

2625 Carling Avenue and 1480 Richmond Road

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report

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2.2 Existing Conditions

2.2.1 Area Road Network

Richmond Road: Richmond Road is the City of Ottawa arterial road with a two-lane urban cross-section including sidewalks and bike lanes on both sides of the road. The posted speed limit is 50 km/h, and the City protected right-of-way is 30.0 metres. Richmond Road is designated as a truck route.

Carling Avenue: Carling Avenue is a City of Ottawa arterial road with a divided six-lane urban cross-section including sidewalks on both sides of the roadway. The posted speed limit is 60km/h, and the City protected right-of-way is 44.5 metre. Carling Avenue is designated as a truck route.

Alpine Avenue: Alpine Avenue is the City of Ottawa local road with a two-lane urban cross-section. The posted speed limit is 50 km/h, and the existing right-of-way is 18.0 metres.

2.2.2 Existing Intersections

The existing signalized area intersections within the study area of the site have been summarized below:

<i>Carling Avenue at Alpine Avenue/Town and Country Plaza Access</i>	The intersection of Carling Avenue at Alpine Avenue/Town and Country Plaza Access is a signalized intersection. The northbound and southbound approaches each consist of a shared all-movements lane. The eastbound and westbound approaches each consist of an auxiliary left turn lane, two through lanes, and one shared through/right-turn lane. No turn restrictions were noted.
<i>Richmond Road at Town and Country Plaza Access/Farm Boy Access</i>	The intersection of Richmond Road at Town and Country Plaza Access/Farm Boy Access is a signalized intersection. The northbound and southbound approaches each consist of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a shared through/right-turn, and a bike lane, and the westbound approach consists of an auxiliary left-turn lane, a through lane, a bike lane, and an auxiliary right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres the site accesses, driveways to retail spaces and commercial services exist along Carling Avenue and driveways to retail spaces and residential land uses exist along Richmond Road. Figure 3 illustrates the existing driveways.

2.2.4 Cycling and Pedestrian Facilities

Sidewalks are provided along both sides of Richmond Road and Carling Avenue.

The 2025 TMP identifies the feasibility study of improving the cycling crossing of Carling Avenue at Connaught Avenue, and Richmond Road 150 metres east of Croydon Avenue, in conjunction with establishing a cycling route through Lincoln Fields Shopping Centre and separated cycling facilities and/or bike lanes on Richmond Road from Carling Avenue to Bayshore Drive and on Pinecrest Road from Richmond Road to Fallis Avenue.

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 6 and Figure 7, respectively.

Figure 6: Existing Pedestrian Volumes

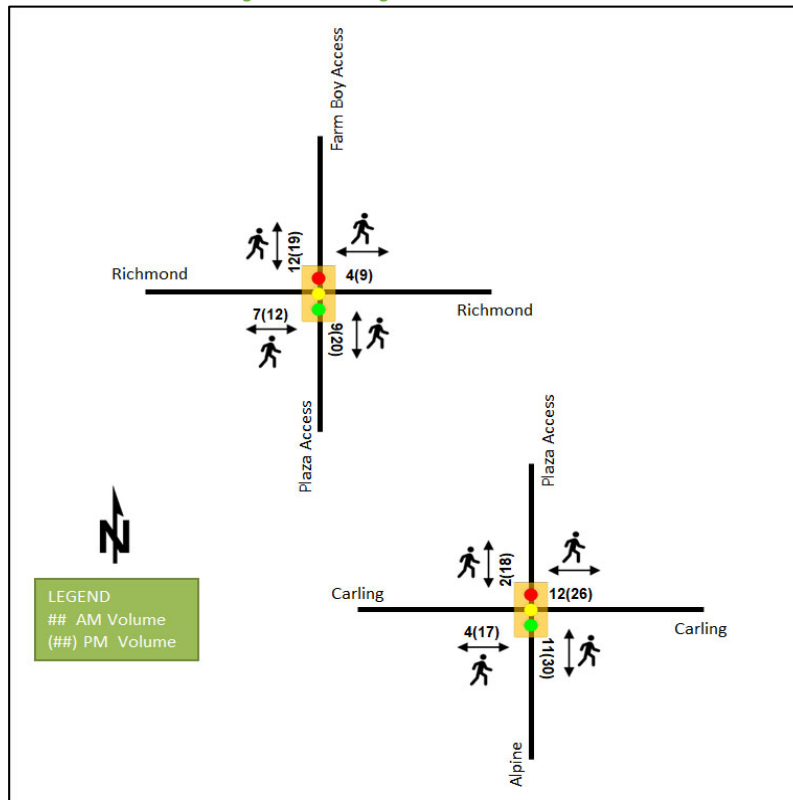
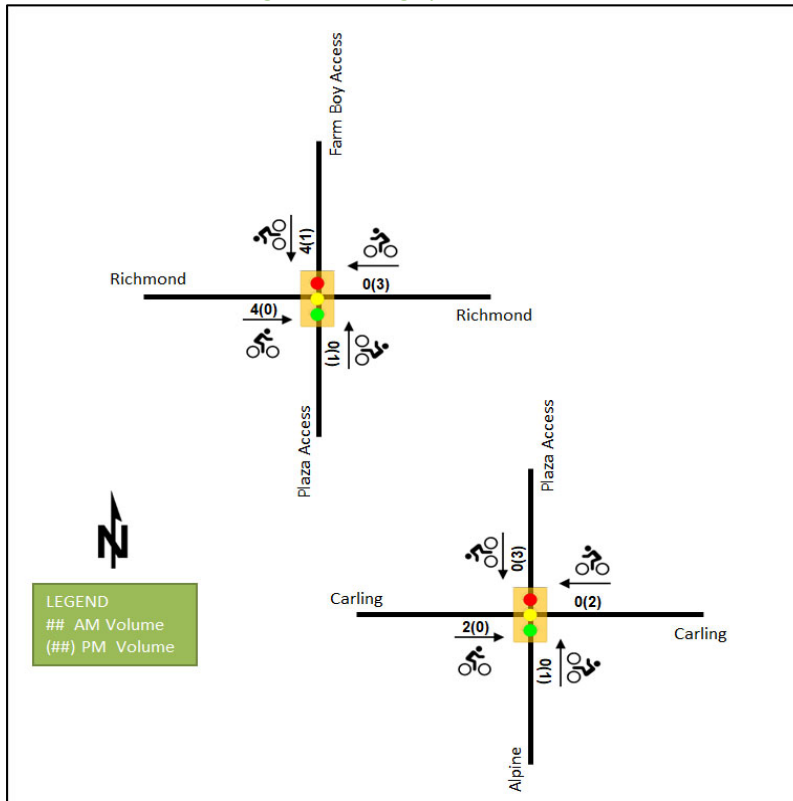


Figure 7: Existing Cyclist Volumes



2.2.5 Existing Transit

Figure 8 illustrates the transit system map in the study area and Figure 9 illustrates nearby transit stops. All transit information is from May 12, 2026, and is included for general information purposes and context to the surrounding area.

Within the study area, the routes #11, #51 travel along Richmond Road and routes #57, #85 travel along Carling Avenue, route #58 travels along Richmond Road and Carling Avenue. The frequency of these routes within proximity of the proposed site based on May 12, 2026, service levels are:

- Route #11 – 15-minute service all day, 30-minute service before 7:00 AM and after 7:00 PM
- Route #51 – 30-minute service all day
- Route #57 – 30-minute service all day, 15-minute service during PM peak hour/direction
- Route #58 – 30-minute service all day
- Route #85 – 15-minute service all day, 30-minute service after 6:00 PM

[illegible]

Source: <http://www.octranspo.com/> Accessed: May 12, 2026

2.2.6 Existing Area Traffic Management Measures

The existing area traffic management measures along boundary streets consist of seasonal flexible bollards along both sides of Richmond Road between Carling Avenue and the Town and Country Plaza access to delineate bike lanes and bulb-outs framing on-street parking along Richmond Road between Forest Street and approximately 65 metres north of Croydon Avenue within the study area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing study area intersections. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Richmond Road at Town and Country Plaza Access/Farm Boy Access	Wednesday, October 09, 2024
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access	Wednesday, March 13, 2024

Figure 10 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 10: Existing Traffic Counts

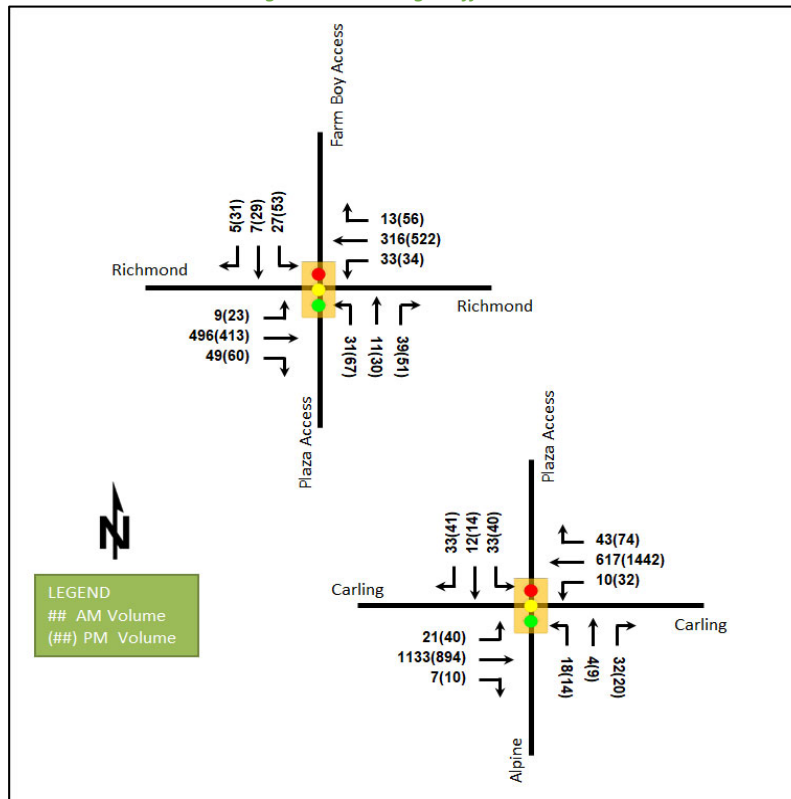


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Town and Country Plaza Access/Farm Boy Access <i>Signalized</i>	EBL	A	0.01	7.0	2.8	A	0.05	6.3	4.8
	EBT/R	A	0.47	9.1	#99.4	A	0.41	7.6	68.3
	WBL	A	0.07	7.1	7.1	A	0.07	6.4	6.3
	WBT	A	0.27	6.7	45.8	A	0.44	8.2	79.0
	WBR	A	0.01	0.5	0.6	A	0.06	2.1	4.3
	NBL/T	A	0.14	20.8	7.8	A	0.36	35.8	21.6
	NBR	A	0.17	9.6	7.1	A	0.29	15.5	15.7
	SBL/T	A	0.12	20.6	7.1	A	0.29	33.9	18.0
	SBR	A	0.04	14.7	3.8	A	0.22	18.3	14.1
	Overall	A	0.45	8.9	-	A	0.43	10.9	-
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access <i>Signalized</i>	EBL	A	0.26	65.0	14.8	A	0.41	69.0	23.1
	EBT/R	A	0.37	9.7	88.2	A	0.33	14.6	68.9
	WBL	A	0.13	62.0	9.0	A	0.35	67.0	19.9
	WBT/R	A	0.23	11.0	47.8	A	0.58	19.4	136.1
	NB	A	0.28	24.7	16.6	A	0.19	27.9	15.9
	SB	A	0.38	36.9	27.8	A	0.40	37.5	33.9
	Overall	A	0.37	12.5	-	A	0.57	19.9	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 0.90

Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections operate well. No capacity issues are noted. At the intersection of Richmond Road at Town and Country Plaza Access/Farm Boy Access, the eastbound through/right movement may exhibit extended queues during the AM peak hour.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network (2018-2022). Table 3 summarizes the collision types and conditions in the study area, Figure 11 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of the locations analyzed. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2018-2022

Total Collisions		Number	%
		60	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	11	18%
	Property Damage Only	49	82%
Initial Impact Type	Approaching	0	0%
	Angle	3	5%
	Rear end	19	32%
	Sideswipe	13	22%
	Turning Movement	21	35%
	SMV Unattended	0	0%
	SMV Other	4	7%
	Other	0	0%
Road Surface Condition	Dry	50	83%
	Wet	7	12%

		Number	%
Total Collisions		60	100%
	Loose Snow	1	2%
	Slush	0	0%
	Packed Snow	2	3%
	Ice	0	0%
	Unknown	0	0%
Pedestrian Involved		3	5%
Cyclists Involved		0	0%

Figure 11: Study Area Collision Records



Table 4: Summary of Collision Locations, 2018-2022

	Number	%
Intersections / Segments	60	100%
Carling Avenue at Alpine Avenue	35	58%
Carling Avenue WB between Poulin Avenue and Alpine Avenue	7	12%
Carling Avenue WB between Forest Street and Croydon Avenue	5	8%
Richmond Road at 140 E of Poulin Avenue	3	5%
Carling Avenue at Forest Street	2	3%
Carling Avenue EB between Ivanhoe Avenue and Alpine Avenue	2	3%
Richmond Road between Poulin Avenue and 140 E of Poulin Avenue	2	3%
Richmond Road between 140 E of Poulin Avenue and Forest Street	1	2%
Carling Avenue EB between Alpine Avenue and Forest Street S	1	2%
Carling Avenue EB between Forest St S and Norton Avenue	1	2%
Carling Avenue EB between Dundee Avenue and Ivanhoe Avenue	1	2%

Within the study area, three pedestrian collisions were noted between 2018-2022. Two pedestrian collisions occurred at the intersection of Carling Avenue at Alpine Avenue and one pedestrian collision occurred at the intersection of Richmond Road at 140 E of Poulin Avenue. The pedestrian collisions at the intersection of Carling Avenue at Alpine Avenue will be further discussed in detailed collision review for this location below.

The pedestrian collision at the intersection of Richmond Road at 140 E of Poulin Avenue occurred in 2018 in daylight and clear conditions. This collision is not available for further review in the detailed collision data. Table 5 summarizes the collision types and conditions for the intersection of Carling Avenue at Alpine Avenue.

Table 5: Carling Avenue at Alpine Avenue Collision Summary

		Number	%
Total Collisions		35	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	8	23%
	Property Damage Only	27	77%
Initial Impact Type	Approaching	0	0%
	Angle	3	9%
	Rear end	8	23%
	Sideswipe	3	9%
	Turning Movement	20	57%
	SMV Unattended	0	0%
	SMV Other	1	3%
	Other	0	0%
Road Surface Condition	Dry	27	77%
	Wet	6	17%
	Loose Snow	1	3%
	Slush	0	0%
	Packed Snow	1	3%
	Ice	0	0%
	Unknown	0	0%
Pedestrian Involved		2	6%
Cyclists Involved		0	0%

The Carling Avenue at Alpine Avenue intersection had a total of 35 collisions during the 2018-2022 time period, with 27 involving property damage only and the remaining eight having non-fatal injuries. The collision types are most represented by turning movement with 20 collisions, rear end with eight, angle and sideswipe each with three, and SMV other with one collision. Weather conditions do not appear to affect collisions at this location.

Based on detailed collision records from 2019-2022 and 2024 (representing a different analysis period than the publicly available data), a total of 25 collisions were recorded, including 12 turning movement collisions, seven rear end, three sideswipe, two angle, and one SMV other collision.

From the detailed collision records, turning movement collisions predominantly involved eastbound left-turning vehicles conflicting with westbound through vehicles (8 of 12) and westbound left-turning vehicles conflicting with eastbound through vehicles (4 of 12). The signal timing provides fully protected left-turn movements, which appears to be a change implemented post 2021 to address this issue. The left-turn collisions are cluster around the AM, PM, and mid-day peaks.

Based on the detailed collision records, the rear end collisions were entirely involving westbound movements (7 of 7) and sideswipe collisions were entirely in the westbound direction (3 of 3). Both types of collisions may be associated with congestion in the westbound direction. Note that one rear end collision involved pedestrian, which is discussed in more detailed below.

Angle collisions involved southbound through traffic conflicting with eastbound/westbound through traffic, given that these phases are conflicting, it is expected that these collisions were associated with drivers failing to obey traffic control.

Among the collisions involving pedestrians, one was a rear end collision involving westbound through vehicles, where the first driver was reported to have exceeded the speed limit in dusk, packed snow, and strong wind conditions. The other was classified as SMV other and involved a southbound left-turning vehicle in daylight and clear condition. Ladder pedestrian crossing pavement markings have been implemented post 2019 to improve crossing visibility. No further collision review is required at this location as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 *Transportation Master Plan (2025)*

The recently approved Transportation Master Plan includes a Capital Infrastructure Plan identifying transportation investments to support the forecasted growth and strategic connectivity and livability targets for the City. It also identifies committed projects, and a subset of priority projects that are expected to be implemented by 2046 based on current affordability assumptions. Area projects anticipated to impact travel in the study area that are included within the Capital Infrastructure Plan are:

- Active Transportation Network
 - Cycling Projects with Prioritization
 - Feasibility study of improving the cycling crossing of Carling Avenue at Connaught Avenue, and Richmond Road 150 metres east of Croydon Avenue, in conjunction with establishing a cycling route through Lincoln Fields Shopping Centre
 - Separated cycling facilities and/or bike lanes on Richmond Road from Carling Avenue to Bayshore Drive and on Pinecrest Road from Richmond Road to Fallis Avenue
- Transit Network
 - Priority Network
 - Transit Priority Corridors along:
 - Carling Avenue
 - Richmond Road south of Carling Avenue
 - Carling Avenue continuous bus lanes from Lincoln Fields Station to Sherwood Drive
 - Needs-Based Network
 - Carling Transitway median bus rapid transit from Lincoln Fields Station to Dow's Lake Station
- Road Network
 - Priority Network
 - Carling Avenue improvements, including the implementation of new cycletracks and upgrades to the existing sidewalks from Pinecrest Road to Connaught Avenue
 - Richmond Road urbanization including the implementation of new sidewalks and cycletracks on both sides of the road from Bayshore Drive to Pinecrest Road

2.3.2 Other Study Area Developments

2583 & 2589 Bond Street, 365 Forest Street, 1420 Richmond Road

The proposed development application includes an official plan amendment, zoning by-law amendment, and site plan application to construct two residential buildings with a total of 391 residential units. The development was

initially anticipated to be built out by 2024 and to generate 45 AM and 42 PM peak hour two-way auto trips. (exp, 2022)

3 Study Area and Time Periods

3.1 Study Area

Due to the building conversion and reduce trip impacts as part of the land use change, the study area was confirmed with the City Transportation Project Manager to include the site access intersections of:

- Carling Avenue at Alpine Avenue/Town and Country Plaza Access
- Richmond Road at Town and Country Plaza Access/Farm Boy Access

The boundary road will be Carling Avenue and Richmond Road and Screenline 42 is present within proximity to the site; however, it is not required for the analysis within this study.

3.2 Time Periods

As the proposed development is composed of a drive-through restaurant, the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2026. As a result, the full build-out plus five years horizon year is 2031.

4 Development-Generated Travel Demand

4.1 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for Bayshore/Cedarview have been summarized in Table 6.

Table 6: TRANS Trip Generation Manual Recommended Mode Shares – Bayshore/Cedarview

Travel Mode	Commercial Generator	
	AM	PM
Auto Driver	64%	62%
Auto Passenger	15%	20%
Transit	4%	6%
Cycling	0%	1%
Walking	17%	11%
Total	100%	100%

4.2 Trip Generation

This TIA has been prepared using the vehicle trip rates and derived person trip rates for the drive-through restaurant from the ITE Trip Generation Manual 11th Edition (2021) using the City-prescribed conversion factor of 1.28. Table 7 summarizes the person trip rates for the drive-through restaurant by peak hour.

Table 7: Trip Generation Person Trip Rates by Peak Hour

Land Use	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Fast-Food Restaurant with Drive-Through Window	934 (ITE)	AM	33.24	42.55
		PM	31.60	40.45

Using the above person trip rates, the total person trip generation has been estimated. Table 8 summarizes the total person trip generation for the drive-through restaurant.

Table 8: Total Person Trip Generation by Peak Hour

Land Use	GFA	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Fast-Food Restaurant with Drive-Through Window	6,152 sq. ft	134	128	262	129	120	249

Pass-by reductions applied to the drive-through restaurant trip generation at a rate of 50% have been included, with the value taken as a moderately conservative interpretation from the rates presented in the ITE Trip Generation Handbook 3rd Edition.

Using the above mode share targets, pass-by rates, and the person trip rates, the person trips by mode have been projected. Table 9 summarizes the drive-through restaurant trip generation by mode and peak hour.

Table 9: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Proposed Drive-through Restaurant	Auto Driver	64%	43	41	84	62%	40	37	77
	Auto Passenger	15%	20	19	39	20%	26	24	50
	Transit	4%	5	5	10	6%	8	7	15
	Cycling	0%	0	0	0	1%	1	1	2
	Walking	17%	23	22	45	11%	14	13	27
	Pass-by	50%	-43	-41	-84	50%	-40	-37	-77
	Total	100%	91	87	178	100%	89	82	171

As shown above, a total of 84 AM and 77 PM new peak hour tow-way vehicle trips are projected as a result of the proposed development.

4.3 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the drive-through restaurant, and these patterns were applied based on the build-out of Bayshore/Cedarview. Table 10 below summarizes the distributions.

Table 10: OD Survey Distribution – Bayshore/Cedarview

To/From	% of Trips
North	15%
South	25%
East	40%
West	20%
Total	100%

4.4 Trip Assignment

Using the distribution outlined above, turning movement splits, and existing volume splits at the study area intersections, the trips generated by the site have been assigned to the study area road network. Table 11 summarizes the proportional assignment to the study area roadways.

Table 11: Trip Assignment

To/From	Via
North	10% Carling Ave (E) 5% Richmond Rd (E)

To/From	Via
South	15% Richmond Rd (W) 10% Carling Ave (w)
East	30% Carling Ave (E) 10% Richmond Rd (E)
West	15% Richmond Rd (W) 5% Carling Ave (W)
Total	100%

4.5 Trip Reductions

The existing development includes bank with a drive-through of approximately 571.6 sq. m. The ITE Trip Generation Manual land use category of Drive-in Bank (ITE 912) with a 30% pass-by rate has been applied. Based on the commercial generator mode shares for Bayshore/Cedarview, the estimated trip generation of the existing site is 35 two-way vehicle trips during the AM peak hour and 72 two-way vehicle trips during the PM peak hour. Table 12 compares the trip generation of the existing and proposed land uses.

Table 12: Trip Generation Comparison-Estimated and Proposed Land Uses

Horizon	Scenario	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Proposed	Auto Driver	43	41	84	40	37	77
	Pass-by	-43	-41	-84	-40	-37	-77
Existing	Auto Driver	20	15	35	36	36	72
	Pass-by	-9	-6	-15	-15	-15	-30
Difference	Auto Driver	+23	+26	+49	+4	+1	+5
	Pass-by	+34	+35	+69	+25	+22	+47

As shown above, the proposed redevelopment is anticipated to generate 49 additional two-way AM peak hour vehicles and five additional two-way PM peak hour vehicles on the adjacent road network. Figure 12 illustrates the net site volumes. The proposed redevelopment is also expected to generate additional 69 two-way AM peak hour pass-by trips and 47 two-way PM peak hour pass-by trips. Figure 12 illustrates the net site generated volumes, and Figure 13 illustrates the net pass-by volumes.

