Boulevard to four lanes between Navan Road and Mer-Bleue Road; and
- widen Mer-Bleue Road from two to four lanes between Brian Coburn Boulevard and Renaud Road (beyond horizon year).

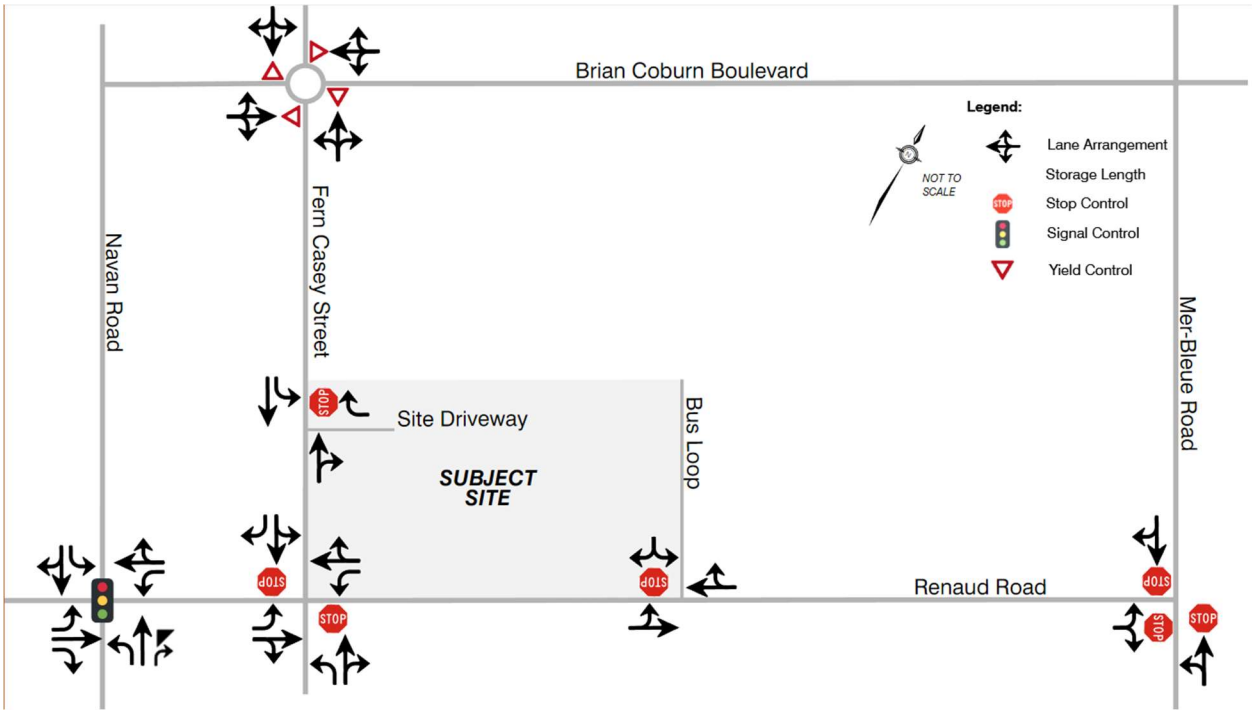
The 2013 TMP, 2031 Network Concept indicates that Mer Bleue Road is to be realigned slightly to the west of its current alignment between Renaud Road and Navan Road. No other road network modifications are anticipated in the study area.

The City has indicated that the intersection of Renaud Road and Mer-Bleue Road, as well as the intersection of Fern Casey Street and Renaud Road, will be signalized at some point in the future, with these traffic signals funded through development charges (DC funds). However, it is understood that these signals will likely be installed beyond the horizon year of this analysis (2029).

Fern Casey Street is planned to be extended south, at the intersection of Renaud Road, to ultimately connect to Navan Road as part of the Ashcroft Eastboro DevelopmentAs a result, the Fern Casey Street and Renaud Road intersection will ultimately be a four-legged intersection. Given a traffic signal is ultimately planned at this intersection, it has been assumed that exclusive left-turn lanes will be introduced on all four legs of this intersection.

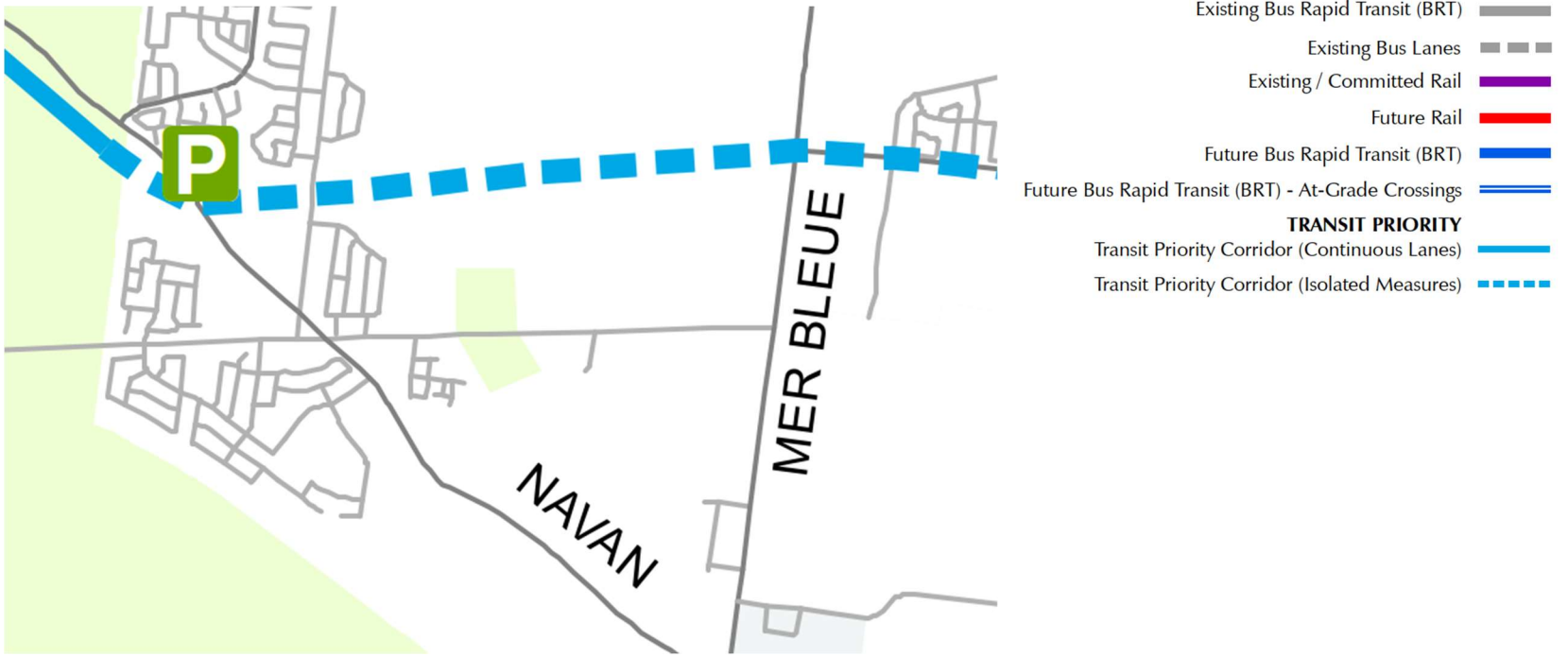
The lane geometry and traffic control for the future study area intersections, as analyzed in this TIA, is shown in **Figure 12**.

Figure 12: Future Lane Geometry and Traffic Control



The City's TMP includes the implementation of isolated Transit Priority Corridor measures along Brian Coburn Boulevard, based on the 2031 Affordable Transit Network. **Figure 13** shows the 2031 planned affordable transit network.

Figure 13: Planned Transit Network

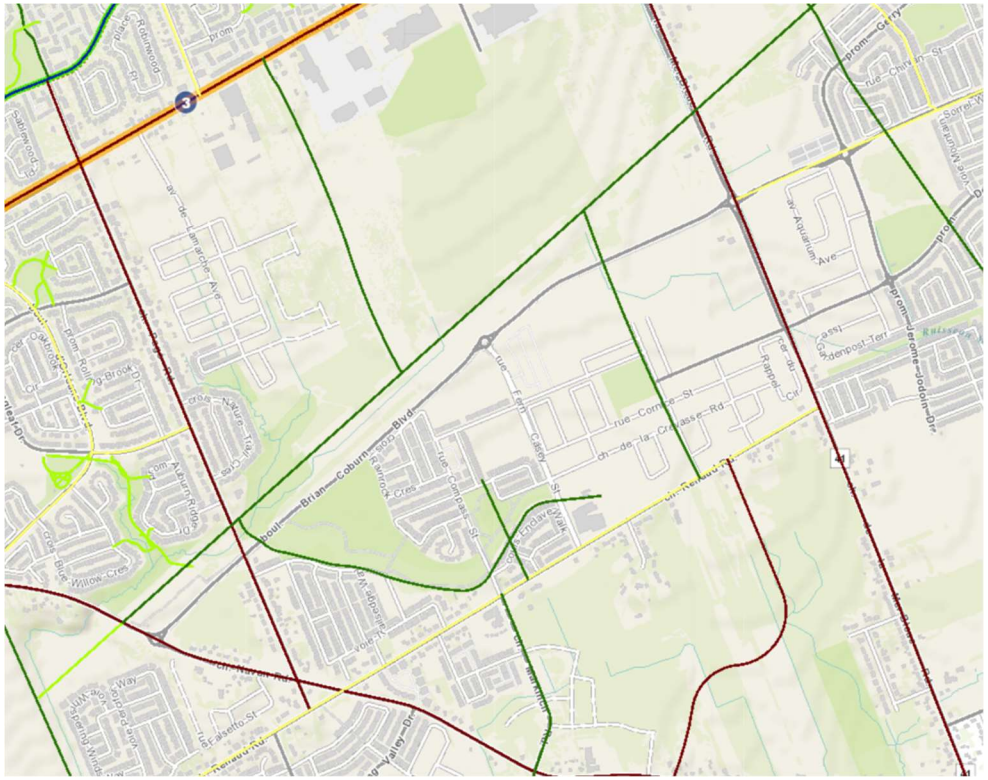


Source: City of Ottawa 2013 TMP, 2031 Affordable Transit Network

2.1.3.2 Walking and Cycling

The pedestrian and cycling plans of the TMP do not indicate improvements within the study area; however, it is expected that facilities would be added to Brian Coburn Boulevard, Renaud Road, and Mer-Bleue Road in conjunction with widening and urbanization of the corridors. **Figure 14** illustrates the planned walking and cycling facilities, as shown on geoOttawa.

Figure 14: Planned Walking and Cycling Facilities

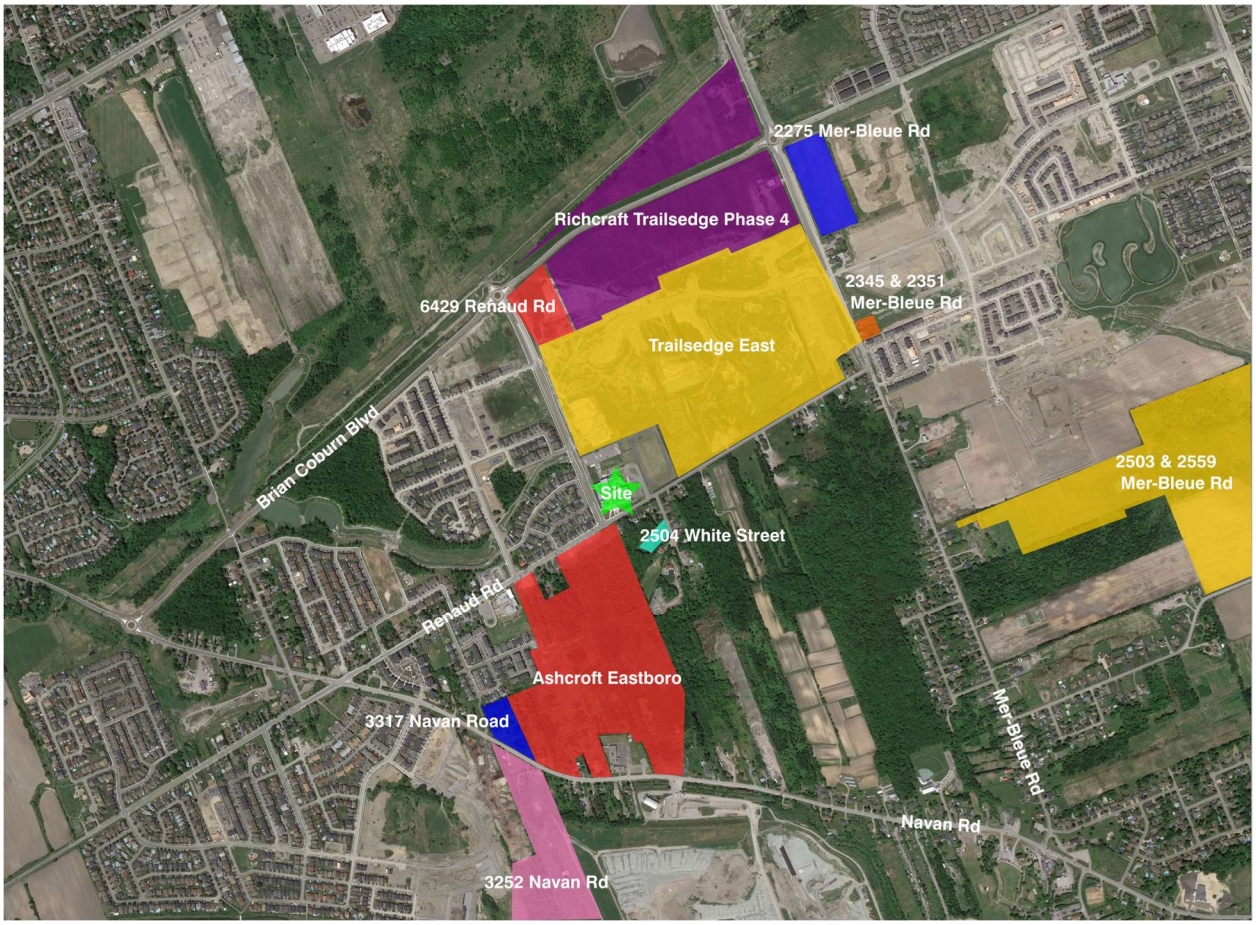


Source: geoOttawa, accessed January 12, 2023.

2.1.3.3 Future Background Developments

The City of Ottawa's development applications search tool was used to identify other developments within the study area that could impact study area intersections. Staff at the City of Ottawa also provided additional information on some of these developments that are either planned or are in the midst of being constructed. **Figure 15** illustrates the background developments that are in proximity to the school, as indicated within the City of Ottawa Online Development Applications website.

Figure 15: Background Developments



The following background developments, depicted in **Figure 15**, were considered in this TIA:

- 6429 Renaud Road (Blocks 193 and 194) – 2024 (Status – pipes being installed); and
- 186 residential dwellings:
  - 90 townhome units; and
  - 96 mid-rise terrace dwellings.
- Richcraft Trailsedge Phase 4 – 2031 (Status – no obvious construction activity);
- 142 single-family homes, 167 townhouses, 116 back-to-back townhouses;
- Commercial area (181 jobs);

- Mixed-use composed of 352 apartment units and 296 commercial/office jobs;
- 2275 Mer-Bleue Road – 2024 (Status – No activity);
- 32 back-to-back townhouses;
- 80 standard townhouses;
- 0.75-hectare mid-rise mixed-use development block;
- 2345 & 2351 Mer-Bleue Road – (construction year unknown) (Status – no activity, existing houses appear to still be in use on the subject lands);
- Two buildings with 15 dwelling units each (3-storeys);
- No TIS available;
- 2503 & 2559 Mer-Bleue Road & 2666 Tenth Line Road – 2025 (Status – signs of near future activity, some earth works has occurred);
- 274 single family homes;
- 370 townhome units;
- 2,100 m2 shopping centre;
- 2504 White Street – (construction year unknown) (Status – no activity);
- Two 2-storey townhouse dwellings (8 units);
- Two 2.5-storey stacked townhouse dwellings (16 units);
- No TIS available – assumed build-out beyond the study horizon year (2029);
- 3252 Navan Road (Spring Valley Trails Phases 5 & 6) – 2023 (Status – not initiated);
- 11 single family homes;
- 262 townhome units;
- 48 units condominiums;
- 3317 Navan Road – file pending;
- Residential dwellings – assumed build-out beyond the study horizon year (2029);
- Ashcroft Eastboro Development (including 3323 Navan Road) – 2026;
- 852 residential units;
- Trailsedge East Residential Development - Phases 2 & 3 – 2029 (Status – just initiated framing);
- 163 single family homes;
- 372 townhome units; and
- 60 back-to-back townhouse units.

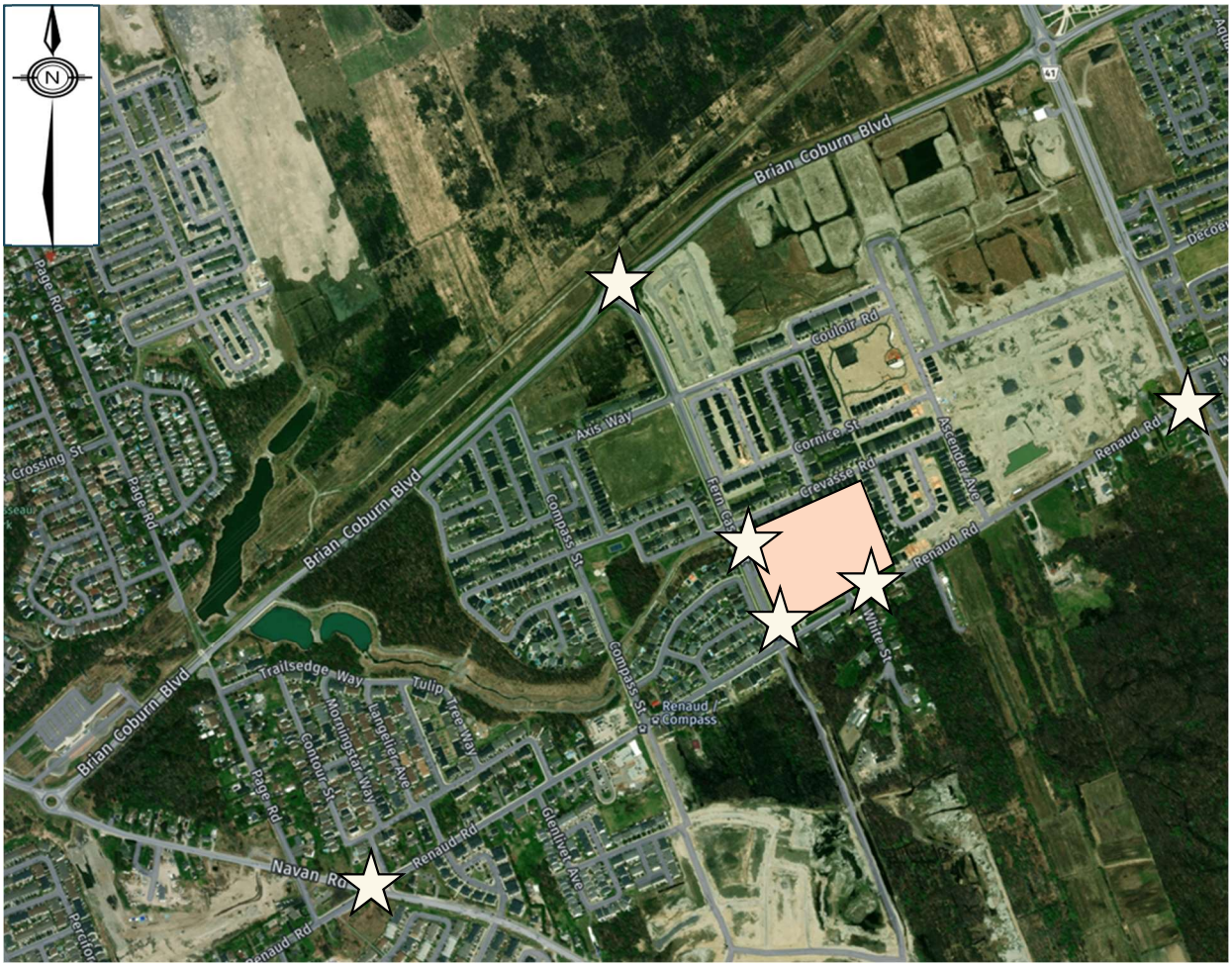
It is noted that in order to represent the most conservative approach, all background developments, to be developed within the horizon year, have been assumed to be in place by 2024.

2.2 Study Parameters

2.2.1 Study Area

Figure 16 illustrates the proposed study area and study area intersections. The current school parcel is shown in light pink. The white stars denote intersections and site accesses that were included within the subsequent analysis.

Figure 16: Study Area and Study Area Intersections



Background image source: HERE Wego, accessed January 12, 2023.

2.2.2 Time Periods

The site is an operating school, therefore the time periods used within this study are the weekday AM commuter hour and the PM (2:30 PM to 3:30 PM) school peak hours, which align with the school bell times, and will govern the traffic capacity analysis. It is noted that traffic volumes for the intersection of Renaud Road and Navan Road were used from 3:00 PM to 4:00 PM, as traffic data was not available for 2:30 PM to 3:30 PM.

2.2.3 Horizon Years

The school expansion is estimated to be complete by 2024. The analysis will assess transportation impacts for the 2024 horizon year, and the 2029 horizon year (+5 years after build-out).

2.3 Exemptions Review

Table 4 presents the exemptions review table from the City of Ottawa's 2017 Transportation Impact Assessment Guidelines. The exemptions were rationalized as follows:

Table 4: Exemptions Review

Module	Element	Exemption Consideration	Status
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans Exempt as no access changes are proposed to transportation elements	Exempt
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans Parking supply is not expected to be 15% below unconstrained demand	Included
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Included
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on Local or Collector streets for access and total volumes exceed ATM capacity thresholds Total volume is not expected to exceed ATM capacity thresholds; further information is provided in **Section 4.6**.	Exempt
4.8 Network Concept		Only required when proposed development generates more than 200 person trips during the peak hour in excess of the equivalent volume permitted by established zoning Not expected to exceed established zoning.	Exempt

3.0 Forecasting

3.1 Development-Generated Travel Demand

Traffic volumes within the study area will consist of trips generated by staff and students at the proposed school expansion, and trips generated by background developments.

3.1.1 Trip Generation and Mode Shares

Peak hour person trips were determined using the appropriate land-use code from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th edition. In accordance with City of Ottawa TIA Guidelines, a 1.28 factor was applied to the vehicle trips, in order to determine person trips for the land use. The TRANS *Trip Generation Manual Summary Report (2020)* was used to determine mode shares, as it is the recommended source as per the City's TIA Guidelines (2017) with established high school mode shares specific to the City of Ottawa. Applicable tables used from the *Trans Trip Generation Manual* can be found in **Appendix B**.

3.1.1.1 Trip Rates

Mode shares for the school trips were determined using Table 10 from the TRANS *Trip Generation Manual Summary Report*. **Table 5** summarizes the person trip generation rates used for the school, and the resulting peak hour person trips.

Table 5: Peak Hour Trips

Land Use Code/Land Use	Source	New Students	ITE Trip-Rate (Peak Hour)		Peak Hour Person Trips	
			AM	PM	AM	PM
525: High School	ITE	336	0.51	0.32	219	138

The AM and PM peak hour person trips were multiplied by the appropriate mode share and directional splits to determine total site generated high school trips during the AM and PM peak hours to/from the site, as shown in **Table 6**.

Table 6: Peak Hour Trips

LUC 525 – High School	Mode Share		Peak Hour Trips		Directional Split		AM Peak Hour			PM Peak Hour		
	AM	PM	AM	PM	AM IN %	PM IN %	Total	In	Out	Total	In	Out
Auto Passenger	17%	17%	38	10	68%	48%	37	25	12	23	7	16
School Bus	19%	19%	42	11			41	28	13	26	8	18
Transit	38%	38%	85	23			84	57	27	53	17	36
Walking	18%	18%	40	11			40	27	13	25	8	17
Biking	3%	3%	7	2			6	4	2	4	1	3
Other	5%	5%	11	3			11	7	4	7	2	5
Total	**100%**	**100%**	**224**	**60**	**Total Trips**		**219**	**148**	**71**	**138**	**43**	**95**

Total site generated vehicle trips presented in **Table 7**. It is anticipated that up to seven (7) new school buses will be provided to accommodate the new students. These buses can be accomodated in the bus loop, as shown in Figure 2. Each school bus has the capacity to accommodate 48 students. It is noted that the mode shares indicated in the TRANS *Trip Generation Manual Summary Report* may overestimate the number of transit riders in this specific case. Many of these trips are likely to occur by school bus. Some new students are also anticipated to arrive using City transit due to the presence of OC Transpo's two transit routes, although no new transit buses are anticipated to be added at this time.

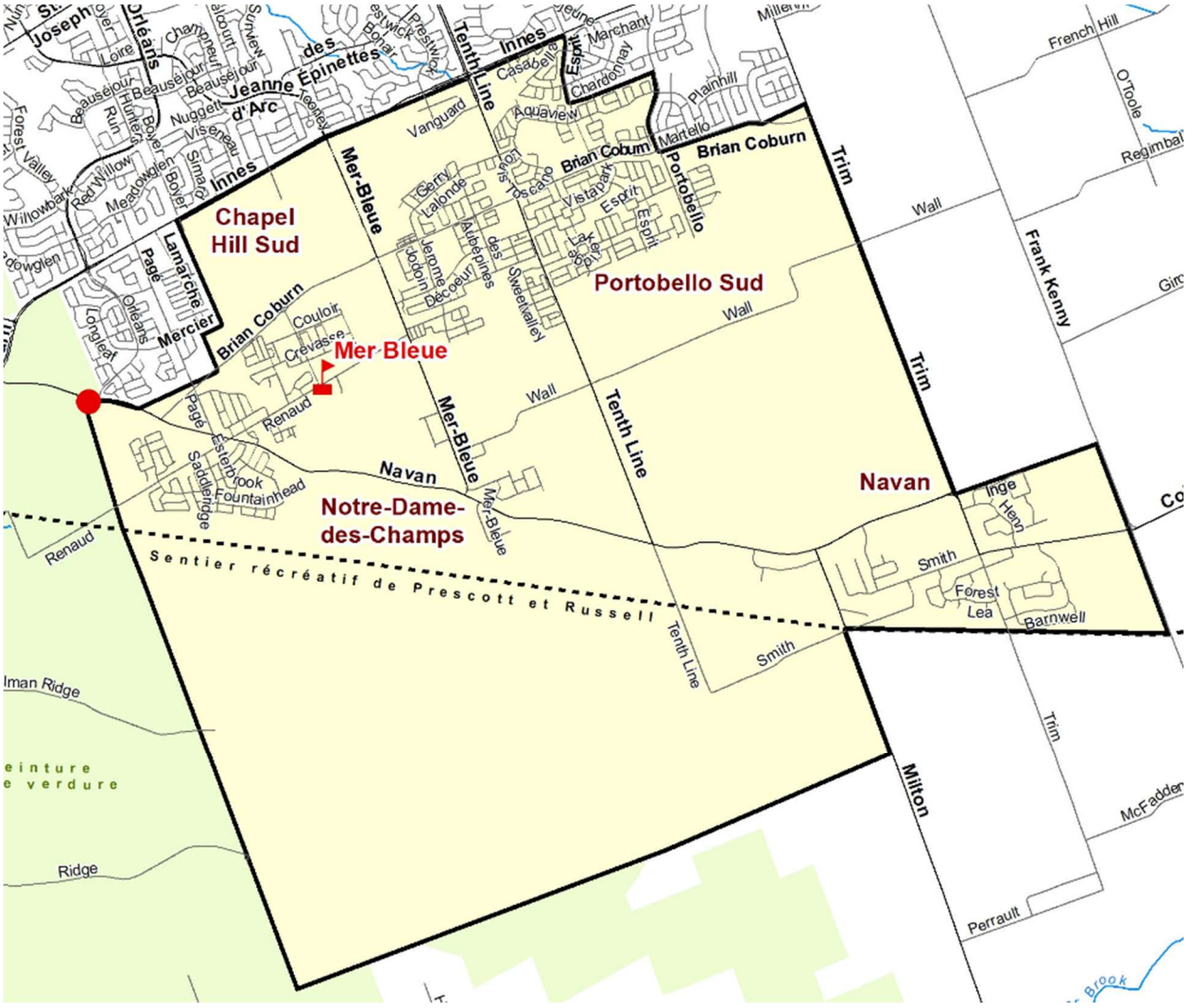
Table 7: Total Site Generated Vehicle Trips

	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Auto trips	25	12	7	16
School bus trips	7	7	7	7
TOTAL	**32**	**19**	**14**	**23**

3.1.2 Trip Distribution

Collège Catholique Mer-Bleue services a broad geographic area, **Figure 17** illustrates the school's catchment area.

Figure 17: School Catchment Area



Based on the catchment area, and surrounding residential land uses, as well as consistency with TIAs from neighbouring developments, **Table 8** summarizes the cardinal trip direction and network assignment applied to the site generated passenger car trips. Note that inbound trips and outbound trips are distributed differently as the site driveway does not permit a left turn movement out of the site.

Table 8: Passenger Cars: Cardinal Trip Direction and Network Distribution

Cardinal Direction	Distribution	Direct Assignment	Percent of Cardinal Distribution
North	10%	OUT/IN: N on Fern Casey, W on Brian Coburn, N on Navan	50%
		OUT/IN: N on Fern Casey, E on Brian Coburn, N on Mer-Bleue	50%

Cardinal Direction	Distribution	Direct Assignment	Percent of Cardinal Distribution
East	50%	OUT: N on Fern Casey, E on Brian Coburn	60% out
		OUT: N on Fern Casey, E on Brian Coburn, S on Mer-Bleue (toward Navan)	40% out
		IN: W on Brian Coburn, S on Fern Casey	60% in
		IN: N on Mer-Bleue (from Navan), W on Renaud, N on Fern Casey	40% in
South	25%	OUT: N on Fern Casey, E on Brian Coburn, S on Mer-Bleue	60% out
		OUT: N on Fern Casey, W on Brian Coburn, S on Navan	40% out
		IN: N on Mer-Bleue, W on Renaud, N on Fern Casey	60% in
		IN: N on Navan, E on Renaud, N on Fern Casey	40% in
West	15%	OUT: N on Fern Casey, W on Brian Coburn, S on Navan, W on Renaud	100% out
		IN: E on Renaud, N on Fern Casey	100% in
Total	**100%**	-	

Table 9 summarizes the cardinal trip direction and network assignment applied to the new school bus trips.

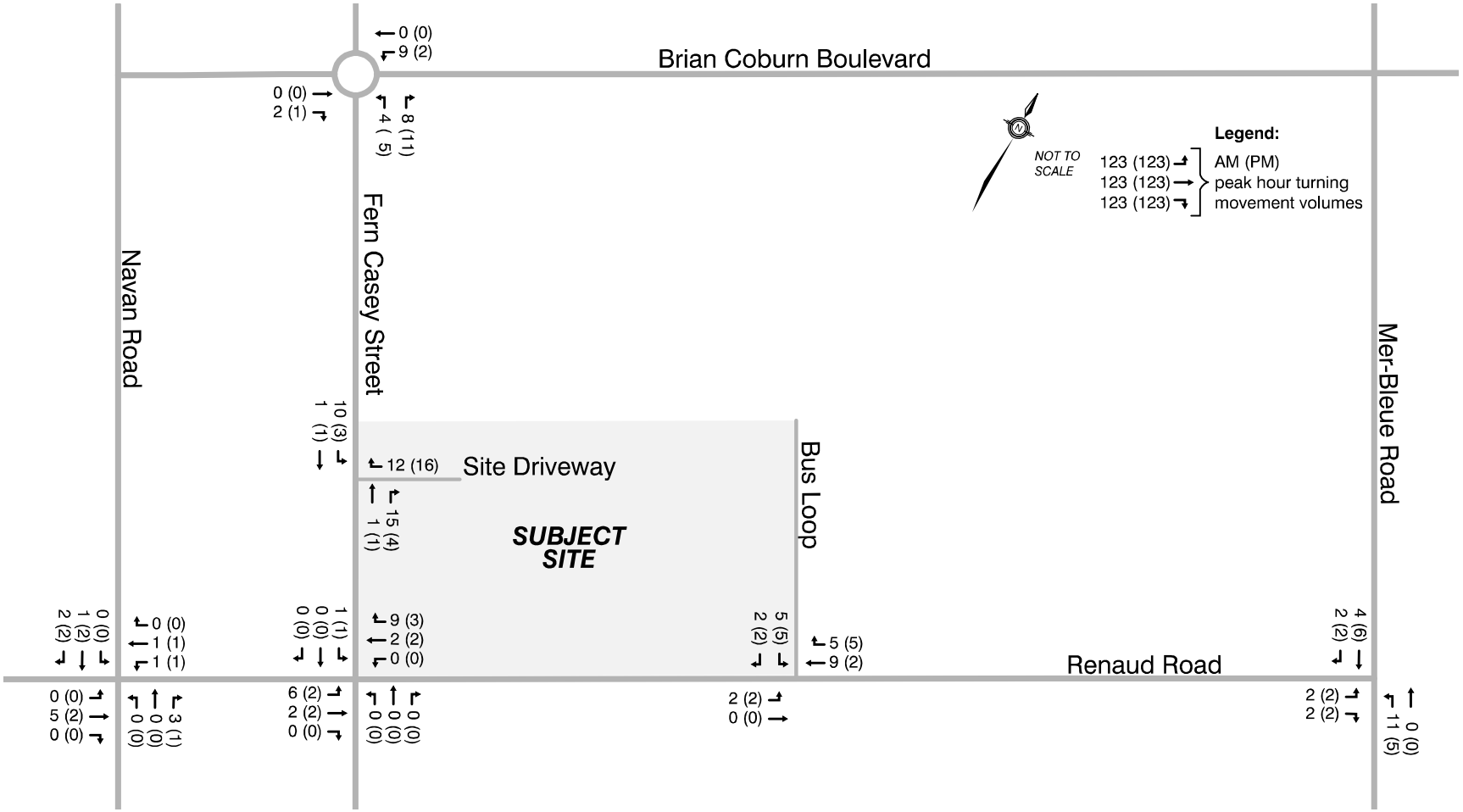
Table 9: Bus Trips: Cardinal Trip Direction and Network Distribution

Cardinal Direction	Distribution	Direct Assignment	Percent of Cardinal Distribution
North	10%	OUT/IN: W on Renaud, N on Navan	50%
		OUT/IN: E on Renaud, N on Mer-Bleue	50%
East	50%	OUT/IN: E on Renaud, N on Mer-Bleue	60%
		OUT/IN: E on Renaud, S on Mer-Bleue	40%
South	25%	OUT/IN: E on Renaud, S on Mer-Bleue	60%
		OUT/IN: W on Renaud, S on Navan	40%
West	15%	OUT/IN: W on Renaud	100%
Total	**100%**	-	

3.1.3 Trip Assignment

Trips were assigned to the road network connecting the site with the arterial network using the distribution presented above. **Figure 18** illustrates assignment of the site generated traffic volumes, noting that the buses were all assigned to the Bus Loop entrance off Renaud Road while all passenger vehicles were assigned to the site driveway off Fern Casey Street.

Figure 18: Site Generated Traffic Volumes



3.2 Background Network Travel Demand

3.2.1 Transportation Network Plans

Fern Casey Street is planned to be extended south, at the intersection of Renaud Road, to ultimately connect to Navan Road as part of the Ashcroft Eastboro DevelopmentThis future modification has been included in the road network plans for the TIA analysis. Other road and network modifications, detailed in Section 2.1.3.1, are not anticipated to occur prior to the horizon year for the study (2029). Therefore, no other network modifications have been included that will directly impact the study area road network.

3.2.2 Background Growth

Background growth refers to traffic generated by population and employment growth in parts of the City beyond the study area and adjacent neighbourhoods.

A compound annual background growth rate of 0.5% was assumed, to be consistent with the surrounding developments. Given the high-rate of new developments in the school vicinity, it is assumed that the included background developments are already accounting for a significant portion of the area's background traffic growth. The background growth rate was applied to the existing traffic volumes within the two horizon years.

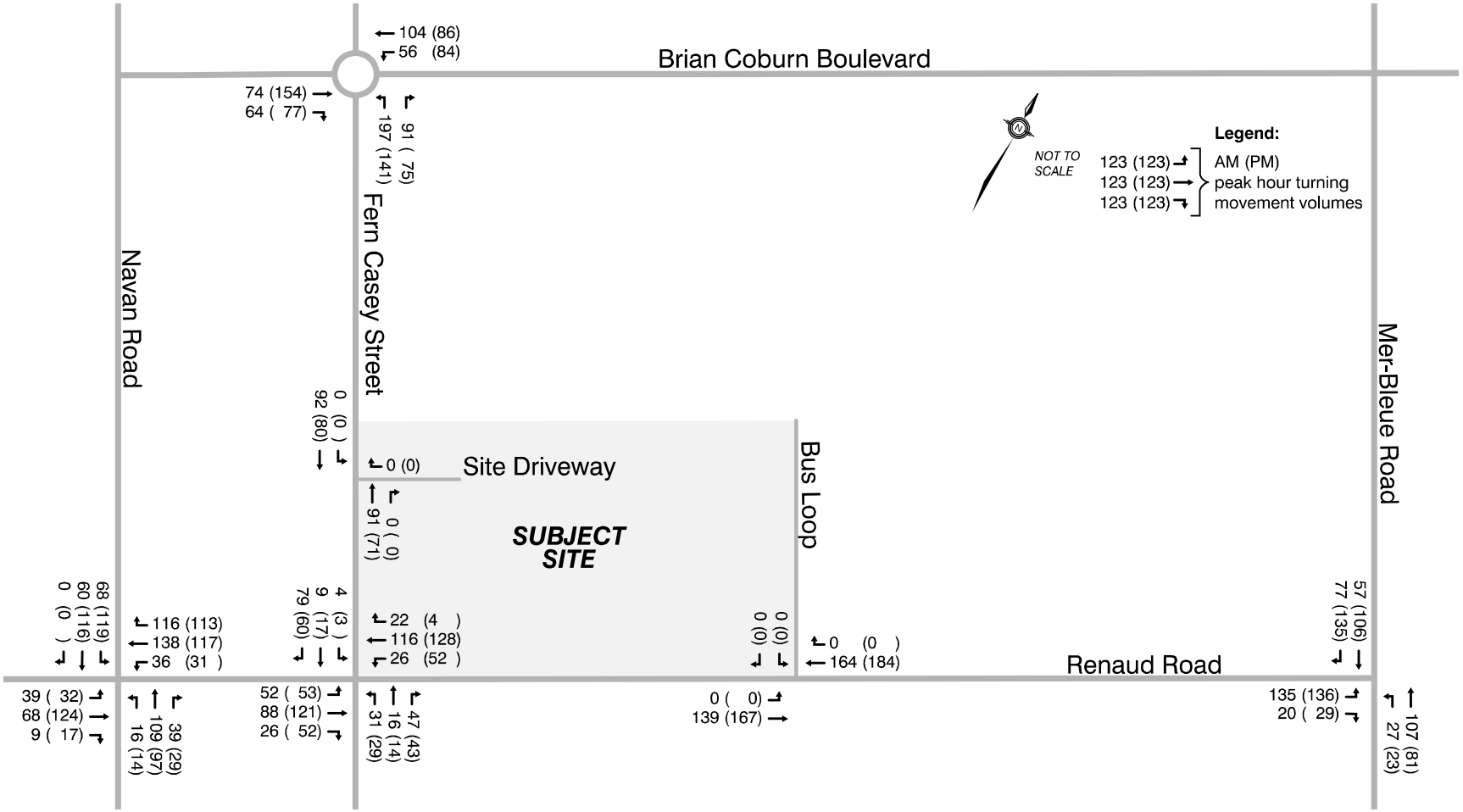
3.2.3 Background Developments

Traffic from background developments refers to traffic generated by developments close to the proposed site which may have an impact on study area intersections. When developments are in close proximity to the proposed site, cumulative impacts to area traffic volumes can be estimated. The included background developments are listed in **Section 2.1.3.3**.