Figure 12: Net Auto Volumes

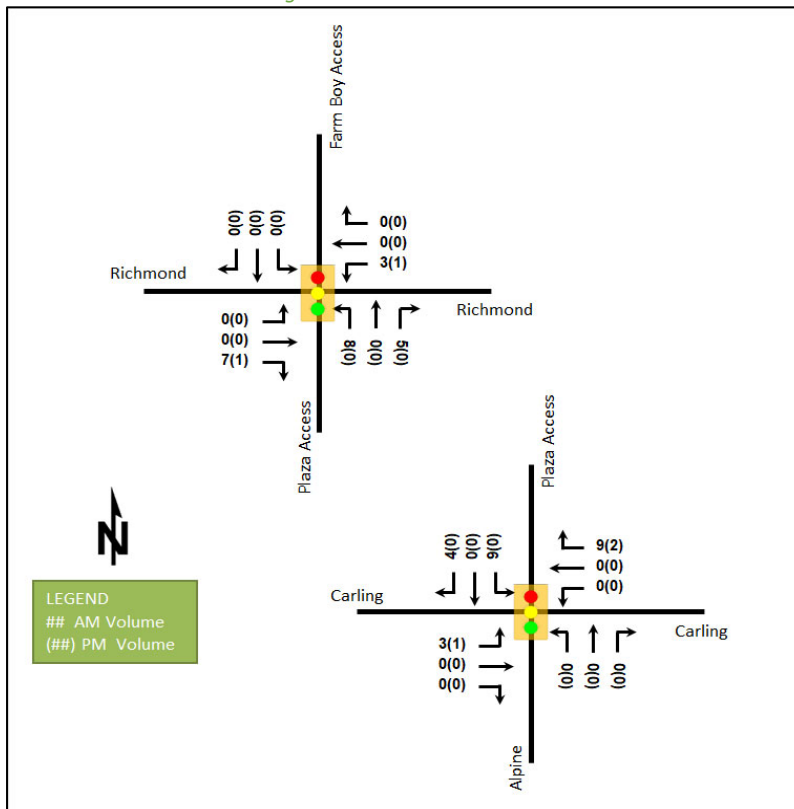
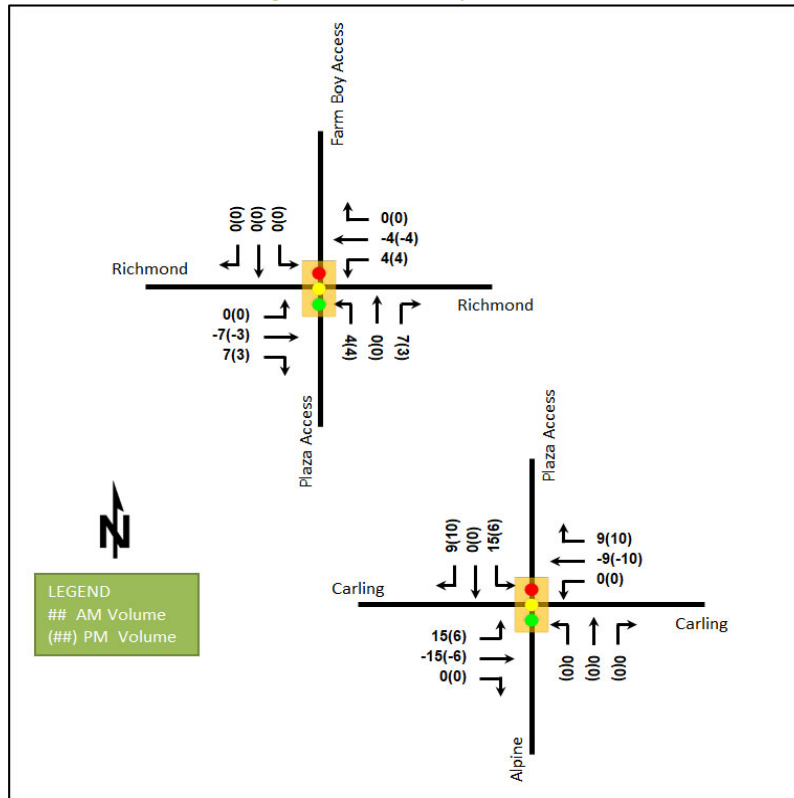


Figure 13: Net Pass-by Volumes



5 Exemption Review

Table 13 summarizes the exemptions for this TIA.

Table 13: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
Development Design	4.1.2 Circulation and Access	Only required for site plan and zoning by-law applications	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Required
Boundary Street Design		All applications	Required
Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required
Network Impact			
Background Network Travel Demand	All Elements	Only required when one or more other Network Impact Modules are triggered when the development generates more than 75 auto or transit trips	Required
Demand Rationalization		Only required when one or more other Network Impact Modules when the development generates more than 75 auto trips	Required
Neighbourhood Traffic Calming	4.6.1 Adjacent Neighbourhoods	If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between an arterial road and the site's access: 1. Access to Collector or Local; 2. "Significant sensitive land use presence" exists, where there is at least two of the following adjacent to the subject street segment: • School (within 250m walking distance); • Park; • Retirement / Older Adult Facility (i.e. long-term care and retirement homes); • Licenced Child Care Centre; • Community Centre; or • 50%, or greater, of adjacent property along the route(s) is occupied by residential lands and a minimum of 10 occupied residential units are present on the route. 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision; 4. At least 75 site-generated auto trips; 5. Site Trip Infiltration is expected. Site traffic will increase peak hour vehicle volumes along the route by 50% or more.	Exempt

Module	Element	Explanation	Exempt/Required
Transit	4.7.1 Transit Route Capacity	Only required when the development generates more than 75 transit trips	Exempt
	4.7.2 Transit Priority Requirements	Only required when the development generates more than 75 auto trips	Exempt
Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt
Intersection Design	4.4.1-2/4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.4.3/4.9.2 Intersection Design	Only required when the development generates more than 75 auto trips	Required

6 Development Design

6.1 Design for Sustainable Modes

The proposed development is the conversion of the existing 571.6 sq. m drive-through bank to a drive-through restaurant, including an adjustment to the drive-through aisle and adjacent parking spaces. The total parking reduction is 17 spaces to accommodate the adjustments to the drive-through alignment, and the remaining vehicle parking is maintained within the overall plaza. Four bicycle parking spaces are located in surface racks west of the building. Painted pedestrian crossings are proposed throughout the site at locations of major pedestrian desire lines including between each of the site buildings and between the buildings and the pedestrian facilities at the site accesses. Locally surrounding the building, these crossing locations include across both drive aisles at the northeast corner of the building, across the east-west drive aisle at the southeast corner of the building, and across the new parking area west of the building providing access to surface bicycle parking racks. The on-site pedestrian crossings are proposed to be accessed by depressed curbs and TWSIs (Tactile Walking Surface Indicators). The building entrance is located northwest corner of the building.

Beyond the scope of this application, existing sidewalks are present along Richmond Road and Carling Avenue, and existing hard surface connections are provided from the existing plaza. Bus stops are located on both sides of Richmond Road and Carling Avenue within a 180-metre walk of the building entrance.

The infrastructure TDM checklist is provided in Appendix E.

6.2 Circulation and Access

No changes to the plaza accesses are proposed. The existing access is 12.7-metre-wide and permits full movements on Richmond Road and is 7.3-metre-wide and permits full movements on Carling Avenue. The existing internal drive aisles vary in width, with a minimum width of 6.7 metres.

The proposed changes to the site vehicular circulation are limited to the boundary of the existing building and adjustments to the drive-through and adjacent parking spaces. The drive aisles will change from approximately 5.4 metres to 6.7 metres on the north side of the subject building, from approximately 7.7 metres to 6.7 meters on the east side of the subject building, from 8.4 meters to 7.0 metres on the southwest side of the subject building, and 9.0 metres to 6.7 metres directly south of the subject building. The proposed drive-through lane is 3.65-metre-wide and can accommodate larger passenger vehicles, including Ford F-150 pickup trucks. Loading turning movements can be accommodated on-site at the loading bay west of the building, and garbage collection

will occur at the northwest corner of the plaza within a designated garbage collection bay. Turning templates are provided in Appendix F.

7 Parking

7.1 Parking Supply

The proposed changes to the drive-through will reduce the adjacent parking by 17 spaces; however, the plaza provides a total of approximately 197 parking spaces.

According to the new Zoning By-Law (2026-50) for Area B, a maximum parking ratio of 3.6 spaces per 100 m² of gross floor is permitted for a restaurant and a shopping centre, resulting in a maximum of 120 parking spaces for the overall plaza. According to the legacy Zoning By-Law (2008-250) for Area Z, no off-street motor vehicle parking is required to be provided, and no maximum parking rate is applicable to a restaurant. The site is an existing development with a change in use for a single building. This change in use results in a net reduction of on-site parking. The proposed parking reduction is not expected to negatively impact the overall plaza, and results in the overall parking total closer to the new Zoning By-Law's maximum value. The proposed parking rates are considered appropriate and are recommended to be approved.

The drive-through restaurant is proposed to include four bicycle parking spaces. According to the new Zoning By-Law (2026-50), a minimum of two bicycle parking spaces, plus one additional space per 250 m² above 250 m², is required for a restaurant, resulting in a minimum requirement of three bicycle spaces. This value is above the legacy Zoning By-Law (2008-250) requirement of one space per 250 m², equating to two spaces. Therefore, the site meets the minimum bicycle parking requirements considering both Zoning By-Laws.

8 Boundary Street Design

Table 14 summarizes the MMLOS analysis for the boundary streets of Richmond Road and Carling Avenue. Both roadways are within the "Inner Urban" area. The TMP identifies active mode infrastructure improvements along Carling Avenue from Pinecrest Road to Connaught Avenue, which have been incorporated into the future analysis. The MMLOS worksheets have been provided in Appendix G.

Table 14: Boundary Street MMLOS Analysis

Segment	Conditions	Pedestrian LOS		Bicycle LOS		Transit LOS		Public Realm LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target
Richmond Road	Existing/Future	A	A	D	A	D	D	B	B
Carling Avenue	Existing	C	A	F	B	D	C	C	C
	Future	B	A	C	B	D	C	B	B

Richmond Road will not meet the bicycle LOS target in the existing and future conditions. Although beyond the scope of this study, to meet the bicycle LOS target, either a 2.0-2.5-metre painted or physically separated bike lanes with a 1.0 metre boulevard and vertical measure would be required, or a 1.8-2.09-metre cycletrack with a 1.0 metre boulevard would be required.

Carling Road will not meet the pedestrian, bicycle, and transit LOS targets in the existing and future conditions. Although beyond the scope of this study, to meet the pedestrian LOS target, either a 3.0-metre boulevard would be required, or the operating speed would require to be reduced to 50 km/h. To meet the bicycle LOS target, either a 0.6-1.49-metre boulevard with adjacent parking would be required or a 2.1-2.5-metre cycletrack with a 1.0-1.49-metre boulevard and no adjacent parking. To meet the transit LOS target, either a curbside bus lane or a partially segregated right-of-way (median bus transit) would be required. Given that Carling Avenue is identified

as a transit priority corridor in the TMP, transit signal priority or queue jump lanes are expected to be implemented along the corridor, which may improve the transit LOS.

9 Transportation Demand Management

9.1 Context for TDM

The mode shares used within the TIA represent a reliance on auto modes. Overall, the modal shares are likely to be achieved and supporting TDM measures should be provided.

The subject site is within a Design Priority Area and is subject to Lincoln Fields Secondary Plan and the boundary streets of Carling Avenue and Richmond Road are “Mainstreet within Design Priority Area” corridors.

9.2 Need and Opportunity

The subject site has been assumed to rely predominantly on auto travel, and those assumptions have been carried through the analysis.

9.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for the proposed drive-through restaurant. The checklists are provided in Appendix E. The key TDM measures recommended for consideration, primarily focused on employees, include:

- Display local area maps with walking/cycling access routes and key destinations at the entrance
- Display relevant transit schedules and route maps at the entrance
- Provide transit incentives to encourage commuters to use transit
- Provide a multimodal travel option information package to new employees
- Provide secure bike parking

10 Background Network Travel Demands

10.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3 and will be considered in the analysis.

10.2 Background Growth

A review of the background projections from the City’s TRANS Regional Model for the 2022 and 2046 horizons was completed to determine the background growth for each of the study area roadways. As growth within the City is not a linear process, comparisons of existing volumes to the forecasted 2046 volumes have been included to determine how regional development has occurred and the impact on the study area. Table 15 summarizes the result of the model, and the TRANS model plots are provided in Appendix H.

Table 15: Study Area Growth Rates- AM Peak Hour

Street	Directional Growth % from 2022 to 2046		Directional Growth % from Existing to 2046	
	Eastbound	Westbound	Eastbound	Westbound
Richmond Rd	0.33%	-0.61%	2.20%	2.79%
Carling Ave	0.17%	-1.60%	-1.24%	0.31%

Given the roadways have finite capacity and cannot grow unconstrained, the growth rates from the existing volumes to 2046 will be used to generate the study area growth rates. Growth rates will be applied to the mainline and major turning movements for the appropriate roads during the AM peak hour, rounded to the nearest 0.25%

and reversed for the PM peak hour. Table 16 summarizes the suggested growth rates applied for the background road network.

Table 16: Recommended Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Richmond Rd	2.25%	2.75%	2.75%	2.25%
Carling Ave	0.00%	0.25%	0.25%	0.00%

10.3 Other Developments

The background developments explicitly considered in the background conditions (Section 10.2) include:

- 2583 & 2589 Bond Street, 365 Forest Street, 1420 Richmond Road

The trip generation for these developments have been updated to the TRANS 2020 methodology. The background development volumes within the study area have been provided in Appendix I.

11 Demand Rationalization

11.1 2026 Future Background Intersection Operations

Figure 14 illustrates the 2026 background volumes and Table 17 summarizes the 2026 background intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services. The synchro worksheets for the 2026 future background horizon are provided in Appendix J.

Figure 14: 2026 Future Background Volumes

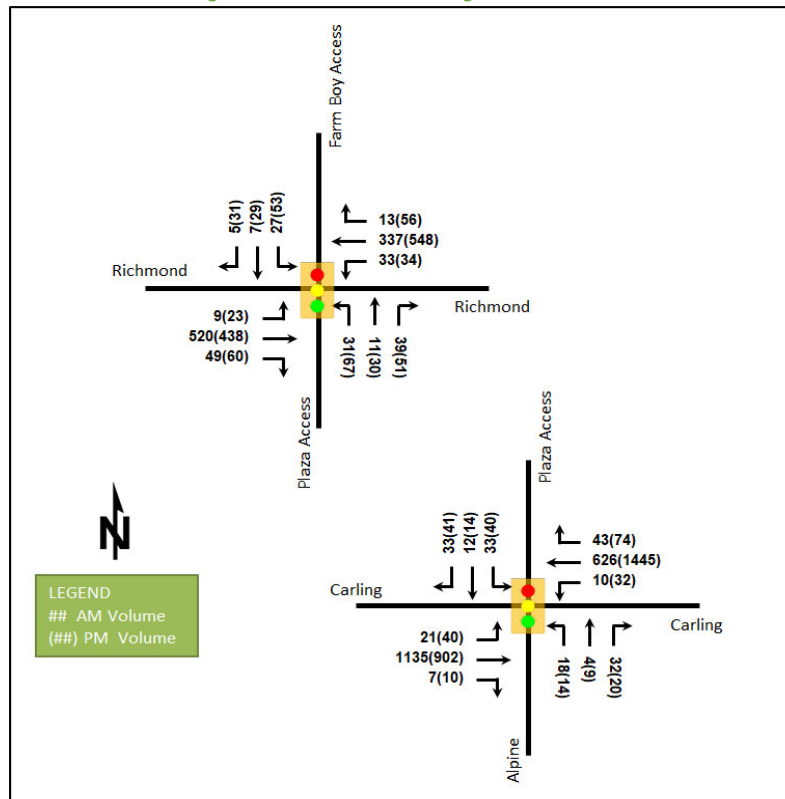


Table 17: 2026 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Town and Country Plaza Access/Farm Boy Access Signalized	EBL	A	0.01	7.0	2.6	A	0.04	6.3	4.4
	EBT/R	A	0.44	8.3	85.4	A	0.39	7.3	63.1
	WBL	A	0.06	6.9	6.5	A	0.06	6.3	5.9
	WBT	A	0.26	6.6	43.8	A	0.42	7.8	72.9
	WBR	A	0.01	0.2	0.4	A	0.05	2.2	4.1
	NBL/T	A	0.13	20.5	7.3	A	0.33	34.9	19.9
	NBR	A	0.16	9.7	6.8	A	0.27	15.5	14.8
	SBL/T	A	0.11	20.3	6.7	A	0.26	33.2	16.6
	SBR	A	0.04	14.8	3.4	A	0.21	18.1	13.2
	Overall	A	0.42	8.4	-	A	0.41	10.5	-
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access Signalized	EBL	A	0.24	64.6	13.8	A	0.38	68.1	21.8
	EBT/R	A	0.32	8.9	77.2	A	0.30	14.2	61.7
	WBL	A	0.12	61.9	8.3	A	0.32	66.0	18.3
	WBT/R	A	0.20	10.4	43.1	A	0.52	18.1	117.1
	NB	A	0.25	25.2	15.7	A	0.17	27.5	14.8
	SB	A	0.34	35.1	24.8	A	0.37	35.0	30.1
	Overall	A	0.32	11.7	-	A	0.51	18.8	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2026 future background horizon operate similarly to the existing conditions. No capacity issues are noted. The incremental improvement to the intersection operations is predominantly a result of the peak hour factor adjustment to 1.00 for forecasted conditions.

11.2 2031 Future Background Intersection Operations

Figure 15 illustrates the 2031 background volumes and Table 18 summarizes the 2031 background intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services. The synchro worksheets for the 2031 future background horizon are provided in Appendix K.

Figure 15: 2031 Future Background Volumes

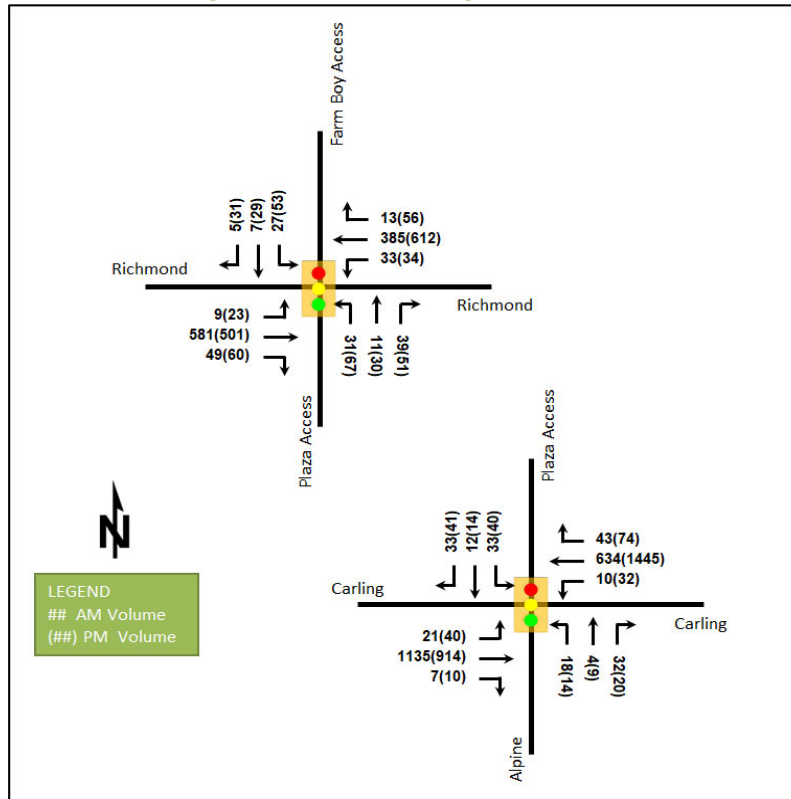


Table 18: 2031 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Town and Country Plaza Access/Farm Boy Access Signalized	EBL	A	0.01	7.0	2.6	A	0.05	6.3	4.4
	EBT/R	A	0.49	9.6	#114.6	A	0.44	7.9	74.8
	WBL	A	0.07	7.1	6.6	A	0.06	6.4	5.9
	WBT	A	0.30	6.9	51.2	A	0.47	8.5	85.6
	WBR	A	0.01	0.2	0.4	A	0.05	2.2	4.1
	NBL/T	A	0.13	20.5	7.3	A	0.33	34.9	19.9
	NBR	A	0.16	9.7	6.8	A	0.27	15.5	14.8
	SBL/T	A	0.11	20.3	6.7	A	0.26	33.2	16.6
	SBR	A	0.04	14.8	3.4	A	0.21	18.1	13.2
	Overall	A	0.47	9.1	-	A	0.46	10.7	-
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access Signalized	EBL	A	0.24	64.6	13.8	A	0.38	68.1	21.8
	EBT/R	A	0.32	8.9	77.2	A	0.31	14.2	62.6
	WBL	A	0.12	61.9	8.3	A	0.32	66.0	18.3
	WBT/R	A	0.20	10.4	43.6	A	0.52	18.1	117.1
	NB	A	0.25	25.2	15.7	A	0.17	27.5	14.8
	SB	A	0.34	35.1	24.8	A	0.37	35.0	30.1
	Overall	A	0.32	11.8	-	A	0.51	18.8	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds
 m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2031 future background horizon operate similarly to the 2026 future background conditions. No capacity issues are noted.

At the intersection of Richmond Road at Town and Country Plaza Access/Farm Boy Access, the eastbound through/right movement may exhibit extended queues during the AM peak hour.

12 Transit

12.1 Transit Priority

Site traffic is anticipated to have negligible impact on transit movements throughout the study area. All intersections' transit LOS scores will be the same between the background and total conditions.

13 Intersection Design

13.1 Location and Design of Access

No changes to the existing plaza accesses are proposed. All proposed modifications are captured within the Circulation and Access Section. A review of the existing site accesses is provided for informational purposes only.

The existing access configuration includes one full-movement access on Richmond Road and one on Carling Avenue. The existing access on Richmond Road is located approximately 137 metres from Poulin Avenue and approximately 122 metres from Forest Street. The existing access on Carling Avenue is located approximately 172 metres from Poulin Avenue and 42 metres from Forest Street. The Geometric Design Guide for Canadian Roads (TAC, 2017) suggests minimum corner clearance value of 70.0 metres for driveways along arterial road; therefore, the existing site access on Carling Avenue does not meet this guideline given the proximity to Forest Street. The Private Approach By-Law requires a minimum offset of 3.0 metres from the adjacent property line and 60.0 metres from the adjacent road right-of-way. The existing site access on Carling Avenue does not meet this guideline given the proximity to Forest Street.

The existing access on Richmond Road is 12.7-metre-wide in its typical dimension and 24.4-metre at the curb line with an approximate 5.0-metre corner radius on the west side and a compound curve on the east side consisting of a 4.0-metre radius transitioning to a 12.0-metre radius. The existing access on Carling Avenue is 7.3-metre-wide in its typical dimension and 16.8-metre at the curb line with an approximate corner radius of 8.0-metre on the west and 6.0-metre on the east side. The maximum width of a two-way access from the private Approach By-Law is 9.0 metres at the highway line and 19.0 metres in width at the curb line or roadway edge. The access on Richmond Road does not meet the Private Approach By-Law width requirements.