A conservative, first-principles approach was taken in order to estimate background traffic volumes from developments, where a TIA was not available. The distribution of the background development trips was performed using information from their respective TIAs.

Figure 19 illustrates the specific development background vehicle trip volumes only, it does not include the existing traffic volume or future general background growth.

Figure 19: Background Development Traffic Volumes



3.2.4 Background Traffic Volumes

Figure 20 illustrates the 2024 background traffic volumes including existing, background growth and other specific development demands. **Figure 21** illustrates the 2029 background traffic volumes. Site generated traffic volumes are added to the background traffic volumes to estimate total future traffic volumes in **Section 3.4.**

Figure 20: 2024 Future Background Traffic Volumes

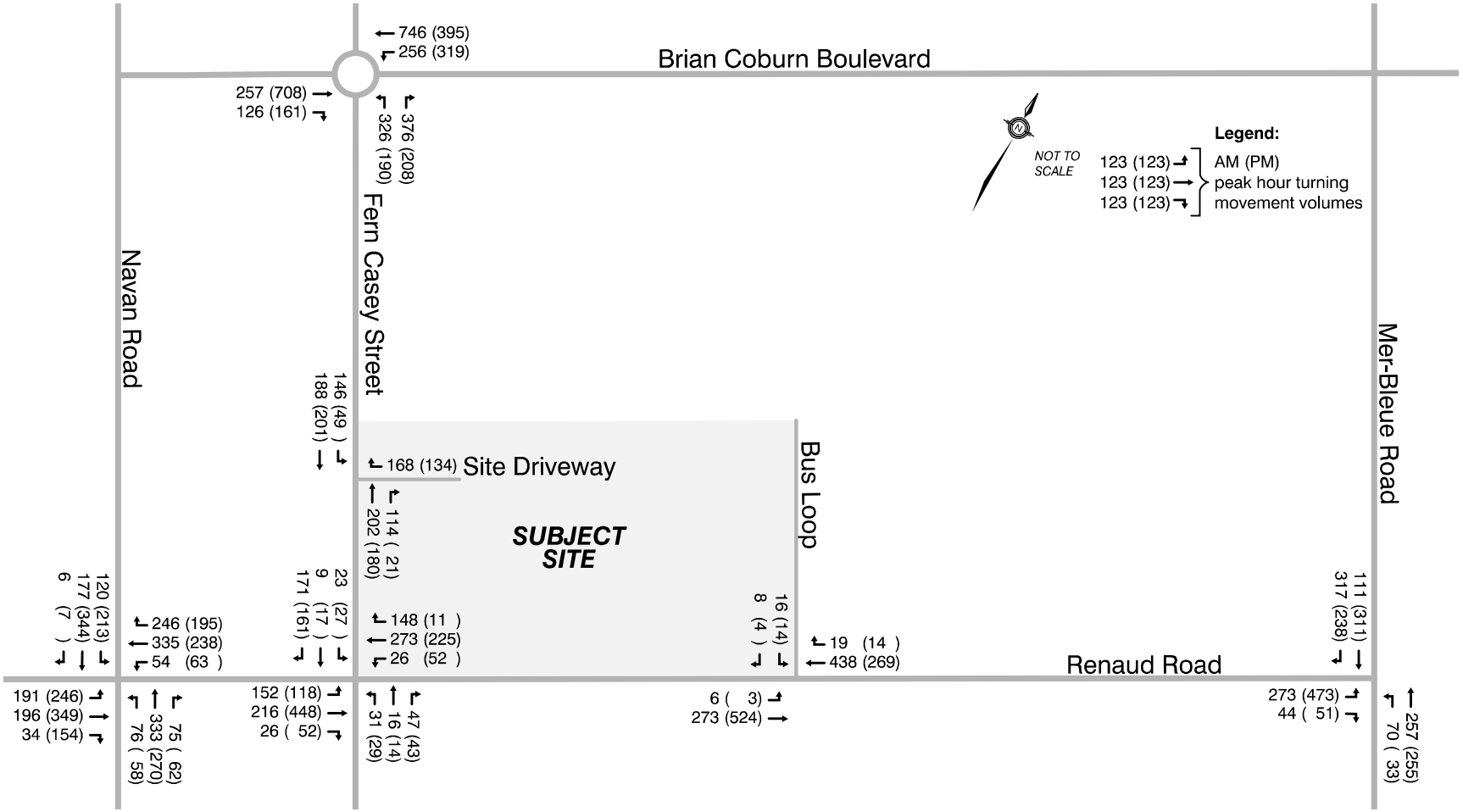
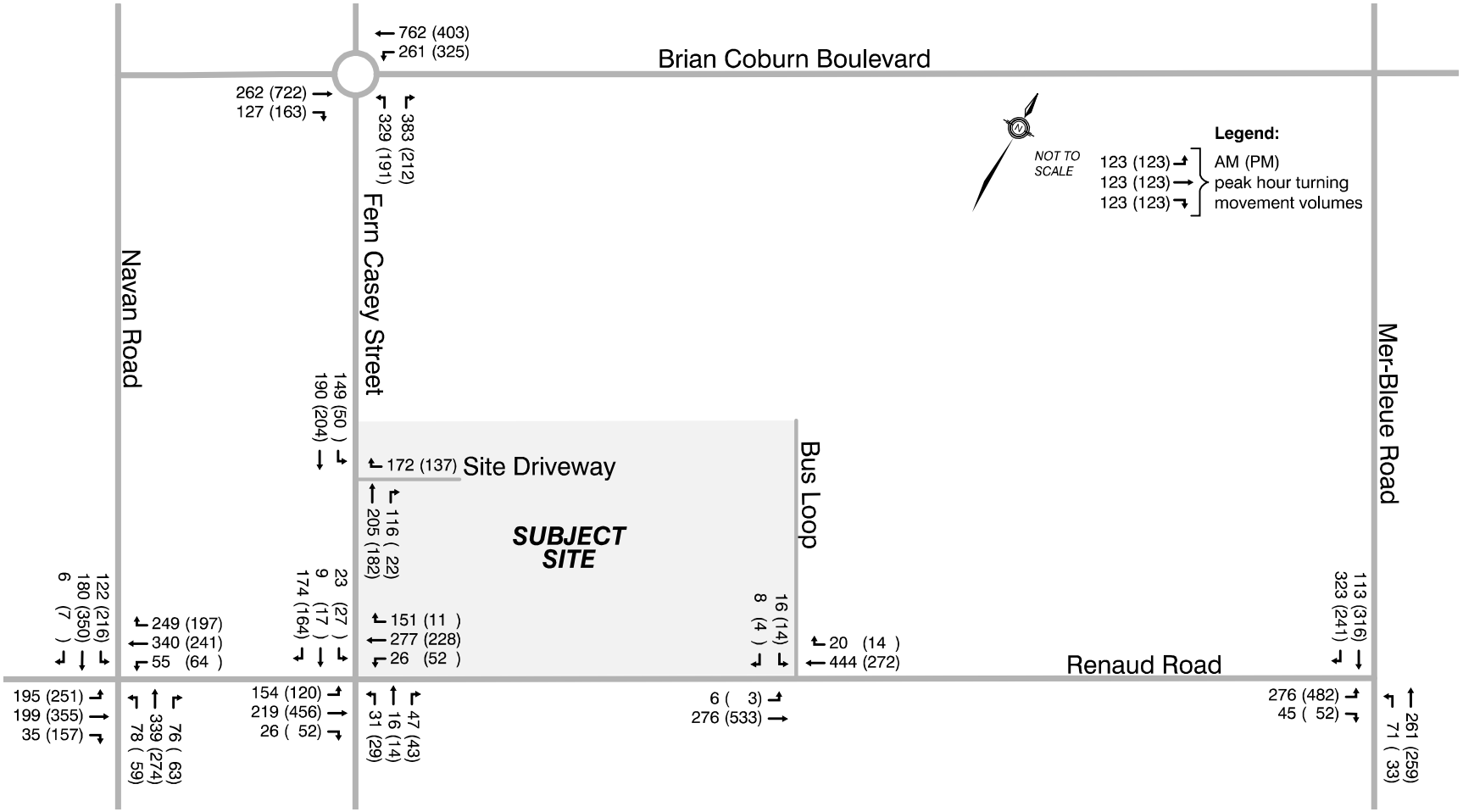


Figure 21: 2029 Future Background Traffic Volumes



3.3 Demand Rationalization

The school expansion is expected to generate a total of 51 AM and 37 PM peak hour vehicles and school bus trips.

Transit mode shares are expected to remain consistent with current mode shares, given the direct bus service provided with routes 32 and 634 and as a number of students and/or staff are currently using these transit services. It is noted that the mode shares indicated in the TRANS *Trip Generation Manual Summary Report* may overestimate the number of transit riders in this specific case. Many of these trips are likely to occur by school bus.

The school site also has extensive infrastructure to accommodate and encourage the use of sustainable transportation modes such as walking and cycling, making use of a cycling lane on Fern Casey Street, a MUP along Brian Coburn Boulevard, and sidewalks along all adjacent roads to the school.

The estimated peak vehicle traffic demands were distributed to the various road network intersections providing access to the school, 16 veh/hr or less being added to any intersection approach during the peak hours, which can reasonably be accommodated. Should vehicle volumes exceed the road network capacity, tools that can be adopted to manage growth in peak hour vehicle demand include:

- Peak period spreading,
- TDM, and
- Parking restrictions.

TDM measures can be adopted to help encourage peak spreading and increased use of sustainable modes. While not included in the analysis, these tools would allow for the forecast demands to be accommodated, even after the peak hour intersection capacity is reached.

3.4 Total Traffic

The total traffic volumes were calculated by adding existing, background traffic volumes and site generated traffic from the Mer-Bleue School expansion. **Figure 22** illustrates the 2024 total traffic volumes, and **Figure 23** illustrates the 2029 total traffic volumes.

Figure 22: 2024 Total Traffic Volumes

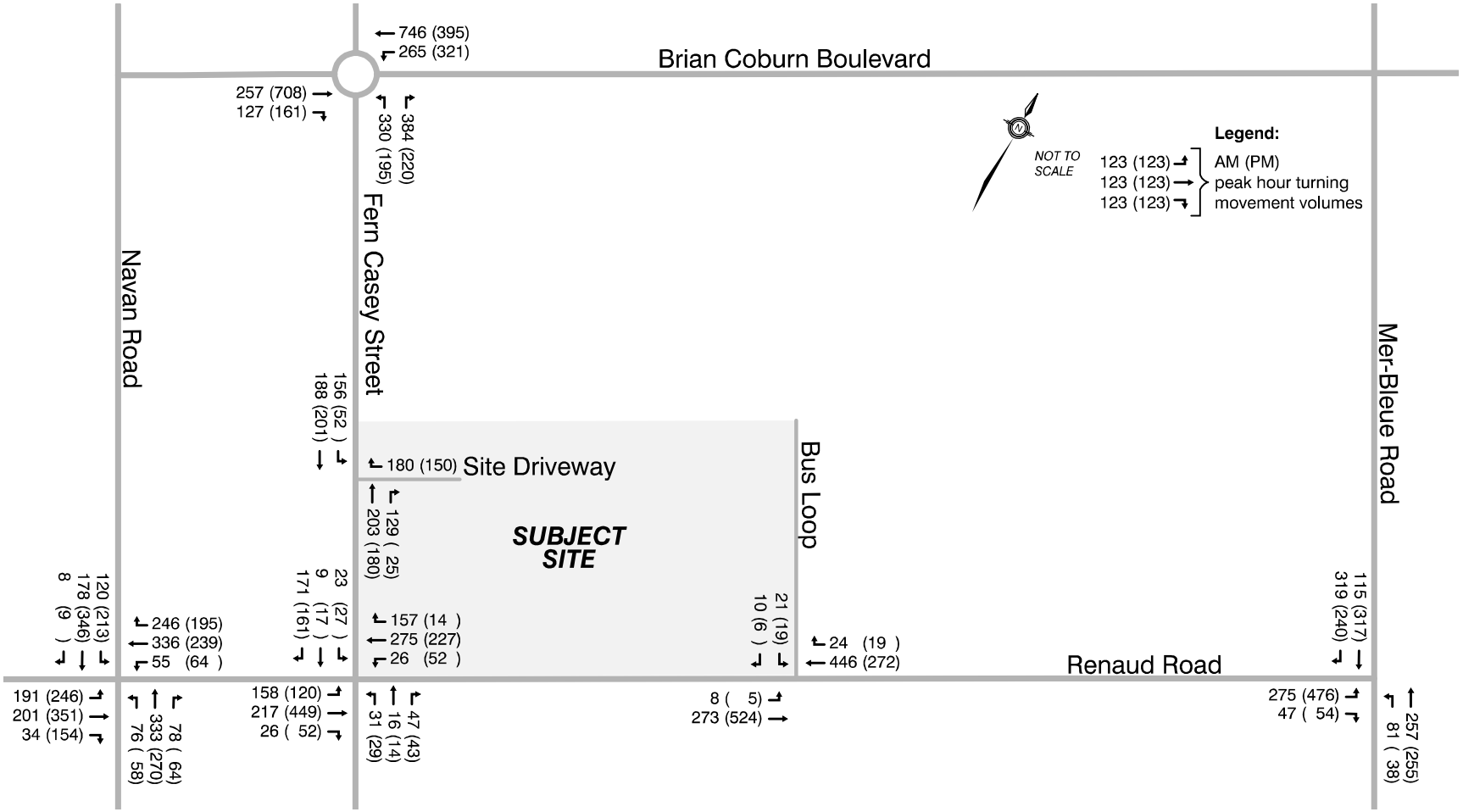
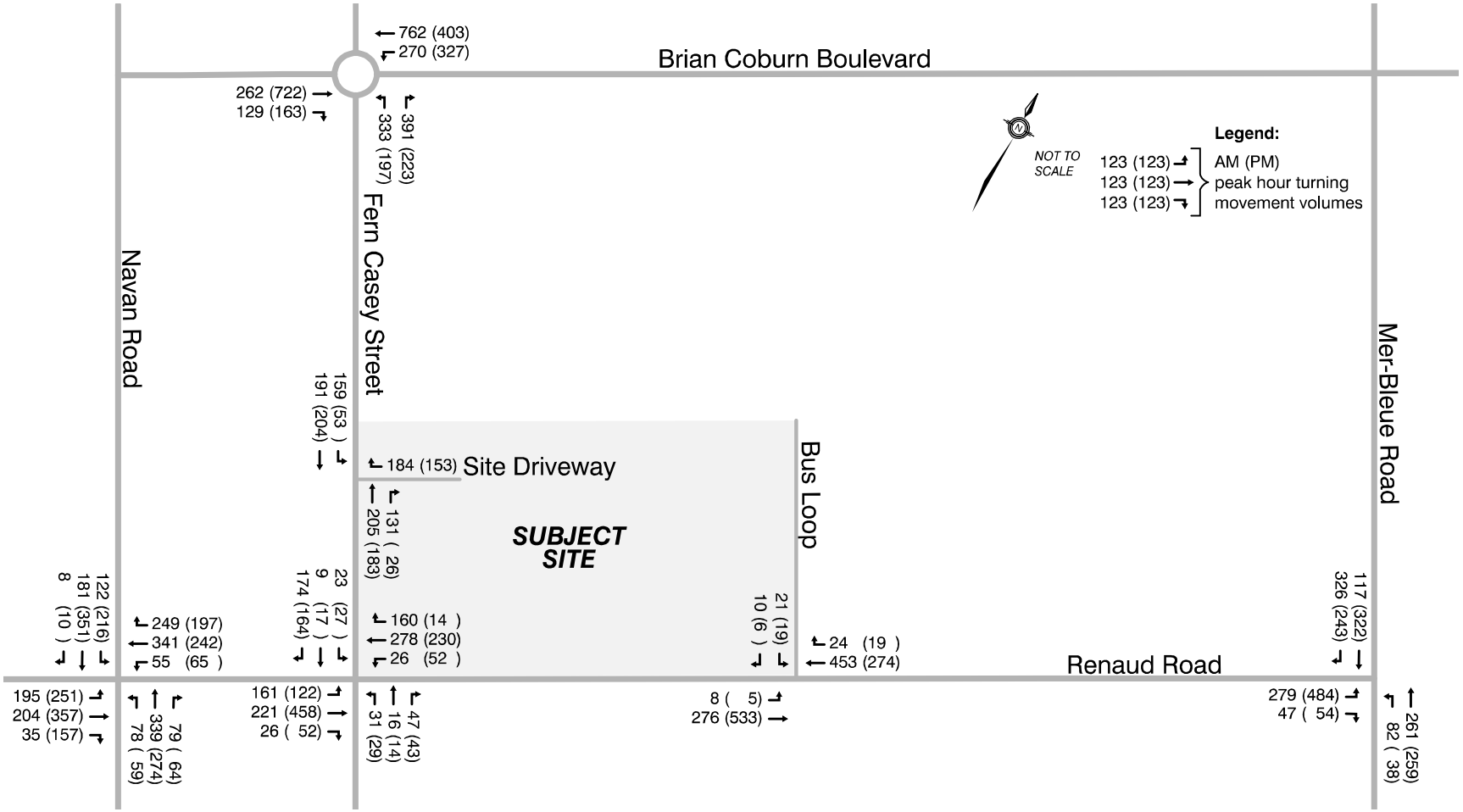


Figure 23: 2029 Total Traffic Volumes



4.0 Analysis

4.1 Development Design

4.1.1 Design for Sustainable Modes

Bicycle facilities – A total of 108 bicycling parking spaces will be provided at the school. These bicycle parking spaces are located on the north side of the school. Direct and convenient paved surfaces are provided to access the school from the bike parking areas. Cycling connections to/from the school can be made using Renaud Road (a local route in the City's Ultimate Cycling Network), or Enclave Walk (a Major Pathway in the City's Ultimate Cycling Network)

Pedestrian access and circulation – Sidewalks are currently provided around the school and along both sides of Renaud Road and Fern Casey Street, connecting the school to the surrounding pedestrian infrastructure. Direct access is provided from the school bus lay-by to the main school entrance. Paved surfaces around the school also provide direct and convenient access from the staff parking lot, bicycle parking areas, and drop-off/pick-up lay-by area to the school entrances.

Transit facilities – OC Transpo stops are provided on Fern Casey Street in front of the school. The stops are connected by sidewalks on both the east and west sides of Fern Casey Street.

4.2 Parking

4.2.1 Parking Supply

Automobile Parking – As per City of Ottawa Zoning By-law 2008-250 (Sections 101 and 102), the minimum parking space rate is 1.5 parking spaces per classroom. The school expansion will result in the school having an additional 17 classrooms with up to 16 portables in the future. Therefore, 26 additional parking spaces[1] are required for the school. It is understood that 141 total parking spaces are being provided on the site, with 5 of these spaces designated as barrier-free. As a result, 136 total spaces are being provided, with 28 spaces allocated for the existing portables and 103 spaces allocated for the main building. As there will be 56 classrooms in the main building, 84 parking spaces are required. As a result, the minimum number of parking spaces is being exceeded on the site.

Bicycle Parking – As per City of Ottawa Zoning By-law 2016-249 (Section 111), the minimum bicycle parking rate is one bicycle parking space per 100 m^2 of gross floor area. Therefore, 91 bicycle parking spaces[2] are required, the site plan provides 108 spaces. Therefore, the site plan meets the zoning by-law requirements.

[1] 17 classrooms x 1.5 spaces/classroom = 26 spaces

[2] 9,035 sq.m gross school floor area x 1 bicycle parking space / 100 sq.m = 108 bicycle parking spaces

4.3 Boundary Street Design

4.3.1 Mobility

The Multi-Modal Level of Service (MMLOS) was evaluated along Fern Casey Street and Renaud Road to assist with developing a concept that maximizes the achievement of the MMLOS objectives. Since the development is at a school, it is subject to MMLOS targets of the school policy area. Note that there are no targets for trucks on a collector roadway within the school policy area, and there are no targets for auto traffic between intersections (there are targets for auto traffic at signalized intersections only, there are no signalized intersections within proximity of the site).

Table 10 presents the MMLOS conditions for roadway segments adjacent the school on Fern Casey Street and Renaud Road. This MMLOS analysis is based on the planned conditions of the roadways.

Table 10: MMLOS Conditions - Segments

Travel Mode	Criteria	Target	Fern Casey Street Major Collector	Renaud Road Collector
Pedestrian LOS	Sidewalk width	A	2 metres	2 metres
	Boulevard width		0.5 – 2 metres	0.5 – 2 metres
	AADT > 3000		Yes (assume 12x multiplier for AM peak hour volumes)	Yes (assume 12x multiplier for AM peak hour volumes)
	On-Street Parking		No	No
	Operating Speed		50-60 km/h	> 30 or <50 km/h
	Level of Service		D	C
Cycling LOS	Type of facility	B	Bike Lane	Mixed traffic
	Number of travel lanes/direction		1	1
	Operating speed		60 km/h	50 km/h
	Level of Service		C	C
Transit LOS	Type of facility	D	Mixed traffic	Mixed traffic
	Parking/driveway friction		Limited / Low	Limited / Low
	Level of Service		D	D

The analysis shows that all MMLOS targets are met for transit modes on Fern Casey Street and Renaud Road. The MMLOS targets for pedestrians and cyclists have not been met.

4.3.2 Road Safety

No existing safety issues were observed and no modifications are anticipated to alter the safety performance of the boundary roads. As the various background developments become built out and are fully occupied, traffic management measures may be needed to manage speed-related safety concerns, and protected multi-modal transportation alternatives should be provided.

4.4 Access Intersection Design

4.4.1 Location and Design of Driveway

No new accesses are proposed for the school expansion.

The existing school driveway for vehicle access is located on Fern Casey Street providing a single lane in and, right turn only access out of the site. The bus loop is located on Renaud Road.

4.4.2 Intersection Control

As no new site driveways are proposed, and the site driveway and bus loop are located on a Collector roadway with future signalization plans; stop-control (TWSC) facing traffic exiting the site driveway is appropriate. No changes to the current intersection control are necessary based on the analysis undertaken.

4.4.3 Access Intersection Design

The following subsections provide a review of the traffic operations for the access intersections. The existing, 2024 and 2029 forecast total future traffic conditions have been analysed using Synchro 10 software.

Table 11 summarizes the traffic operations for the site driveway on Fern Casey Street for the weekday AM and PM peak hours in the existing conditions (2023), and 2024 and 2029 horizon years. **Appendix C** contains the intersection performance worksheets. All movements at the driveway intersection currently operate at a LOS B or better and will continue to do so in the future with minimal delay.

Table 11: Site Driveway and Fern Casey Street Intersection Operations - AM (PM) Peak Hour

Existing				
Approach/Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
WBR	10.3 (9.6)	B (A)	0.21 (0.16)	6.3 (4.7)
NBTR	0.0 (0.0)	A (A)	0.14 (0.08)	0.0 (0.0)
SBL	8.1 (7.5)	A (A)	0.12 (0.02)	3.2 (0.6)
SBT	0.0	A (A)	0.06 (0.08)	0.0 (0.0)
Total Future 2024				
Approach/Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
WBR	11.5 (10.3)	B (B)	0.26 (0.20)	8.3 (5.8)
NBTR	0.0 (0.0)	A (A)	0.21 (0.13)	0.0 (0.0)
SBL	8.5 (7.8)	A (A)	0.14 (0.04)	3.9 (1.1)
SBT	0.0 (0.0)	A (A)	0.12 (0.13)	0.0 (0.0)
Total Future 2029				
Approach/Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
WBR	11.5 (10.4)	B (B)	0.27 (0.20)	8.6 (5.9)

NBTR	0.0 (0.0)	A (A)	0.21 (0.13)	0.0 (0.0)
SBL	8.5 (7.8)	A (A)	0.14 (0.04)	4.0 (1.1)
SBT	0.0 (0.0)	A (A)	0.12 (0.13)	0.0 (0.0)

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

Table 12 summarizes the traffic operations for the bus loop on Renaud Road for the weekday AM and PM peak hours in the existing conditions (2023), and 2024 and 2029 horizon years. **Appendix C** contains the intersection performance worksheets. All movements at the bus loop currently operate at a LOS C or better, and will continue to perform well in the future with minimal delay.

Table 12: Bus Loop and Renaud Road Intersection Operations - AM (PM) Peak Hour

Existing				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLT	0.4 (0.0)	A (A)	0.01 (0.00)	0.2 (0.0)
WBTR	0.0 (0.0)	A (A)	0.19 (0.06)	0.0 (0.0)
SBLR	12.8 (9.8)	B (A)	0.05 (0.02)	1.3 (0.6)
Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLT	0.4 (0.1)	A (A)	0.01 (0.00)	0.3 (0.1)
WBTR	0.0 (0.0)	A (A)	0.30 (0.19)	0.0 (0.0)
SBLR	18.6 (16.8)	C (C)	0.11 (0.08)	3.0 (2.2)
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLT	0.4 (0.1)	A (A)	0.01 (0.00)	0.3 (0.1)
WBTR	0.0 (0.0)	A (A)	0.30 (0.19)	0.0 (0.0)
SBLR	18.8 (17.0)	C (C)	0.12 (0.09)	3.1 (2.2)

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

4.5 Transportation Demand Management

Appendix D contains the TDM checklists. From the TDM checklists, some recommendations are as follows:

- Display relevant transit schedules and route maps at entrances of the school;
- Provide links to OC Transpo and STO information on the school website; and
- Provide shower and lockers for staff use (these measures are provided).

The school board should also consider offering preloaded PRESTO cards to encourage staff and/or students to use transit, or provide reimbursement of monthly transit passes for employees.

All students residing beyond a 1.6 km radius from the school will be given access to school bus transportation. To promote active transportation for those who live closer to the school, students will be encouraged to walk or cycle to school. The school will develop and make available educational materials on alternative transportation modes through its website, which will also display transportation options and encourage parents to choose non-automotive options. The school's parent association will support in creating and distributing these educational materials and keep an eye on transportation-related matters, reporting to the Principal. The school board plans to participate in the city's cycling education programs.

4.6 Neighbourhood Traffic Management

Only required when the development relies on Local or Collector streets for access and total volumes exceed ATM capacity thresholds. Total volume is not expected to exceed ATM capacity thresholds.

The following provides further details with regard to the capacity of boundary roads for the school site.

Fern Casey Street is a Major Collector and Renaud Road is designated a Collector roadway.

Forecast traffic volumes on Fern Casey Street during the 2029 weekday AM peak hour south of the Site Driveway are 527 vehicles per hour (vph). The forecast traffic volumes are generally in keeping with the major collector roadway designation as indicated in the TIA guidelines.

The existing traffic volumes on Renaud Road during the weekday AM peak hour east of the Fern Casey Street intersection is 426 vph, which is excess of the Collector road threshold. Forecast traffic volumes on Renaud Road during the 2029 weekday AM peak hour east of the intersection of Renaud Road and Fern Casey Street are 747 vph, which is significantly above the Collector road threshold. The additional school site traffic is forecast to add just 14 trips. The existing and background development traffic is forecast to exceed the threshold of a Collector roadway and the City should consider upgrading the classification of the roadway.

4.7 Transit

Current boarding and alighting data from OC Transpo is provided in **Section 2.1.2.3**. Route 32 and Route 634 provide access to the school site, with route times that align with school bell times. It is anticipated that the vast majority of these boardings and alightings during these periods would be associated with student/staff at the school.

4.7.1 Route Capacity

The proposed school is not anticipated to require additional OC Transpo buses or additional transit trips, therefore transit service is not expected to be significantly impacted. It is noted that the mode shares

indicated in the TRANS *Trip Generation Manual Summary Report* may overestimate the number of transit riders in this specific case. Many of these trips are likely to occur by school bus.

4.8 Review of Network Concept

A review of the network concept is not included within this study. The network concept review is only required when a proposed development generates more than 200 person trips during the peak hour in excess of the equivalent volume permitted by established zoning. The proposed school expansion is in keeping with the proposed zoning.

4.9 Intersection Design

The following subsections provide a review of the traffic operations for the network intersections. The existing, 2024 and 2029 forecast total future traffic conditions have been analysed using Synchro 10 software. The level-of-service (LOS) of traffic signal-controlled intersections in the City of Ottawa is based on the volume to capacity (v/c) ratio, refer to **Appendix E** for the City of Ottawa LOS definitions.

4.9.1 Brian Coburn Boulevard and Fern Casey Street (roundabout)

The roundabout has been found to operate at an acceptable LOS under existing conditions, as indicated in **Table 13**. The worst movement is the westbound approach, with a LOS C.

Under 2024 and 2029 future conditions, excessive background traffic volumes at the intersection result in failing movements in the eastbound direction during the PM peak hour and the westbound direction during the AM peak hour. The school impact on the intersection is negligible.

Table 13: Brian Coburn Boulevard and Fern Casey Street Intersection Operations

Existing				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)** *7 metres per vehicle
EB	5.7 (7.5)	A (A)	0.25 (0.41)	7 (14)
WB	16.2 (7.2)	C (A)	0.77 (0.43)	56 (14)
NB	7.5 (6.6)	A (A)	0.41 (0.25)	14 (7)
SB	7.7 (4.9)	A (A)	0.00 (0.00)	0 (0)
Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EB	8.2 (47.8)	A (E)	0.41 (0.99)	14 (126)
WB	107.4 (14.7)	F (C)	**1.17** (0.71)	231 (42)
NB	17.8 (22.9)	C (C)	0.77 (0.72)	56 (42)
SB	11.7 (7.3)	B (A)	0.00 (0.00)	0 (0)
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EB	8.4 (54.2)	A (F)	0.42 (**1.02**)	14 (140)
WB	118.0 (15.4)	F (C)	**1.20** (0.73)	245 (49)

NB	18.8 (24.5)	C (C)	0.78 (0.74)	56 (42)
SB	12.0 (7.4)	B (A)	0.00 (0.00)	0 (0)

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

The ultimate design for Brian Coburn includes a four-lane cross-section. It is anticipated that this will mitigate the capacity issues forecast at the roundabout, as this will add a lane in the eastbound and westbound directions.

4.9.2 Navan Road and Renaud Road

The signalized intersection is operating at an acceptable LOS under existing conditions, as indicated in **Table 14**. The worse movement is the shared westbound through / right lane, with a v/c ratio of 0.71 and a LOS C. The school impact on the intersection is negligible, and no site-generated vehicle volumes are being added to this westbound approach.

Under 2024 and 2029 future conditions, excessive background traffic volumes at the intersection result in the shared westbound through / right lane exceeding capacity, with a v/c ratio of 1.08 and 1.11 during the 2024 AM and 2029 AM peak hours respectively.

Table 14: Navan Road and Renaud Road Intersection Operations - AM (PM) Peak Hour

Existing				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	11.8 (11.7)	A (A)	0.36 (0.39)	28.6 (39.5)
EBT	10.7 (11)	A (A)	0.17 (0.24)	25.1 (36.9)
EBR	2.9 (3.6)	A (A)	0.04 (0.14)	3 (8.6)
WBL	20.3 (22.1)	A (A)	0.06 (0.10)	8 (7.9)
WBTR	28.6 (21.8)	C (A)	0.71 (0.50)	81.7 (42.2)
NBL	19.3 (16.3)	A (A)	0.19 (0.14)	16.3 (11.2)
NBTR	24.8 (20.8)	A (A)	0.59 (0.54)	58.2 (46.4)
SBL	20.1 (18.2)	A (A)	0.21 (0.26)	15.2 (16.5)
SBTR	20.1 (19.0)	A (A)	0.31 (0.41)	28.7 (35)
OVERALL	**21.0 (16.0)**	**A (A)**	**0.46 (0.38)**	-
WORST MOVEMENT	**WBTR (NBTR)**	**C (A)**	**0.71 (0.54)**	-
Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	29.2 (32.7)	C (C)	0.7 (0.78)	#56.0 (#67.8)
EBT	13 (16.6)	A (A)	0.24 (0.44)	38.8 (70.2)
EBR	4.2 (3.2)	A (A)	0.05 (0.21)	4.8 (10.5)
WBL	23.1 (26.8)	A (A)	0.17 (0.27)	18.3 (21.4)
WBTR	89.9 (46.6)	F (D)	1.08 (0.89)	#204.8 (#134.2)
NBL	21.1 (22.0)	A (A)	0.24 (0.26)	20.3 (17.4)
NBTR	39.9 (25.1)	D (B)	0.85 (0.60)	100 (74.6)
SBL	65.8 (63.4)	D (E)	0.83 (0.91)	#48.9 (#78.6)

SBTR	23.1 (27.2)	A (B)	0.41 (0.64)	42.3 (82.2)
OVERALL	**49.6 (31.3)**	**C (B)**	**0.74 (0.64)**	-
WORST MOVEMENT	**WBTR (SBL)**	**F (E)**	**1.08 (0.91)**	-
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	30.4 (36.6)	C (D)	0.72 (0.82)	#57.9 (#73.0)
EBT	13.2 (17.0)	A (A)	0.24 (0.44)	39.4 (71.5)
EBR	4.3 (3.1)	A (A)	0.05 (0.22)	5 (10.6)
WBL	23.3 (27.1)	A (A)	0.17 (0.27)	18.3 (21.8)
WBTR	97.7 (47.9)	F (E)	1.11 (0.90)	#208.7 (#136.6)
NBL	21.2 (22.1)	A (A)	0.25 (0.27)	20.7 (17.6)
NBTR	40.3 (25.2)	D (B)	0.85 (0.60)	102.2 (75.8)
SBL	71.8 (65.7)	D (E)	0.86 (0.92)	#51.3 (#80.6)
SBTR	23.1 (27.4)	A (B)	0.41 (0.65)	43.1 (84)
OVERALL	**53.1 (32.3)**	**C (B)**	**0.75 (0.65)**	-
WORST MOVEMENT	**WBTR (SBL)**	**F (E)**	**1.11 (0.92)**	-

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

4.9.2.1 Mitigation for Westbound Right Movement

A sensitivity analysis was performed at the intersection of Navan Road and Renaud Road. If a separate westbound right turning lane were provided at the intersection, the westbound right movement would no longer exceed capacity under future 2024 and 2029 conditions. The 50th percentile queue for the westbound movement under 2029 AM conditions (worst condition) is anticipated to be 49.9 metres. As such, a 50 metre storage lane is deemed to be required to accommodate the forecast future traffic.

Table 15 presents the results of this addition, with no other timing changes.

Table 15: Navan Road and Renaud Road Intersection Optimized Operations - AM (PM) Peak Hour

Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	16.3 (19.0)	A (A)	0.50 (0.57)	36.2 (46.7)
EBT	13.5 (17.7)	A (A)	0.26 (0.48)	38.8 (70.6)
EBR	4.2 (3.4)	A (A)	0.05 (0.23)	4.8 (10.8)
WBL	24.1 (30.2)	A (A)	0.20 (0.35)	18.3 (21.6)
WBT	36.6 (33.3)	C (B)	0.76 (0.63)	91.0 (62.8)
WBR	5.8 (6.6)	A (A)	0.44 (0.41)	17.5 (16.1)
NBL	19.8 (18.5)	A (A)	0.23 (0.23)	20.2 (16.4)
NBTR	34.2 (21.3)	D (A)	0.81 (0.57)	100 (72.0)
SBL	44.9 (42.9)	C (D)	0.71 (0.80)	#44.5 (#72.3)
SBTR	21.1 (23.0)	A (B)	0.39 (0.61)	42.3 (79.6)
OVERALL	**24.7 (21.8)**	**A (A)**	**0.56 (0.54)**	-
WORST MOVEMENT	**NBTR (SBL)**	**D (C)**	**0.81 (0.80)**	-
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	16.8 (19.7)	A (A)	0.52 (0.59)	36.9 (47.8)
EBT	13.6 (18.0)	A (A)	0.26 (0.49)	39.4 (71.9)
EBR	4.3 (3.4)	A (A)	0.05 (0.23)	5.0 (10.8)
WBL	24.2 (30.5)	A (A)	0.20 (0.35)	18.3 (22)
WBT	37.2 (33.7)	C (B)	0.77 (0.64)	92.6 (63.5)
WBR	5.8 (6.6)	A (A)	0.44 (0.42)	17.6 (16.2)
NBL	19.9 (18.7)	A (A)	0.23 (0.24)	20.6 (16.9)
NBTR	34.9 (21.4)	D (A)	0.82 (0.57)	102.2 (73.3)
SBL	48.6 (44.3)	C (D)	0.74 (0.81)	#47.0 (#74.4)
SBTR	21.3 (23.2)	A (B)	0.40 (0.61)	43.1 (81.5)
OVERALL	**25.3 (22.1)**	**A (A)**	**0.57 (0.54)**	-
WORST MOVEMENT	**NBTR (SBL)**	**D (D)**	**0.82 (0.81)**	-

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

It should be noted that due to the access arrangement of the school (right-out only onto Fern Casey Street northbound), no site-generated trips are anticipated to make the eastbound right-turn movement at this intersection.

4.9.3 Renaud Road and Fern Casey Street

The stop-controlled intersection is forecast to operate at an acceptable LOS under existing and future conditions for most movements, as indicated in **Table 16**; however, there is excessive delay in the northbound movement. Under existing conditions, the intersection has only three legs, while under future conditions in both 2024 and 2029, the fourth (south) leg has been added. Under existing and future conditions, the intersection was assessed to operate under two-way stop control (TWSC).

Table 16: Renaud Road and Fern Casey Street Intersection Operations

Existing				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	8.2 (7.6)	A (A)	0.09 (0.06)	2.3 (1.5)
EBT	0.0 (0.0)	A (A)	0.08 (0.09)	0.0 (0.0)
WBTR	0.0 (0.0)	A (A)	0.18 (0.06)	0.0 (0.0)
SBL	13.8 (11.8)	B (B)	0.05 (0.03)	1.2 (0.8)
SBR	10.1 (9.2)	B (A)	0.12 (0.11)	3.4 (3.1)
Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	8.9 (8.1)	A (A)	0.16 (0.10)	4.5 (2.7)
EBTR	0.0 (0.0)	A (A)	0.16 (0.32)	0.0 (0.0)
WBL	7.8 (8.7)	A (A)	0.02 (0.06)	0.5 (1.4)
WBTR	0.0 (0.0)	A (A)	0.28 (0.15)	0.0 (0.0)
NBL	53.3 (70.7)	F (F)	0.32 (0.38)	9.8 (11.8)
NBTR	15.3 (17.1)	C (C)	0.16 (0.17)	4.6 (4.9)
SBL	34.5 (41.7)	D (E)	0.17 (0.23)	4.7 (6.7)
SBTR	14.1 (14.3)	B (B)	0.33 (0.33)	11.6 (11.6)
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBL	9.0 (8.1)	A (A)	0.16 (0.10)	4.6 (2.7)
EBTR	0.0 (0.0)	A (A)	0.16 (0.33)	0.0 (0.0)
WBL	7.8 (8.7)	A (A)	0.02 (0.06)	0.5 (1.4)
WBTR	0.0 (0.0)	A (A)	0.28 (0.16)	0.0 (0.0)
NBL	55.9 (75.5)	F (F)	0.33 (0.39)	10.2 (12.4)
NBTR	15.6 (17.4)	C (C)	0.17 (0.18)	4.7 (5.0)
SBL	35.4 (43.4)	E (E)	0.17 (0.24)	4.9 (6.9)
SBTR	14.3 (14.4)	B (B)	0.34 (0.34)	12.0 (12.0)

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

It is understood that this intersection will ultimately operate with a traffic signal in place, but that these improvements will be funded through Development Charges (DC Funds). It is not clear exactly when the traffic signal may need to be introduced.