The throat length at the existing site access on Richmond Road to the first on-site conflict is approximately 17.7 metres, and the throat length at the existing site access on Carling Avenue is approximately 15.7 metres. According to the TAC Geometric Design Guidelines, the suggested minimum throat length for shopping centres smaller than 25,000 sq. m is 15.0 metres and the suggested minimum throat length for restaurants greater than 200 sq. m is 40.0 metres for access onto arterial roads. Therefore, the current throat lengths meet the minimum requirement for shopping centres; however, they do not meet the suggested minimum requirement for restaurants.

13.2 Intersection Control

No change to the existing signalized control is recommended for the network intersections.

13.3 Intersection Design

13.3.1 2026 Future Total Intersection Operations

The 2026 future total intersection volumes are illustrated in Figure 16 and the intersection operations are summarized below in Table 19. The level of service for signalized intersections is based on volume to capacity ratio

(v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services. The synchro worksheets have been provided in Appendix L.

Figure 16: 2026 Future Total Volumes

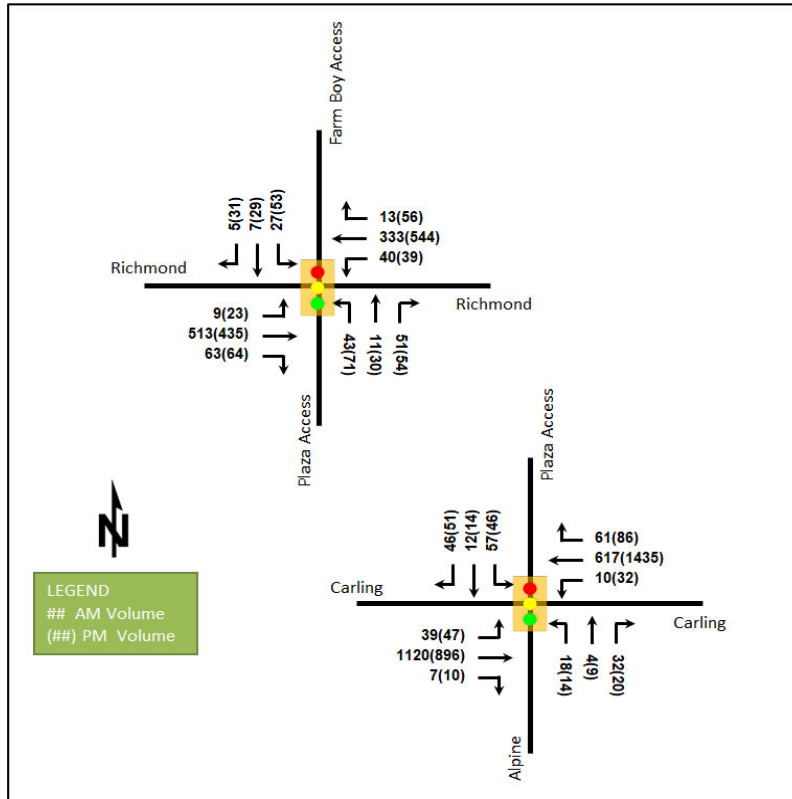


Table 19: 2026 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Town and Country Plaza Access/Farm Boy Access Signalized	EBL	A	0.01	7.0	2.6	A	0.04	6.3	4.4
	EBT/R	A	0.49	9.6	86.7	A	0.39	7.4	63.1
	WBL	A	0.09	7.4	7.7	A	0.07	6.3	6.5
	WBT	A	0.29	7.3	43.0	A	0.42	7.8	72.1
	WBR	A	0.01	0.2	0.4	A	0.05	2.2	4.1
	NBL/T	A	0.17	21.5	9.3	A	0.34	35.3	20.9
	NBR	A	0.19	9.0	7.4	A	0.28	15.2	14.8
	SBL/T	A	0.11	20.3	6.7	A	0.26	33.2	16.6
	SBR	A	0.04	14.8	3.4	A	0.21	18.1	13.2
	Overall	A	0.46	9.5	-	A	0.41	10.5	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access Signalized	EBL	A	0.38	67.6	21.5	A	0.43	69.9	24.2
	EBT/R	A	0.33	9.5	75.8	A	0.30	14.2	61.2
	WBL	A	0.12	61.9	8.3	A	0.32	66.0	18.3
	WBT/R	A	0.23	12.4	45.4	A	0.53	18.4	117.5
	NB	A	0.24	24.5	15.7	A	0.17	27.5	14.8
	SB	A	0.50	44.5	37.5	A	0.42	37.1	34.7
	Overall	A	0.34	14.3	-	A	0.52	19.4	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2026 future total horizon operate similarly to the 2026 future background conditions. No capacity issues are noted.

13.3.2 2031 Future Total Intersection Operations

The 2031 future total intersection volumes are illustrated in Figure 17 and the intersection operations are summarized below in Table 20. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services. The synchro worksheets have been provided in Appendix M.

Figure 17: 2031 Future Total Volumes

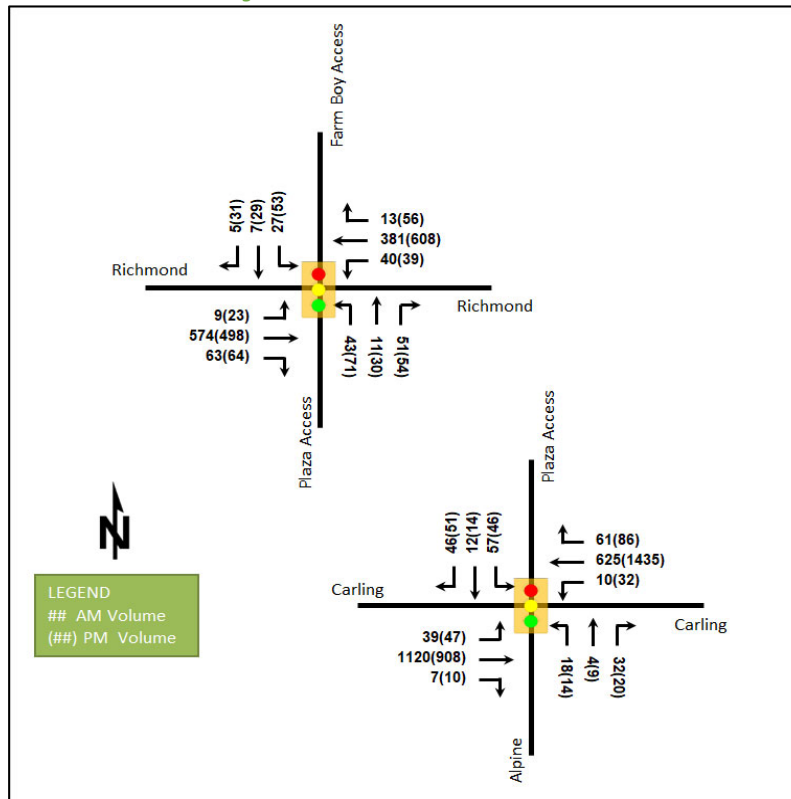


Table 20: 2031 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Richmond Road at Town and Country Plaza Access/Farm Boy Access <i>Signalized</i>	EBL	A	0.02	7.0	2.6	A	0.05	6.3	4.4
	EBT/R	A	0.54	11.1	#116.8	A	0.44	8.0	75.1
	WBL	A	0.10	7.6	7.8	A	0.07	6.4	6.5
	WBT	A	0.33	7.7	50.6	A	0.47	8.5	85.1
	WBR	A	0.01	0.2	0.4	A	0.05	2.2	4.1
	NBL/T	A	0.17	21.5	9.3	A	0.34	35.3	20.9
	NBR	A	0.19	9.0	7.4	A	0.28	15.2	14.8
	SBL/T	A	0.11	20.3	6.7	A	0.26	33.2	16.6
	SBR	A	0.04	14.8	3.4	A	0.21	18.1	13.2
	Overall	A	0.51	10.3	-	A	0.46	10.8	-
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access <i>Signalized</i>	EBL	A	0.38	67.6	21.5	A	0.43	69.9	24.2
	EBT/R	A	0.33	9.5	75.8	A	0.30	14.2	62.1
	WBL	A	0.12	61.9	8.3	A	0.32	66.0	18.3
	WBT/R	A	0.23	12.4	46.0	A	0.53	18.4	117.5
	NB	A	0.24	24.5	15.7	A	0.17	27.5	14.8
	SB	A	0.50	44.5	37.5	A	0.42	37.1	34.7
	Overall	A	0.34	14.3	-	A	0.52	19.3	-

Notes: Saturation flow rate of 1800 veh/h/lane
Queue is measured in metres
Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds
m = metered queue
= volume for the 95th %ile cycle exceeds capacity

During both the AM and PM peak hours, the study area intersections at the 2031 future total horizon operate similarly to the 2031 future background conditions. No capacity issues are noted.

At the intersection of Richmond Road at Town and Country Plaza Access/Farm Boy Access, the eastbound through/right movement may exhibit extended queues during the AM peak hour.

13.3.3 Intersection MMLOS

Table 21 summarizes the MMLOS analysis for the study area intersections. Both intersections are within the “Inner Urban” area. The TMP identifies active mode infrastructure improvements along Carling Avenue from Pinecrest Road to Connaught Avenue, which have been incorporated into the future analysis. The MMLOS worksheets has been provided in Appendix G.

Table 21: Study Area Intersection MMLOS Analysis

Intersection	Conditions	Pedestrian LOS		Bicycle LOS		Transit LOS		Auto LOS	
		PLOS	Target	BLOS	Target	TLOS	Target	ALOS	Target
Richmond Road at Town and Country Plaza Access/Farm Boy Access	Ex/Fut	B	A	C	A	C	D	A	E
Carling Avenue at Alpine Avenue/ Town and Country Plaza Access	Ex	C	A	D	B	C	C	A	E
	Fut	C	A	C	B	C	C	A	E

The pedestrian and cycling LOS targets will not meet at the intersection of Richmond Road at Town and Country Plaza Access/Farm Boy Access in the existing and future conditions. Although beyond the scope of this study, to meet the pedestrian LOS target, the maximum number of travel lanes crossed at each pedestrian crossing would need to be reduced to three lanes, with an effective walk time of at least 31 seconds. Alternatively, a median refuge island greater than 2.7 meters combined with an effective walk time of at least 31 seconds would be required. To meet the bicycle LOS target, either a unidirectional crossside with protected corners/or no left turn

lane would be required, or a signalised right-turn channel with a bike lane and protected corners/ or no left turn lane would be required.

The pedestrian and cycling LOS targets will not meet at the intersection of Carling Avenue at Alpine Avenue/ Town and Country Plaza Access in the existing and future conditions. Although beyond the scope of this study, to meet the pedestrian LOS target, the maximum number of travel lanes crossed at each pedestrian crossing would need to be reduced to three lanes, with an effective walk time of at least 42 seconds and all crosswalk treatment need to be zebra-striped markings. Alternatively, the maximum number of travel lanes crossed at each pedestrian crossing would need to be reduced to four lanes, with a median refuge island greater than 2.7 meters combined with an effective walk time of at least 42 seconds.

Although beyond the scope of this study, to meet the bicycle LOS target, a unidirectional crossride on the north and south legs of the intersection would be required. Alternatively, protected corners as a cyclist left-turn treatment for the westbound left-turn and eastbound left-turn movements would be required.

13.3.4 Recommended Design Elements

No study area intersection design elements are proposed for the network intersections as part of this study.