4.9.4 Renaud Road and Mer-Bleue Road

The all-way-stop controlled intersection currently operates at an acceptable LOS B or better. Under 2024 and 2029 future conditions, excessive background traffic volumes at the intersection result in failing movements in the eastbound and southbound direction during the PM peak hour, as indicated in **Table**

17. It is anticipated that the planned signalization of this intersection through the DC fund will mitigate the forecast capacity issues.

Table 17: Renaud Road and Mer-Bleue Road Intersection Operations

Existing				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLR	10.2 (9.8)	B (A)	0.26 (0.27)	-
NBLT	9.9 (9.0)	A (A)	0.28 (0.20)	-
SBTR	9.9 (9.5)	A (A)	0.38 (0.31)	-
Total Future 2024				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLR	19.0 (84.8)	C (**F**)	0.62 (**1.07**)	-
NBLT	18.0 (21.1)	C (C)	0.61 (0.62)	-
SBTR	20.3 (80.4)	C (**F**)	0.71 (**1.06**)	-
Total Future 2029				
Approach/ Movement	**Delay (s)**	**LOS**	**V/C**	**Q95th (m)**
EBLR	19.6 (90.8)	C (**F**)	0.63 (**1.09**)	-
NBLT	18.6 (21.5)	C (C)	0.63 (0.63)	-
SBTR	21.5 (85.5)	C (**F**)	0.73 (**1.08**)	-

Note: Results are presented in the format AM (PM) peak hour; Q95th (m) indicates the 95th percentile queues, LOS is an abbreviation for Level-of-Service, EB = eastbound, WB = westbound, SB = southbound; LTR = left, through, right movements for single lane

It is understood that this intersection will ultimately be reconstructed to include a traffic signal and additional lanes on Mer-Bleue Road.

5.0 Summary/Conclusions

The CECCE is proposing to expand the existing French Catholic high school, Collège Catholique Mer-Bleue. The school currently provides education for students in grades 7 to 12 and currently accommodates 1200 students and 68 staff members.

The planned expansion will add 13 classrooms, 2 science labs, and a technology room, along with approximately 336 new students (expanding the student population by 28%) to the school, 13 teachers, and 4 administrative staff. The new students will be accommodated using up to seven (7) new buses. The school's staff and student parking lot can be accessed from Fern Casey Street, and the school's bus loop can be accessed from Renaud Road. No changes to the school's current access driveways are anticipated.

It is forecast that all MMLOS targets will be met for transit modes on Fern Casey Street and Renaud Road. However, the MMLOS targets for pedestrians and cyclists are not met.

When developing the total traffic volumes for the 2024 and 2029 future conditions, eleven different background developments were considered.

The **site driveway** and **bus loop** are forecast to operate at LOS C or better under future conditions within the horizon years.

The roundabout at **Brian Coburn Boulevard and Fern Casey Street** is forecast to exceed capacity under future conditions, due to background development traffic. Failing movements are forecast in the eastbound direction during the PM peak hour and the westbound direction during the AM peak hour. The school impact on the intersection is negligible. The ultimate design for Brian Coburn includes a four-lane cross-section. It is anticipated that this will mitigate the capacity issues forecast at the roundabout.

The shared westbound through / right turning lane at the intersection of **Navan Road and Renaud Road** is forecast to exceed capacity under 2024 and 2029 future conditions due to background traffic volumes at the intersection. The westbound shared through/right turn lane v/c ratios of 1.08 and 1.11 are forecast during the 2024 AM and 2029 AM peak hours respectively. The ultimate implementation of a separate westbound right turning lane with 50 metres of available storage will mitigate the capacity issues.

The intersection of **Renaud Road and Fern Casey Street** is anticipated to operate at an acceptable LOS under existing and future conditions for most movements; however, there is excessive delay in the northbound movement. It is understood that a traffic signal will ultimately be installed at this intersection (using DC funds).

The eastbound and southbound movements at the intersection of **Renaud Road and Mer-Bleue Road** are anticipated to exceed capacity under 2024 and 2029 future conditions due to excessive background traffic volumes at the intersection. It is anticipated that the planned signalization of this intersection through the DC fund will mitigate the forecast capacity issues.

The following TDM measures are to be provided:

- Display relevant transit schedules and route maps at the various school entrances;
- Provide links to OC Transpo and STO information on the school board website;
- Provide shower and lockers for staff use (these measures are provided); and
- Consider offering preloaded PRESTO cards to encourage staff and/or students to use transit, or provide reimbursement of monthly transit passes for employees.

Appendix A

Traffic Count Data

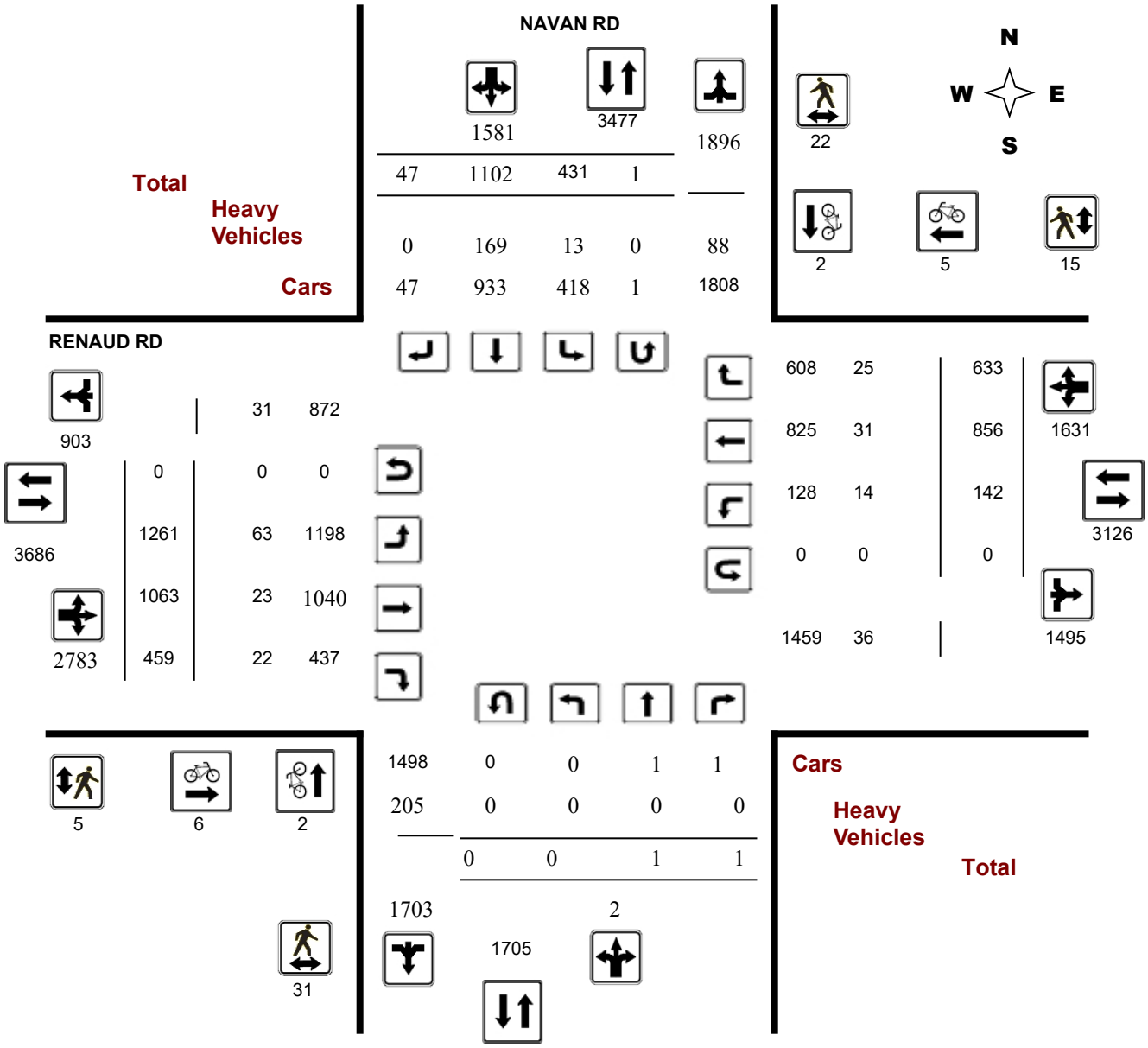
Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022
Start Time: 07:00
WO No: 40588
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

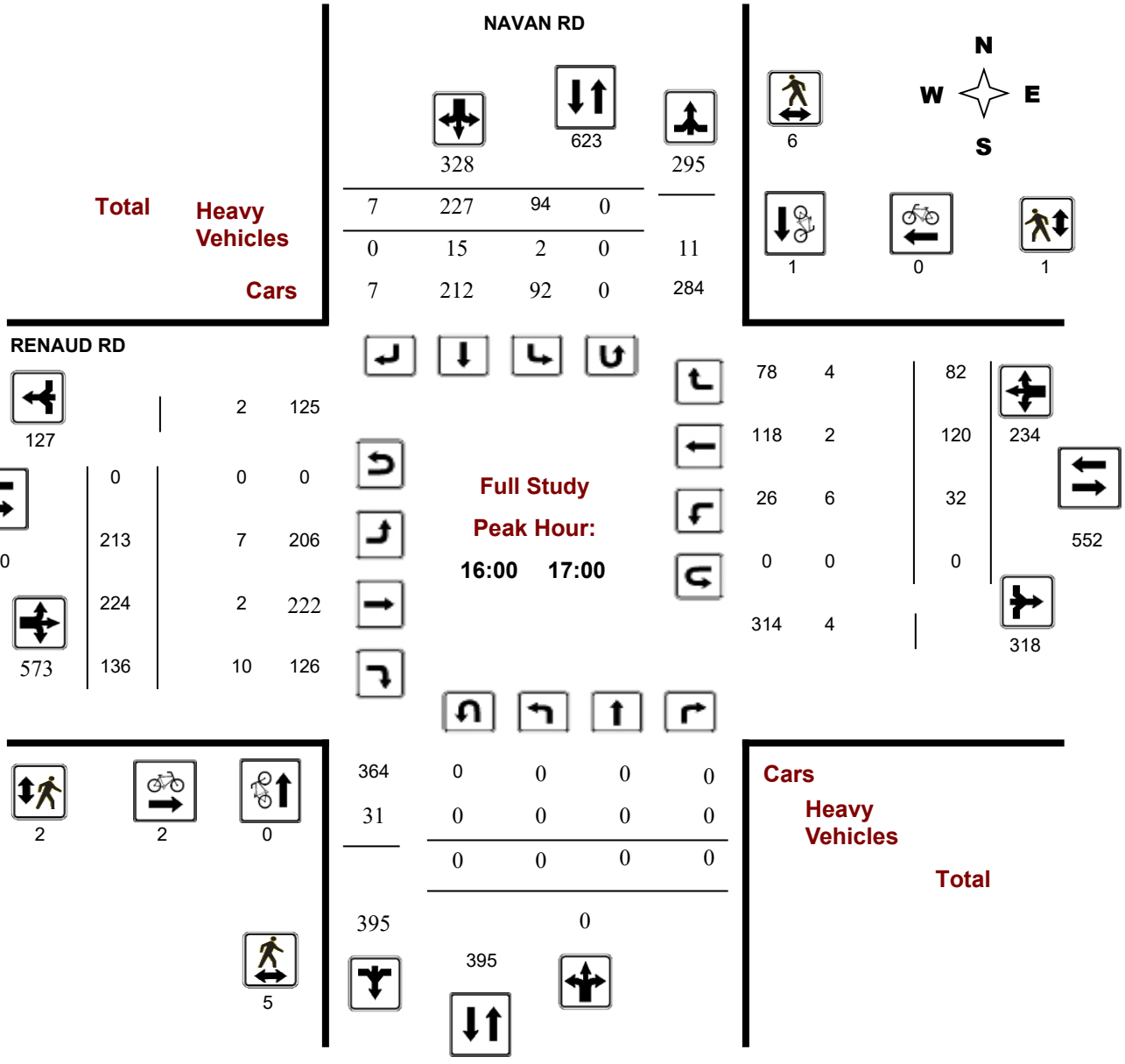
Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study Peak Hour Diagram

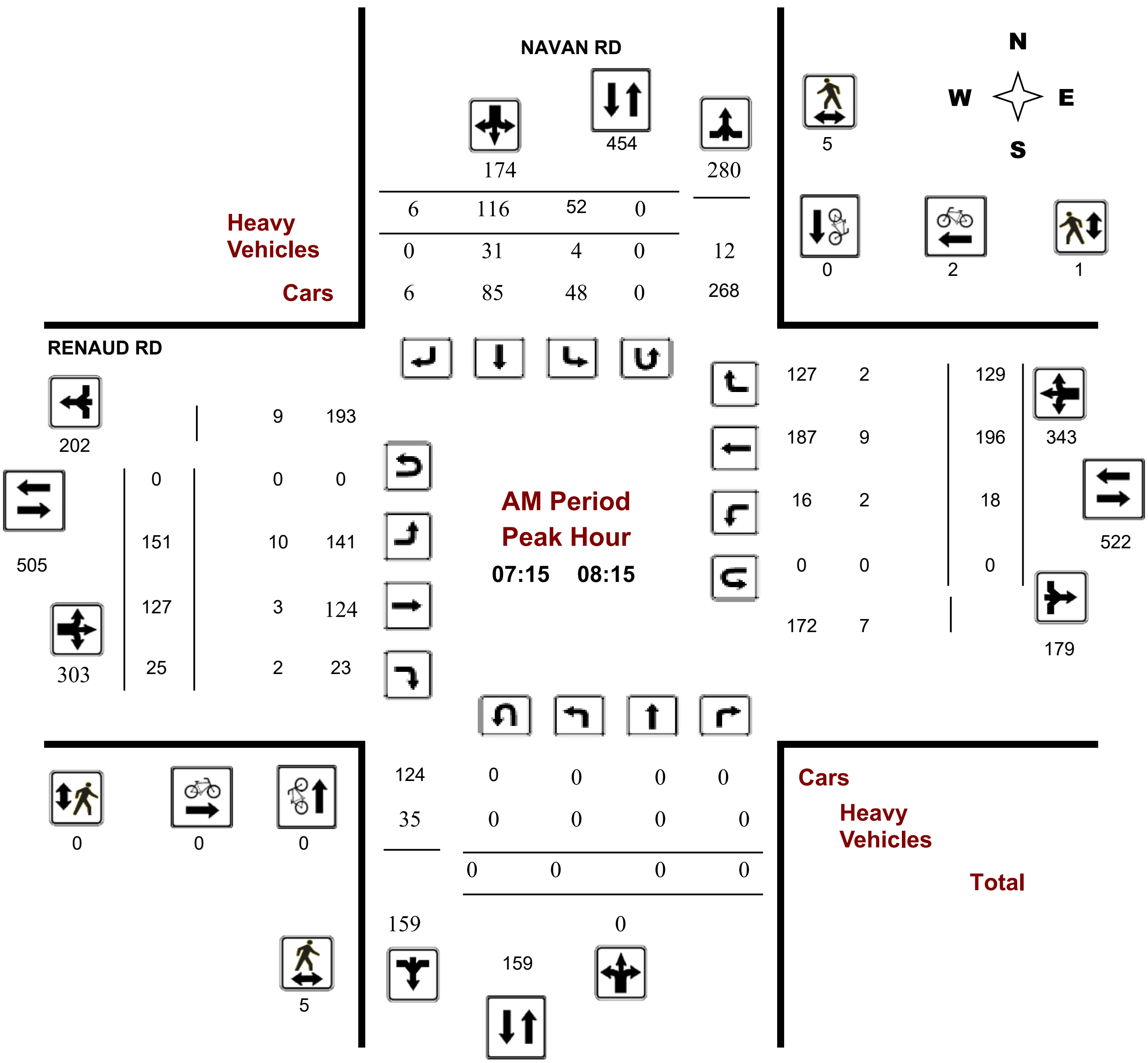


Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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



Comments

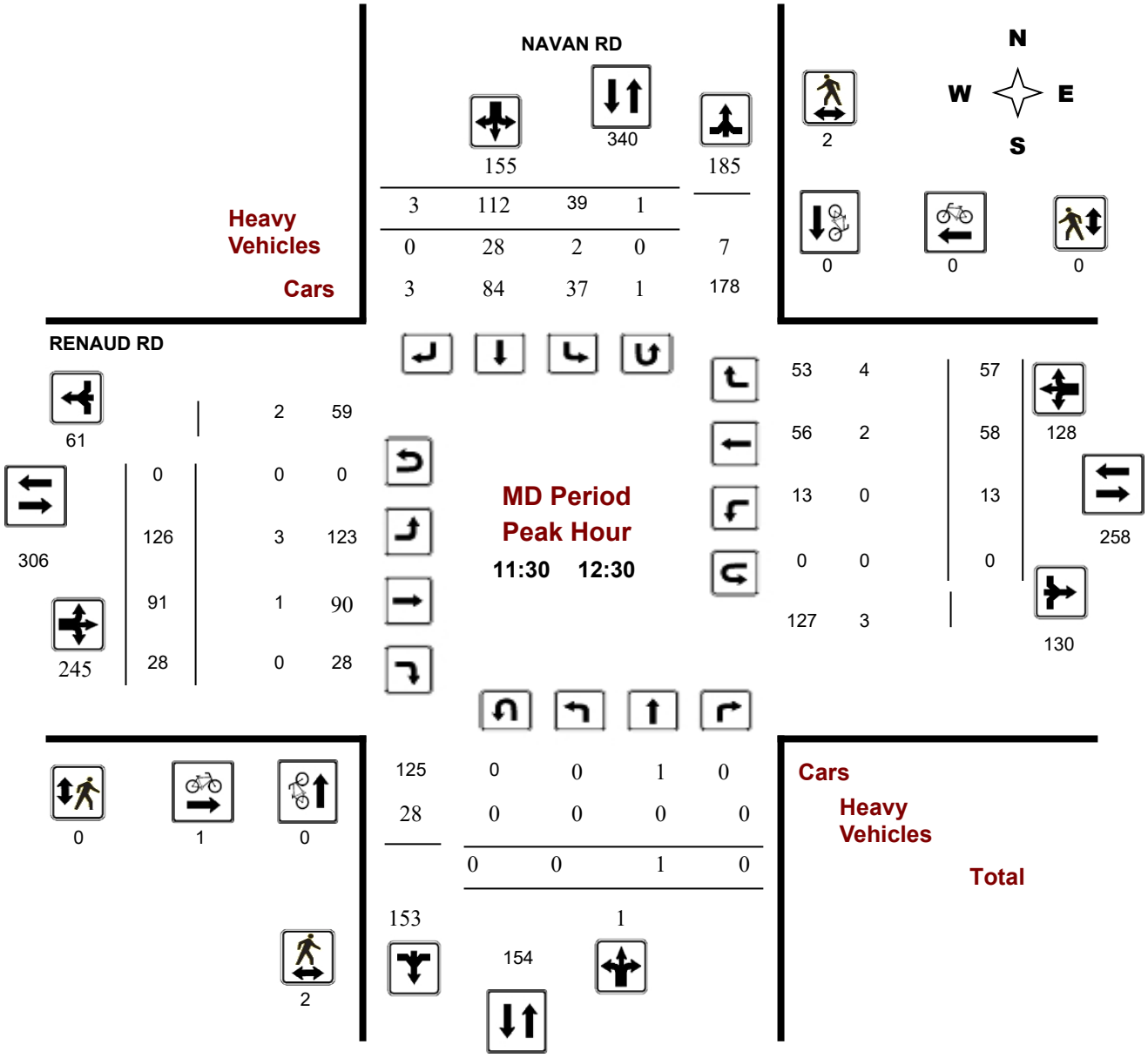
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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



Comments

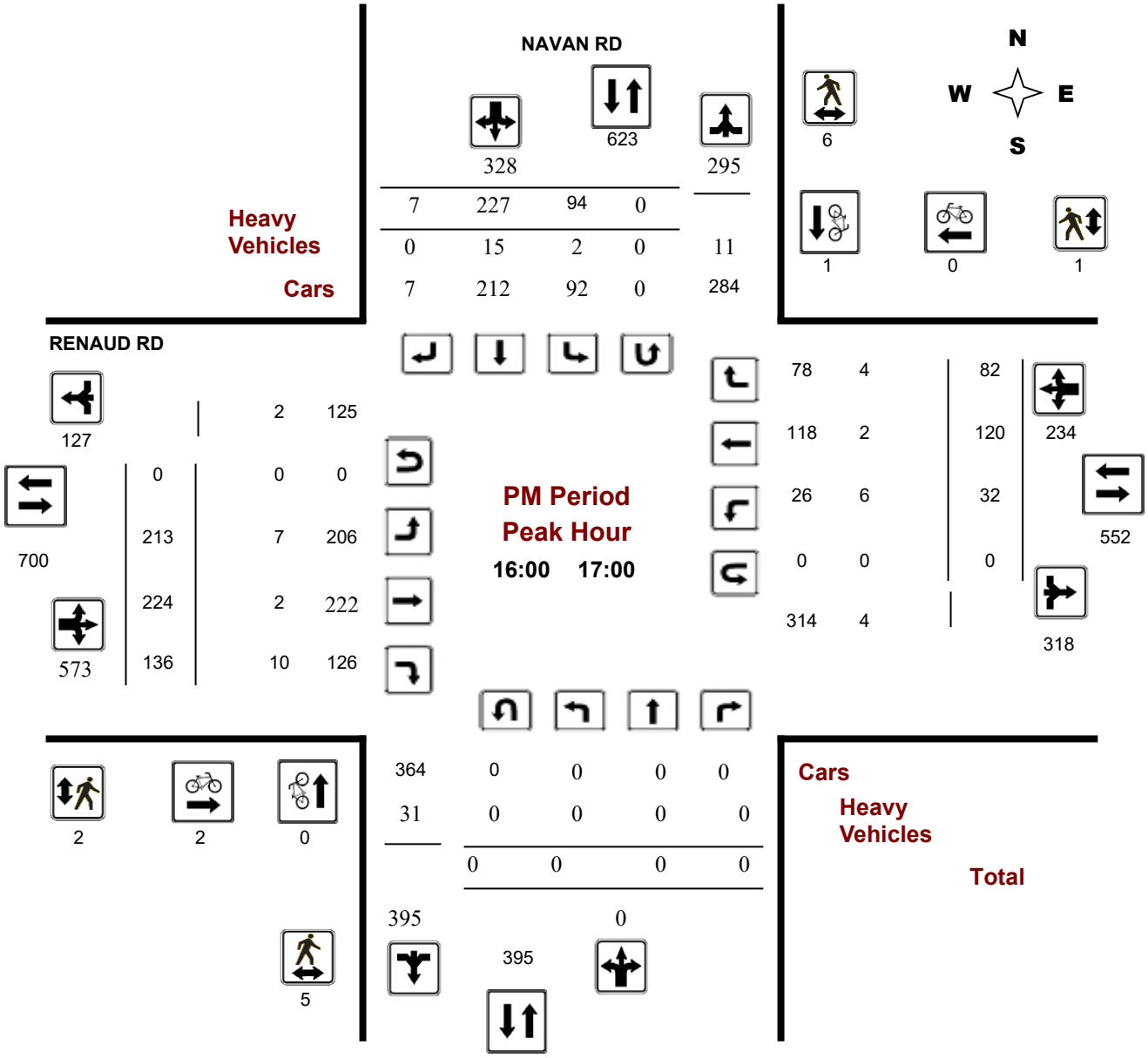
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, September 22, 2022

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 0 Westbound: 0

AADT Factor

1.00

	NAVAN RD									RENAUD RD									
	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	0	0	**0**	44	102	4	**150**	**150**	132	119	28	**279**	19	184	123	**326**	**605**	**755**
08:00 09:00	0	0	0	**0**	34	90	5	**129**	**129**	173	113	27	**313**	7	149	102	**258**	**571**	**700**
09:00 10:00	0	0	0	**0**	39	110	5	**154**	**154**	129	65	14	**208**	17	75	65	**157**	**365**	**519**
11:30 12:30	0	1	0	**1**	39	112	3	**154**	**155**	126	91	28	**245**	13	58	57	**128**	**373**	**528**
12:30 13:30	0	0	0	**0**	27	133	4	**164**	**164**	105	78	29	**212**	15	60	46	**121**	**333**	**497**
15:00 16:00	0	0	1	**1**	67	164	11	**242**	**243**	209	190	92	**491**	17	107	75	**199**	**690**	**933**
16:00 17:00	0	0	0	**0**	94	227	7	**328**	**328**	213	224	136	**573**	32	120	82	**234**	**807**	**1135**
17:00 18:00	0	0	0	**0**	87	164	8	**259**	**259**	174	183	105	**462**	22	103	83	**208**	**670**	**929**
Sub Total	0	1	1	**2**	431	1102	47	**1580**	**1582**	1261	1063	459	**2783**	142	856	633	**1631**	**4414**	**5996**
U Turns				**0**				**1**	**1**				**0**				**0**	**0**	**1**
Total	0	1	1	**2**	431	1102	47	**1581**	**1583**	1261	1063	459	**2783**	142	856	633	**1631**	**4414**	**5997**
EQ 12Hr	0	1	1	**3**	599	1532	65	**2198**	**2200**	1753	1478	638	**3868**	197	1190	880	**2267**	**6135**	**8336**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	1	1	**3**	599	2007	86	**2198**	**2200**	1753	1478	638	**3868**	197	1190	880	**2267**	**6135**	**8336**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	0	1	1	**4**	785	2629	113	**2879**	**2882**	2296	1936	836	**5067**	258	1559	1153	**2970**	**8037**	**10920**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study 15 Minute Increments

		NAVAN RD									RENAUD RD									
		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	0	0	0	4	14	0	18	18	25	14	7	46	2	32	17	51	97	115
07:15	07:30	0	0	0	0	13	31	1	45	45	37	15	5	57	7	38	35	80	137	182
07:30	07:45	0	0	0	0	11	27	1	39	39	34	44	8	86	3	55	36	94	180	219
07:45	08:00	0	0	0	0	16	30	2	48	48	36	46	8	90	7	59	35	101	191	239
08:00	08:15	0	0	0	0	12	28	2	42	42	44	22	4	70	1	44	23	68	138	180
08:15	08:30	0	0	0	0	4	15	3	22	22	46	32	9	87	0	37	28	65	152	174
08:30	08:45	0	0	0	0	11	19	0	30	30	38	32	3	73	3	51	27	81	154	184
08:45	09:00	0	0	0	0	7	28	0	35	35	45	27	11	83	3	17	24	44	127	162
09:00	09:15	0	0	0	0	11	34	0	45	45	41	16	2	59	1	19	20	40	99	144
09:15	09:30	0	0	0	0	14	28	2	44	44	34	21	4	59	5	20	15	40	99	143
09:30	09:45	0	0	0	0	7	22	1	30	30	26	10	2	38	6	23	12	41	79	109
09:45	10:00	0	0	0	0	7	26	2	35	35	28	18	6	52	5	13	18	36	88	123
11:30	11:45	0	0	0	0	7	34	1	43	43	28	26	6	60	2	16	14	32	92	135
11:45	12:00	0	1	0	1	13	24	1	38	39	28	19	8	55	4	13	16	33	88	127
12:00	12:15	0	0	0	0	11	28	1	40	40	38	23	7	68	3	11	11	25	93	133
12:15	12:30	0	0	0	0	8	26	0	34	34	32	23	7	62	4	18	16	38	100	134
12:30	12:45	0	0	0	0	7	38	0	45	45	31	15	8	54	4	14	12	30	84	129
12:45	13:00	0	0	0	0	6	33	0	39	39	31	18	10	59	3	14	13	30	89	128
13:00	13:15	0	0	0	0	7	30	3	40	40	23	19	7	49	4	11	15	30	79	119
13:15	13:30	0	0	0	0	7	32	1	40	40	20	26	4	50	4	21	6	31	81	121
15:00	15:15	0	0	1	1	13	28	1	42	43	38	45	17	100	1	24	11	36	136	179
15:15	15:30	0	0	0	0	11	35	6	52	52	50	40	20	110	6	35	30	71	181	233
15:30	15:45	0	0	0	0	15	62	1	78	78	72	51	22	145	2	21	21	44	189	267
15:45	16:00	0	0	0	0	28	39	3	70	70	49	54	33	136	8	27	13	48	184	254
16:00	16:15	0	0	0	0	25	60	0	85	85	60	51	23	134	13	30	26	69	203	288
16:15	16:30	0	0	0	0	25	59	2	86	86	54	51	40	145	5	32	15	52	197	283
16:30	16:45	0	0	0	0	19	63	2	84	84	54	66	34	154	7	29	16	52	206	290
16:45	17:00	0	0	0	0	25	45	3	73	73	45	56	39	140	7	29	25	61	201	274
17:00	17:15	0	0	0	0	19	48	2	69	69	50	44	28	122	2	30	22	54	176	245
17:15	17:30	0	0	0	0	22	54	1	77	77	54	43	30	127	8	22	16	46	173	250
17:30	17:45	0	0	0	0	32	42	2	76	76	33	53	30	116	5	18	23	46	162	238
17:45	18:00	0	0	0	0	14	20	3	37	37	37	43	17	97	7	33	22	62	159	196
Total:		0	1	1	2	431	1102	47	1581	1583	1261	1063	459	2783	142	856	633	1631	4414	5,997

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study Cyclist Volume

Time Period		NAVAN RD			RENAUD RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	0	0	0	0	1	1	1
07:30	07:45	0	0	0	0	0	0	0
07:45	08:00	0	0	0	0	0	0	0
08:00	08:15	0	0	0	0	1	1	1
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
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
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	1	0	1	1
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
15:00	15:15	1	0	1	0	1	1	2
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	1	1	1
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	1	1	0	0	0	1
16:30	16:45	0	0	0	2	0	2	2
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	1	1	1	0	1	2
17:15	17:30	0	0	0	0	1	1	1
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	1	0	1	2	0	2	3
Total		2	2	**4**	6	5	11	15

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study Pedestrian Volume

	NAVAN RD			RENAUD RD			
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	1	1	**2**	0	1	**1**	**3**
07:15 07:30	0	1	**1**	0	0	**0**	**1**
07:30 07:45	3	1	**4**	0	0	**0**	**4**
07:45 08:00	1	2	**3**	0	1	**1**	**4**
08:00 08:15	1	1	**2**	0	0	**0**	**2**
08:15 08:30	0	0	**0**	0	2	**2**	**2**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	1	0	**1**	0	0	**0**	**1**
09:00 09:15	1	0	**1**	0	0	**0**	**1**
09:15 09:30	0	1	**1**	0	0	**0**	**1**
09:30 09:45	2	0	**2**	0	1	**1**	**3**
09:45 10:00	1	1	**2**	1	0	**1**	**3**
11:30 11:45	1	0	**1**	0	0	**0**	**1**
11:45 12:00	0	0	**0**	0	0	**0**	**0**
12:00 12:15	0	1	**1**	0	0	**0**	**1**
12:15 12:30	1	1	**2**	0	0	**0**	**2**
12:30 12:45	2	0	**2**	0	0	**0**	**2**
12:45 13:00	0	2	**2**	0	0	**0**	**2**
13:00 13:15	1	0	**1**	0	0	**0**	**1**
13:15 13:30	1	0	**1**	0	0	**0**	**1**
15:00 15:15	1	2	**3**	0	0	**0**	**3**
15:15 15:30	5	0	**5**	0	2	**2**	**7**
15:30 15:45	1	0	**1**	0	4	**4**	**5**
15:45 16:00	0	0	**0**	1	1	**2**	**2**
16:00 16:15	0	3	**3**	0	0	**0**	**3**
16:15 16:30	1	3	**4**	2	0	**2**	**6**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	4	0	**4**	0	1	**1**	**5**
17:00 17:15	2	0	**2**	0	2	**2**	**4**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	1	**1**	0	0	**0**	**1**
17:45 18:00	0	1	**1**	1	0	**1**	**2**
Total	31	22	**53**	5	15	**20**	**73**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study Heavy Vehicles

		NAVAN RD									RENAUD RD									
		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	0	0	**1**	0	1	0	**2**	**3**	1	0	0	**3**	0	2	0	**2**	**5**	**4**
07:15	07:30	0	0	0	**4**	1	4	0	**8**	**12**	3	0	0	**5**	0	2	0	**3**	**8**	**10**
07:30	07:45	0	0	0	**16**	0	15	0	**19**	**35**	4	1	1	**8**	0	2	0	**3**	**11**	**23**
07:45	08:00	0	0	0	**11**	1	9	0	**12**	**23**	1	1	0	**4**	2	2	1	**7**	**11**	**17**
08:00	08:15	0	0	0	**4**	2	3	0	**8**	**12**	2	1	1	**7**	0	3	1	**7**	**14**	**13**
08:15	08:30	0	0	0	**1**	1	1	0	**4**	**5**	2	4	0	**6**	0	0	0	**5**	**11**	**8**
08:30	08:45	0	0	0	**5**	2	5	0	**13**	**18**	5	1	0	**10**	0	4	1	**8**	**18**	**18**
08:45	09:00	0	0	0	**3**	0	3	0	**13**	**16**	7	2	0	**11**	0	2	3	**7**	**18**	**17**
09:00	09:15	0	0	0	**11**	1	10	0	**16**	**27**	4	0	1	**5**	0	0	1	**2**	**7**	**17**
09:15	09:30	0	0	0	**10**	0	9	0	**10**	**20**	1	1	0	**2**	1	0	0	**2**	**4**	**12**
09:30	09:45	0	0	0	**8**	0	6	0	**6**	**14**	0	0	0	**1**	2	1	0	**3**	**4**	**9**
09:45	10:00	0	0	0	**9**	0	7	0	**8**	**17**	1	0	2	**4**	0	1	0	**1**	**5**	**11**
11:30	11:45	0	0	0	**11**	0	11	0	**11**	**22**	0	0	0	**1**	0	1	0	**1**	**2**	**12**
11:45	12:00	0	0	0	**5**	0	5	0	**8**	**13**	1	1	0	**2**	0	0	2	**3**	**5**	**9**
12:00	12:15	0	0	0	**5**	1	5	0	**8**	**13**	1	0	0	**1**	0	0	1	**2**	**3**	**8**
12:15	12:30	0	0	0	**7**	1	7	0	**10**	**17**	1	0	0	**2**	0	1	1	**3**	**5**	**11**
12:30	12:45	0	0	0	**4**	0	4	0	**5**	**9**	1	1	0	**2**	0	0	0	**1**	**3**	**6**
12:45	13:00	0	0	0	**13**	0	12	0	**16**	**29**	3	1	1	**5**	0	0	1	**2**	**7**	**18**
13:00	13:15	0	0	0	**9**	0	8	0	**10**	**19**	1	1	0	**3**	1	1	1	**4**	**7**	**13**
13:15	13:30	0	0	0	**11**	0	10	0	**11**	**22**	1	0	0	**1**	1	0	0	**1**	**2**	**12**
15:00	15:15	0	0	0	**2**	0	2	0	**4**	**6**	1	2	0	**3**	0	0	1	**3**	**6**	**6**
15:15	15:30	0	0	0	**5**	1	3	0	**8**	**13**	3	0	2	**9**	0	4	1	**6**	**15**	**14**
15:30	15:45	0	0	0	**7**	0	7	0	**16**	**23**	6	1	0	**9**	0	2	3	**6**	**15**	**19**
15:45	16:00	0	0	0	**4**	0	3	0	**6**	**10**	3	0	1	**4**	0	0	0	**0**	**4**	**7**
16:00	16:15	0	0	0	**8**	1	5	0	**12**	**20**	3	0	1	**5**	2	1	3	**7**	**12**	**16**
16:15	16:30	0	0	0	**13**	0	4	0	**7**	**20**	3	2	7	**13**	2	1	0	**5**	**18**	**19**
16:30	16:45	0	0	0	**7**	0	4	0	**6**	**13**	1	0	1	**2**	2	0	1	**3**	**5**	**9**
16:45	17:00	0	0	0	**3**	1	2	0	**3**	**6**	0	0	1	**1**	0	0	0	**1**	**2**	**4**
17:00	17:15	0	0	0	**3**	0	2	0	**5**	**8**	1	1	1	**3**	0	0	2	**3**	**6**	**7**
17:15	17:30	0	0	0	**2**	0	0	0	**1**	**3**	1	0	1	**2**	1	0	0	**1**	**3**	**3**
17:30	17:45	0	0	0	**2**	0	2	0	**3**	**5**	0	1	0	**2**	0	1	1	**3**	**5**	**5**
17:45	18:00	0	0	0	**1**	0	0	0	**1**	**2**	1	1	1	**3**	0	0	0	**1**	**4**	**3**
Total:	None	0	0	0	**205**	13	169	0	**270**	**475**	63	23	22	**139**	14	31	25	**106**	**245**	**360**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Thursday, September 22, 2022 **WO No:** 40588

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

Full Study 15 Minute U-Turn Total

		NAVAN RD		RENAUD RD		
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	1	0	0	1
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	0	0	0	0
13:15	13:30	0	0	0	0	0
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	1	0	0	1

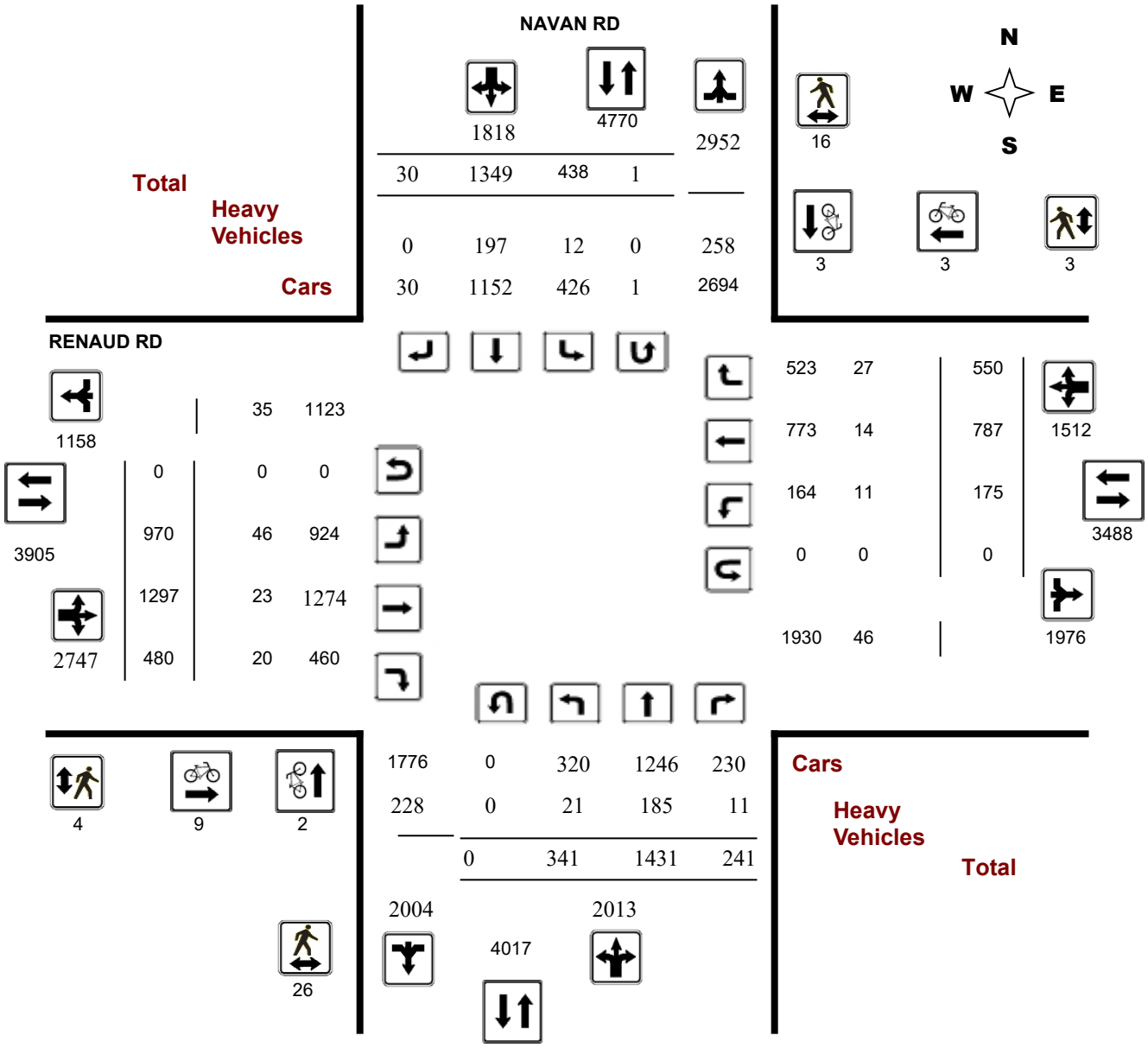
Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021
Start Time: 07:00
WO No: 39933
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