14 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposed site includes the conversion of the existing 571.6 sq. m drive-through bank to a drive-through restaurant with same building
- The drive-through and adjacent parking spaces will be adjusted to accommodate the new use, while the remaining parking lot will remain unchanged
- The existing access configuration, consisting of one full-movement access on Carling Avenue and one on Richmond Road, will remain unchanged
- The building conversion is anticipated to be completed by 2026
- The site is located within a Design Priority Area and is subject to Lincoln Fields Secondary Plan
- The boundary streets of Carling Avenue and Richmond Road are “Mainstreet within Design Priority Area” corridors

TIA Screening and Exemptions

- The TIA Screening form indicated a full TIA was required due to trip generation, location, and safety triggers
- The exemption review for the TIA did not require new street networks, neighbourhood traffic calming review, transit review, network concept review

Existing Conditions

- Richmond Road and Carling Avenue are arterial roads, and Alpine Avenue is a local road in the study area
- Sidewalks are provided along both sides of Richmond Road and Carling Avenue and bike lanes along both sides of Richmond Road within the study area
- During both the AM and PM peak hours, the study area intersections operate well
- Two pedestrian collisions occurred at the intersection of Carling Avenue at Alpine Avenue and ladder pedestrian crossing pavement markings have been implemented post 2019 to improve crossing visibility

- One pedestrian collision occurred at the intersection of Richmond Road at 140 E of Poulin Avenue in 2018 in daylight and clear conditions and this collision is not available for further review in the detailed collision data
- Signal timing at Carling Avenue at Alpine Avenue provides fully protected left-turn movements, which appears to be a change implemented post 2021 to address turning movement collisions

Planned Conditions

- Feasibility study of improving the cycling crossing of Carling Avenue at Connaught Avenue, and Richmond Road 150 metres east of Croydon Avenue, in conjunction with establishing a cycling route through Lincoln Fields Shopping Centre and separated cycling facilities and/or bike lanes on Richmond Road from Carling Avenue to Bayshore Drive and on Pinecrest Road from Richmond Road to Fallis Avenue are identified as priority projects within the TMP Active Transportation Network
- Carling Avenue transit priority corridor, Richmond Road transit priority corridor south of Carling Avenue, and Carling Avenue continuous bus lanes from Lincoln Fields Station to Sherwood Drive are identified as transit priority projects, and Carling Transitway median bus rapid transit from Lincoln Fields Station to Dow's Lake Station is identified as a need-based transit project within the TMP Transit Network
- Carling Avenue improvements, including the implementation of new cycletracks and upgrades to the existing sidewalks from Pinecrest Road to Connaught Avenue and Richmond Road urbanization including the implementation of new sidewalks and cycletracks on both sides of the road from Bayshore Drive to Pinecrest Road are identified as priority projects within the TMP Road Network

Development Generated Travel Demand

- The proposed drive-thru restaurant is forecasted produce 178 two-way people trips during the AM peak hour and 171 two-way people trips during the PM peak hour
- Of the forecasted people trips, 84 two-way trips will be vehicle trips during the AM peak hour, and 77 two-way trips will be vehicle trips during the PM peak hour
- The proposed drive-thru restaurant is forecasted produce 84 two-way pass-by trips during the AM peak hour and 77 two-way pass-by trips during the PM peak hour
- The existing drive-thru bank comparatively generates 35 two-way vehicle trips during the AM peak hour, and 72 two-way vehicle trips during the PM peak hour
- The existing drive-thru bank also generates 15 two-way pass-by trips during the AM peak hour, and 30 two-way pass-by trips during the PM peak hour
- Net new trips are forecasted to be 49 two-way vehicle trips during the AM peak hour, and 5 two-way vehicle trips during the PM peak hour
- Net pass-by trips are forecasted to be 69 two-way pass-by trips during the AM peak hour, and 47 two-way pass-by trips during the PM peak hour
- Of the forecasted trips, 15% are anticipated to travel north, 40% to the east, 20% to the west, and 25% to both the west and south

Development Design

- The proposed conversion includes an adjustment to the drive-through aisle and adjacent parking spaces
- The total parking reduction is 17 spaces, and the remaining vehicle parking is maintained within the overall plaza
- Bicycle parking spaces are located in surface racks west of the building

- Painted pedestrian crossings are proposed throughout the site at locations of major pedestrian desire lines including between each of the site buildings and between the buildings and the pedestrian facilities at the site accesses
- The on-site pedestrian crossings are proposed to be accessed by depressed curbs and TWSIs
- Beyond the scope of this application, existing sidewalks are present along Richmond Road and Carling Avenue, and existing hard surface connections are provided from the existing plaza, and bus stops are located on both sides of Richmond Road and Carling Avenue within a 180-metre walk of the building entrance
- No changes to the plaza access are proposed
- The internal drive aisles vary, with a minimum width of 6.7 metres
- The proposed changes to the site circulation are limited to the boundary of the existing building and adjustments to the drive through and parking spaces
- The proposed drive-through lane is 3.65-metre-wide and can accommodate larger passenger vehicles, including Ford F-150 pickup trucks
- The loading turning movements can be accommodated on-site at the loading bay west of the building, and the garbage collection will occur at the northwest corner of the plaza within a designated area

Parking

- The proposed changes to the drive-through will reduce the adjacent parking by 17 spaces; however, the plaza provides a total of approximately 197 parking spaces
- The proposed parking reduction is not expected to negatively impact the overall plaza and overall parking after this adjustment is closer to the maximum parking permitted by the new Zoning By-Law 2026-50, and there is no minimum parking requirement by the legacy Zoning By-Law 2008-250
- The proposed drive-through restaurant meets the minimum bicycle parking requirement

Boundary Street Design

- Richmond Road will not meet the bicycle LOS target in the existing and future conditions
- Although beyond the scope of this study, to meet the bicycle LOS target, either a 2.0-2.5-metre painted or physically separated bike lanes with a 1.0 metre boulevard and vertical measure would be required, or a 1.8-2.09-metre cycletrack with a 1.0 metre boulevard would be required
- Carling Road will not meet the pedestrian, bicycle, and transit LOS targets in the existing and future conditions
- Although beyond the scope of this study, to meet the pedestrian LOS target, either a 3.0-metre boulevard would be required, or the operating speed would require to be reduced to 50 km/h
- Although beyond the scope of this study, to meet the bicycle LOS target, either a 0.6-1.49-metre boulevard with adjacent parking would be required or a 2.1-2.5-metre cycletrack with a 1.0-1.49-metre boulevard and no adjacent parking
- Although beyond the scope of this study, to meet the transit LOS target, either a curbside bus lane or a partially segregated right-of-way (median bus transit) would be required
- Given that Carling Avenue is identified as a transit priority corridor in the TMP, transit signal priority or queue jump lanes are expected to be implemented along the corridor, which may improve the transit LOS

TDM

- Supportive TDM measures to be considered for implementation within the proposed building conversation should include:
 - Display local area maps with walking/cycling access routes and key destinations at the entrance
 - Display relevant transit schedules and route maps at the entrance
 - Provide transit incentives to encourage commuters to use transit
 - Provide a multimodal travel option information package to new employees
 - Provide secure bike parking

Background Conditions

- The background developments were explicitly included in the background conditions, along with a total background growth applied on study area roadways along the mainline volumes
- During both the AM and PM peak hours, the intersections in the study area operate acceptably in the future background conditions
- No capacity constraints are noted at the study area intersections in the background conditions

Transit

- No specific transit priority measures were considered as part of this development

Intersection Design

- No changes to the existing plaza accesses are proposed
- During both the AM and PM peak hours, the study area intersections at the future total conditions operate similar to the corresponding future background conditions
- The pedestrian and cycling LOS targets will not meet at the intersections of Richmond Road at Town and Country Plaza Access/Farm Boy Access and Carling Avenue at Alpine Avenue/ Town and Country Plaza Access in the existing and future conditions
- Although beyond the scope of this study, improvements to the pedestrian crossing facilities and cycling infrastructure would be required to meet the LOS targets

15 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:

Reihaneh Azhdar

Reihaneh Azhdar
Transportation Engineering, Intern

Reviewed By:



Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
Step 1 - Screening Form

Date: 2026-06-02
Project Number: 2026-042
Project Reference: 2625 Carling 1480 Richmond

1.1 Description of Proposed Development	
Municipal Address	2625 Carling Avenue and 1480 Richmond Road
Description of Location	North of Carling Avenue, south of Richmond Road
Land Use Classification	Hub Zone 2 (H2 H(100))
Development Size	Conversion of the existing drive-through bank to a drive-through restaurant
Accesses	The building is located internal to the site, set back from the two existing accesses; one on Carling Avenue and one on Richmond Avenue
Phase of Development	Single
Buildout Year	2026
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger		
Land Use Type	Fast-Food Restaurant with Drive-Through Window	
Development Size	6,308 sq.ft	G.F.A.
Trip Generation Trigger	Yes	

1.3 Location Triggers		
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No	
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	Yes	The development is in a Hub, a Protected Major Transit Station Area, and a Design Priority Area. Carling Avenue and Richmond Road are Mainstreet corridors
Location Trigger	Yes	

1.4. Safety Triggers		
Are posted speed limits on a boundary street 80 km/hr or greater?	No	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No	
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)?	No	
Is the proposed driveway within auxiliary lanes of an intersection?	No	
Does the proposed driveway make use of an existing median break that serves an existing site?	No	
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	Yes	Within 500 m of the development, there are 14 pedestrian collisions across seven intersections and four cyclist collisions across three intersections and one roadway segment
Does the development include a drive-thru facility?	Yes	
Safety Trigger	Yes	



Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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

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

CERTIFICATION



I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines; (Update effective July 2023)



I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;



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



I am either a licensed or registered¹ professional in good standing, whose field of expertise



is either transportation engineering



or transportation planning.

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

Dated at Ottawa this 17 day of August, 20 23.
(City)

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa



Signature of individual certifier that s/he/they meet the above criteria

Office Contact Information (Please Print)
Address: <u>6 Plaza Court</u>
City / Postal Code: <u>Ottawa, K2H 7W1</u>
Telephone / Extension: <u>613-697-3797</u>
Email Address: <u>andrew.harte@cghtransportation.com</u>