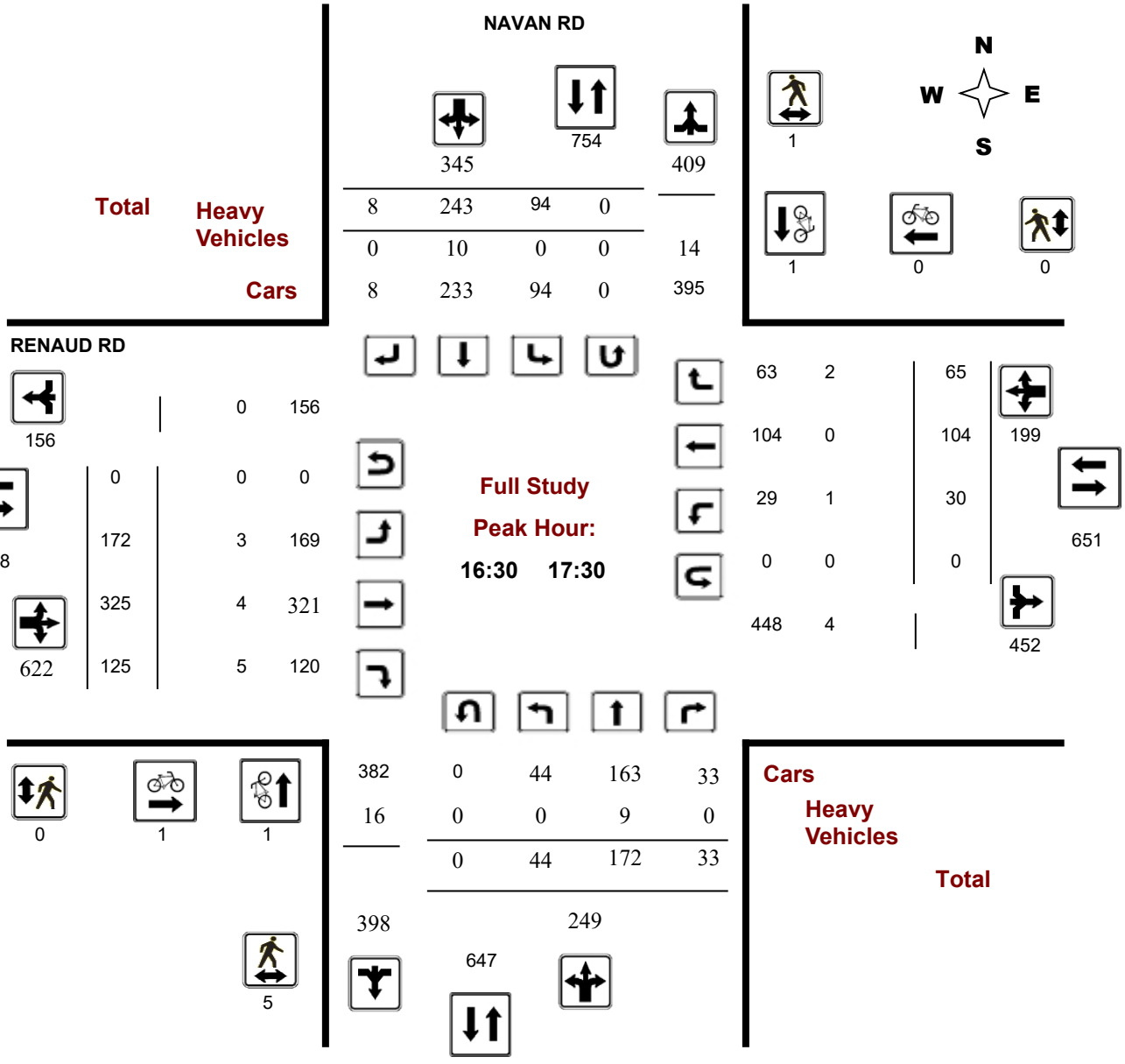
Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study Peak Hour Diagram



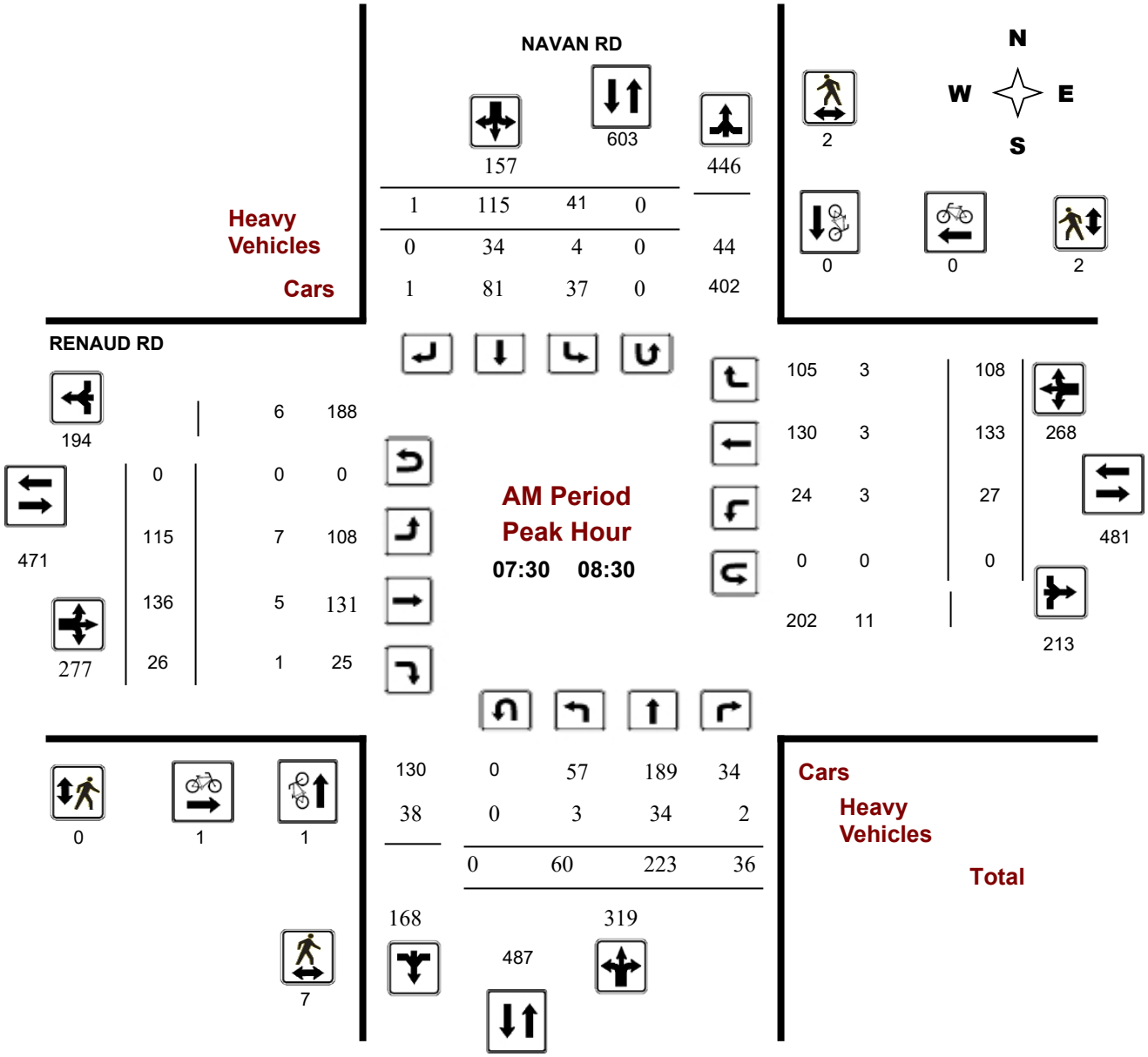
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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



Heavy Vehicles	1	115	41	0
Cars	0	34	4	0
	1	81	37	0

	130	0	57	189
	38	0	3	34
		0	60	223

44	105	3
402	130	3
	24	3
	0	0
	202	11

34	108	
2	133	
36	27	
	0	

6	188	
0	0	0
7	108	
5	131	
1	25	

0		
115		
136		
26		

168		
487	319	

Comments

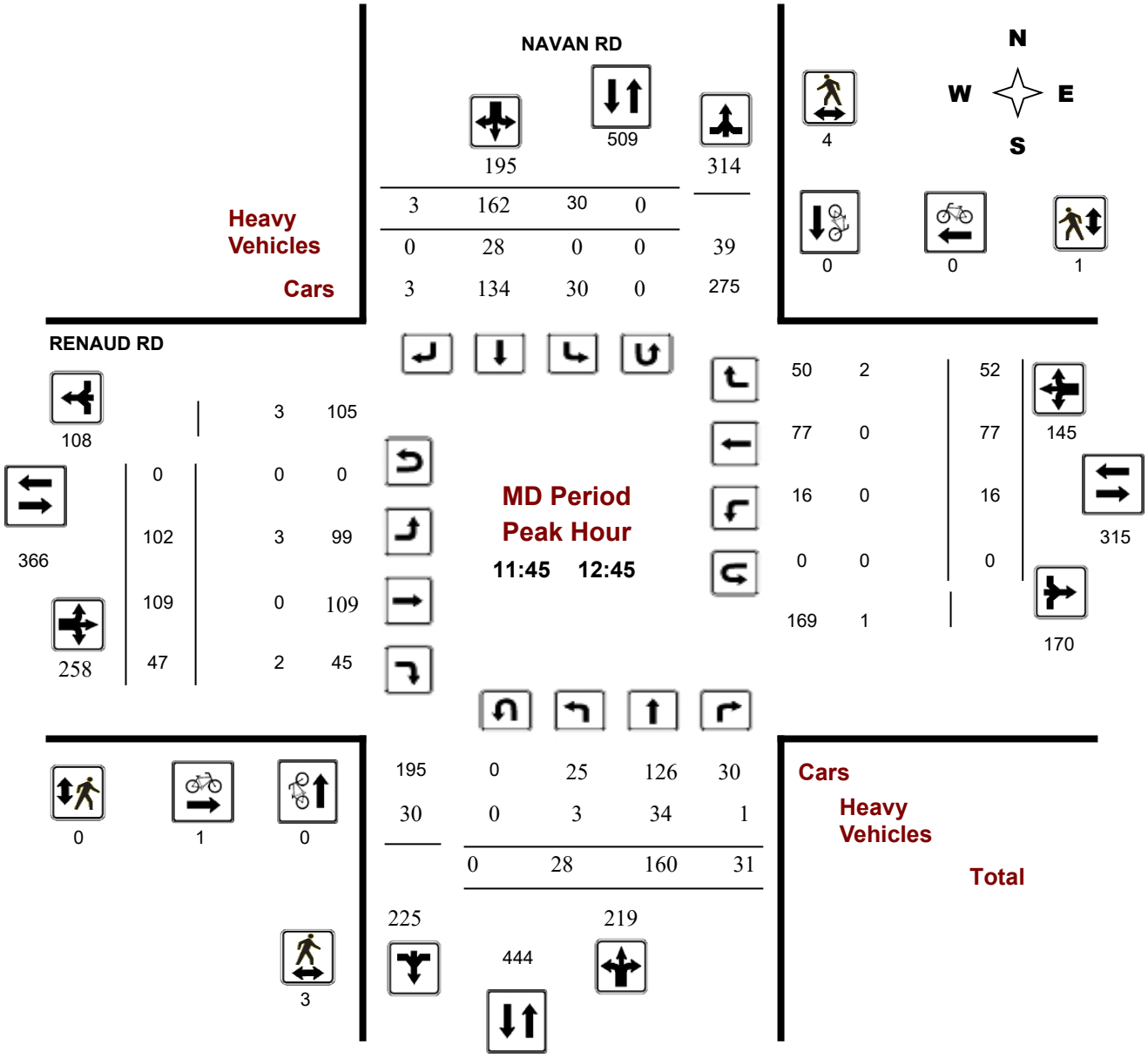
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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



Comments

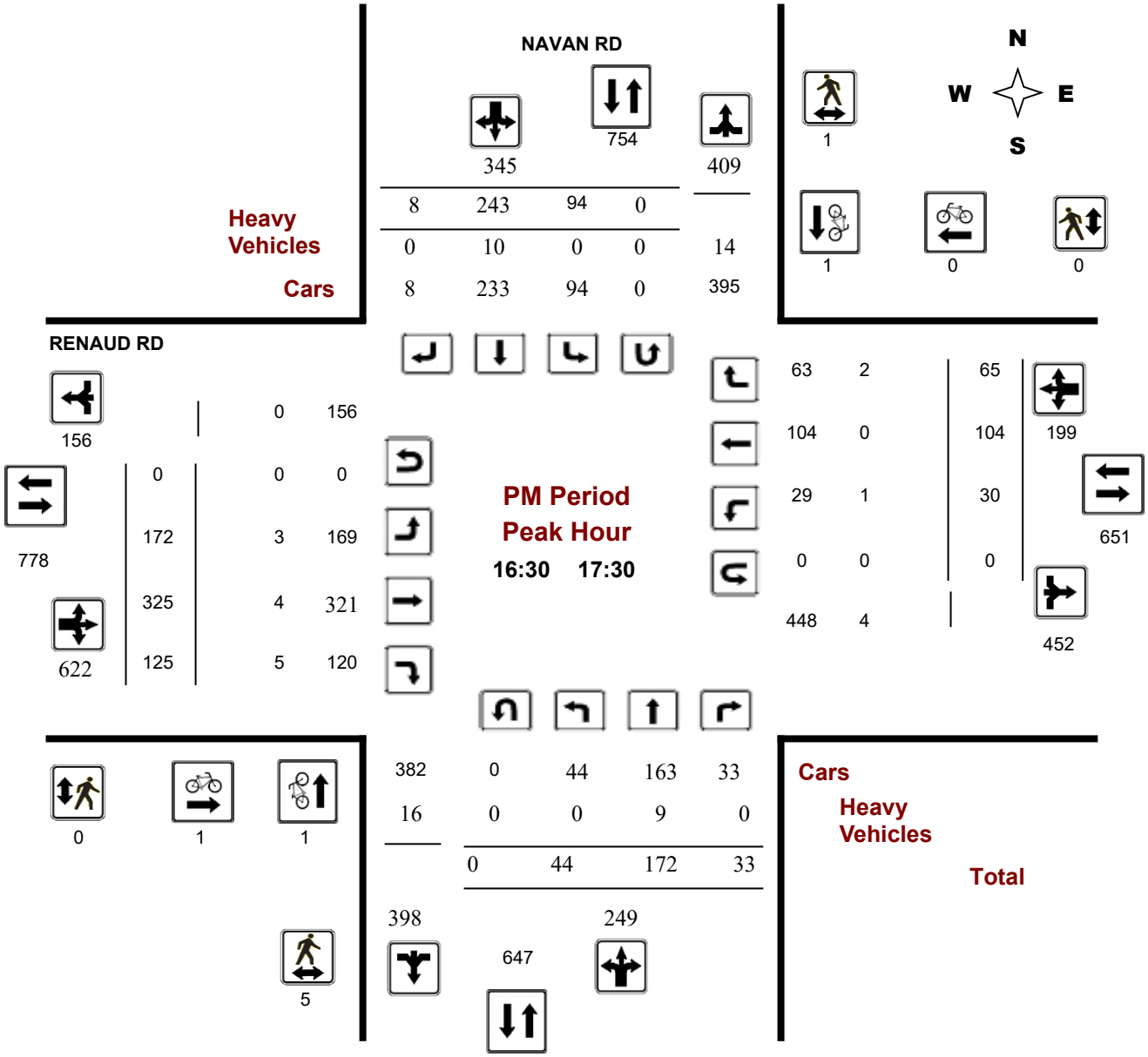
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, October 19, 2021

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 0 Westbound: 0

AADT Factor

.90

	NAVAN RD									RENAUD RD									
	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	79	197	34	**310**	31	110	0	**141**	**451**	89	101	30	**220**	22	139	109	**270**	**490**	**941**
08:00 09:00	46	213	32	**291**	47	110	1	**158**	**449**	120	134	20	**274**	21	136	93	**250**	**524**	**973**
09:00 10:00	31	162	22	**215**	29	142	2	**173**	**388**	93	80	19	**192**	12	68	44	**124**	**316**	**704**
11:30 12:30	36	169	30	**235**	34	149	4	**187**	**422**	100	89	46	**235**	15	71	59	**145**	**380**	**802**
12:30 13:30	23	149	25	**197**	40	152	2	**194**	**391**	69	109	46	**224**	12	79	47	**138**	**362**	**753**
15:00 16:00	42	202	37	**281**	71	223	6	**300**	**581**	176	222	84	**482**	36	104	62	**202**	**684**	**1265**
16:00 17:00	55	169	31	**255**	97	242	7	**346**	**601**	166	285	135	**586**	34	80	80	**194**	**780**	**1381**
17:00 18:00	29	170	30	**229**	89	221	8	**318**	**547**	157	277	100	**534**	23	110	56	**189**	**723**	**1270**
Sub Total	341	1431	241	**2013**	438	1349	30	**1817**	**3830**	970	1297	480	**2747**	175	787	550	**1512**	**4259**	**8089**
U Turns				**0**				**1**	**1**				**0**				**0**	**0**	**1**
Total	341	1431	241	**2013**	438	1349	30	**1818**	**3831**	970	1297	480	**2747**	175	787	550	**1512**	**4259**	**8090**
EQ 12Hr	474	1989	335	**2798**	609	1875	42	**2527**	**5325**	1348	1803	667	**3818**	243	1094	764	**2102**	**5920**	**11245**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	427	1790	302	**2518**	548	2211	49	**2274**	**4792**	1213	1623	600	**3436**	219	985	688	**1892**	**5328**	**10120**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	559	2345	396	**3299**	718	2896	64	**2979**	**6278**	1589	2126	786	**4501**	287	1290	901	**2479**	**6980**	**13257**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study 15 Minute Increments

		NAVAN RD									RENAUD RD									
		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	21	43	5	69	5	28	0	33	102	9	13	9	31	3	27	27	57	88	190
07:15	07:30	17	38	10	65	8	20	0	28	93	14	21	8	43	4	39	27	70	113	206
07:30	07:45	23	64	7	94	6	31	0	37	131	40	33	8	81	7	29	23	59	140	271
07:45	08:00	18	52	12	82	12	31	0	43	125	26	34	5	65	8	44	32	84	149	274
08:00	08:15	4	54	8	66	12	32	1	45	111	29	32	6	67	4	31	29	64	131	242
08:15	08:30	15	53	9	77	11	21	0	32	109	20	37	7	64	8	29	24	61	125	234
08:30	08:45	15	46	8	69	17	30	0	47	116	33	34	4	71	6	49	22	77	148	264
08:45	09:00	12	60	7	79	7	27	0	34	113	38	31	3	72	3	27	18	48	120	233
09:00	09:15	9	43	8	60	2	44	0	46	106	38	20	5	63	3	16	15	34	97	203
09:15	09:30	9	49	4	62	8	35	1	44	106	18	21	5	44	3	15	7	25	69	175
09:30	09:45	5	36	4	45	9	29	1	39	84	19	13	7	39	2	15	5	22	61	145
09:45	10:00	8	34	6	48	10	34	0	44	92	18	26	2	46	4	22	17	43	89	181
11:30	11:45	10	52	5	67	11	31	2	44	111	16	13	11	40	4	15	22	41	81	192
11:45	12:00	10	40	5	55	13	35	1	49	104	38	35	10	83	3	14	12	29	112	216
12:00	12:15	9	40	10	59	5	44	1	50	109	20	24	12	56	3	20	9	32	88	197
12:15	12:30	7	37	10	54	5	39	0	44	98	26	17	13	56	5	22	16	43	99	197
12:30	12:45	2	43	6	51	7	44	1	52	103	18	33	12	63	5	21	15	41	104	207
12:45	13:00	6	35	9	50	16	49	0	65	115	14	27	11	52	2	18	11	31	83	198
13:00	13:15	10	38	9	57	13	34	0	47	104	15	24	12	51	3	16	12	31	82	186
13:15	13:30	5	33	1	39	4	25	1	30	69	22	25	11	58	2	24	9	35	93	162
15:00	15:15	8	52	12	72	23	34	1	58	130	33	39	12	84	7	24	11	42	126	256
15:15	15:30	8	56	11	75	22	59	2	84	159	54	60	28	142	11	34	23	68	210	369
15:30	15:45	10	52	5	67	10	61	2	73	140	43	46	23	112	9	23	16	48	160	300
15:45	16:00	16	42	9	67	16	69	1	86	153	46	77	21	144	9	23	12	44	188	341
16:00	16:15	14	42	11	67	25	60	0	85	152	44	59	28	131	8	20	27	55	186	338
16:15	16:30	10	46	5	61	22	75	3	100	161	34	64	47	145	10	15	18	43	188	349
16:30	16:45	13	35	8	56	24	59	2	85	141	43	80	29	152	7	25	21	53	205	346
16:45	17:00	18	46	7	71	26	48	2	76	147	45	82	31	158	9	20	14	43	201	348
17:00	17:15	3	54	7	64	21	71	3	95	159	37	80	35	152	7	30	17	54	206	365
17:15	17:30	10	37	11	58	23	65	1	89	147	47	83	30	160	7	29	13	49	209	356
17:30	17:45	6	45	5	56	24	47	2	73	129	37	69	23	129	3	26	18	47	176	305
17:45	18:00	10	34	7	51	21	38	2	61	112	36	45	12	93	6	25	8	39	132	244
Total:		341	1431	241	2013	438	1349	30	1818	3831	970	1297	480	2747	175	787	550	1512	4259	8,090

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study Cyclist Volume

Time Period		NAVAN RD			RENAUD RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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
08:00	08:15	1	0	1	0	0	0	1
08:15	08:30	0	0	0	1	0	1	1
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	2	0	2	2
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	1	1	2	2
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	1	1	1
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	1	0	1	1
12:00	12:15	0	0	0	0	0	0	0
12:15	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
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	1	1	2	2
15:30	15:45	0	1	1	0	0	0	1
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	1	1	0	0	0	1
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	1	1	2	0	0	0	2
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	1	0	1	1
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	2	0	2	2
Total		2	3	**5**	9	3	12	17

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study Pedestrian Volume

	NAVAN RD			RENAUD RD			
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	1	0	**1**	0	0	**0**	**1**
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**
08:00 08:15	1	0	**1**	0	1	**1**	**2**
08:15 08:30	6	2	**8**	0	1	**1**	**9**
08:30 08:45	1	0	**1**	1	0	**1**	**2**
08:45 09:00	0	0	**0**	1	0	**1**	**1**
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**	1	0	**1**	**1**
11:30 11:45	0	2	**2**	0	0	**0**	**2**
11:45 12:00	2	2	**4**	0	0	**0**	**4**
12:00 12:15	0	1	**1**	0	0	**0**	**1**
12:15 12:30	1	1	**2**	0	1	**1**	**3**
12:30 12:45	0	0	**0**	0	0	**0**	**0**
12:45 13:00	1	0	**1**	0	0	**0**	**1**
13:00 13:15	0	1	**1**	0	0	**0**	**1**
13:15 13:30	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	1	**1**	0	0	**0**	**1**
15:15 15:30	7	0	**7**	0	0	**0**	**7**
15:30 15:45	0	0	**0**	1	0	**1**	**1**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	1	2	**3**	0	0	**0**	**3**
16:15 16:30	0	1	**1**	0	0	**0**	**1**
16:30 16:45	1	0	**1**	0	0	**0**	**1**
16:45 17:00	2	1	**3**	0	0	**0**	**3**
17:00 17:15	2	0	**2**	0	0	**0**	**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	2	**2**	0	0	**0**	**2**
Total	26	16	**42**	4	3	**7**	**49**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study Heavy Vehicles

		NAVAN RD									RENAUD RD									
		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	3	3	1	**15**	0	6	0	**10**	**25**	1	1	1	**6**	1	0	0	**3**	**9**	**17**
07:15	07:30	0	4	0	**10**	1	6	0	**14**	**24**	2	1	0	**3**	0	0	1	**3**	**6**	**15**
07:30	07:45	2	7	1	**22**	1	12	0	**22**	**44**	2	2	0	**7**	0	1	0	**5**	**12**	**28**
07:45	08:00	1	10	0	**27**	2	14	0	**28**	**55**	1	1	0	**4**	2	1	1	**7**	**11**	**33**
08:00	08:15	0	8	0	**13**	0	4	0	**17**	**30**	3	0	1	**5**	0	1	2	**3**	**8**	**19**
08:15	08:30	0	9	1	**15**	1	4	0	**15**	**30**	1	2	0	**3**	1	0	0	**5**	**8**	**19**
08:30	08:45	1	6	0	**19**	0	12	0	**24**	**43**	5	1	0	**9**	0	2	1	**4**	**13**	**28**
08:45	09:00	0	7	1	**14**	0	6	0	**20**	**34**	5	2	0	**8**	0	1	2	**6**	**14**	**24**
09:00	09:15	0	8	2	**23**	0	13	0	**23**	**46**	2	0	0	**2**	0	0	0	**2**	**4**	**25**
09:15	09:30	0	10	1	**20**	2	8	0	**23**	**43**	2	0	0	**2**	1	0	1	**5**	**7**	**25**
09:30	09:45	0	8	0	**13**	0	4	0	**12**	**25**	0	1	1	**2**	0	0	0	**1**	**3**	**14**
09:45	10:00	0	7	1	**18**	1	9	0	**20**	**38**	1	0	0	**1**	1	0	2	**5**	**6**	**22**
11:30	11:45	0	7	0	**14**	1	7	0	**17**	**31**	1	2	0	**3**	0	0	1	**4**	**7**	**19**
11:45	12:00	2	10	0	**22**	0	9	0	**21**	**43**	1	0	1	**4**	0	0	1	**1**	**5**	**24**
12:00	12:15	1	9	0	**16**	0	5	0	**15**	**31**	0	0	1	**2**	0	0	1	**1**	**3**	**17**
12:15	12:30	0	7	0	**14**	0	7	0	**16**	**30**	2	0	0	**2**	0	0	0	**0**	**2**	**16**
12:30	12:45	0	8	1	**16**	0	7	0	**15**	**31**	0	0	0	**0**	0	0	0	**1**	**1**	**16**
12:45	13:00	0	6	0	**12**	0	5	0	**14**	**26**	1	0	1	**2**	0	0	2	**2**	**4**	**15**
13:00	13:15	1	8	0	**15**	0	5	0	**14**	**29**	0	1	1	**3**	0	0	1	**2**	**5**	**17**
13:15	13:30	1	1	0	**8**	0	6	0	**9**	**17**	2	0	0	**4**	0	1	0	**1**	**5**	**11**
15:00	15:15	1	8	0	**11**	1	2	0	**13**	**24**	1	0	0	**2**	0	0	1	**2**	**4**	**14**
15:15	15:30	0	8	0	**19**	1	9	0	**22**	**41**	2	0	2	**7**	0	3	2	**6**	**13**	**27**
15:30	15:45	1	7	0	**14**	0	4	0	**14**	**28**	2	1	0	**5**	2	1	1	**5**	**10**	**19**
15:45	16:00	0	2	0	**8**	0	5	0	**9**	**17**	1	1	1	**3**	0	0	1	**2**	**5**	**11**
16:00	16:15	3	2	1	**12**	0	6	0	**11**	**23**	3	1	0	**8**	0	1	0	**3**	**11**	**17**
16:15	16:30	2	3	1	**23**	1	11	0	**18**	**41**	1	2	4	**9**	2	0	2	**8**	**17**	**29**
16:30	16:45	0	1	0	**5**	0	3	0	**5**	**10**	0	0	1	**1**	0	0	1	**1**	**2**	**6**
16:45	17:00	0	3	0	**9**	0	3	0	**7**	**16**	1	1	2	**4**	1	0	0	**2**	**6**	**11**
17:00	17:15	0	5	0	**10**	0	3	0	**10**	**20**	1	0	2	**3**	0	0	1	**1**	**4**	**12**
17:15	17:30	0	0	0	**1**	0	1	0	**2**	**3**	1	3	0	**4**	0	0	0	**3**	**7**	**5**
17:30	17:45	0	2	0	**3**	0	1	0	**4**	**7**	0	0	0	**1**	0	1	1	**2**	**3**	**5**
17:45	18:00	2	1	0	**4**	0	0	0	**3**	**7**	1	0	1	**5**	0	1	1	**2**	**7**	**7**
Total:	None	21	185	11	**445**	12	197	0	**467**	**912**	46	23	20	**124**	11	14	27	**98**	**222**	**567**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ NAVAN RD

Survey Date: Tuesday, October 19, 2021 **WO No:** 39933

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

Full Study 15 Minute U-Turn Total

		NAVAN RD		RENAUD RD		
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	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	1	0	0	1
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	1	0	0	1

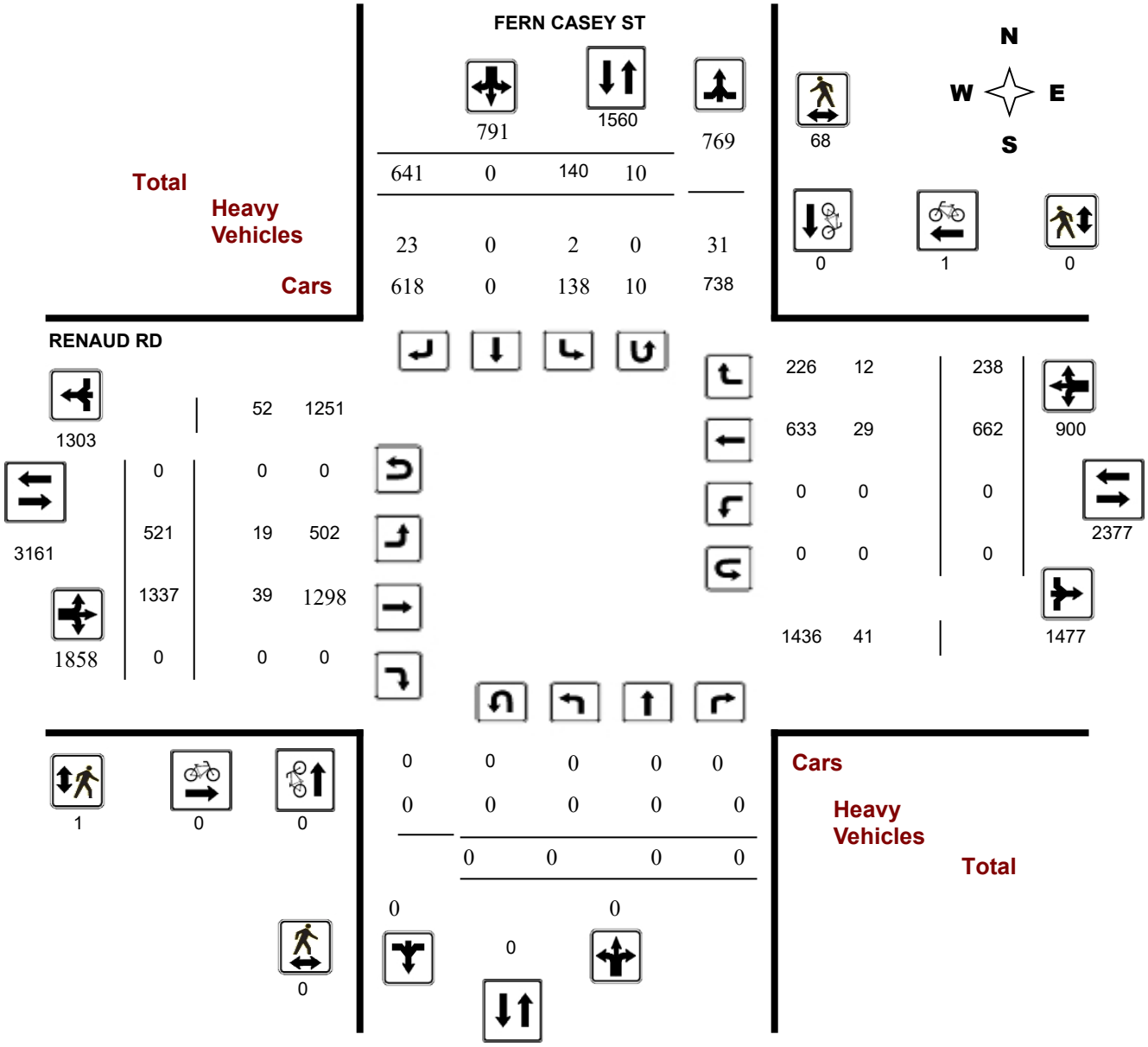
Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40726
Device: Miovision

Full Study Diagram



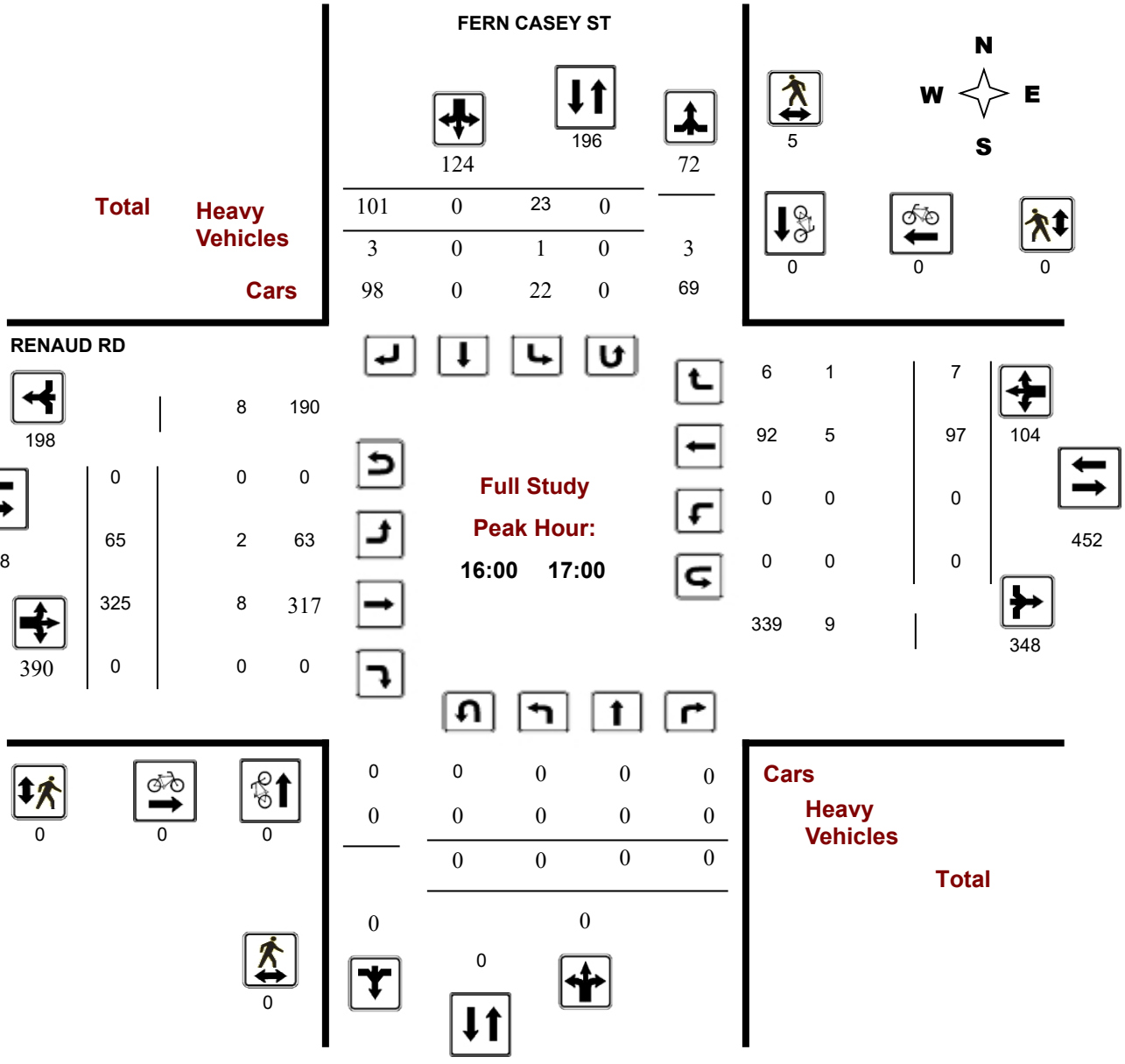
Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40726
Device: Miovision

Full Study Peak Hour Diagram



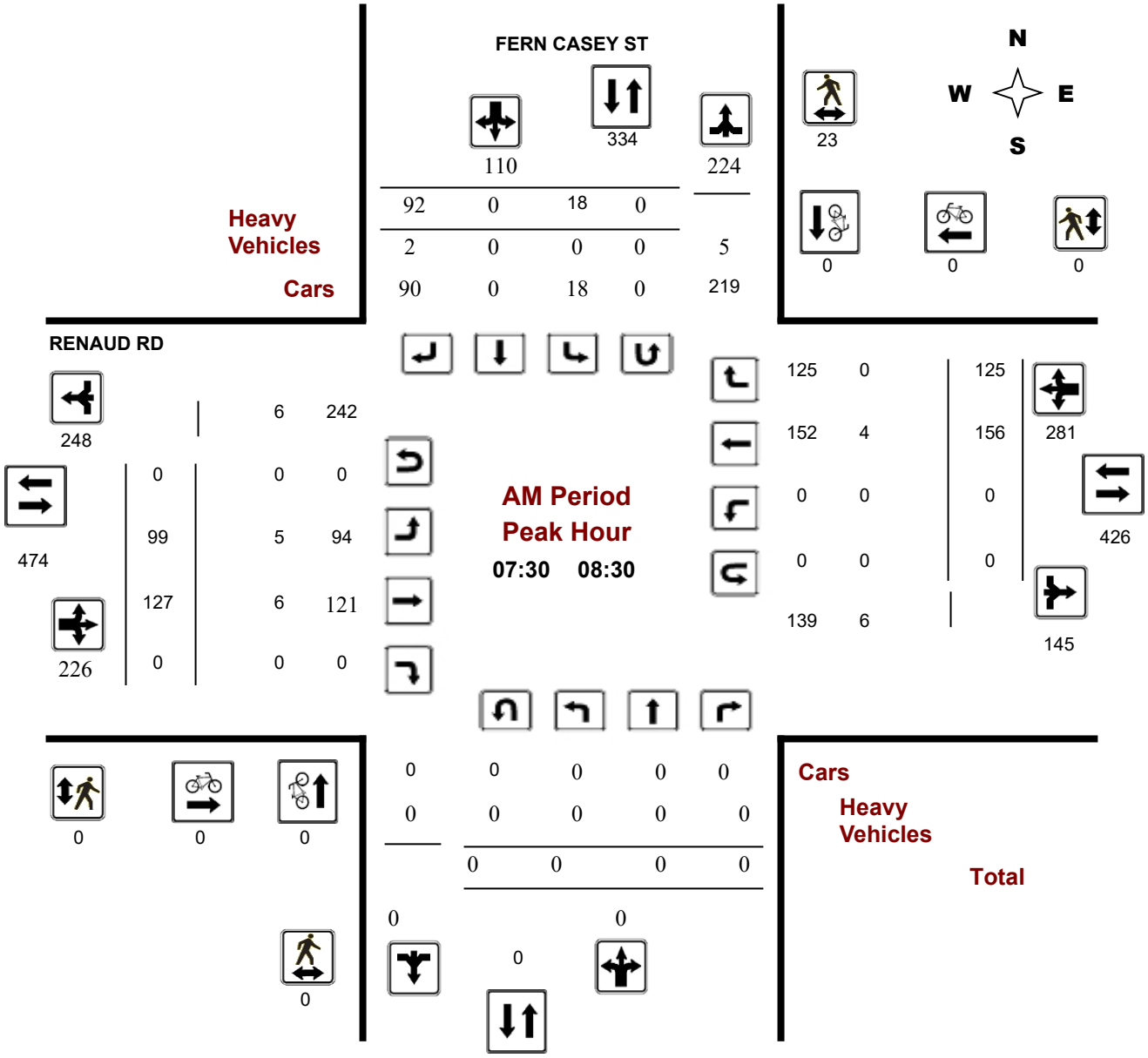
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision



Comments

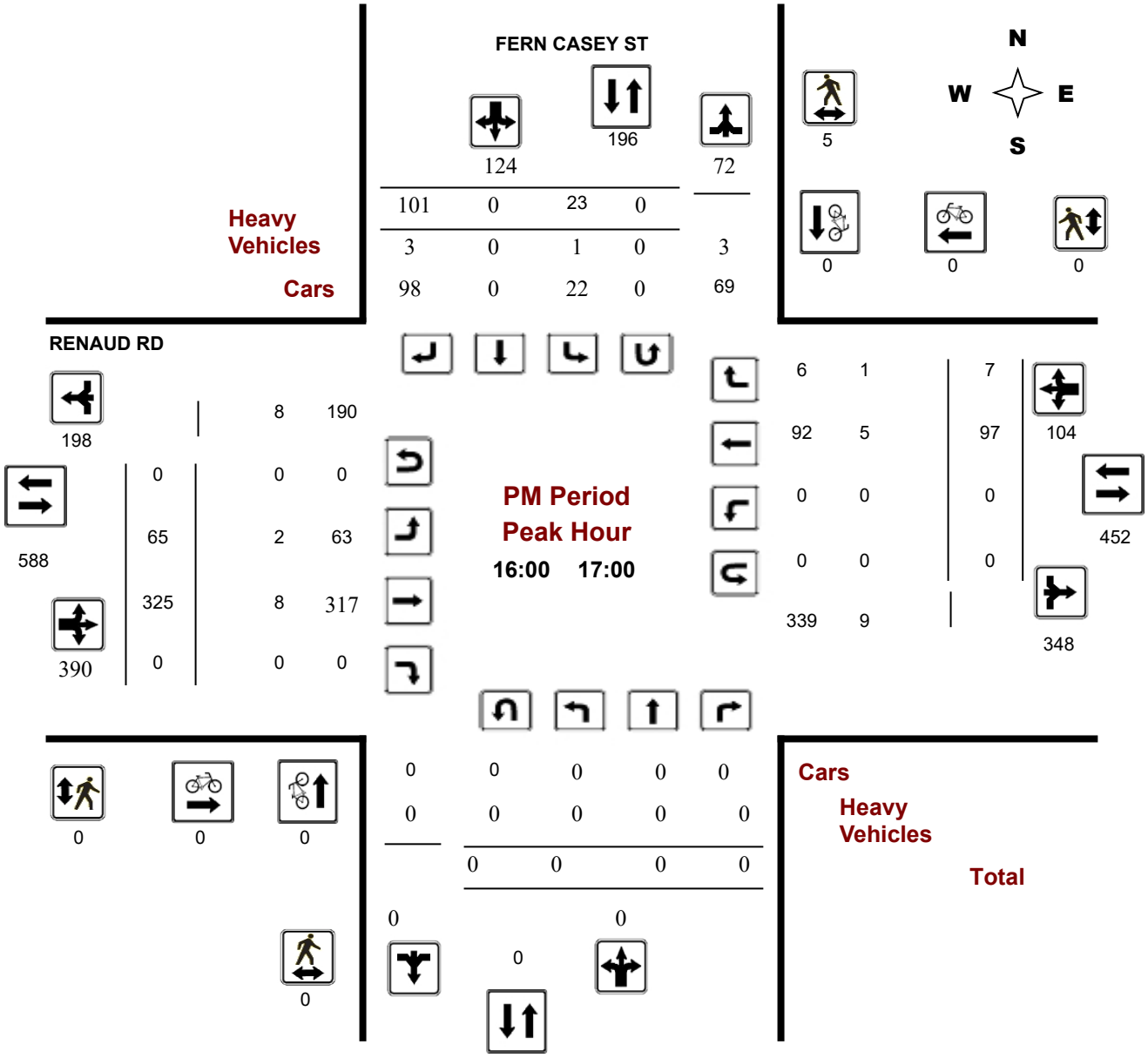
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, December 20, 2022

Total Observed U-Turns

Northbound: 0 Southbound: 10

Eastbound: 0 Westbound: 0

AADT Factor

.00

	FERN CASEY ST									RENAUD RD									
	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**
06:30 07:30	0	0	0	**0**	2	0	37	**39**	**39**	30	71	0	**101**	0	52	14	**66**	**167**	**206**
07:30 08:30	0	0	0	**0**	18	0	92	**110**	**110**	99	127	0	**226**	0	156	125	**281**	**507**	**617**
08:30 09:30	0	0	0	**0**	13	0	46	**59**	**59**	62	109	0	**171**	0	85	22	**107**	**278**	**337**
13:00 14:00	0	0	0	**0**	7	0	57	**64**	**64**	50	93	0	**143**	0	55	11	**66**	**209**	**273**
14:00 15:00	0	0	0	**0**	27	0	88	**115**	**115**	74	108	0	**182**	0	69	41	**110**	**292**	**407**
15:00 16:00	0	0	0	**0**	11	0	113	**124**	**124**	83	233	0	**316**	0	79	12	**91**	**407**	**531**
16:00 17:00	0	0	0	**0**	23	0	101	**124**	**124**	65	325	0	**390**	0	97	7	**104**	**494**	**618**
17:00 18:00	0	0	0	**0**	39	0	107	**146**	**146**	58	271	0	**329**	0	69	6	**75**	**404**	**550**
Sub Total	0	0	0	**0**	140	0	641	**781**	**781**	521	1337	0	**1858**	0	662	238	**900**	**2758**	**3539**
U Turns				**0**				**10**	**10**				**0**				**0**	**0**	**10**
Total	0	0	0	**0**	140	0	641	**791**	**791**	521	1337	0	**1858**	0	662	238	**900**	**2758**	**3549**
EQ 12Hr	0	0	0	**0**	195	0	891	**1099**	**1099**	724	1858	0	**2583**	0	920	331	**1251**	**3834**	**4933**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.00**

AVG 24Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute Increments

		FERN CASEY ST									RENAUD RD									
		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
06:30	06:45	0	0	0	0	0	0	5	5	5	4	21	0	25	0	11	0	11	36	41
06:45	07:00	0	0	0	0	0	0	6	6	6	6	18	0	24	0	7	2	9	33	39
07:00	07:15	0	0	0	0	0	0	13	13	13	7	10	0	17	0	8	4	12	29	42
07:15	07:30	0	0	0	0	2	0	13	15	15	13	22	0	35	0	26	8	34	69	84
07:30	07:45	0	0	0	0	4	0	13	17	17	27	24	0	51	0	31	34	65	116	133
07:45	08:00	0	0	0	0	9	0	27	36	36	40	45	0	85	0	59	78	137	222	258
08:00	08:15	0	0	0	0	4	0	31	35	35	14	25	0	39	0	38	11	49	88	123
08:15	08:30	0	0	0	0	1	0	21	22	22	18	33	0	51	0	28	2	30	81	103
08:30	08:45	0	0	0	0	0	0	18	18	18	13	33	0	46	0	36	3	39	85	103
08:45	09:00	0	0	0	0	8	0	9	17	17	18	27	0	45	0	23	10	33	78	95
09:00	09:15	0	0	0	0	2	0	9	12	12	19	25	0	44	0	15	4	19	63	75
09:15	09:30	0	0	0	0	3	0	10	13	13	12	24	0	36	0	11	5	16	52	65
09:30	09:45	0	0	0	0	3	0	14	17	17	14	27	0	41	0	17	2	19	60	77
09:45	10:00	0	0	0	0	1	0	16	17	17	10	25	0	35	0	15	3	18	53	70
13:30	13:45	0	0	0	0	2	0	13	15	15	13	16	0	29	0	16	0	16	45	60
13:45	14:00	0	0	0	0	1	0	14	16	16	13	25	0	38	0	7	6	13	51	67
14:00	14:15	0	0	0	0	3	0	14	23	23	21	24	0	45	0	15	11	26	71	94
14:15	14:30	0	0	0	0	15	0	33	50	50	20	30	0	50	0	21	25	46	96	146
14:30	14:45	0	0	0	0	9	0	23	32	32	14	28	0	42	0	18	3	21	63	95
14:45	15:00	0	0	0	0	0	0	18	18	18	19	26	0	45	0	15	2	17	62	80
15:00	15:15	0	0	0	0	2	0	32	34	34	15	36	0	51	0	16	5	21	72	106
15:15	15:30	0	0	0	0	5	0	28	33	33	30	56	0	86	0	28	2	30	116	149
15:30	15:45	0	0	0	0	2	0	28	30	30	23	61	0	84	0	16	4	20	104	134
15:45	16:00	0	0	0	0	2	0	25	27	27	15	80	0	95	0	19	1	20	115	142
16:00	16:15	0	0	0	0	4	0	30	34	34	11	71	0	82	0	30	5	35	117	151
16:15	16:30	0	0	0	0	4	0	22	26	26	23	90	0	113	0	16	2	18	131	157
16:30	16:45	0	0	0	0	10	0	22	32	32	11	96	0	107	0	20	0	20	127	159
16:45	17:00	0	0	0	0	5	0	27	32	32	20	68	0	88	0	31	0	31	119	151
17:00	17:15	0	0	0	0	6	0	25	31	31	19	69	0	88	0	21	2	23	111	142
17:15	17:30	0	0	0	0	10	0	28	38	38	13	67	0	80	0	16	2	18	98	136
17:30	17:45	0	0	0	0	15	0	29	44	44	9	79	0	88	0	14	0	14	102	146
17:45	18:00	0	0	0	0	8	0	25	33	33	17	56	0	73	0	18	2	20	93	126
Total:		0	0	0	0	140	0	641	791	791	521	1337	0	1858	0	662	238	900	2758	3,549

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study Cyclist Volume

Time Period		FERN CASEY ST			RENAUD RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
06:30	06:45	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0
07:00	07:15	0	0	0	0	1	1	1
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
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
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
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
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
Total		0	0	**0**	0	1	1	1

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study Pedestrian Volume

	FERN CASEY ST			RENAUD RD			
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**
06:30 06:45	0	0	**0**	0	0	**0**	**0**
06:45 07:00	0	1	**1**	0	0	**0**	**1**
07:00 07:15	0	1	**1**	0	0	**0**	**1**
07:15 07:30	0	2	**2**	1	0	**1**	**3**
07:30 07:45	0	7	**7**	0	0	**0**	**7**
07:45 08:00	0	11	**11**	0	0	**0**	**11**
08:00 08:15	0	4	**4**	0	0	**0**	**4**
08:15 08:30	0	1	**1**	0	0	**0**	**1**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	0	0	**0**	0	0	**0**	**0**
09:00 09:15	0	1	**1**	0	0	**0**	**1**
09:15 09:30	0	4	**4**	0	0	**0**	**4**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
13:30 13:45	0	0	**0**	0	0	**0**	**0**
13:45 14:00	0	0	**0**	0	0	**0**	**0**
14:00 14:15	0	0	**0**	0	0	**0**	**0**
14:15 14:30	0	12	**12**	0	0	**0**	**12**
14:30 14:45	0	7	**7**	0	0	**0**	**7**
14:45 15:00	0	2	**2**	0	0	**0**	**2**
15:00 15:15	0	1	**1**	0	0	**0**	**1**
15:15 15:30	0	7	**7**	0	0	**0**	**7**
15:30 15:45	0	1	**1**	0	0	**0**	**1**
15:45 16:00	0	1	**1**	0	0	**0**	**1**
16:00 16:15	0	1	**1**	0	0	**0**	**1**
16:15 16:30	0	3	**3**	0	0	**0**	**3**
16:30 16:45	0	1	**1**	0	0	**0**	**1**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
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**
Total	0	68	**68**	1	0	**1**	**69**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study Heavy Vehicles

		FERN CASEY ST									RENAUD RD									
		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**
06:30	06:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**1**	0	1	0	**1**	**2**	**1**
06:45	07:00	0	0	0	**0**	0	0	0	**1**	**1**	1	1	0	**2**	0	0	0	**1**	**3**	**2**
07:00	07:15	0	0	0	**0**	0	0	0	**1**	**1**	0	1	0	**2**	0	1	1	**3**	**5**	**3**
07:15	07:30	0	0	0	**0**	0	0	1	**3**	**3**	1	1	0	**3**	0	0	1	**2**	**5**	**4**
07:30	07:45	0	0	0	**0**	0	0	0	**1**	**1**	1	2	0	**3**	0	0	0	**2**	**5**	**3**
07:45	08:00	0	0	0	**0**	0	0	0	**2**	**2**	2	0	0	**4**	0	2	0	**2**	**6**	**4**
08:00	08:15	0	0	0	**0**	0	0	2	**2**	**2**	0	1	0	**4**	0	1	0	**2**	**6**	**4**
08:15	08:30	0	0	0	**0**	0	0	0	**2**	**2**	2	3	0	**6**	0	1	0	**4**	**10**	**6**
08:30	08:45	0	0	0	**0**	0	0	1	**2**	**2**	0	2	0	**7**	0	4	1	**7**	**14**	**8**
08:45	09:00	0	0	0	**0**	0	0	1	**5**	**5**	0	1	0	**6**	0	4	4	**9**	**15**	**10**
09:00	09:15	0	0	0	**0**	0	0	2	**5**	**5**	2	1	0	**5**	0	0	1	**2**	**7**	**6**
09:15	09:30	0	0	0	**0**	0	0	0	**3**	**3**	3	1	0	**4**	0	0	0	**1**	**5**	**4**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	0	0	**3**	**6**	**3**
09:45	10:00	0	0	0	**0**	0	0	1	**2**	**2**	0	1	0	**3**	0	1	1	**3**	**6**	**4**
13:30	13:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
13:45	14:00	0	0	0	**0**	1	0	1	**3**	**3**	1	2	0	**4**	0	0	0	**3**	**7**	**5**
14:00	14:15	0	0	0	**0**	0	0	0	**1**	**1**	1	0	0	**2**	0	1	0	**1**	**3**	**2**
14:15	14:30	0	0	0	**0**	0	0	0	**2**	**2**	1	0	0	**6**	0	5	1	**6**	**12**	**7**
14:30	14:45	0	0	0	**0**	0	0	2	**2**	**2**	0	1	0	**3**	0	0	0	**1**	**4**	**3**
14:45	15:00	0	0	0	**0**	0	0	2	**2**	**2**	0	2	0	**4**	0	0	0	**2**	**6**	**4**
15:00	15:15	0	0	0	**0**	0	0	3	**4**	**4**	1	1	0	**6**	0	1	0	**2**	**8**	**6**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**3**	0	1	0	**3**	**6**	**3**
15:30	15:45	0	0	0	**0**	0	0	1	**3**	**3**	1	1	0	**3**	0	0	1	**2**	**5**	**4**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
16:00	16:15	0	0	0	**0**	0	0	2	**4**	**4**	1	1	0	**7**	0	3	1	**5**	**12**	**8**
16:15	16:30	0	0	0	**0**	1	0	0	**2**	**2**	1	4	0	**5**	0	0	0	**5**	**10**	**6**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
16:45	17:00	0	0	0	**0**	0	0	1	**1**	**1**	0	2	0	**4**	0	1	0	**3**	**7**	**4**
17:00	17:15	0	0	0	**0**	0	0	1	**1**	**1**	0	1	0	**2**	0	0	0	**1**	**3**	**2**
17:15	17:30	0	0	0	**0**	0	0	1	**1**	**1**	0	0	0	**1**	0	0	0	**0**	**1**	**1**
17:30	17:45	0	0	0	**0**	0	0	1	**1**	**1**	0	0	0	**2**	0	1	0	**1**	**3**	**2**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
Total:	None	0	0	0	**0**	2	0	23	**56**	**56**	19	39	0	**110**	0	29	12	**82**	**192**	**124**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

FERN CASEY ST @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40726

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		FERN CASEY ST		RENAUD RD		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
06:30	06:45	0	0	0	0	0
06:45	07:00	0	0	0	0	0
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	1	0	0	1
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
13:30	13:45	0	0	0	0	0
13:45	14:00	0	1	0	0	1
14:00	14:15	0	6	0	0	6
14:15	14:30	0	2	0	0	2
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
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	10	0	0	10

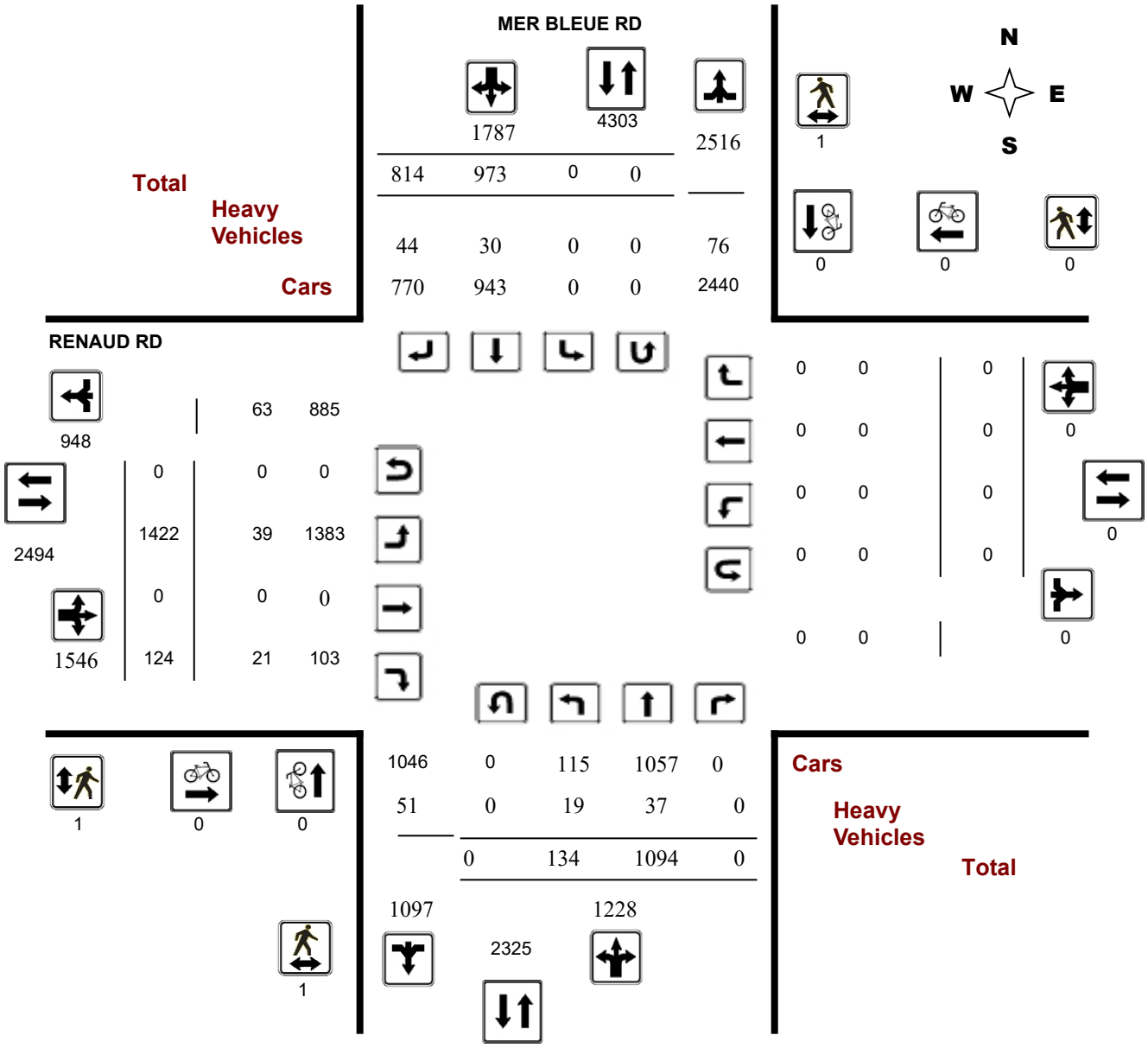
Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40730
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

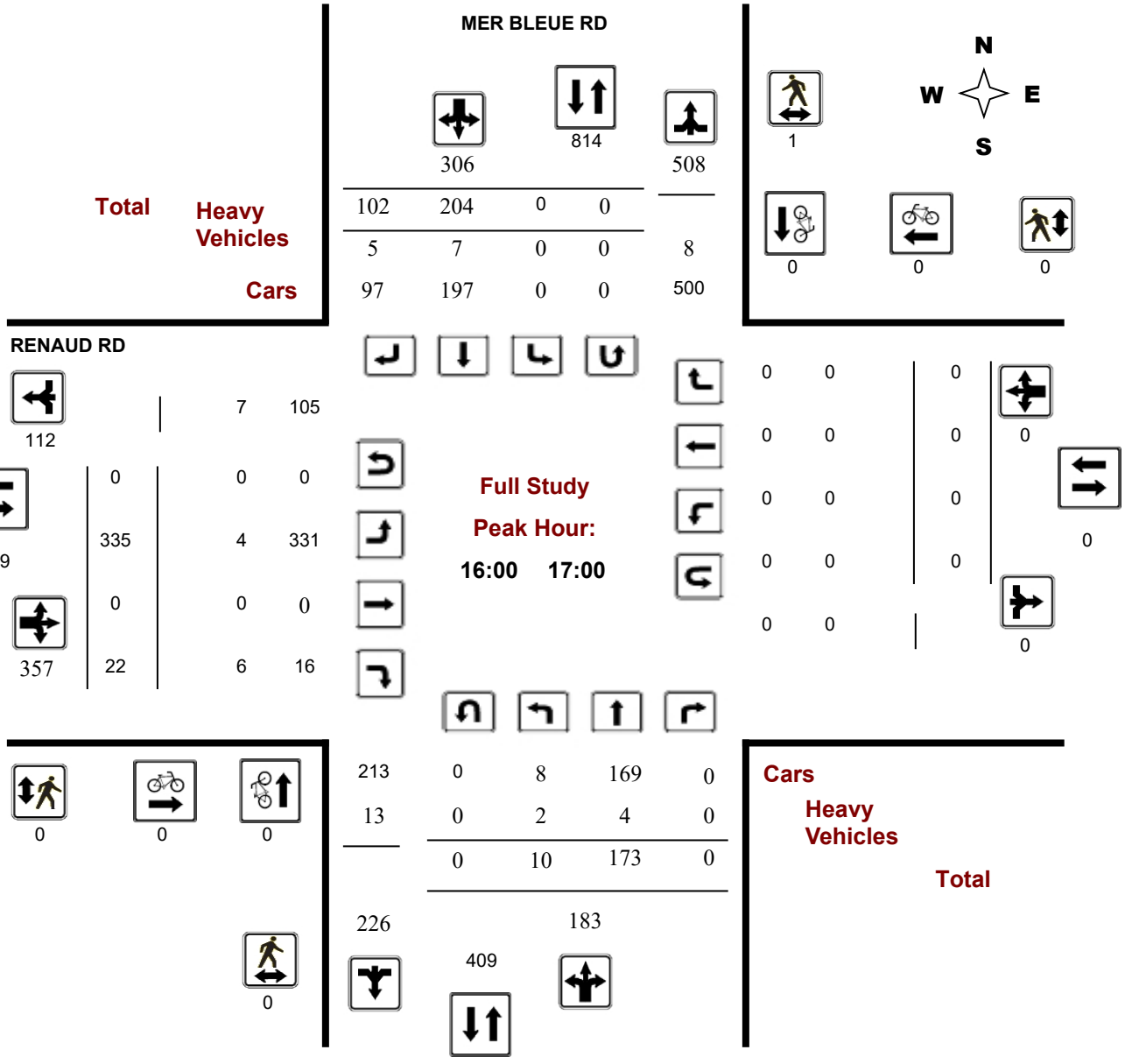
Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study Peak Hour Diagram



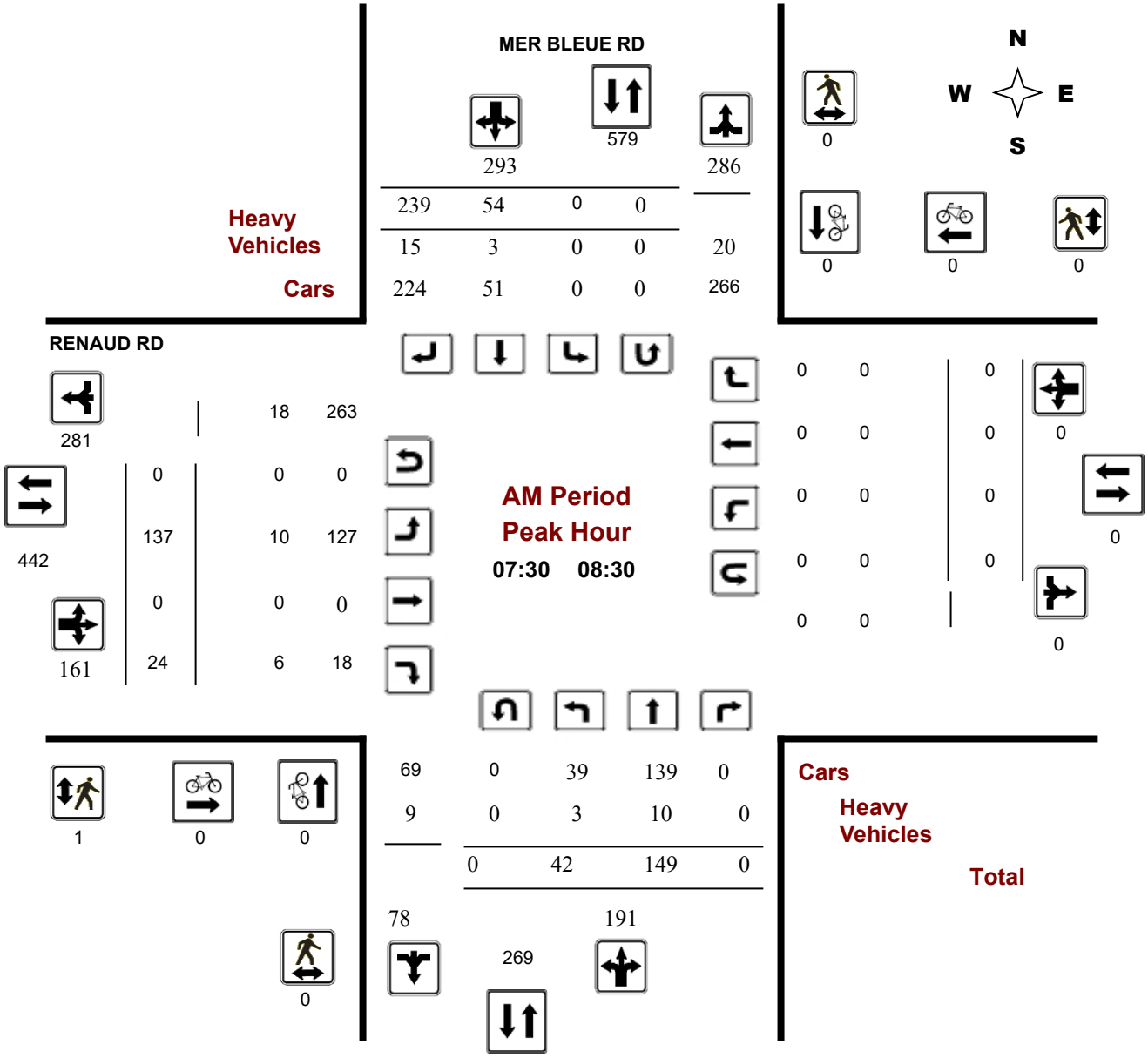
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision



Comments

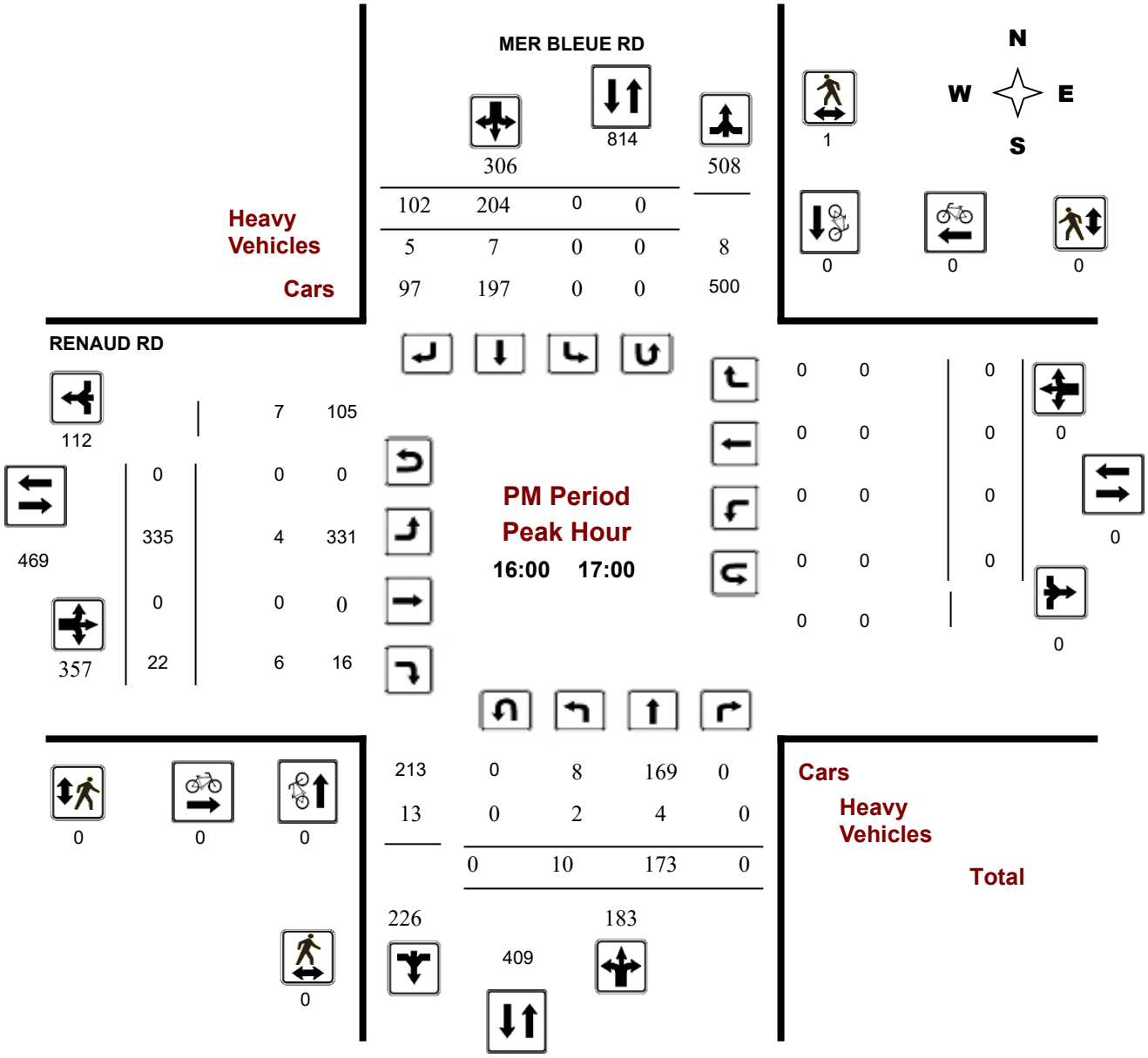
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, December 20, 2022

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.00

	MER BLEUE RD									RENAUD RD									
	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**
06:30 07:30	15	88	0	**103**	0	54	67	**121**	**224**	55	0	5	**60**	0	0	0	**0**	**60**	**284**
07:30 08:30	42	149	0	**191**	0	54	239	**293**	**484**	137	0	24	**161**	0	0	0	**0**	**161**	**645**
08:30 09:30	15	145	0	**160**	0	81	94	**175**	**335**	120	0	9	**129**	0	0	0	**0**	**129**	**464**
13:00 14:00	15	133	0	**148**	0	98	62	**160**	**308**	98	0	10	**108**	0	0	0	**0**	**108**	**416**
14:00 15:00	20	123	0	**143**	0	149	87	**236**	**379**	144	0	20	**164**	0	0	0	**0**	**164**	**543**
15:00 16:00	9	128	0	**137**	0	176	82	**258**	**395**	232	0	23	**255**	0	0	0	**0**	**255**	**650**
16:00 17:00	10	173	0	**183**	0	204	102	**306**	**489**	335	0	22	**357**	0	0	0	**0**	**357**	**846**
17:00 18:00	8	155	0	**163**	0	157	81	**238**	**401**	301	0	11	**312**	0	0	0	**0**	**312**	**713**
Sub Total	134	1094	0	**1228**	0	973	814	**1787**	**3015**	1422	0	124	**1546**	0	0	0	**0**	**1546**	**4561**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	134	1094	0	**1228**	0	973	814	**1787**	**3015**	1422	0	124	**1546**	0	0	0	**0**	**1546**	**4561**
EQ 12Hr	186	1521	0	**1707**	0	1352	1131	**2484**	**4191**	1977	0	172	**2149**	0	0	0	**0**	**2149**	**6340**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.00**						
AVG 24Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute Increments

		MER BLEUE RD									RENAUD RD									
		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
06:30	06:45	4	16	0	20	0	8	11	19	39	17	0	0	17	0	0	0	0	17	56
06:45	07:00	2	20	0	22	0	14	8	22	44	13	0	0	13	0	0	0	0	13	57
07:00	07:15	4	19	0	23	0	18	20	38	61	9	0	3	12	0	0	0	0	12	73
07:15	07:30	5	33	0	38	0	14	28	42	80	16	0	2	18	0	0	0	0	18	98
07:30	07:45	20	42	0	62	0	13	68	81	143	26	0	8	34	0	0	0	0	34	177
07:45	08:00	16	29	0	45	0	13	103	116	161	42	0	10	52	0	0	0	0	52	213
08:00	08:15	2	37	0	39	0	8	43	51	90	35	0	1	36	0	0	0	0	36	126
08:15	08:30	4	41	0	45	0	20	25	45	90	34	0	5	39	0	0	0	0	39	129
08:30	08:45	7	37	0	44	0	19	40	59	103	33	0	1	34	0	0	0	0	34	137
08:45	09:00	7	43	0	50	0	25	25	50	100	33	0	7	40	0	0	0	0	40	140
09:00	09:15	0	31	0	31	0	13	15	28	59	28	0	1	29	0	0	0	0	29	88
09:15	09:30	1	34	0	35	0	24	14	38	73	26	0	0	26	0	0	0	0	26	99
09:30	09:45	2	38	0	40	0	15	13	28	68	27	0	3	30	0	0	0	0	30	98
09:45	10:00	6	41	0	47	0	23	13	36	83	25	0	1	26	0	0	0	0	26	109
13:30	13:45	4	29	0	33	0	28	20	48	81	23	0	6	29	0	0	0	0	29	110
13:45	14:00	3	25	0	28	0	32	16	48	76	23	0	0	23	0	0	0	0	23	99
14:00	14:15	10	22	0	32	0	42	31	73	105	26	0	2	28	0	0	0	0	28	133
14:15	14:30	3	37	0	40	0	34	27	61	101	55	0	8	63	0	0	0	0	63	164
14:30	14:45	3	30	0	33	0	35	15	50	83	36	0	7	43	0	0	0	0	43	126
14:45	15:00	4	34	0	38	0	38	14	52	90	27	0	3	30	0	0	0	0	30	120
15:00	15:15	2	27	0	29	0	45	16	61	90	35	0	5	40	0	0	0	0	40	130
15:15	15:30	3	34	0	37	0	40	23	63	100	56	0	6	62	0	0	0	0	62	162
15:30	15:45	3	37	0	40	0	46	21	67	107	56	0	4	60	0	0	0	0	60	167
15:45	16:00	1	30	0	31	0	45	22	67	98	85	0	8	93	0	0	0	0	93	191
16:00	16:15	2	33	0	35	0	47	36	83	118	78	0	5	83	0	0	0	0	83	201
16:15	16:30	4	49	0	53	0	56	13	69	122	89	0	5	94	0	0	0	0	94	216
16:30	16:45	1	44	0	45	0	46	29	75	120	83	0	6	89	0	0	0	0	89	209
16:45	17:00	3	47	0	50	0	55	24	79	129	85	0	6	91	0	0	0	0	91	220
17:00	17:15	3	40	0	43	0	41	21	62	105	66	0	2	68	0	0	0	0	68	173
17:15	17:30	1	46	0	47	0	37	20	57	104	84	0	3	87	0	0	0	0	87	191
17:30	17:45	1	35	0	36	0	44	18	62	98	84	0	5	89	0	0	0	0	89	187
17:45	18:00	3	34	0	37	0	35	22	57	94	67	0	1	68	0	0	0	0	68	162
Total:		134	1094	0	1228	0	973	814	1787	3015	1422	0	124	1546	0	0	0	0	1546	4,561

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study Cyclist Volume

Time Period		MER BLEUE RD			RENAUD RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
06:30	06:45	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0
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
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
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
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
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
Total		0	0	**0**	0	0	0	0

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study Pedestrian Volume

	MER BLEUE RD			RENAUD RD			
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**
06:30 06:45	0	0	**0**	0	0	**0**	**0**
06:45 07:00	0	0	**0**	0	0	**0**	**0**
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**	1	0	**1**	**1**
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**
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**
13:30 13:45	0	0	**0**	0	0	**0**	**0**
13:45 14:00	0	0	**0**	0	0	**0**	**0**
14:00 14:15	0	0	**0**	0	0	**0**	**0**
14:15 14:30	0	0	**0**	0	0	**0**	**0**
14:30 14:45	0	0	**0**	0	0	**0**	**0**
14:45 15:00	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	1	0	**1**	0	0	**0**	**1**
16:00 16:15	0	1	**1**	0	0	**0**	**1**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
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**
Total	1	1	**2**	1	0	**1**	**3**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study Heavy Vehicles