Stamp



Revision Date: June 2023

Appendix B

Turning Movement Counts

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

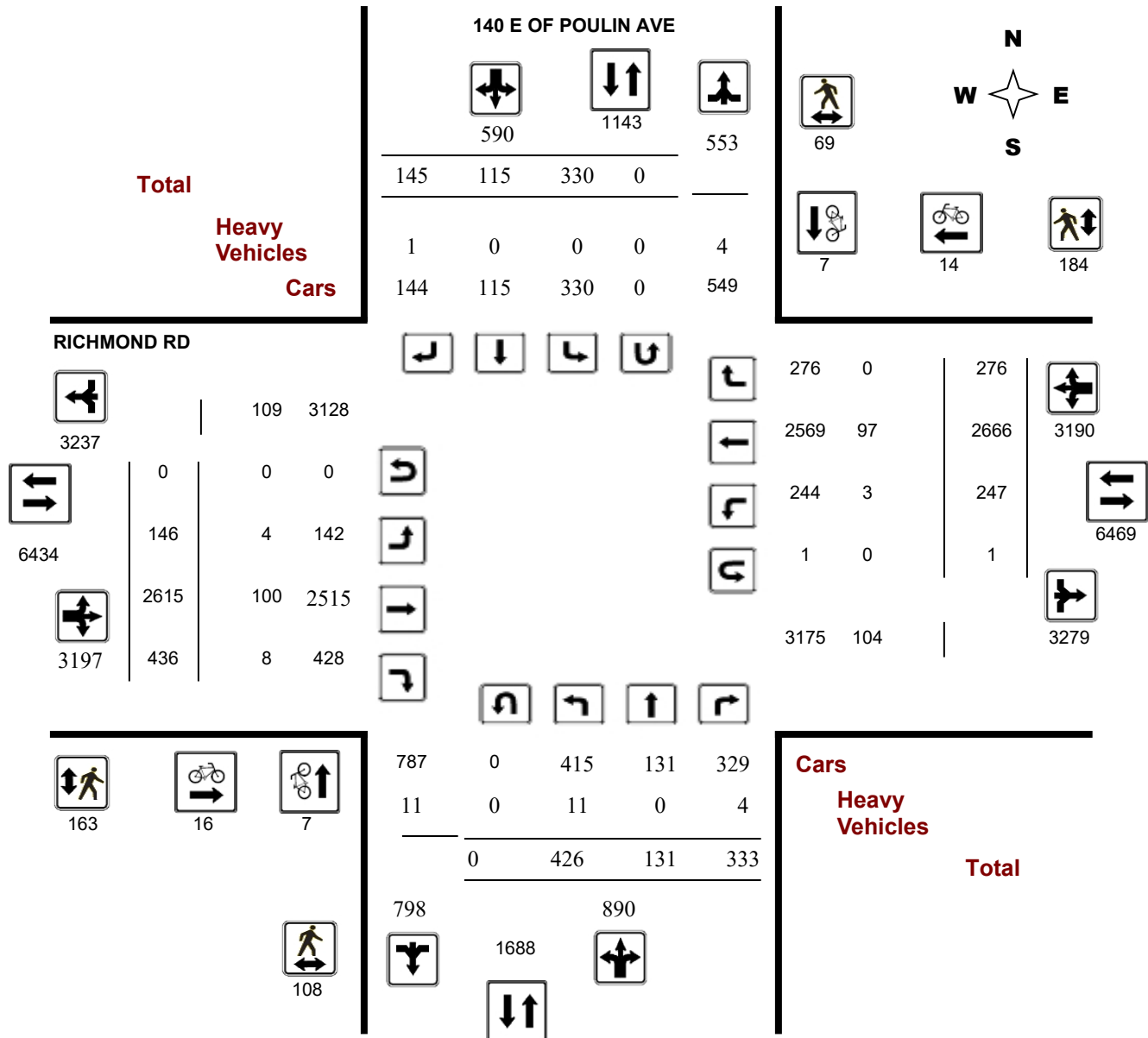
Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

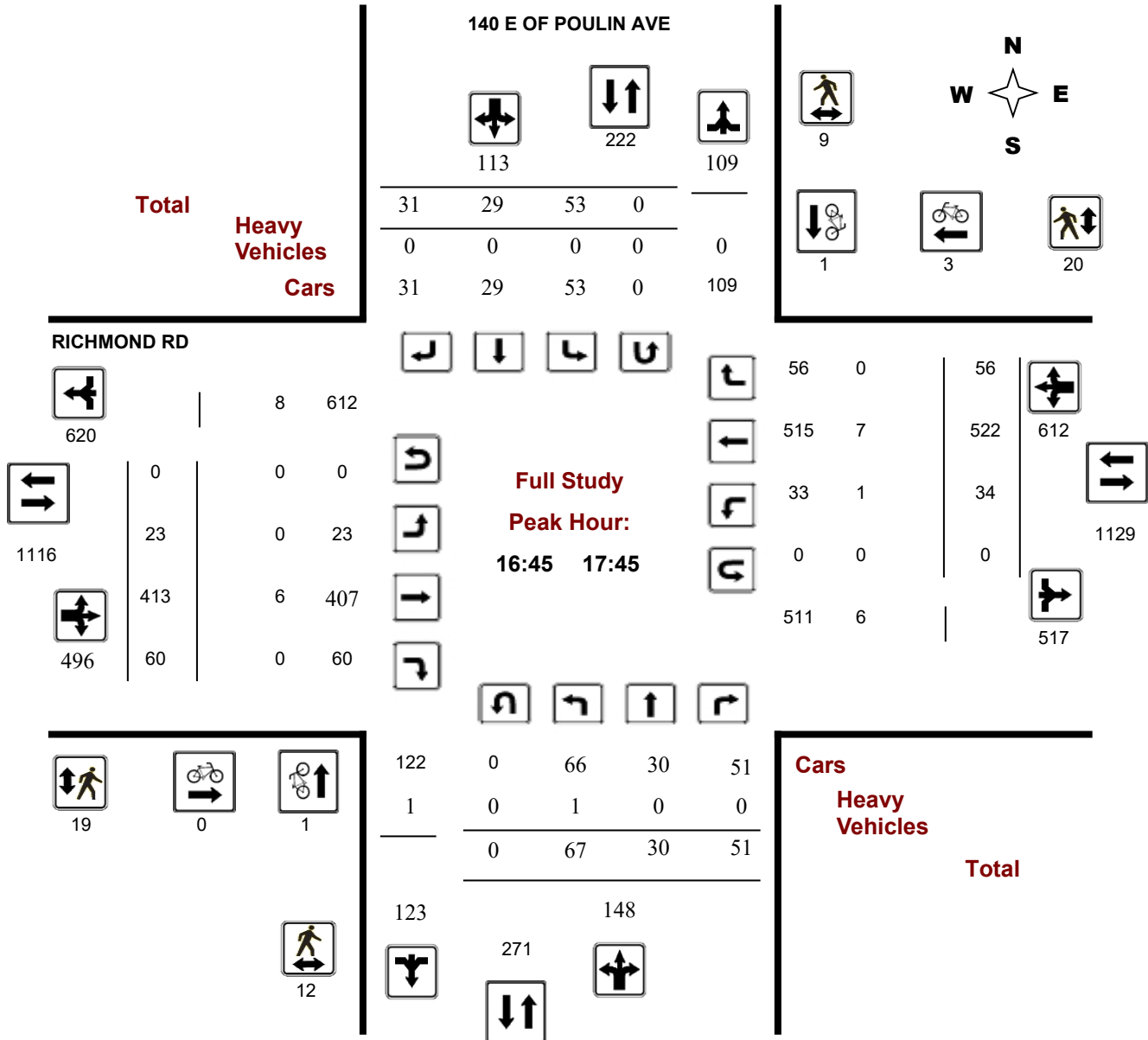
Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

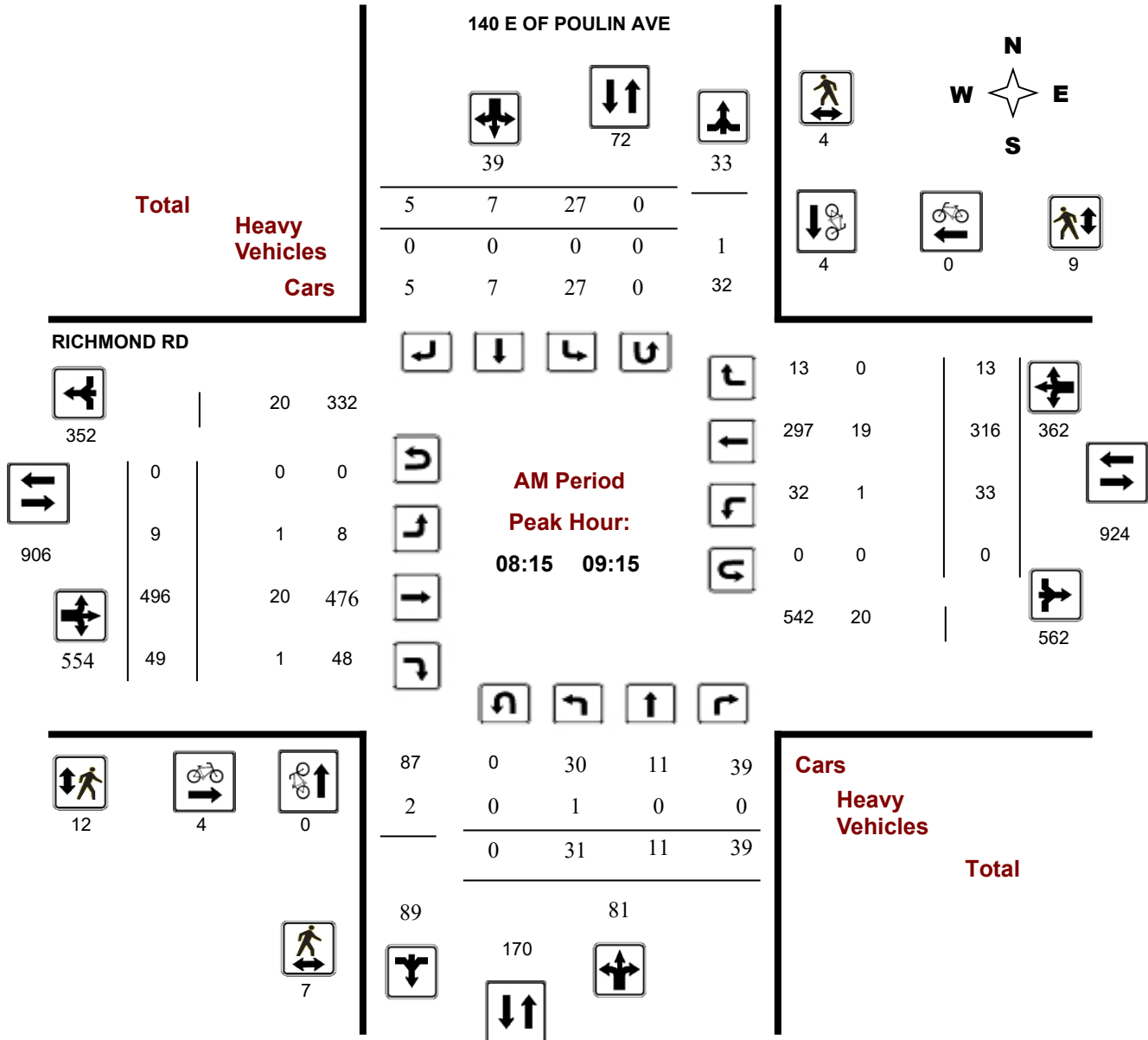
Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

AM Period Peak Hour Diagram



Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

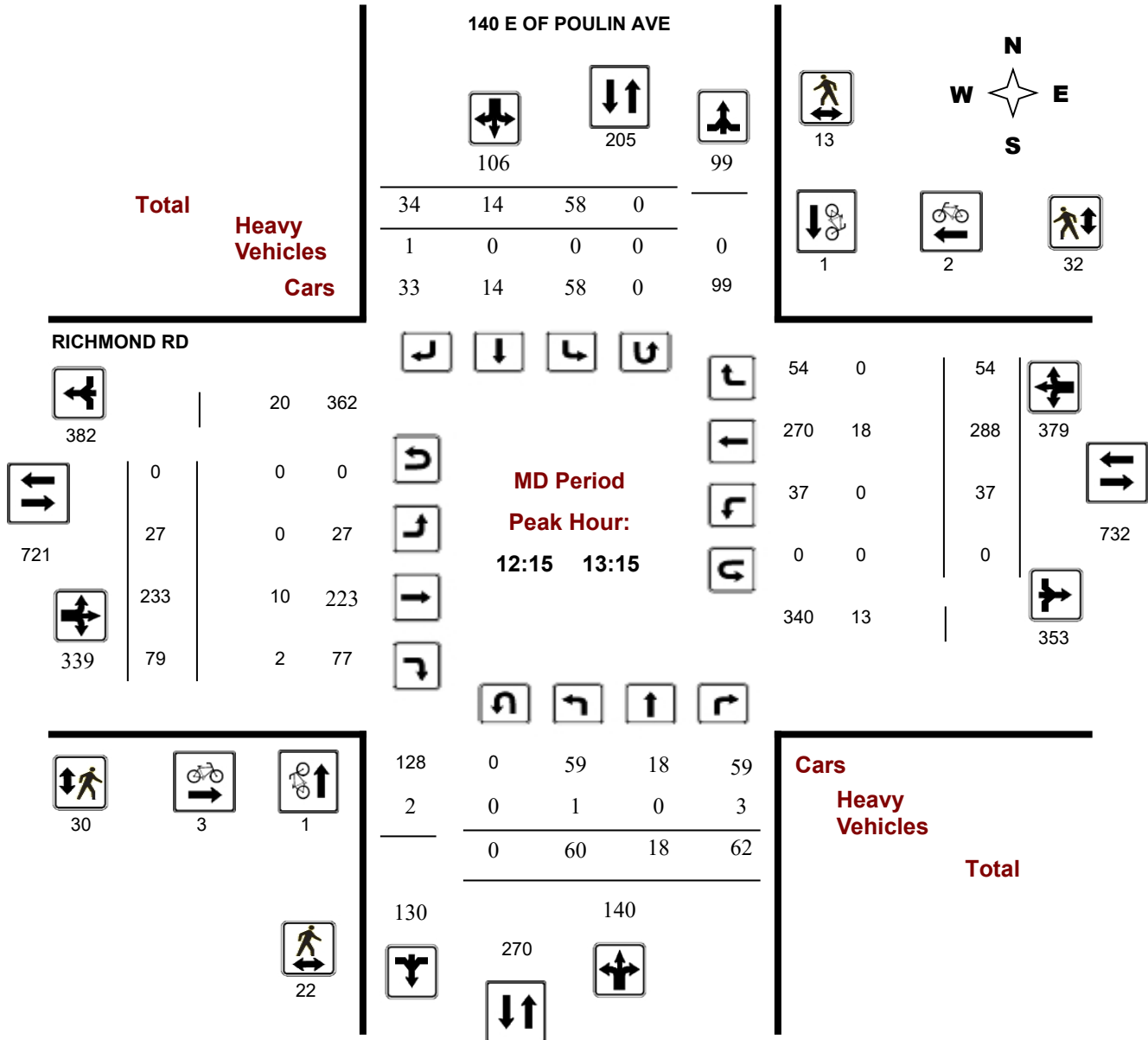
Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