		MER BLEUE RD									RENAUD RD									
		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**
06:30	06:45	1	1	0	**3**	0	1	0	**2**	**5**	0	0	0	**1**	0	0	0	**0**	**1**	**3**
06:45	07:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
07:00	07:15	2	2	0	**4**	0	0	1	**4**	**8**	1	0	0	**4**	0	0	0	**0**	**4**	**6**
07:15	07:30	0	3	0	**4**	0	1	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
07:30	07:45	3	5	0	**12**	0	1	11	**20**	**32**	3	0	3	**20**	0	0	0	**0**	**20**	**26**
07:45	08:00	0	2	0	**5**	0	1	2	**10**	**15**	5	0	2	**9**	0	0	0	**0**	**9**	**12**
08:00	08:15	0	3	0	**4**	0	1	2	**7**	**11**	1	0	0	**3**	0	0	0	**0**	**3**	**7**
08:15	08:30	0	0	0	**1**	0	0	0	**1**	**2**	1	0	1	**2**	0	0	0	**0**	**2**	**2**
08:30	08:45	0	2	0	**3**	0	1	7	**10**	**13**	0	0	0	**7**	0	0	0	**0**	**7**	**10**
08:45	09:00	0	3	0	**5**	0	1	4	**9**	**14**	1	0	1	**6**	0	0	0	**0**	**6**	**10**
09:00	09:15	0	0	0	**0**	0	0	0	**1**	**1**	1	0	0	**1**	0	0	0	**0**	**1**	**1**
09:15	09:30	0	2	0	**6**	0	4	0	**6**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
09:30	09:45	0	0	0	**2**	0	0	0	**0**	**2**	0	0	2	**2**	0	0	0	**0**	**2**	**2**
09:45	10:00	1	0	0	**2**	0	1	0	**2**	**4**	1	0	0	**2**	0	0	0	**0**	**2**	**3**
13:30	13:45	2	1	0	**4**	0	0	4	**6**	**10**	1	0	1	**8**	0	0	0	**0**	**8**	**9**
13:45	14:00	1	0	0	**1**	0	0	2	**4**	**5**	2	0	0	**5**	0	0	0	**0**	**5**	**5**
14:00	14:15	5	1	0	**6**	0	0	1	**3**	**9**	1	0	0	**7**	0	0	0	**0**	**7**	**8**
14:15	14:30	1	0	0	**4**	0	0	1	**11**	**15**	10	0	3	**15**	0	0	0	**0**	**15**	**15**
14:30	14:45	0	0	0	**1**	0	1	0	**2**	**3**	1	0	0	**1**	0	0	0	**0**	**1**	**2**
14:45	15:00	0	3	0	**4**	0	1	0	**5**	**9**	1	0	0	**1**	0	0	0	**0**	**1**	**5**
15:00	15:15	1	2	0	**5**	0	2	1	**5**	**10**	0	0	0	**2**	0	0	0	**0**	**2**	**6**
15:15	15:30	0	1	0	**3**	0	1	1	**3**	**6**	0	0	1	**2**	0	0	0	**0**	**2**	**4**
15:30	15:45	0	1	0	**3**	0	2	0	**5**	**8**	2	0	0	**2**	0	0	0	**0**	**2**	**5**
15:45	16:00	0	1	0	**5**	0	4	1	**7**	**12**	1	0	0	**2**	0	0	0	**0**	**2**	**7**
16:00	16:15	0	0	0	**0**	0	0	3	**3**	**3**	0	0	0	**3**	0	0	0	**0**	**3**	**3**
16:15	16:30	2	3	0	**12**	0	3	0	**8**	**20**	2	0	4	**8**	0	0	0	**0**	**8**	**14**
16:30	16:45	0	0	0	**3**	0	2	1	**3**	**6**	0	0	1	**2**	0	0	0	**0**	**2**	**4**
16:45	17:00	0	1	0	**4**	0	2	1	**6**	**10**	2	0	1	**4**	0	0	0	**0**	**4**	**7**
17:00	17:15	0	0	0	**1**	0	0	1	**1**	**2**	0	0	1	**2**	0	0	0	**0**	**2**	**2**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:30	17:45	0	0	0	**0**	0	0	0	**1**	**1**	1	0	0	**1**	0	0	0	**0**	**1**	**1**
17:45	18:00	0	0	0	**0**	0	0	0	**1**	**1**	1	0	0	**1**	0	0	0	**0**	**1**	**1**
Total:	None	19	37	0	**107**	0	30	44	**150**	**257**	39	0	21	**123**	0	0	0	**0**	**123**	**190**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RENAUD RD @ MER BLEUE RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40730

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		MER BLEUE RD		RENAUD RD		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
06:30	06:45	0	0	0	0	0
06:45	07:00	0	0	0	0	0
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
13:30	13:45	0	0	0	0	0
13:45	14:00	0	0	0	0	0
14:00	14:15	0	0	0	0	0
14:15	14:30	0	0	0	0	0
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
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	0	0	0	0

Transportation Services - Traffic Services

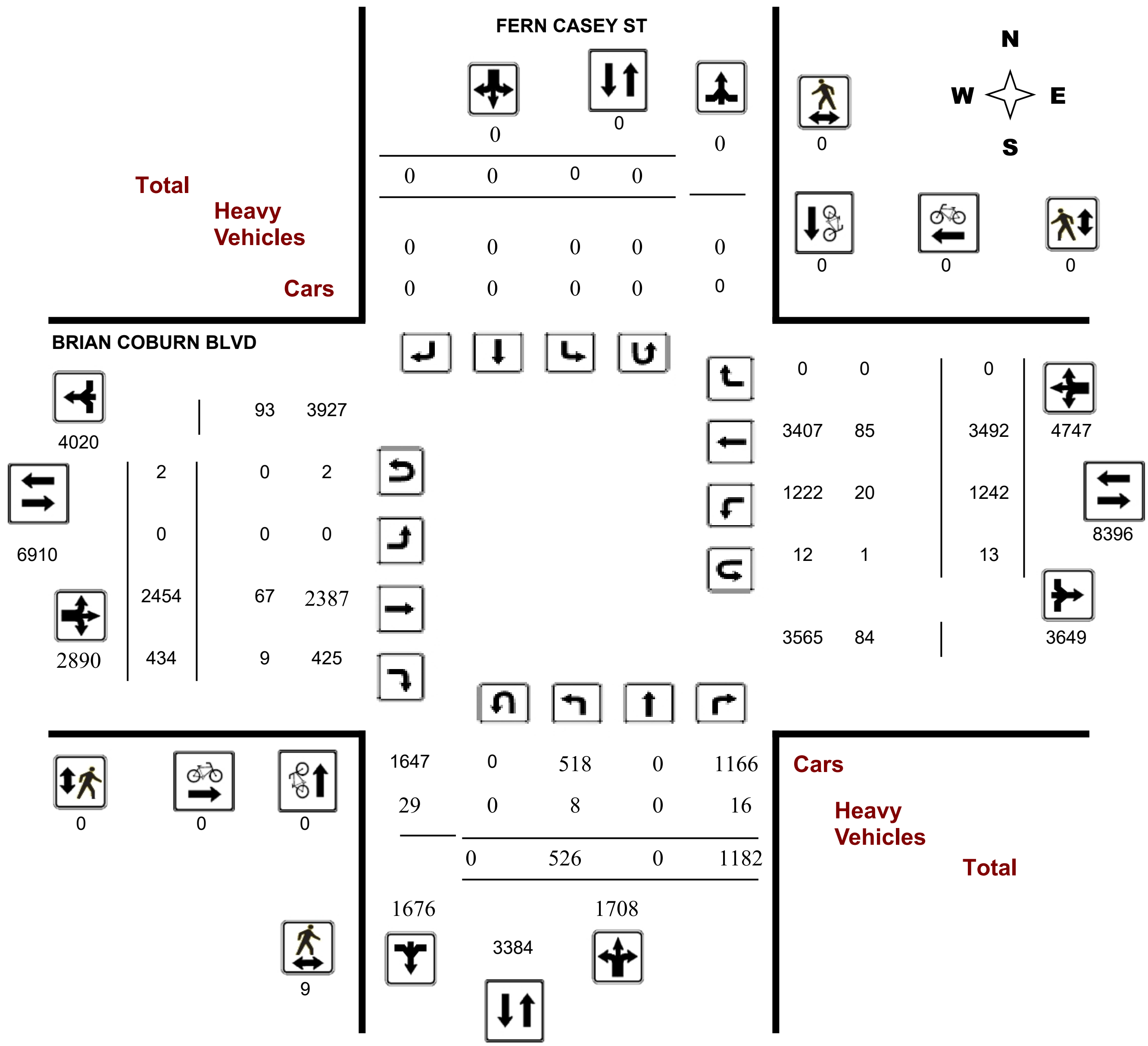
Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

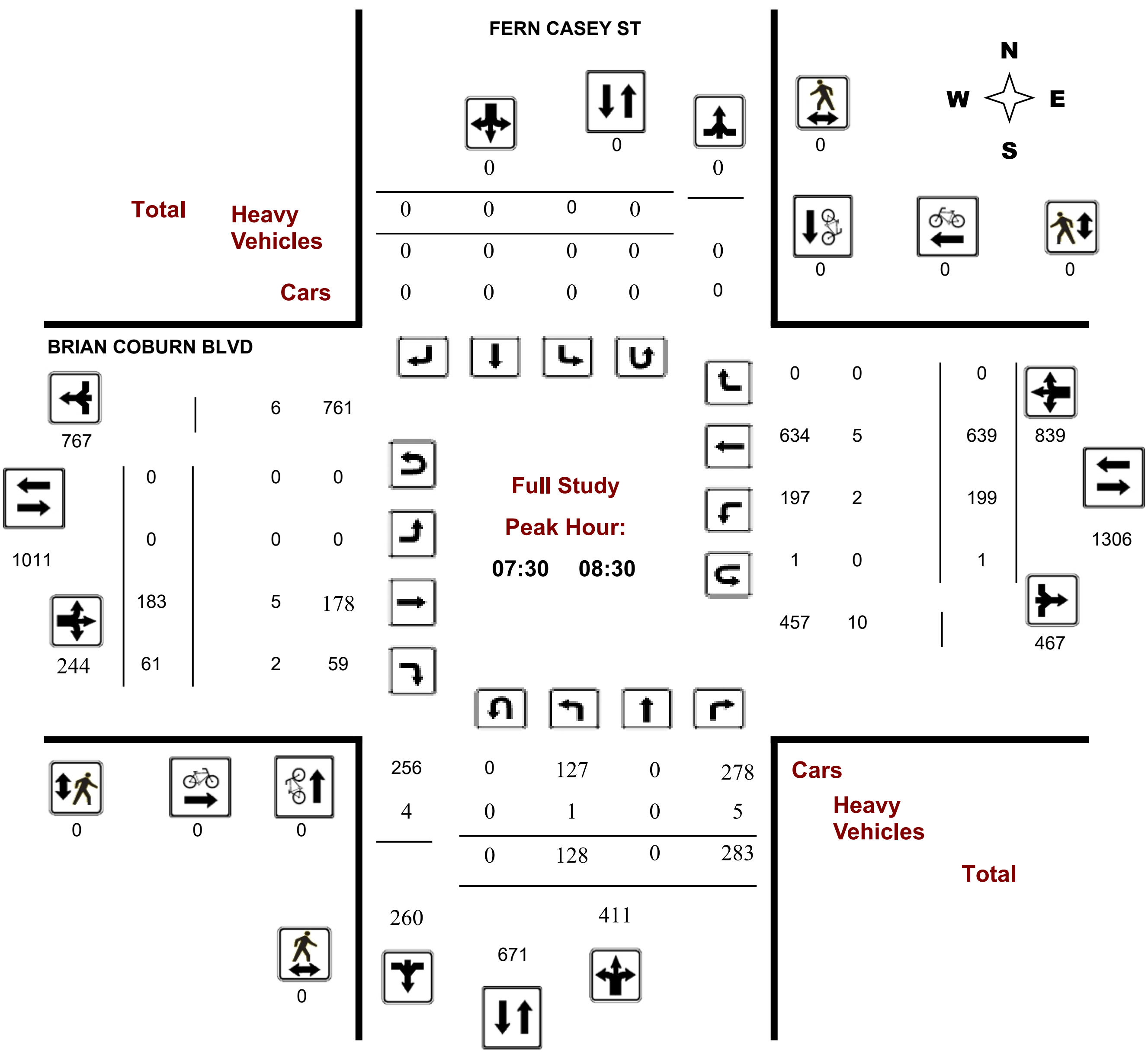
Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study Peak Hour Diagram



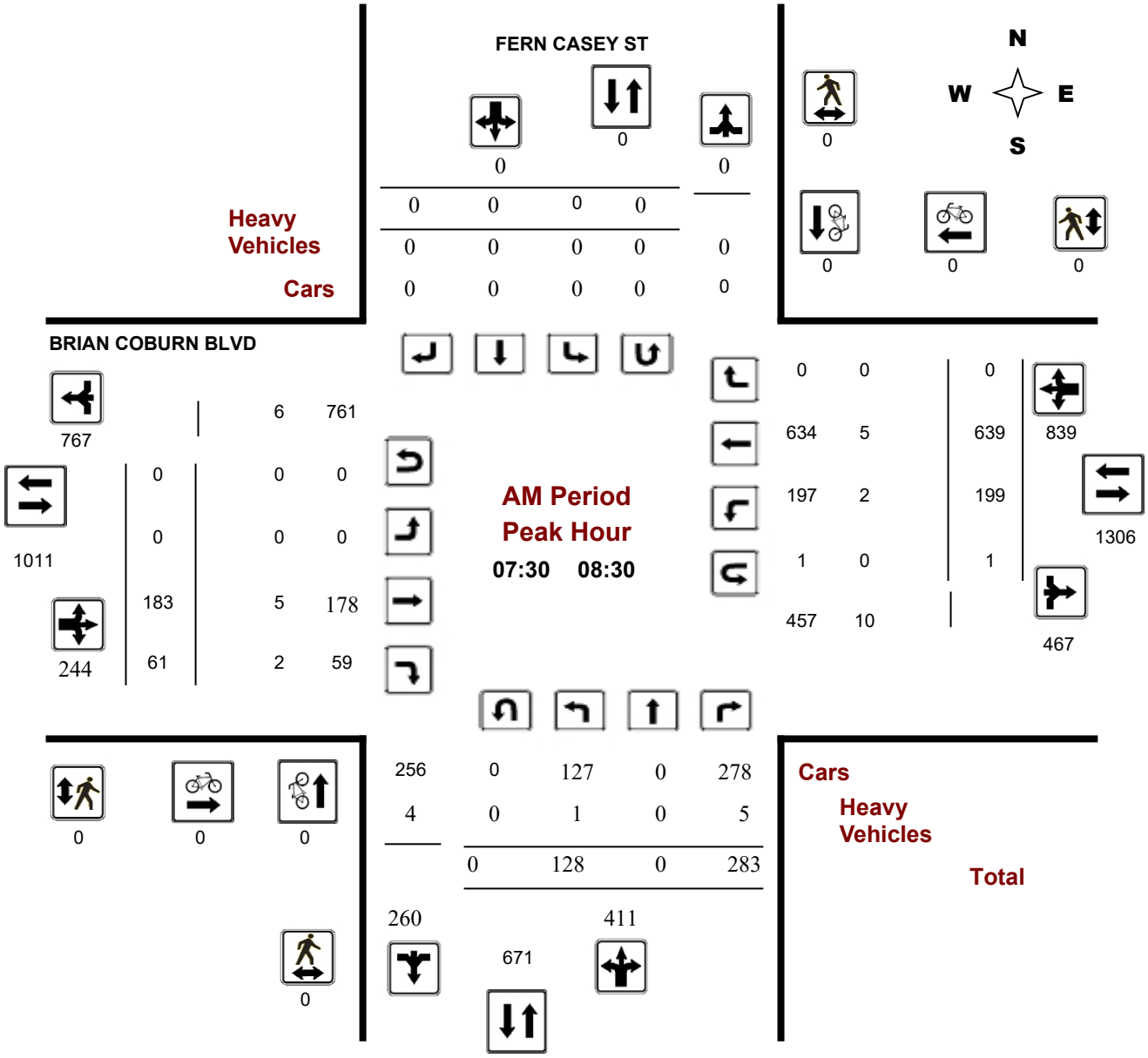
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision



Comments

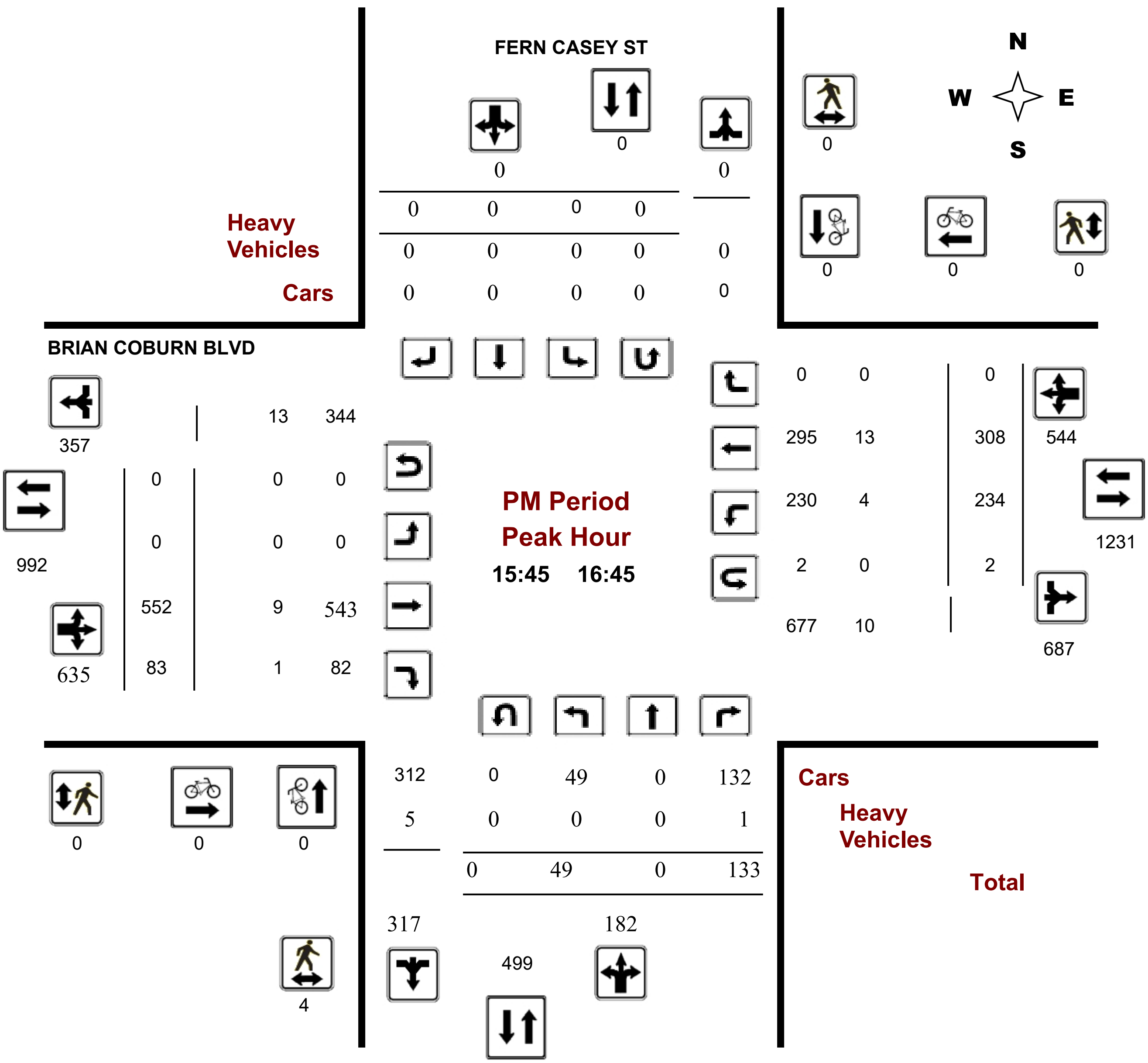
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Work Order
40747

Turning Movement Count - Full Study Summary (No AADT) Report

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 13

Full Study

	FERN CASEY ST									BRIAN COBURN BLVD									
	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**
06:30 07:30	80	0	59	**139**	0	0	0	**0**	**139**	0	97	25	**122**	73	621	0	**694**	**816**	**955**
07:30 08:30	128	0	283	**411**	0	0	0	**0**	**411**	0	183	61	**244**	199	639	0	**838**	**1082**	**1493**
08:30 09:30	70	0	119	**189**	0	0	0	**0**	**189**	0	183	37	**220**	134	567	0	**701**	**921**	**1110**
13:00 14:00	39	0	98	**137**	0	0	0	**0**	**137**	0	200	28	**228**	97	317	0	**414**	**642**	**779**
14:00 15:00	56	0	211	**267**	0	0	0	**0**	**267**	0	305	42	**347**	149	343	0	**492**	**839**	**1106**
15:00 16:00	66	0	155	**221**	0	0	0	**0**	**221**	0	466	72	**538**	192	307	0	**499**	**1037**	**1258**
16:00 17:00	47	0	127	**174**	0	0	0	**0**	**174**	0	530	70	**600**	219	337	0	**556**	**1156**	**1330**
17:00 18:00	40	0	130	**170**	0	0	0	**0**	**170**	0	490	99	**589**	179	361	0	**540**	**1129**	**1299**
Sub Total	526	0	1182	**1708**	0	0	0	**0**	**1708**	0	2454	434	**2888**	1242	3492	0	**4734**	**7622**	**9330**
U Turns	0			**0**	0			**0**	**0**	2			**2**	13			**13**	**15**	**15**
Total	526	0	1182	**1708**	0	0	0	**0**	**1708**	2	2454	434	**2890**	1255	3492	0	**4747**	**7637**	**9345**

Comments:

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute Increments

		FERN CASEY ST									BRIAN COBURN BLVD									
		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
06:30	06:45	17	0	9	26	0	0	0	0	26	0	19	4	24	15	145	0	160	184	210
06:45	07:00	7	0	14	21	0	0	0	0	21	0	23	3	26	12	139	0	151	177	198
07:00	07:15	31	0	9	40	0	0	0	0	40	0	22	7	29	19	152	0	171	200	240
07:15	07:30	25	0	27	52	0	0	0	0	52	0	33	11	44	27	185	0	213	257	309
07:30	07:45	41	0	63	104	0	0	0	0	104	0	51	26	77	63	172	0	236	313	417
07:45	08:00	32	0	112	144	0	0	0	0	144	0	45	26	71	69	135	0	204	275	419
08:00	08:15	31	0	60	91	0	0	0	0	91	0	44	4	48	34	156	0	190	238	329
08:15	08:30	24	0	48	72	0	0	0	0	72	0	43	5	48	33	176	0	209	257	329
08:30	08:45	21	0	34	55	0	0	0	0	55	0	45	11	56	37	190	0	227	283	338
08:45	09:00	22	0	39	61	0	0	0	0	61	0	55	4	59	37	166	0	203	262	323
09:00	09:15	15	0	21	36	0	0	0	0	36	0	40	12	52	26	113	0	140	192	228
09:15	09:30	12	0	25	37	0	0	0	0	37	0	43	10	53	34	98	0	132	185	222
09:30	09:45	15	0	24	39	0	0	0	0	39	0	36	9	45	26	86	0	112	157	196
09:45	10:00	7	0	26	33	0	0	0	0	33	0	39	2	41	22	78	0	100	141	174
13:30	13:45	11	0	24	35	0	0	0	0	35	0	67	7	75	24	74	0	98	173	208
13:45	14:00	6	0	24	30	0	0	0	0	30	0	58	10	68	25	79	0	105	173	203
14:00	14:15	9	0	23	32	0	0	0	0	32	0	73	8	81	44	72	0	116	197	229
14:15	14:30	26	0	120	146	0	0	0	0	146	0	68	18	86	36	97	0	134	220	366
14:30	14:45	18	0	41	59	0	0	0	0	59	0	85	8	93	29	88	0	117	210	269
14:45	15:00	3	0	27	30	0	0	0	0	30	0	79	8	87	40	86	0	126	213	243
15:00	15:15	14	0	24	38	0	0	0	0	38	0	97	12	109	56	78	0	136	245	283
15:15	15:30	19	0	57	76	0	0	0	0	76	0	115	17	132	43	81	0	126	258	334
15:30	15:45	22	0	35	57	0	0	0	0	57	0	117	14	131	39	82	0	121	252	309
15:45	16:00	11	0	39	50	0	0	0	0	50	0	137	29	166	54	66	0	120	286	336
16:00	16:15	8	0	30	38	0	0	0	0	38	0	146	19	165	54	82	0	137	302	340
16:15	16:30	15	0	32	47	0	0	0	0	47	0	144	19	163	62	74	0	136	299	346
16:30	16:45	15	0	32	47	0	0	0	0	47	0	125	16	141	64	86	0	151	292	339
16:45	17:00	9	0	33	42	0	0	0	0	42	0	115	16	131	39	95	0	134	265	307
17:00	17:15	17	0	37	54	0	0	0	0	54	0	134	27	161	43	98	0	142	303	357
17:15	17:30	4	0	32	36	0	0	0	0	36	0	112	19	131	42	101	0	144	275	311
17:30	17:45	9	0	23	32	0	0	0	0	32	0	128	39	167	51	79	0	130	297	329
17:45	18:00	10	0	38	48	0	0	0	0	48	0	116	14	130	43	83	0	126	256	304
Total:		526	0	1182	1708	0	0	0	0	1708	0	2454	434	2890	1242	3492	0	4747	7637	9,345

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study Cyclist Volume

Time Period		FERN CASEY ST			BRIAN COBURN BLVD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
06:30	06:45	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0
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
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
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
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
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
Total		0	0	**0**	0	0	0	0

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study Pedestrian Volume

	FERN CASEY ST			BRIAN COBURN BLVD			
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**
06:30 06:45	0	0	**0**	0	0	**0**	**0**
06:45 07:00	0	0	**0**	0	0	**0**	**0**
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**
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**
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**
13:30 13:45	1	0	**1**	0	0	**0**	**1**
13:45 14:00	0	0	**0**	0	0	**0**	**0**
14:00 14:15	2	0	**2**	0	0	**0**	**2**
14:15 14:30	0	0	**0**	0	0	**0**	**0**
14:30 14:45	0	0	**0**	0	0	**0**	**0**
14:45 15:00	0	0	**0**	0	0	**0**	**0**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	1	0	**1**	0	0	**0**	**1**
16:15 16:30	3	0	**3**	0	0	**0**	**3**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	1	0	**1**	0	0	**0**	**1**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	1	0	**1**	0	0	**0**	**1**
Total	9	0	**9**	0	0	**0**	**9**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study Heavy Vehicles

		FERN CASEY ST									BRIAN COBURN BLVD									
		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**
06:30	06:45	0	0	0	**1**	0	0	0	**0**	**1**	0	0	1	**2**	0	1	0	**1**	**3**	**2**
06:45	07:00	0	0	1	**1**	0	0	0	**0**	**1**	0	0	0	**2**	0	2	0	**3**	**5**	**3**
07:00	07:15	0	0	0	**1**	0	0	0	**0**	**1**	0	2	0	**2**	1	0	0	**3**	**5**	**3**
07:15	07:30	0	0	1	**3**	0	0	0	**0**	**3**	0	0	2	**2**	0	0	0	**1**	**3**	**3**
07:30	07:45	1	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**2**	1	1	0	**2**	**4**	**3**
07:45	08:00	0	0	3	**6**	0	0	0	**0**	**6**	0	2	2	**6**	1	2	0	**8**	**14**	**10**
08:00	08:15	0	0	1	**1**	0	0	0	**0**	**1**	0	2	0	**3**	0	1	0	**4**	**7**	**4**
08:15	08:30	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**2**	0	1	0	**3**	**5**	**3**
08:30	08:45	0	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**3**	2	3	0	**5**	**8**	**5**
08:45	09:00	1	0	2	**3**	0	0	0	**0**	**3**	0	1	0	**4**	0	2	0	**5**	**9**	**6**
09:00	09:15	0	0	1	**1**	0	0	0	**0**	**1**	0	6	0	**9**	0	3	0	**10**	**19**	**10**
09:15	09:30	2	0	0	**3**	0	0	0	**0**	**3**	0	3	0	**8**	1	3	0	**7**	**15**	**9**
09:30	09:45	0	0	0	**1**	0	0	0	**0**	**1**	0	1	0	**1**	1	0	0	**2**	**3**	**2**
09:45	10:00	1	0	2	**3**	0	0	0	**0**	**3**	0	3	0	**6**	0	2	0	**7**	**13**	**8**
13:30	13:45	1	0	0	**2**	0	0	0	**0**	**2**	0	4	0	**10**	1	5	0	**10**	**20**	**11**
13:45	14:00	0	0	0	**1**	0	0	0	**0**	**1**	0	4	1	**10**	0	5	0	**9**	**19**	**10**
14:00	14:15	1	0	0	**1**	0	0	0	**0**	**1**	0	2	0	**4**	0	1	0	**3**	**7**	**4**
14:15	14:30	0	0	1	**2**	0	0	0	**0**	**2**	0	3	1	**10**	0	6	0	**10**	**20**	**11**
14:30	14:45	0	0	0	**2**	0	0	0	**0**	**2**	0	8	1	**16**	1	7	0	**16**	**32**	**17**
14:45	15:00	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**6**	0	5	0	**7**	**13**	**7**
15:00	15:15	0	0	0	**1**	0	0	0	**0**	**1**	0	6	0	**10**	1	4	0	**11**	**21**	**11**
15:15	15:30	1	0	1	**5**	0	0	0	**0**	**5**	0	2	0	**6**	3	3	0	**11**	**17**	**11**
15:30	15:45	0	0	0	**1**	0	0	0	**0**	**1**	0	3	0	**8**	1	5	0	**9**	**17**	**9**
15:45	16:00	0	0	1	**2**	0	0	0	**0**	**2**	0	2	0	**5**	1	3	0	**7**	**12**	**7**
16:00	16:15	0	0	0	**2**	0	0	0	**0**	**2**	0	4	1	**7**	1	2	0	**7**	**14**	**8**
16:15	16:30	0	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**6**	1	6	0	**7**	**13**	**7**
16:30	16:45	0	0	0	**1**	0	0	0	**0**	**1**	0	3	0	**5**	1	2	0	**6**	**11**	**6**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**3**	0	2	0	**3**	**6**	**3**
17:00	17:15	0	0	0	**1**	0	0	0	**0**	**1**	0	3	0	**4**	1	1	0	**5**	**9**	**5**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**4**	0	4	0	**4**	**8**	**4**
17:30	17:45	0	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**1**	1	1	0	**2**	**3**	**2**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**2**	0	2	0	**2**	**4**	**2**
Total:	None	8	0	16	**53**	0	0	0	**0**	**53**	0	67	9	**169**	20	85	0	**190**	**359**	**206**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BRIAN COBURN BLVD @ FERN CASEY ST

Survey Date: Wednesday, January 11, 2023 **WO No:** 40747

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		FERN CASEY ST		BRIAN COBURN BLVD		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
06:30	06:45	0	0	1	0	1
06:45	07:00	0	0	0	0	0
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	1	1
07:30	07:45	0	0	0	1	1
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	1	1
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
13:30	13:45	0	0	1	0	1
13:45	14:00	0	0	0	1	1
14:00	14:15	0	0	0	0	0
14:15	14:30	0	0	0	1	1
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
15:00	15:15	0	0	0	2	2
15:15	15:30	0	0	0	2	2
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	1	1
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	1	1
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	1	1
17:15	17:30	0	0	0	1	1
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	2	13	15

Transportation Services - Traffic Services

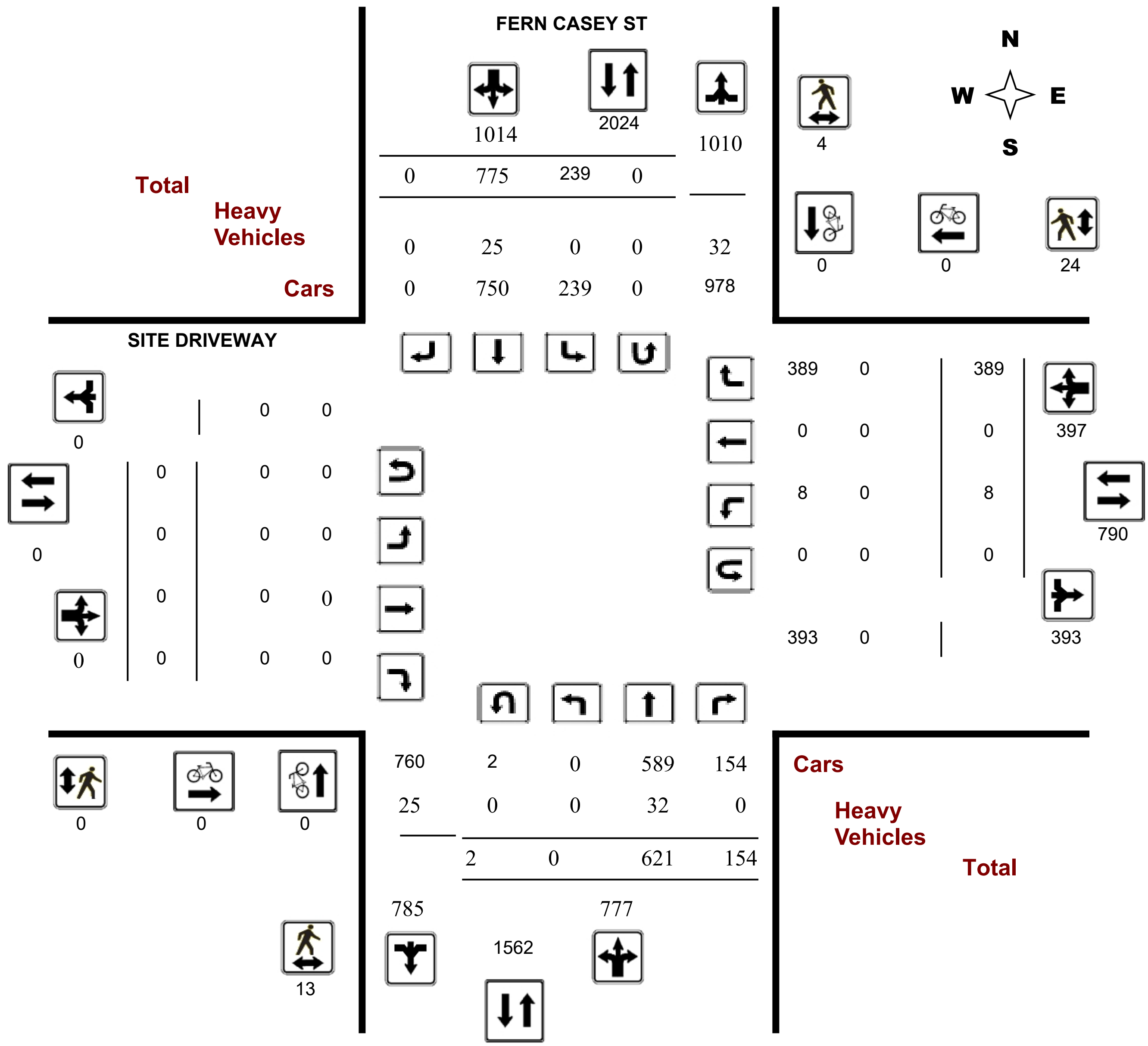
Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study Diagram



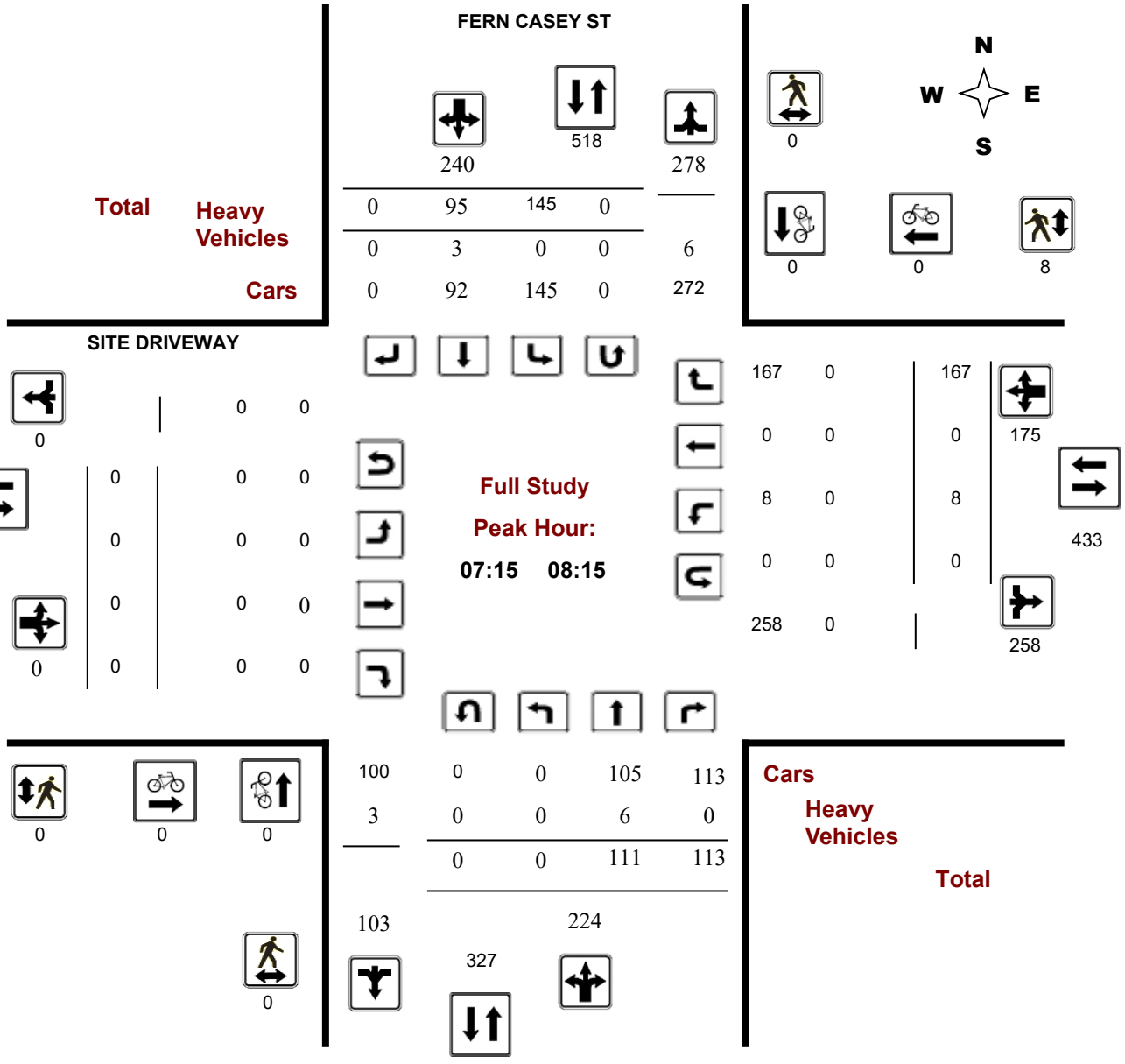
Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40725
Device: Miovision

Full Study Peak Hour Diagram



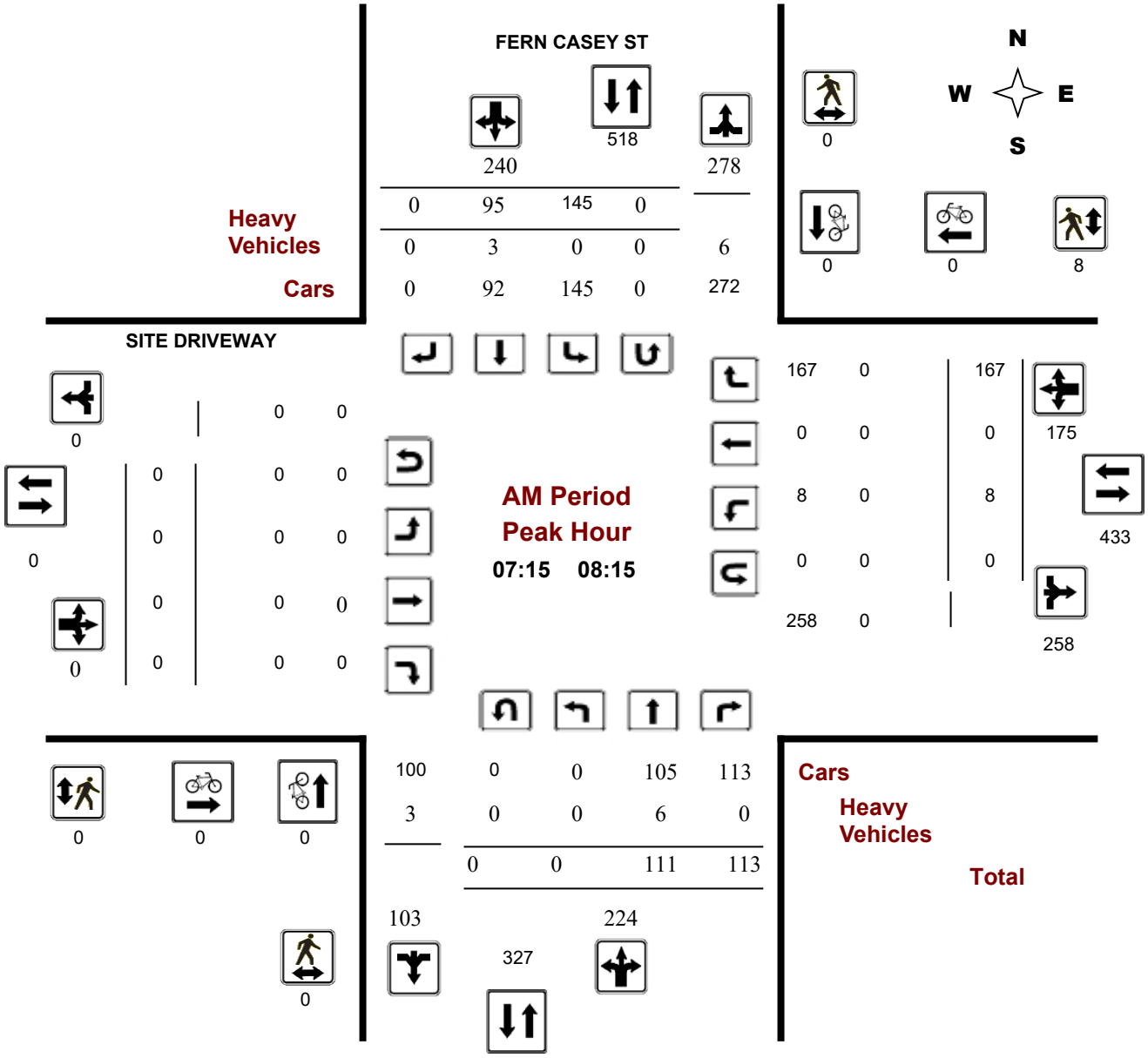
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision



Comments

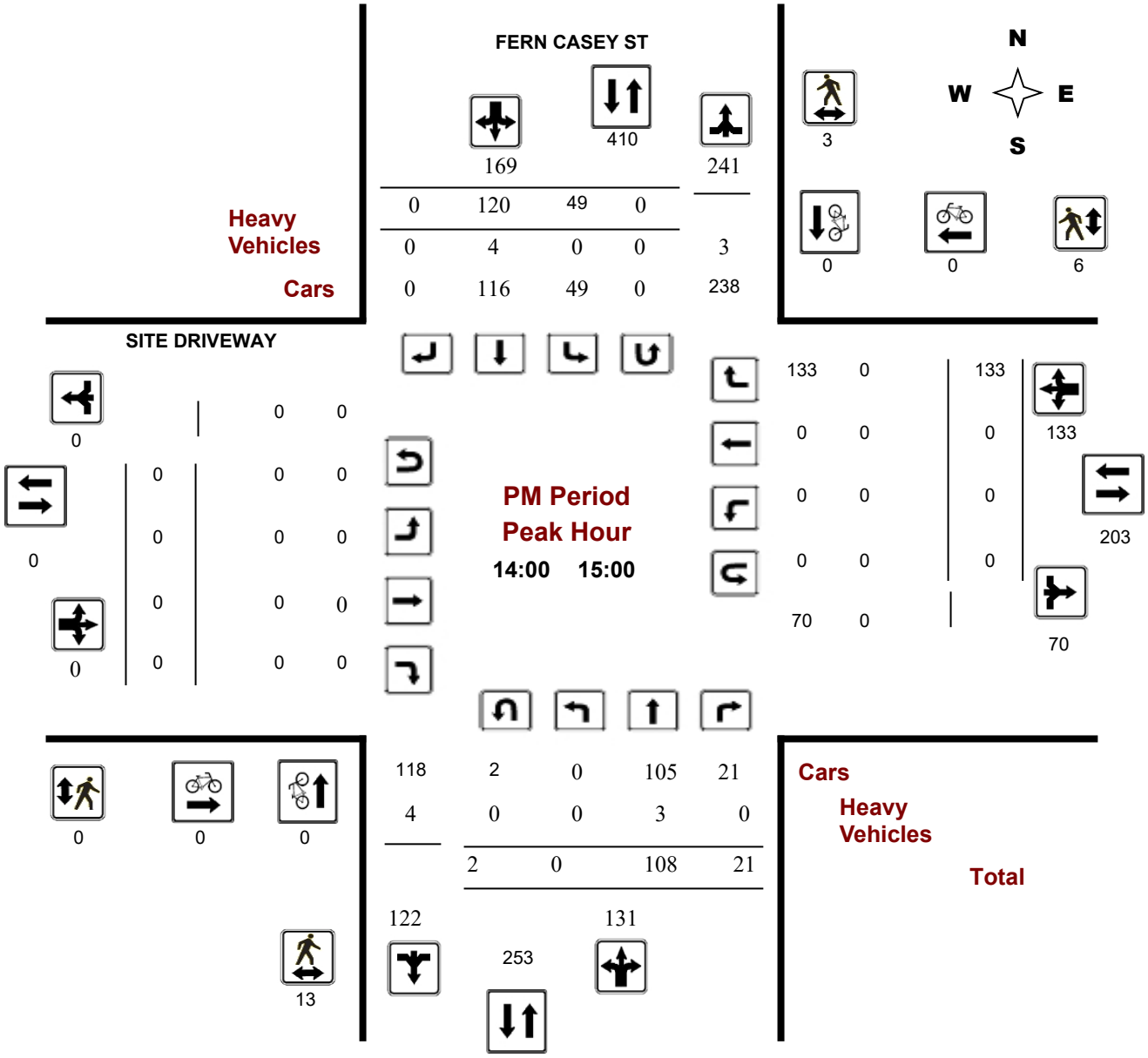
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, December 20, 2022

Total Observed U-Turns

Northbound: 2 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.00

	FERN CASEY ST									SITE DRIVEWAY									
	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
06:30 07:30	0	34	9	**43**	25	40	0	**65**	**108**	0	0	0	**0**	0	0	4	**4**	**4**	**112**
07:30 08:30	0	117	105	**222**	133	100	0	**233**	**455**	0	0	0	**0**	8	0	164	**172**	**172**	**627**
08:30 09:30	0	87	3	**90**	7	60	0	**67**	**157**	0	0	0	**0**	0	0	8	**8**	**8**	**165**
13:00 14:00	0	54	6	**60**	9	63	0	**72**	**132**	0	0	0	**0**	0	0	6	**6**	**6**	**138**
14:00 15:00	0	108	21	**129**	49	120	0	**169**	**298**	0	0	0	**0**	0	0	133	**133**	**133**	**431**
15:00 16:00	0	89	6	**95**	6	125	0	**131**	**226**	0	0	0	**0**	0	0	45	**45**	**45**	**271**
16:00 17:00	0	71	3	**74**	8	123	0	**131**	**205**	0	0	0	**0**	0	0	25	**25**	**25**	**230**
17:00 18:00	0	61	1	**62**	2	144	0	**146**	**208**	0	0	0	**0**	0	0	4	**4**	**4**	**212**
Sub Total	0	621	154	**775**	239	775	0	**1014**	**1789**	0	0	0	**0**	8	0	389	**397**	**397**	**2186**
U Turns				**2**				**0**	**2**				**0**				**0**	**0**	**2**
Total	0	621	154	**777**	239	775	0	**1014**	**1791**	0	0	0	**0**	8	0	389	**397**	**397**	**2188**
EQ 12Hr	0	863	214	**1080**	332	1077	0	**1409**	**2489**	0	0	0	**0**	11	0	541	**552**	**552**	**3041**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.00**					
AVG 24Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute Increments

FERN CASEY ST **SITE DRIVEWAY**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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
06:30	06:45	0	4	0	4	0	5	0	5	9	0	0	0	0	0	0	0	0	0	9
06:45	07:00	0	7	1	8	3	6	0	9	17	0	0	0	0	0	0	0	0	0	17
07:00	07:15	0	11	0	11	7	13	0	20	31	0	0	0	0	0	0	0	0	0	31
07:15	07:30	0	12	8	20	15	16	0	31	51	0	0	0	0	0	0	4	4	4	55
07:30	07:45	0	23	38	61	56	15	0	71	132	0	0	0	0	2	0	37	39	39	171
07:45	08:00	0	54	61	115	65	33	0	98	213	0	0	0	0	3	0	101	104	104	317
08:00	08:15	0	22	6	28	9	31	0	40	68	0	0	0	0	3	0	25	28	28	96
08:15	08:30	0	18	0	18	3	21	0	24	42	0	0	0	0	0	0	1	1	1	43
08:30	08:45	0	17	1	18	1	18	0	19	37	0	0	0	0	0	0	1	1	1	38
08:45	09:00	0	30	1	31	1	16	0	17	48	0	0	0	0	0	0	2	2	2	50
09:00	09:15	0	24	1	25	2	12	0	14	39	0	0	0	0	0	0	0	0	0	39
09:15	09:30	0	16	0	16	3	14	0	17	33	0	0	0	0	0	0	5	5	5	38
09:30	09:45	0	14	2	16	0	16	0	16	32	0	0	0	0	0	0	3	3	3	35
09:45	10:00	0	13	0	13	3	16	0	19	32	0	0	0	0	0	0	0	0	0	32
13:30	13:45	0	12	0	12	1	15	0	16	28	0	0	0	0	0	0	2	2	2	30
13:45	14:00	0	15	4	19	5	16	0	21	40	0	0	0	0	0	0	1	1	1	41
14:00	14:15	0	15	8	24	16	23	0	39	63	0	0	0	0	0	0	5	5	5	68
14:15	14:30	0	55	10	66	23	48	0	71	137	0	0	0	0	0	0	91	91	91	228
14:30	14:45	0	18	1	19	10	33	0	43	62	0	0	0	0	0	0	22	22	22	84
14:45	15:00	0	20	2	22	0	16	0	16	38	0	0	0	0	0	0	15	15	15	53
15:00	15:15	0	17	2	19	0	33	0	33	52	0	0	0	0	0	0	13	13	13	65
15:15	15:30	0	30	1	31	2	33	0	35	66	0	0	0	0	0	0	15	15	15	81
15:30	15:45	0	26	3	29	2	32	0	34	63	0	0	0	0	0	0	7	7	7	70
15:45	16:00	0	16	0	16	2	27	0	29	45	0	0	0	0	0	0	10	10	10	55
16:00	16:15	0	14	2	16	3	32	0	35	51	0	0	0	0	0	0	10	10	10	61
16:15	16:30	0	24	0	24	3	25	0	28	52	0	0	0	0	0	0	2	2	2	54
16:30	16:45	0	12	0	12	2	32	0	34	46	0	0	0	0	0	0	10	10	10	56
16:45	17:00	0	21	1	22	0	34	0	34	56	0	0	0	0	0	0	3	3	3	59
17:00	17:15	0	19	0	19	0	30	0	30	49	0	0	0	0	0	0	1	1	1	50
17:15	17:30	0	16	0	16	1	38	0	39	55	0	0	0	0	0	0	2	2	2	57
17:30	17:45	0	10	0	10	0	44	0	44	54	0	0	0	0	0	0	0	0	0	54
17:45	18:00	0	16	1	17	1	32	0	33	50	0	0	0	0	0	0	1	1	1	51
Total:		0	621	154	777	239	775	0	1014	1791	0	0	0	0	8	0	389	397	397	2,188

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study Cyclist Volume

Time Period		FERN CASEY ST			SITE DRIVEWAY			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
06:30	06:45	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0
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
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
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
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
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
Total		0	0	**0**	0	0	0	0

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study Pedestrian Volume

	FERN CASEY ST			SITE DRIVEWAY			
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**
06:30 06:45	0	0	**0**	0	0	**0**	**0**
06:45 07:00	0	0	**0**	0	0	**0**	**0**
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	1	**1**	**1**
07:30 07:45	0	0	**0**	0	3	**3**	**3**
07:45 08:00	0	0	**0**	0	2	**2**	**2**
08:00 08:15	0	0	**0**	0	2	**2**	**2**
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**
09:00 09:15	0	0	**0**	0	1	**1**	**1**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	1	**1**	**1**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
13:30 13:45	0	0	**0**	0	0	**0**	**0**
13:45 14:00	0	0	**0**	0	0	**0**	**0**
14:00 14:15	0	0	**0**	0	1	**1**	**1**
14:15 14:30	13	3	**16**	0	2	**2**	**18**
14:30 14:45	0	0	**0**	0	1	**1**	**1**
14:45 15:00	0	0	**0**	0	2	**2**	**2**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	3	**3**	**3**
15:30 15:45	0	0	**0**	0	1	**1**	**1**
15:45 16:00	0	0	**0**	0	2	**2**	**2**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	2	**2**	**2**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	1	**1**	0	0	**0**	**1**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
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**
Total	13	4	**17**	0	24	**24**	**41**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study Heavy Vehicles

FERN CASEY ST **SITE DRIVEWAY**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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**
06:30	06:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
06:45	07:00	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
07:00	07:15	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
07:15	07:30	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
07:30	07:45	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
07:45	08:00	0	3	0	**3**	0	0	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
08:00	08:15	0	0	0	**2**	0	2	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
08:15	08:30	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
08:30	08:45	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
08:45	09:00	0	4	0	**5**	0	1	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
09:00	09:15	0	3	0	**5**	0	2	0	**5**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
09:15	09:30	0	2	0	**2**	0	0	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
09:30	09:45	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
09:45	10:00	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
13:30	13:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
13:45	14:00	0	1	0	**3**	0	2	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
14:00	14:15	0	1	0	**1**	0	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
14:15	14:30	0	2	0	**3**	0	1	0	**3**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
14:30	14:45	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
14:45	15:00	0	0	0	**2**	0	2	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
15:00	15:15	0	1	0	**4**	0	3	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
15:30	15:45	0	3	0	**4**	0	1	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
16:00	16:15	0	2	0	**4**	0	2	0	**4**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**4**
16:15	16:30	0	1	0	**2**	0	1	0	**2**	**4**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
16:45	17:00	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
17:00	17:15	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
17:15	17:30	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
17:30	17:45	0	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Total:	None	0	32	0	**57**	0	25	0	**57**	**114**	0	0	0	**0**	0	0	0	**0**	**0**	**57**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

SITE DRIVEWAY @ FERN CASEY ST

Survey Date: Tuesday, December 20, 2022 **WO No:** 40725

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		FERN CASEY ST		SITE DRIVEWAY		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
06:30	06:45	0	0	0	0	0
06:45	07:00	0	0	0	0	0
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
13:30	13:45	0	0	0	0	0
13:45	14:00	0	0	0	0	0
14:00	14:15	1	0	0	0	1
14:15	14:30	1	0	0	0	1
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
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		2	0	0	0	2

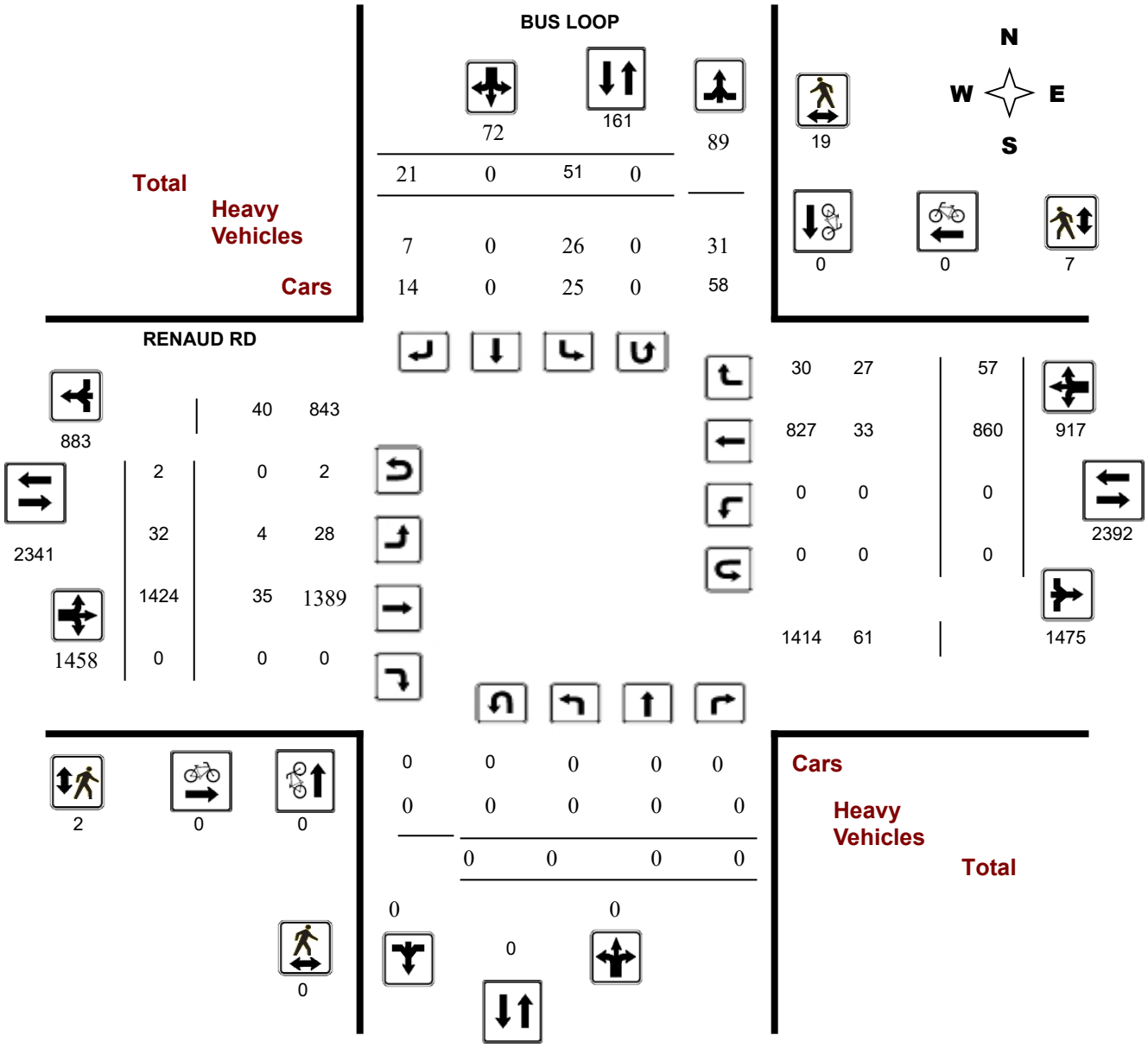
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40729
Device: Miovision

Full Study Diagram



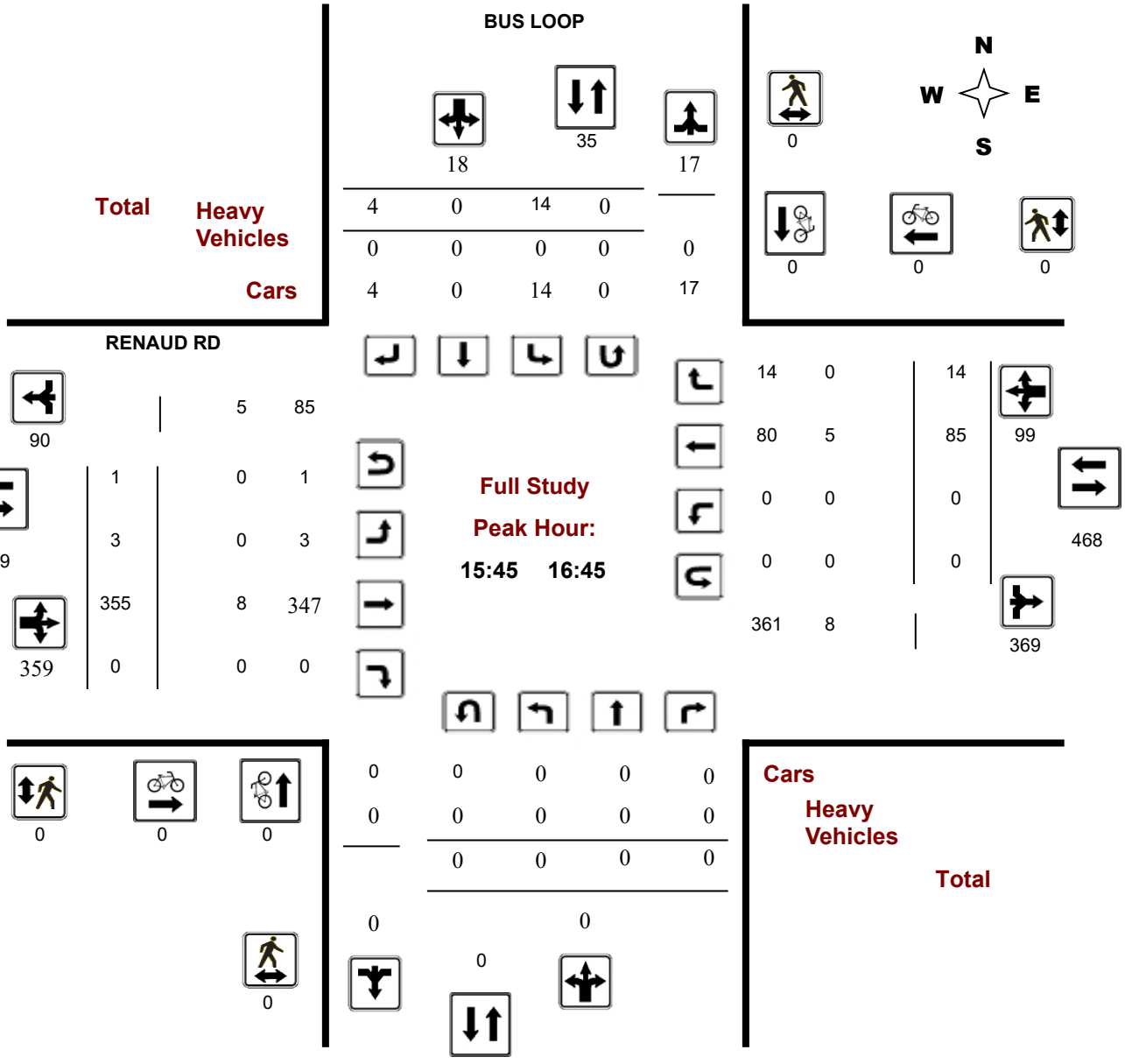
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022
Start Time: 06:30
WO No: 40729
Device: Miovision

Full Study Peak Hour Diagram



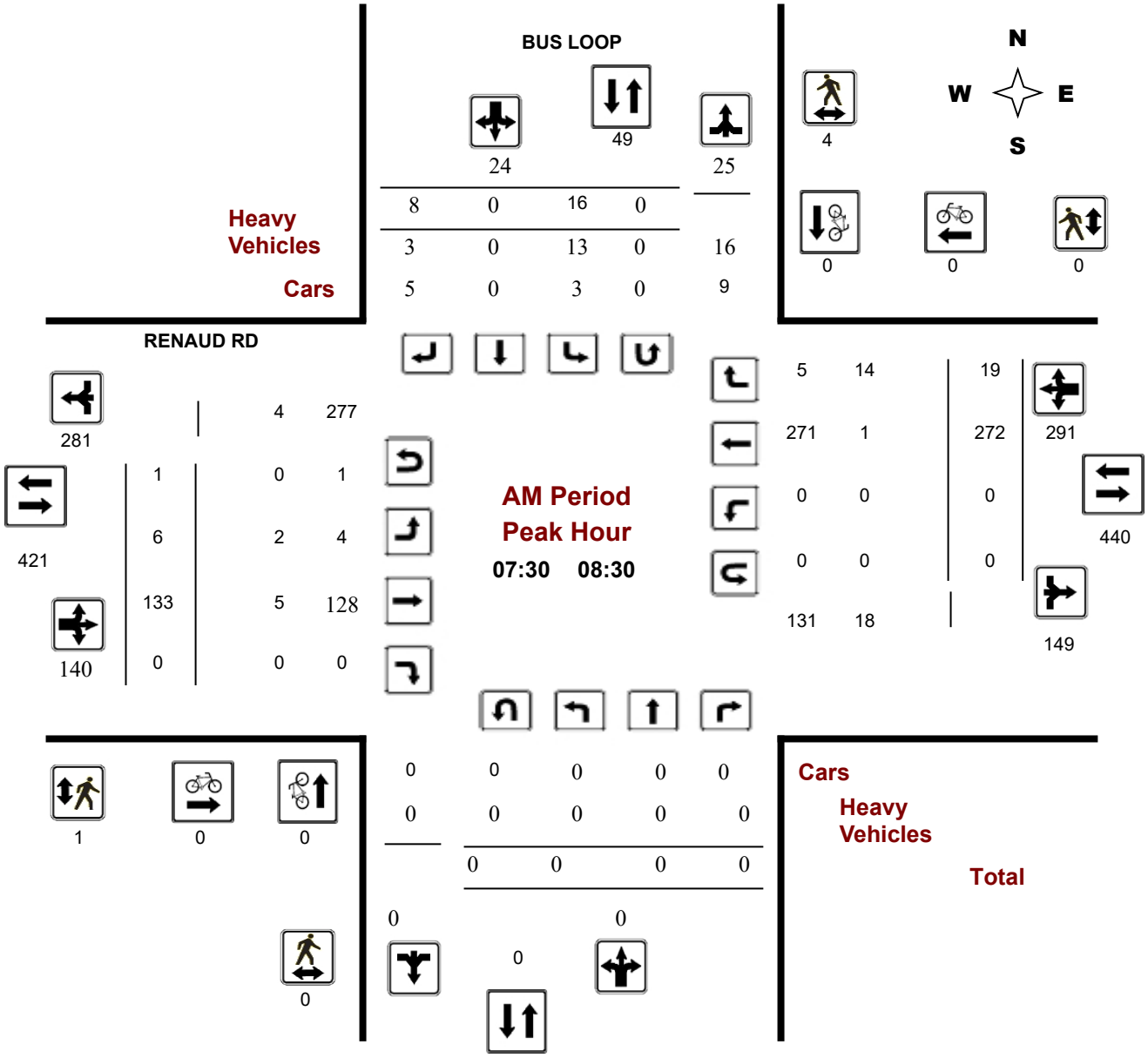
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision



Comments

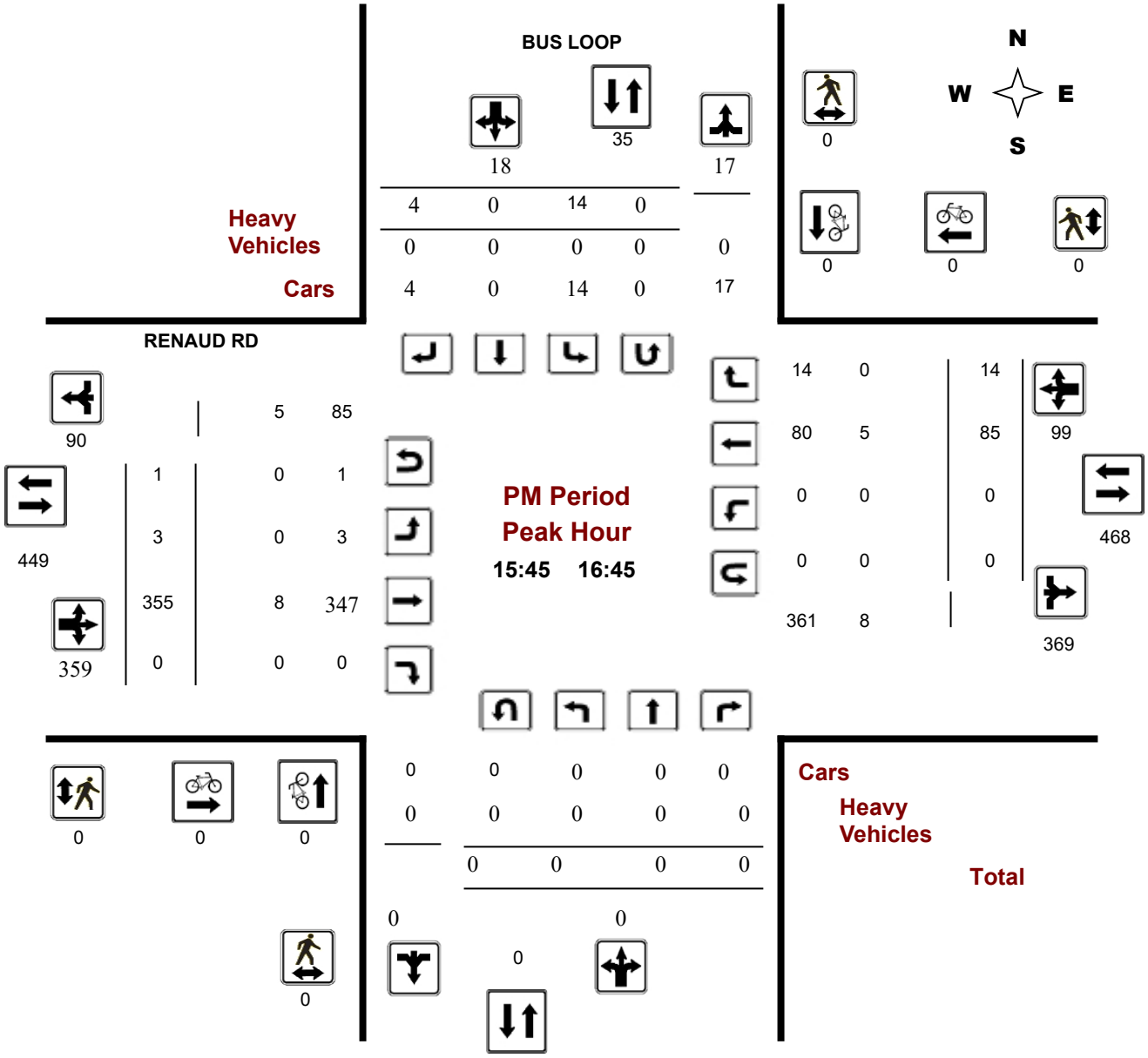
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, December 20, 2022

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 0

AADT Factor

.00

	BUS LOOP									RENAUD RD									
	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**
06:30 07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	71	0	**71**	0	66	1	**67**	**138**	**138**
07:30 08:30	0	0	0	**0**	16	0	8	**24**	**24**	6	133	0	**139**	0	272	19	**291**	**430**	**454**
08:30 09:30	0	0	0	**0**	0	0	1	**1**	**1**	0	122	0	**122**	0	105	1	**106**	**228**	**229**
13:00 14:00	0	0	0	**0**	0	0	0	**0**	**0**	2	100	0	**102**	0	65	5	**70**	**172**	**172**
14:00 15:00	0	0	0	**0**	14	0	3	**17**	**17**	0	134	0	**134**	0	106	7	**113**	**247**	**264**
15:00 16:00	0	0	0	**0**	11	0	3	**14**	**14**	6	234	0	**240**	0	81	10	**91**	**331**	**345**
16:00 17:00	0	0	0	**0**	6	0	3	**9**	**9**	2	343	0	**345**	0	98	9	**107**	**452**	**461**
17:00 18:00	0	0	0	**0**	4	0	3	**7**	**7**	16	287	0	**303**	0	67	5	**72**	**375**	**382**
Sub Total	0	0	0	**0**	51	0	21	**72**	**72**	32	1424	0	**1456**	0	860	57	**917**	**2373**	**2445**
U Turns				**0**				**0**	**0**				**2**				**0**	**2**	**2**
Total	0	0	0	**0**	51	0	21	**72**	**72**	32	1424	0	**1458**	0	860	57	**917**	**2375**	**2447**
EQ 12Hr	0	0	0	**0**	71	0	29	**100**	**100**	44	1979	0	**2027**	0	1195	79	**1275**	**3301**	**3401**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.00**						
AVG 24Hr	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute Increments

BUS LOOP **RENAUD RD**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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
06:30	06:45	0	0	0	0	0	0	0	0	0	0	19	0	19	0	12	0	12	31	31
06:45	07:00	0	0	0	0	0	0	0	0	0	0	18	0	18	0	8	0	8	26	26
07:00	07:15	0	0	0	0	0	0	0	0	0	0	12	0	12	0	13	0	13	25	25
07:15	07:30	0	0	0	0	0	0	0	0	0	0	22	0	22	0	33	1	34	56	56
07:30	07:45	0	0	0	0	7	0	0	7	7	3	23	0	26	0	67	10	77	103	110
07:45	08:00	0	0	0	0	7	0	6	13	13	2	44	0	47	0	129	8	137	184	197
08:00	08:15	0	0	0	0	2	0	2	4	4	1	32	0	33	0	45	1	46	79	83
08:15	08:30	0	0	0	0	0	0	0	0	0	0	34	0	34	0	31	0	31	65	65
08:30	08:45	0	0	0	0	0	0	0	0	0	0	35	0	35	0	40	1	41	76	76
08:45	09:00	0	0	0	0	0	0	1	1	1	0	32	0	32	0	31	0	31	63	64
09:00	09:15	0	0	0	0	0	0	0	0	0	0	29	0	29	0	20	0	20	49	49
09:15	09:30	0	0	0	0	0	0	0	0	0	0	26	0	26	0	14	0	14	40	40
09:30	09:45	0	0	0	0	0	0	0	0	0	0	30	0	30	0	19	0	19	49	49
09:45	10:00	0	0	0	0	0	0	0	0	0	0	26	0	26	0	18	0	18	44	44
13:30	13:45	0	0	0	0	0	0	0	0	0	0	18	0	18	0	15	2	17	35	35
13:45	14:00	0	0	0	0	0	0	0	0	0	2	26	0	28	0	13	3	16	44	44
14:00	14:15	0	0	0	0	0	0	0	0	0	0	26	0	26	0	34	6	40	66	66
14:15	14:30	0	0	0	0	13	0	3	16	16	0	46	0	46	0	39	1	40	86	102
14:30	14:45	0	0	0	0	1	0	0	1	1	0	37	0	37	0	19	0	19	56	57
14:45	15:00	0	0	0	0	0	0	0	0	0	0	25	0	25	0	14	0	14	39	39
15:00	15:15	0	0	0	0	0	0	0	0	0	0	36	0	36	0	19	0	19	55	55
15:15	15:30	0	0	0	0	2	0	1	3	3	3	58	0	61	0	27	0	27	88	91
15:30	15:45	0	0	0	0	0	0	0	0	0	2	56	0	58	0	19	5	24	82	82
15:45	16:00	0	0	0	0	9	0	2	11	11	1	84	0	86	0	16	5	21	107	118
16:00	16:15	0	0	0	0	3	0	2	5	5	1	75	0	76	0	33	3	36	112	117
16:15	16:30	0	0	0	0	0	0	0	0	0	0	91	0	91	0	16	1	17	108	108
16:30	16:45	0	0	0	0	2	0	0	2	2	1	105	0	106	0	20	5	25	131	133
16:45	17:00	0	0	0	0	1	0	1	2	2	0	72	0	72	0	29	0	29	101	103
17:00	17:15	0	0	0	0	0	0	1	1	1	1	70	0	71	0	19	0	19	90	91
17:15	17:30	0	0	0	0	0	0	0	0	0	0	75	0	75	0	16	2	18	93	93
17:30	17:45	0	0	0	0	1	0	0	1	1	7	86	0	93	0	14	1	15	108	109
17:45	18:00	0	0	0	0	3	0	2	5	5	8	56	0	64	0	18	2	20	84	89
Total:		0	0	0	0	51	0	21	72	72	32	1424	0	1458	0	860	57	917	2375	2,447

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study Cyclist Volume

		BUS LOOP			RENAUD RD			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
06:30	06:45	0	0	0	0	0	0	0
06:45	07:00	0	0	0	0	0	0	0
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
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
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
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0
14:00	14:15	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
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
Total		0	0	**0**	0	0	0	0

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study Pedestrian Volume

	BUS LOOP			RENAUD RD			
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**
06:30 06:45	0	0	**0**	0	0	**0**	**0**
06:45 07:00	0	0	**0**	0	0	**0**	**0**
07:00 07:15	0	1	**1**	0	0	**0**	**1**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	1	**1**	1	0	**1**	**2**
07:45 08:00	0	3	**3**	0	0	**0**	**3**
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**
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**
13:30 13:45	0	0	**0**	0	0	**0**	**0**
13:45 14:00	0	0	**0**	0	0	**0**	**0**
14:00 14:15	0	0	**0**	0	0	**0**	**0**
14:15 14:30	0	8	**8**	0	4	**4**	**12**
14:30 14:45	0	4	**4**	0	2	**2**	**6**
14:45 15:00	0	1	**1**	0	0	**0**	**1**
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	1	**1**	0	1	**1**	**2**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	1	0	**1**	**1**
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**
Total	0	19	**19**	2	7	**9**	**28**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study Heavy Vehicles

BUS LOOP **RENAUD RD**

Time Period		Northbound				Southbound					Eastbound				Westbound					
		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**
06:30	06:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**1**	0	1	0	**1**	**2**	**1**
06:45	07:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**3**	0	2	0	**3**	**6**	**3**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
07:30	07:45	0	0	0	**0**	6	0	0	**17**	**17**	2	0	0	**2**	0	0	9	**15**	**17**	**17**
07:45	08:00	0	0	0	**0**	6	0	2	**13**	**13**	0	0	0	**2**	0	0	5	**11**	**13**	**13**
08:00	08:15	0	0	0	**0**	1	0	1	**2**	**2**	0	1	0	**2**	0	0	0	**2**	**4**	**3**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**5**	0	1	0	**5**	**10**	**5**
08:30	08:45	0	0	0	**0**	0	0	0	**1**	**1**	0	2	0	**7**	0	5	1	**8**	**15**	**8**
08:45	09:00	0	0	0	**0**	0	0	1	**1**	**1**	0	1	0	**9**	0	7	0	**8**	**17**	**9**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	0	0	**3**	**6**	**3**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**3**	0	2	0	**3**	**6**	**3**
13:30	13:45	0	0	0	**0**	0	0	0	**2**	**2**	0	1	0	**1**	0	0	2	**3**	**4**	**3**
13:45	14:00	0	0	0	**0**	0	0	0	**5**	**5**	2	1	0	**3**	0	0	3	**4**	**7**	**6**
14:00	14:15	0	0	0	**0**	0	0	0	**6**	**6**	0	0	0	**1**	0	1	6	**7**	**8**	**7**
14:15	14:30	0	0	0	**0**	13	0	3	**17**	**17**	0	0	0	**5**	0	2	1	**16**	**21**	**19**
14:30	14:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
14:45	15:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**1**	0	1	0	**1**	**2**	**1**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**5**	0	4	0	**5**	**10**	**5**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	0	0	**5**	**10**	**5**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**3**	0	1	0	**3**	**6**	**3**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**2**	0	1	0	**2**	**4**	**2**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**1**	0	1	0	**1**	**2**	**1**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**1**	**2**	**1**
Total:	None	0	0	0	**0**	26	0	7	**64**	**64**	4	35	0	**79**	0	33	27	**121**	**200**	**132**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BUS LOOP @ RENAUD RD

Survey Date: Tuesday, December 20, 2022 **WO No:** 40729

Start Time: 06:30 **Device:** Miovision

Full Study 15 Minute U-Turn Total

BUS LOOP **RENAUD RD**

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
06:30	06:45	0	0	0	0	0
06:45	07:00	0	0	0	0	0
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	1	0	1
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
13:30	13:45	0	0	0	0	0
13:45	14:00	0	0	0	0	0
14:00	14:15	0	0	0	0	0
14:15	14:30	0	0	0	0	0
14:30	14:45	0	0	0	0	0
14:45	15:00	0	0	0	0	0
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	1	0	1
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	0	2	0	2

Appendix B

Trans Trip Generation Manual Tables

6.1 Elementary and High Schools

Ottawa

In the case of Ottawa, elementary schools were defined as those that include students from the age of 5 to 13 (Grades SK to 8) and high schools were categorized as having students between the ages of 14 to 17 (Grades 9 to 12). The mode shares for elementary and high schools in Ottawa are summarized in **Table 10**. These mode shares are based on the 2011 TRANS Origin-Destination Survey and are included to provide a general benchmark for schools in Ottawa. However, for transportation planning purposes, it is recommended that mode shares for Ottawa schools be developed on a site-specific basis by obtaining data from the school principal, school board, or student transportation authority; conducting local surveys; or consulting other sources.

Table 10: Elementary and High School Mode Shares for Ottawa[3]

Level	Mode Share					
	Auto Passenger	School Bus	Transit	Walk	Bike	Other
Elementary School	22%	48%	6%	20%	2%	2%
High School	17%	19%	38%	18%	3%	5%

Appendix C

Synchro Performance Worksheets

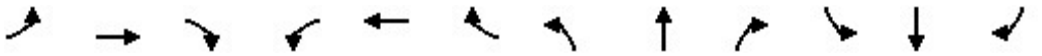
Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	265	911	447	0
Demand Flow Rate, veh/h	273	920	454	0
Vehicles Circulating, veh/h	218	140	205	1060
Vehicles Exiting, veh/h	842	519	286	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.7	16.2	7.5	0.0
Approach LOS	A	C	A	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	273	920	454	0
Cap Entry Lane, veh/h	1105	1196	1120	468
Entry HV Adj Factor	0.971	0.990	0.985	1.000
Flow Entry, veh/h	265	911	447	0
Cap Entry, veh/h	1073	1185	1102	468
V/C Ratio	0.247	0.769	0.406	0.000
Control Delay, s/veh	5.7	16.2	7.5	7.7
LOS	A	C	A	A
95th %tile Queue, veh	1	8	2	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	167	111	113	145	95
Future Volume (vph)	0	167	111	113	145	95
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	5%	0%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	182	244	0	158	103
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 31.0%		ICU Level of Service A	
Analysis Period (min) 15			

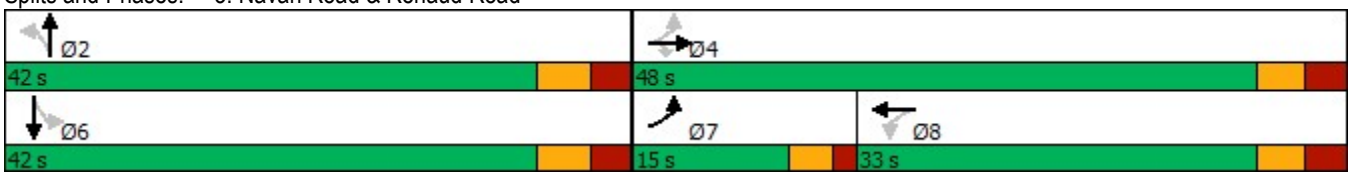


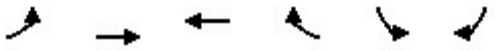
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	127	25	18	196	129	60	223	36	52	116	6
Future Volume (vph)	151	127	25	18	196	129	60	223	36	52	116	6
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	2%	8%	11%	5%	2%	5%	15%	6%	8%	27%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	138	27	20	353	0	65	281	0	57	133	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	30.3	28.4	28.4	17.6	17.6		18.3	18.3		18.3	18.3	
Actuated g/C Ratio	0.50	0.47	0.47	0.29	0.29		0.30	0.30		0.30	0.30	
v/c Ratio	0.36	0.17	0.04	0.06	0.71		0.19	0.59		0.21	0.31	
Control Delay	11.8	10.7	2.9	20.3	28.6		19.3	24.8		20.1	20.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.8	10.7	2.9	20.3	28.6		19.3	24.8		20.1	20.1	
LOS	B	B	A	C	C		B	C		C	C	
Approach Delay		10.6			28.1			23.8			20.1	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	8.5	7.6	0.0	1.7	33.2		5.9	28.0		5.2	12.1	
Queue Length 95th (m)	28.6	25.1	3.0	8.0	81.7		16.3	58.2		15.2	28.7	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	479	1257	1021	534	823		733	989		574	906	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.34	0.11	0.03	0.04	0.43		0.09	0.28		0.10	0.15	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 60.8	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 21.0	Intersection LOS: C
Intersection Capacity Utilization 70.6%	ICU Level of Service C
Analysis Period (min) 15	

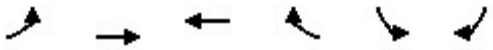
Splits and Phases: 3: Navan Road & Renaud Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	99	127	156	125	18	92
Future Volume (vph)	99	127	156	125	18	92
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	3%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	138	306	0	20	100
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 35.9%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	133	272	19	16	8
Future Volume (vph)	6	133	272	19	16	8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	33%	4%	0%	74%	81%	38%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	152	317	0	26	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 26.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	24	42	149	54	239
Future Volume (vph)	137	24	42	149	54	239
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	25%	7%	7%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	175	0	0	208	319	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

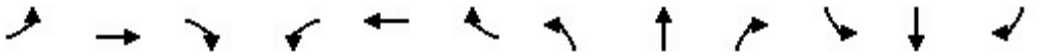
Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	458	545	221	0
Demand Flow Rate, veh/h	467	563	223	0
Vehicles Circulating, veh/h	187	59	417	622
Vehicles Exiting, veh/h	435	581	237	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.5	7.2	6.6	0.0
Approach LOS	A	A	A	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	467	563	223	0
Cap Entry Lane, veh/h	1140	1299	902	732
Entry HV Adj Factor	0.980	0.967	0.991	1.000
Flow Entry, veh/h	458	545	221	0
Cap Entry, veh/h	1118	1257	894	732
V/C Ratio	0.410	0.433	0.247	0.000
Control Delay, s/veh	7.5	7.2	6.6	4.9
LOS	A	A	A	A
95th %tile Queue, veh	2	2	1	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	141	110	15	33	130
Future Volume (vph)	0	141	110	15	33	130
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	153	136	0	36	141
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 23.0%		ICU Level of Service A	
Analysis Period (min) 15			

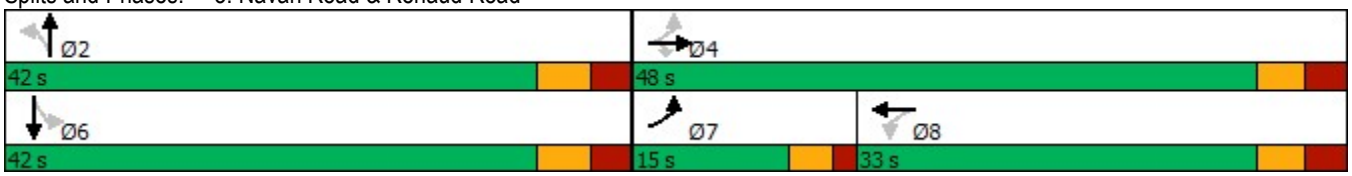


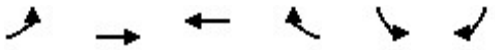
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	190	92	17	107	75	42	202	37	67	164	11
Future Volume (vph)	209	190	92	17	107	75	42	202	37	67	164	11
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	11%	35%	2%	5%	0%	4%	0%	3%	9%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	227	207	100	18	198	0	46	260	0	73	190	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	29.2	27.4	27.4	12.6	12.6		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.52	0.49	0.49	0.22	0.22		0.28	0.28		0.28	0.28	
v/c Ratio	0.39	0.24	0.14	0.10	0.50		0.14	0.54		0.26	0.41	
Control Delay	11.7	11.0	3.6	22.1	21.8		16.3	20.8		18.2	19.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.7	11.0	3.6	22.1	21.8		16.3	20.8		18.2	19.0	
LOS	B	B	A	C	C		B	C		B	B	
Approach Delay		9.9			21.8			20.1			18.7	
Approach LOS		A			C			C			B	
Queue Length 50th (m)	10.3	10.1	0.0	1.4	13.4		3.4	20.6		5.6	14.9	
Queue Length 95th (m)	39.5	36.9	8.6	7.9	42.2		11.2	46.4		16.5	35.0	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	589	1389	1096	418	837		762	1133		677	1093	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.39	0.15	0.09	0.04	0.24		0.06	0.23		0.11	0.17	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 56.3	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

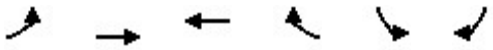
Splits and Phases: 3: Navan Road & Renaud Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	78	146	77	12	16	101
Future Volume (vph)	78	146	77	12	16	101
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	5%	6%	8%	6%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	85	159	97	0	17	110
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 21.2%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	144	91	1	14	3
Future Volume (vph)	0	144	91	1	14	3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	157	100	0	18	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 18.0%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	154	21	12	125	158	68
Future Volume (vph)	154	21	12	125	158	68
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	29%	17%	3%	4%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	0	149	246	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 34.5%		ICU Level of Service A	
Analysis Period (min) 15			

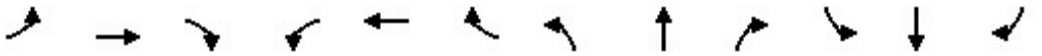
Intersection	
Intersection Delay, s/veh	58.8
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	417	1099	787	0
Demand Flow Rate, veh/h	426	1110	791	0
Vehicles Circulating, veh/h	291	370	285	1469
Vehicles Exiting, veh/h	1178	706	432	11
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.2	107.4	17.8	0.0
Approach LOS	A	F	C	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	426	1110	791	0
Cap Entry Lane, veh/h	1026	946	1032	308
Entry HV Adj Factor	0.980	0.990	0.995	1.000
Flow Entry, veh/h	417	1099	787	0
Cap Entry, veh/h	1005	937	1027	308
V/C Ratio	0.415	1.173	0.767	0.000
Control Delay, s/veh	8.2	107.4	17.8	11.7
LOS	A	F	C	B
95th %tile Queue, veh	2	33	8	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	180	203	129	156	188
Future Volume (vph)	0	180	203	129	156	188
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	196	361	0	170	204
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.0%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	201	34	55	336	246	76	333	78	120	178	8
Future Volume (vph)	191	201	34	55	336	246	76	333	78	120	178	8
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	2%	6%	5%	3%	1%	4%	10%	3%	3%	18%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	218	37	60	632	0	83	447	0	130	202	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	43.7	41.9	41.9	27.0	27.0		25.9	25.9		25.9	25.9	
Actuated g/C Ratio	0.54	0.52	0.52	0.33	0.33		0.32	0.32		0.32	0.32	
v/c Ratio	0.70	0.24	0.05	0.17	1.09		0.24	0.85		0.83	0.41	
Control Delay	28.7	13.0	4.2	23.2	91.2		21.1	39.8		65.8	23.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.7	13.0	4.2	23.2	91.2		21.1	39.8		65.8	23.1	
LOS	C	B	A	C	F		C	D		E	C	
Approach Delay		19.4			85.3			36.9			39.8	
Approach LOS		B			F			D			D	
Queue Length 50th (m)	16.7	18.4	0.0	6.8	~113.5		9.7	63.9		19.1	24.6	
Queue Length 95th (m)	#56.0	38.8	4.8	18.3	#204.8		20.3	100.0		#48.9	42.3	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	303	922	774	357	581		477	725		216	681	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.69	0.24	0.05	0.17	1.09		0.17	0.62		0.60	0.30	

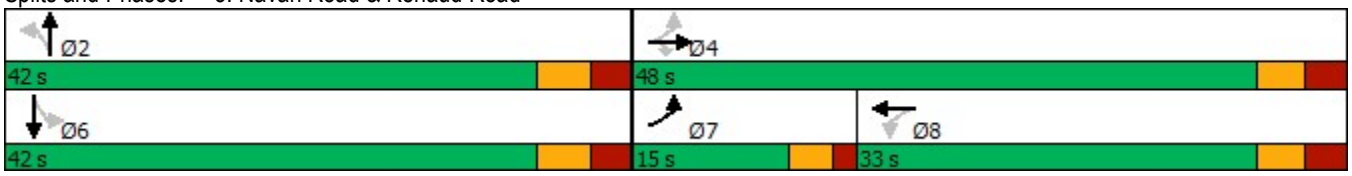
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 80.6	
Natural Cycle: 95	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 49.9	Intersection LOS: D
Intersection Capacity Utilization 97.1%	ICU Level of Service F
Analysis Period (min) 15	

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

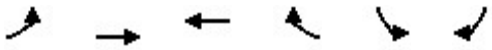
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Navan Road & Renaud Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	217	26	26	275	157	31	16	47	23	9	171
Future Volume (vph)	158	217	26	26	275	157	31	16	47	23	9	171
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	4%	0%	0%	2%	0%	0%	0%	0%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	264	0	28	470	0	34	68	0	25	196	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 63.0%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	273	446	24	21	10
Future Volume (vph)	8	273	446	24	21	10
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	51%	2%	0%	79%	86%	50%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	306	511	0	34	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	275	47	81	257	115	319
Future Volume (vph)	275	47	81	257	115	319
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	18%	7%	4%	3%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	350	0	0	367	472	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 75.2%		ICU Level of Service D	
Analysis Period (min) 15			

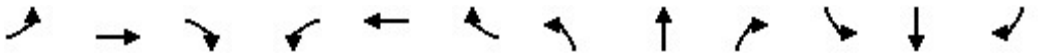
Intersection	
Intersection Delay, s/veh	30.8
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	945	778	451	0
Demand Flow Rate, veh/h	955	794	451	0
Vehicles Circulating, veh/h	352	212	778	1006
Vehicles Exiting, veh/h	654	1017	529	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	47.8	14.7	22.9	0.0
Approach LOS	E	B	C	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	955	794	451	0
Cap Entry Lane, veh/h	964	1112	624	495
Entry HV Adj Factor	0.990	0.980	1.000	1.000
Flow Entry, veh/h	945	778	451	0
Cap Entry, veh/h	954	1089	624	495
V/C Ratio	0.991	0.714	0.723	0.000
Control Delay, s/veh	47.8	14.7	22.9	7.3
LOS	E	B	C	A
95th %tile Queue, veh	18	6	6	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	150	180	25	52	201
Future Volume (vph)	0	150	180	25	52	201
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	163	223	0	57	218
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 28.1%		ICU Level of Service A	
Analysis Period (min) 15			



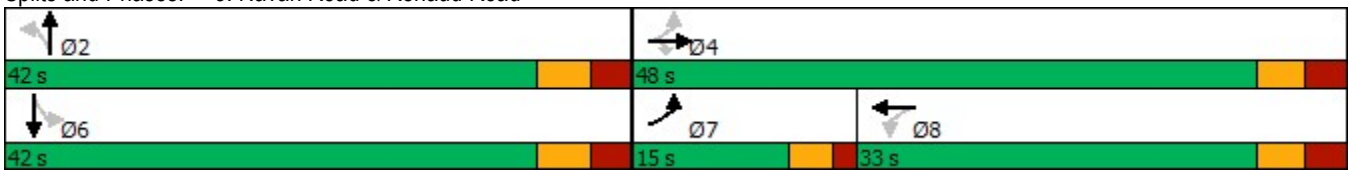
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	351	154	64	239	195	58	270	64	213	346	9
Future Volume (vph)	246	351	154	64	239	195	58	270	64	213	346	9
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	7%	11%	1%	2%	0%	3%	1%	1%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	382	167	70	472	0	63	363	0	232	386	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	41.5	39.7	39.7	24.4	24.4		28.2	28.2		28.2	28.2	
Actuated g/C Ratio	0.51	0.49	0.49	0.30	0.30		0.35	0.35		0.35	0.35	
v/c Ratio	0.78	0.44	0.21	0.27	0.89		0.26	0.60		0.90	0.64	
Control Delay	32.4	16.6	3.1	26.8	46.5		21.9	25.1		63.3	27.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	32.4	16.6	3.1	26.8	46.5		21.9	25.1		63.3	27.2	
LOS	C	B	A	C	D		C	C		E	C	
Approach Delay		19.0			44.0			24.7			40.8	
Approach LOS		B			D			C			D	
Queue Length 50th (m)	26.2	41.8	0.0	9.1	70.3		7.5	47.2		36.5	53.2	
Queue Length 95th (m)	#68.1	70.2	10.5	21.4	#134.2		17.4	74.6		#78.6	82.2	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	342	943	835	294	592		311	776		331	779	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.78	0.41	0.20	0.24	0.80		0.20	0.47		0.70	0.50	

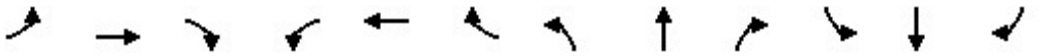
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 80.8	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

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

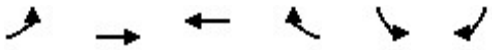
Splits and Phases: 3: Navan Road & Renaud Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	449	52	52	227	14	29	14	43	27	17	161
Future Volume (vph)	120	449	52	52	227	14	29	14	43	27	17	161
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	0%	0%	3%	10%	0%	0%	0%	5%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	545	0	57	262	0	32	62	0	29	193	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	524	272	19	19	6
Future Volume (vph)	5	524	272	19	19	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	41%	2%	2%	26%	26%	34%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	575	317	0	28	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 43.3%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	476	54	38	255	317	240
Future Volume (vph)	476	54	38	255	317	240
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	16%	12%	2%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	576	0	0	318	606	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			

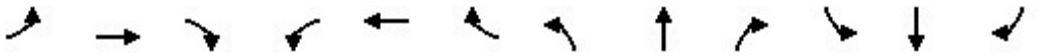
Intersection	
Intersection Delay, s/veh	64.3
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	425	1121	798	0
Demand Flow Rate, veh/h	434	1132	802	0
Vehicles Circulating, veh/h	296	373	291	1494
Vehicles Exiting, veh/h	1198	720	439	11
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	118.0	18.8	0.0
Approach LOS	A	F	C	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	434	1132	802	0
Cap Entry Lane, veh/h	1020	943	1026	301
Entry HV Adj Factor	0.980	0.990	0.995	1.000
Flow Entry, veh/h	425	1121	798	0
Cap Entry, veh/h	1000	934	1020	301
V/C Ratio	0.425	1.200	0.782	0.000
Control Delay, s/veh	8.4	118.0	18.8	12.0
LOS	A	F	C	B
95th %tile Queue, veh	2	35	8	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	184	205	131	159	191
Future Volume (vph)	0	184	205	131	159	191
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	200	365	0	173	208
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 38.5%		ICU Level of Service A	
Analysis Period (min) 15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	204	35	55	341	249	78	339	79	122	181	8
Future Volume (vph)	195	204	35	55	341	249	78	339	79	122	181	8
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	2%	6%	5%	3%	1%	4%	10%	3%	3%	18%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	222	38	60	642	0	85	454	0	133	206	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	43.7	42.0	42.0	27.0	27.0		26.3	26.3		26.3	26.3	
Actuated g/C Ratio	0.54	0.52	0.52	0.33	0.33		0.32	0.32		0.32	0.32	
v/c Ratio	0.71	0.24	0.05	0.17	1.11		0.25	0.85		0.86	0.41	
Control Delay	29.8	13.2	4.3	23.3	99.4		21.2	40.3		71.8	23.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.8	13.2	4.3	23.3	99.4		21.2	40.3		71.8	23.1	
LOS	C	B	A	C	F		C	D		E	C	
Approach Delay		20.0			92.9			37.3			42.2	
Approach LOS		B			F			D			D	
Queue Length 50th (m)	17.3	19.1	0.0	6.9	~118.4		10.0	65.5		19.9	25.2	
Queue Length 95th (m)	#57.9	39.4	5.0	18.3	#208.7		20.7	102.2		#51.3	43.1	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	301	917	770	354	578		469	721		210	676	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.70	0.24	0.05	0.17	1.11		0.18	0.63		0.63	0.30	

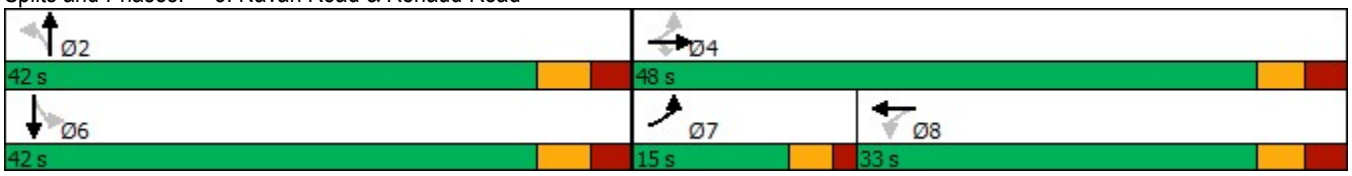
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 81	
Natural Cycle: 95	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 53.1	Intersection LOS: D
Intersection Capacity Utilization 98.2%	ICU Level of Service F
Analysis Period (min) 15	

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

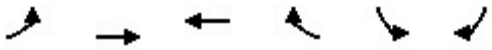
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Navan Road & Renaud Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	221	26	26	278	160	31	16	47	23	9	174
Future Volume (vph)	161	221	26	26	278	160	31	16	47	23	9	174
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	4%	0%	0%	2%	0%	0%	0%	0%	1%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	268	0	28	476	0	34	68	0	25	199	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 63.7%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	276	453	24	21	10
Future Volume (vph)	8	276	453	24	21	10
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	50%	2%	0%	79%	86%	50%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	309	518	0	34	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 36.7%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	279	47	82	261	117	326
Future Volume (vph)	279	47	82	261	117	326
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	18%	7%	4%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	354	0	0	373	481	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

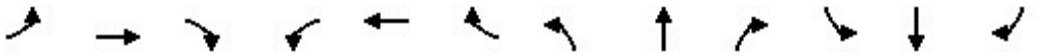
Intersection	
Intersection Delay, s/veh	34.2
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	962	793	456	0
Demand Flow Rate, veh/h	972	810	456	0
Vehicles Circulating, veh/h	359	214	793	1024
Vehicles Exiting, veh/h	665	1035	538	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	54.2	15.4	24.5	0.0
Approach LOS	F	C	C	-

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	972	810	456	0
Cap Entry Lane, veh/h	957	1109	615	486
Entry HV Adj Factor	0.990	0.979	1.000	1.000
Flow Entry, veh/h	962	793	456	0
Cap Entry, veh/h	947	1086	615	486
V/C Ratio	1.016	0.730	0.742	0.000
Control Delay, s/veh	54.2	15.4	24.5	7.4
LOS	F	C	C	A
95th %tile Queue, veh	20	7	6	0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	153	183	26	53	204
Future Volume (vph)	0	153	183	26	53	204
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	166	227	0	58	222
Sign Control	Stop		Free			Free

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 28.5%		ICU Level of Service A	
Analysis Period (min) 15			



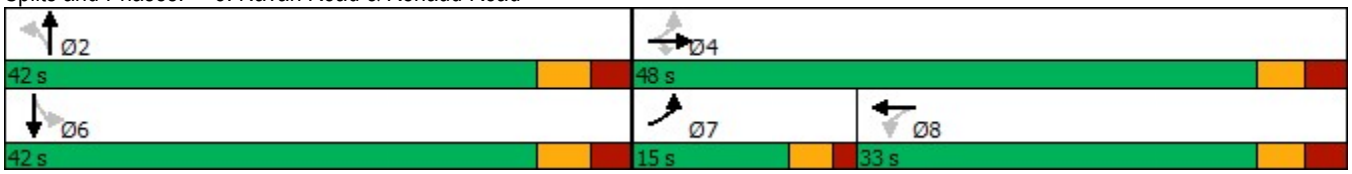
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	357	157	65	242	197	59	274	64	216	351	10
Future Volume (vph)	251	357	157	65	242	197	59	274	64	216	351	10
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	7%	11%	1%	2%	0%	3%	1%	1%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	388	171	71	477	0	64	368	0	235	393	0
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2		41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0		42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%		46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3		3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2		6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Recall Mode	None	None	None	None	None		Min	Min		Min	Min	
Act Effct Green (s)	41.7	40.0	40.0	24.7	24.7		28.8	28.8		28.8	28.8	
Actuated g/C Ratio	0.51	0.49	0.49	0.30	0.30		0.35	0.35		0.35	0.35	
v/c Ratio	0.81	0.44	0.22	0.27	0.90		0.27	0.60		0.92	0.65	
Control Delay	36.5	17.0	3.1	27.1	47.8		22.1	25.2		66.2	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	36.5	17.0	3.1	27.1	47.8		22.1	25.2		66.2	27.4	
LOS	D	B	A	C	D		C	C		E	C	
Approach Delay		20.5			45.1			24.8			41.9	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	27.8	44.1	0.0	9.5	73.2		7.6	48.1		37.4	54.5	
Queue Length 95th (m)	#72.8	71.5	10.6	21.8	#136.6		17.6	75.8		#80.8	84.0	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0			80.0			40.0		
Base Capacity (vph)	335	931	829	289	585		302	767		323	769	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.81	0.42	0.21	0.25	0.82		0.21	0.48		0.73	0.51	

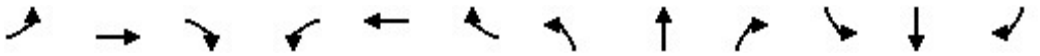
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 81.6	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 32.3	Intersection LOS: C
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

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

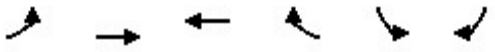
Splits and Phases: 3: Navan Road & Renaud Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	458	52	52	230	14	29	14	43	27	17	164
Future Volume (vph)	122	458	52	52	230	14	29	14	43	27	17	164
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	0%	0%	3%	10%	0%	0%	0%	5%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	555	0	57	265	0	32	62	0	29	196	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	533	274	19	19	6
Future Volume (vph)	5	533	274	19	19	6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	40%	2%	2%	25%	25%	34%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	584	319	0	28	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	484	54	38	259	322	243
Future Volume (vph)	484	54	38	259	322	243
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	16%	12%	2%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	585	0	0	323	614	0
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Control Type: Unsignalized			
Intersection Capacity Utilization 86.7%		ICU Level of Service E	
Analysis Period (min) 15			

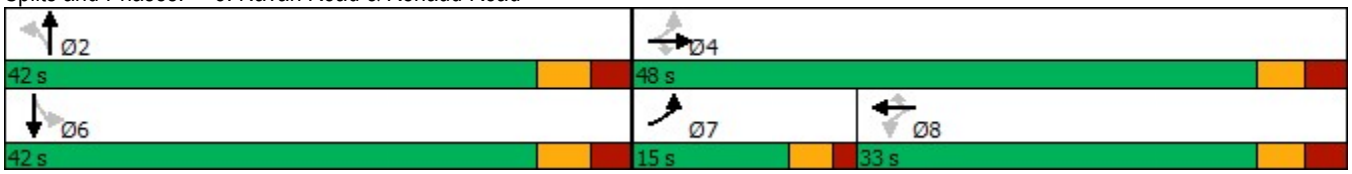
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	201	34	55	336	246	76	333	78	120	178	8
Future Volume (vph)	191	201	34	55	336	246	76	333	78	120	178	8
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	2%	6%	5%	3%	1%	4%	10%	3%	3%	18%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	218	37	60	365	267	83	447	0	130	202	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2	27.2	41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0	33.0	42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%	36.7%	46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9	2.9	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2	6.2	6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	36.8	35.0	35.0	20.0	20.0	20.0	24.5	24.5		24.5	24.5	
Actuated g/C Ratio	0.51	0.48	0.48	0.28	0.28	0.28	0.34	0.34		0.34	0.34	
v/c Ratio	0.50	0.26	0.05	0.20	0.76	0.44	0.23	0.81		0.71	0.39	
Control Delay	16.3	13.5	4.2	24.1	36.6	5.8	19.8	34.2		44.9	21.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	16.3	13.5	4.2	24.1	36.6	5.8	19.8	34.2		44.9	21.1	
LOS	B	B	A	C	D	A	B	C		D	C	
Approach Delay		14.0			23.6			31.9			30.4	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	16.1	17.8	0.0	6.7	48.3	0.0	8.6	56.7		16.4	21.9	
Queue Length 95th (m)	36.2	38.8	4.8	18.3	91.0	17.5	20.2	100.0		#44.5	42.3	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0		50.0	80.0			40.0		
Base Capacity (vph)	423	1063	885	411	674	748	560	832		279	783	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.21	0.04	0.15	0.54	0.36	0.15	0.54		0.47	0.26	

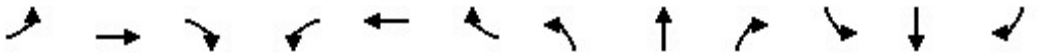
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 72.7	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 81.3%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 3: Navan Road & Renaud Road





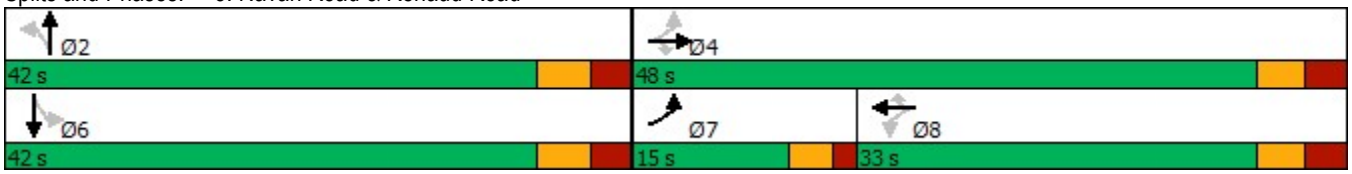
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	351	154	64	239	195	58	270	64	213	346	9
Future Volume (vph)	246	351	154	64	239	195	58	270	64	213	346	9
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	7%	11%	1%	2%	0%	3%	1%	1%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	382	167	70	260	212	63	363	0	232	386	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2	27.2	41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0	33.0	42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%	36.7%	46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9	2.9	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2	6.2	6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	33.4	31.7	31.7	16.4	16.4	16.4	26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.47	0.45	0.45	0.23	0.23	0.23	0.37	0.37		0.37	0.37	
v/c Ratio	0.57	0.48	0.23	0.35	0.63	0.41	0.23	0.57		0.80	0.61	
Control Delay	19.0	17.7	3.4	30.2	33.3	6.6	18.5	21.3		42.9	23.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.0	17.7	3.4	30.2	33.3	6.6	18.5	21.3		42.9	23.0	
LOS	B	B	A	C	C	A	B	C		D	C	
Approach Delay		15.2			22.5			20.9			30.5	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	23.2	37.2	0.0	8.4	33.4	0.0	5.8	36.7		27.5	41.5	
Queue Length 95th (m)	46.7	70.6	10.8	21.6	62.8	16.1	16.4	72.0		#72.3	79.6	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0		50.0	80.0			40.0		
Base Capacity (vph)	473	1099	946	343	704	721	394	902		415	907	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.56	0.35	0.18	0.20	0.37	0.29	0.16	0.40		0.56	0.43	

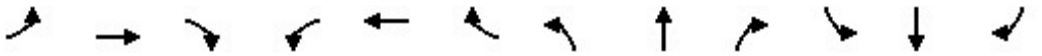
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 70.8	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 3: Navan Road & Renaud Road





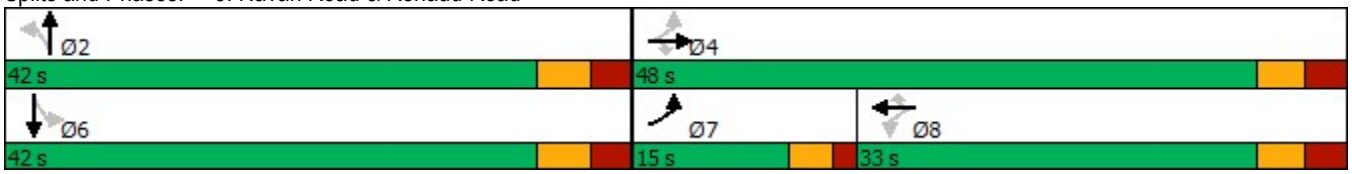
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	357	157	65	242	197	59	274	64	216	351	10
Future Volume (vph)	251	357	157	65	242	197	59	274	64	216	351	10
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	1%	7%	11%	1%	2%	0%	3%	1%	1%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	388	171	71	263	214	64	368	0	235	393	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2	27.2	41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0	33.0	42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%	36.7%	46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9	2.9	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2	6.2	6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	33.7	31.9	31.9	16.6	16.6	16.6	26.5	26.5		26.5	26.5	
Actuated g/C Ratio	0.47	0.45	0.45	0.23	0.23	0.23	0.37	0.37		0.37	0.37	
v/c Ratio	0.59	0.49	0.23	0.35	0.64	0.42	0.24	0.57		0.81	0.61	
Control Delay	19.7	18.0	3.4	30.5	33.7	6.6	18.7	21.4		44.3	23.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.7	18.0	3.4	30.5	33.7	6.6	18.7	21.4		44.3	23.2	
LOS	B	B	A	C	C	A	B	C		D	C	
Approach Delay		15.5			22.7			21.0			31.1	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	24.5	39.2	0.0	8.7	34.6	0.0	5.9	37.7		28.4	42.8	
Queue Length 95th (m)	47.8	71.9	10.8	22.0	63.5	16.2	16.9	73.3		#74.4	81.5	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0		50.0	80.0			40.0		
Base Capacity (vph)	467	1085	938	337	696	716	381	891		405	896	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.58	0.36	0.18	0.21	0.38	0.30	0.17	0.41		0.58	0.44	

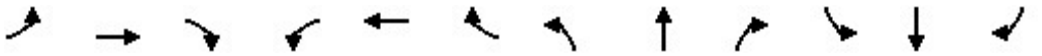
Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 71.5	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 3: Navan Road & Renaud Road





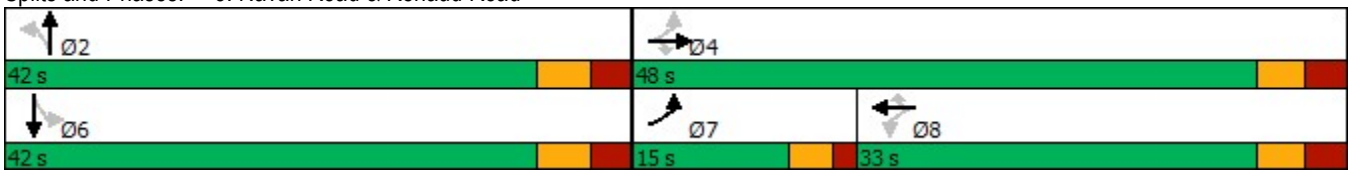
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	204	35	55	341	249	78	339	79	122	181	8
Future Volume (vph)	195	204	35	55	341	249	78	339	79	122	181	8
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	2%	6%	5%	3%	1%	4%	10%	3%	3%	18%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	222	38	60	371	271	85	454	0	133	206	0
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.5	27.2	27.2	27.2	27.2	27.2	41.5	41.5		41.5	41.5	
Total Split (s)	15.0	48.0	48.0	33.0	33.0	33.0	42.0	42.0		42.0	42.0	
Total Split (%)	16.7%	53.3%	53.3%	36.7%	36.7%	36.7%	46.7%	46.7%		46.7%	46.7%	
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.7	3.7		3.7	3.7	
All-Red Time (s)	1.5	2.9	2.9	2.9	2.9	2.9	2.7	2.7		2.7	2.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	6.2	6.2	6.2	6.4	6.4		6.4	6.4	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Recall Mode	None	None	None	None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	37.1	35.3	35.3	20.3	20.3	20.3	24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.51	0.48	0.48	0.28	0.28	0.28	0.34	0.34		0.34	0.34	
v/c Ratio	0.52	0.26	0.05	0.20	0.77	0.44	0.23	0.82		0.74	0.40	
Control Delay	16.8	13.6	4.3	24.2	37.2	5.8	19.9	34.9		48.6	21.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	16.8	13.6	4.3	24.2	37.2	5.8	19.9	34.9		48.6	21.3	
LOS	B	B	A	C	D	A	B	C		D	C	
Approach Delay		14.3			23.9			32.5			32.0	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	16.8	18.5	0.0	6.7	49.9	0.0	8.9	59.0		17.2	22.7	
Queue Length 95th (m)	36.9	39.4	5.0	18.3	92.6	17.6	20.6	102.2		#47.0	43.1	
Internal Link Dist (m)		292.7			919.3			255.8			529.7	
Turn Bay Length (m)	140.0		55.0	30.0		50.0	80.0			40.0		
Base Capacity (vph)	417	1049	875	405	666	745	551	822		269	774	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.51	0.21	0.04	0.15	0.56	0.36	0.15	0.55		0.49	0.27	

Intersection Summary

Cycle Length: 90	
Actuated Cycle Length: 73.4	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 82.2%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 3: Navan Road & Renaud Road



Appendix D

TDM Checklists

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☒
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☒
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☒
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☒
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☒

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☒
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☒
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☒
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☒
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☒
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐ N/A for site plan application.
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐ N/A site is located near street
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐ N/A school site

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☒ Bicycle parking is located at north and south ends of school.
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☒
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☒
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☒
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ N/A for school
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐ N/A for school
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☒ Shower provided for staff.
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☒
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐ N/A for school

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☒
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☒
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N/A for school
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐ N/A for school
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐ N/A for school
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐ N/A for school
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐ N/A for school
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐ N/A for school

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐ N/A parking meets zoning requirements
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐ N/A for school
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐ N/A for school
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐ N/A for school
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐ N/A for school
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐ N/A for school

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☐ N/A for school
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐ N/A for school
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☐ N/A for school
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐ N/A for school
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐ N/A for school

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3. TRANSIT	
		3.1 Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	☒ Recommended
BASIC	3.1.2	Provide online links to OC Transpo and STO information	☒ Recommended
BETTER	3.1.3	Provide real-time arrival information display at entrances	☐ N/A for school
		3.2 Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☒ Recommended
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☒ Recommended
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐ N/A for school
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐ N/A for school
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐ N/A for school
		3.4 Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐ N/A for school
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐ N/A for school

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	4.	**RIDESHARING**	
	4.1	**Ridematching service**	
		Commuter travel	
BASIC ★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐ N/A for school
	4.2	**Carpool parking price incentives**	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐ N/A for school
	4.3	**Vanpool service**	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐ N/A for school
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Bikeshare stations & memberships**	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐ N/A for school
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☐ N/A for school
	5.2	**Carshare vehicles & memberships**	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐ N/A for school
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐ N/A for school
	6.	**PARKING**	
	6.1	**Priced parking**	
		Commuter travel	
BASIC ★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐ N/A for school
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐ N/A for school
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐ N/A for school

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	7.	**TDM MARKETING & COMMUNICATIONS**	
	7.1	**Multimodal travel information**	
		Commuter travel	
BASIC ★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☐ N/A for school
		Visitor travel	
BETTER ★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐ N/A for school
	7.2	**Personalized trip planning**	
		Commuter travel	
BETTER ★	7.2.1	Offer personalized trip planning to new/relocating employees	☐ N/A for school
	7.3	**Promotions**	
		Commuter travel	
BETTER	7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐ N/A for school
	8.	**OTHER INCENTIVES & AMENITIES**	
	8.1	**Emergency ride home**	
		Commuter travel	
BETTER ★	8.1.1	Provide emergency ride home service to non-driving commuters	☐ N/A for school
	8.2	**Alternative work arrangements**	
		Commuter travel	
BASIC ★	8.2.1	Encourage flexible work hours	☐ N/A for school
BETTER	8.2.2	Encourage compressed workweeks	☐ N/A for school
BETTER ★	8.2.3	Encourage telework	☐ N/A for school
	8.3	**Local business travel options**	
		Commuter travel	
BASIC ★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐ N/A for school
	8.4	**Commuter incentives**	
		Commuter travel	
BETTER	8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐ N/A for school
	8.5	**On-site amenities**	
		Commuter travel	
BETTER	8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐ N/A for school

Appendix E

City of Ottawa LOS Definitions

CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. The Level of Service is usually calculated in terms of the ratio between traffic volumes and approach capacity, or "V/C" ratio.

The City of Ottawa has adopted criteria that directly relate the volume to capacity (V/C) ratio of a signalized intersection to a level of service (LOS) rating.

The following table describes the categories and characteristics of each level:

Level of Service	Features	V/C Ratio
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	0-0.60
B	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	0.61-0.70
C	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	0.71-0.80
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	0.81-0.90
E	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection, and delays to vehicles may extend to several signal cycles.	0.91-1.00
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 1.00