MD Period Peak Hour Diagram



Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

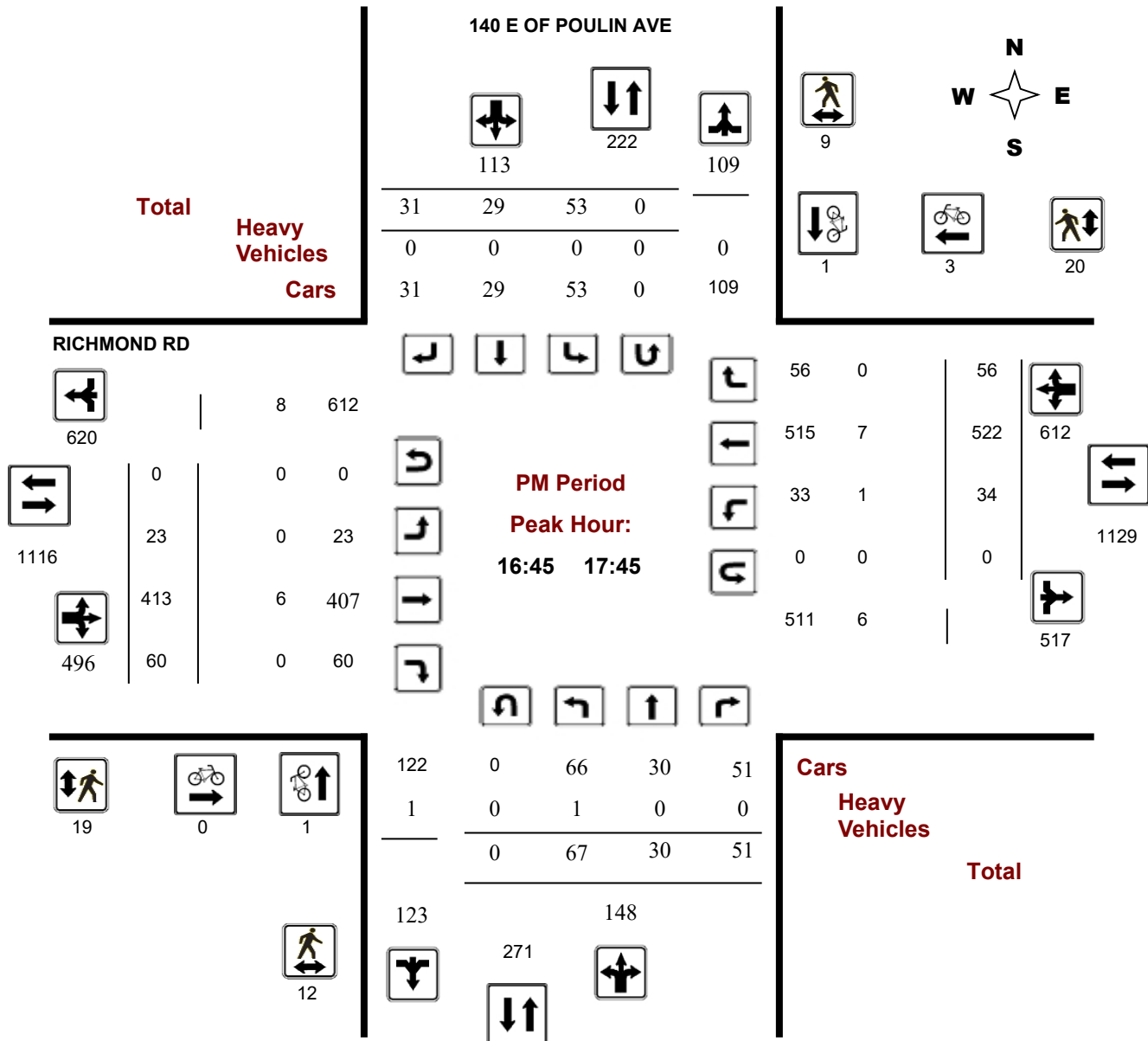
Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

PM Period Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, October 09, 2024

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0

.90

Eastbound: 0 Westbound: 1

140 E OF POULIN AVE

RICHMOND RD

Period		Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total	
		LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT			WB TOT
07:00	08:00	24	4	18	46	10	6	3	19	65	9	327	29	365	14	187	4	205	570	635
08:00	09:00	31	7	35	73	24	9	2	35	108	6	524	51	581	28	290	10	328	909	1017
09:00	10:00	50	13	38	101	32	7	7	46	147	10	295	51	356	32	240	18	290	646	793
11:30	12:30	62	18	48	128	57	16	32	105	233	36	222	70	328	43	236	37	316	644	877
12:30	13:30	53	20	57	130	56	12	25	93	223	23	213	72	308	36	269	50	355	663	886
15:00	16:00	62	20	43	125	55	12	26	93	218	19	269	51	339	29	408	52	489	828	1046
16:00	17:00	73	24	53	150	40	25	21	86	236	24	387	49	460	34	540	47	621	1081	1317
17:00	18:00	71	25	41	137	56	28	29	113	250	19	378	63	460	31	496	58	585	1045	1295
Sub Total		426	131	333	890	330	115	145	590	1480	146	2615	436	3197	247	2666	276	3189	6386	7866
U Turns		0				0				0	0				1				1	1
Total		426	131	333	890	330	115	145	590	1480	146	2615	436	3197	247	2666	276	3190	6387	7867
EQ 12Hr		592	182	463	1237	459	160	202	820	2057	203	3635	606	4444	343	3706	384	4434	8878	10935

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

1.39

AVG 12Hr	533	164	417	1113	413	188	238	738	1851	183	3272	545	4000	309	3335	346	3991	7990	9842
-----------------	-----	-----	-----	------	-----	-----	-----	-----	------	-----	------	-----	------	-----	------	-----	------	------	------

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

.90

AVG 24Hr	698	215	546	1458	541	246	312	967	2425	240	4286	714	5240	405	4369	453	5228	10467	12893
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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

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

140 E OF POULIN AVE

RICHMOND 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	
13:00	13:15	19	5	14	38	11	2	9	22	60	4	64	21	89	5	66	10	81	170	230
13:15	13:30	7	5	15	27	13	3	3	19	46	5	42	12	59	13	58	7	78	137	183
15:00	15:15	14	4	6	24	12	2	6	20	44	5	56	9	70	6	74	13	93	163	207
15:45	16:00	14	7	14	35	16	3	8	27	62	2	81	17	100	3	122	17	142	242	304
16:30	16:45	22	5	15	42	18	8	5	31	73	6	100	14	120	6	135	11	152	272	345
17:15	17:30	16	8	4	28	10	5	11	26	54	3	98	12	113	11	135	14	160	273	327
08:30	08:45	6	2	9	17	6	3	0	9	26	1	163	6	170	7	69	3	79	249	275
12:45	13:00	14	4	16	34	19	4	7	30	64	8	56	16	80	10	70	15	95	175	239
15:15	15:30	16	5	13	34	14	4	7	25	59	5	75	13	93	7	77	11	95	188	247
15:30	15:45	18	4	10	32	13	3	5	21	53	7	57	12	76	13	135	11	159	235	288
16:00	16:15	18	6	12	36	7	6	7	20	56	4	87	9	100	14	116	10	141	241	297
16:15	16:30	15	5	8	28	7	5	2	14	42	7	98	13	118	5	154	11	170	288	330
16:45	17:00	18	8	18	44	8	6	7	21	65	7	102	13	122	9	135	15	159	281	346
17:00	17:15	20	6	15	41	17	8	8	33	74	8	98	20	126	2	121	13	136	262	336
17:30	17:45	13	8	14	35	18	10	5	33	68	5	115	15	135	12	131	14	157	292	360
17:45	18:00	22	3	8	33	11	5	5	21	54	3	67	16	86	6	109	17	132	218	272
07:00	07:15	4	1	6	11	1	2	0	3	14	1	65	4	70	2	31	2	35	105	119
07:15	07:30	3	0	3	6	3	0	1	4	10	2	73	4	79	3	43	1	47	126	136
07:30	07:45	11	2	5	18	3	1	0	4	22	5	84	12	101	8	63	0	71	172	194
07:45	08:00	6	1	4	11	3	3	2	8	19	1	105	9	115	1	50	1	52	167	186
08:00	08:15	8	0	7	15	5	3	0	8	23	0	129	14	143	4	46	2	52	195	218
09:00	09:15	8	4	11	23	8	1	3	12	35	3	101	12	116	9	72	5	86	202	237
08:15	08:30	11	2	8	21	9	2	1	12	33	3	126	13	142	7	79	1	87	229	262
08:45	09:00	6	3	11	20	4	1	1	6	26	2	106	18	126	10	96	4	110	236	262
09:15	09:30	10	3	8	21	4	2	1	7	28	3	83	13	99	13	58	3	74	173	201
09:30	09:45	15	3	9	27	9	3	2	14	41	3	53	15	71	5	50	6	61	132	173
09:45	10:00	17	3	10	30	11	1	1	13	43	1	58	11	70	5	60	4	69	139	182
11:30	11:45	19	7	8	34	13	4	4	21	55	9	46	16	71	11	51	11	73	144	199
11:45	12:00	14	5	5	24	14	3	10	27	51	9	59	19	87	9	53	5	67	154	205
12:00	12:15	15	3	15	33	15	4	6	25	58	9	55	16	80	9	55	10	74	154	212
12:15	12:30	14	3	20	37	15	5	12	32	69	9	62	19	90	14	77	11	102	192	261
12:30	12:45	13	6	12	31	13	3	6	22	53	6	51	23	80	8	75	18	101	181	234
Total:		426	131	333	890	330	115	145	590	1480	146	2615	436	3197	247	2666	276	3190	6387	7,867

Note: U-Turns are included in Totals, cyclist volume is not included in totals. For cyclist volumes refer to Cyclist Volume report.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

140 E OF POULIN AVE

RICHMOND RD

Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
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	1	0	1	0	0	0	1
15:45	16:00	1	0	1	1	0	1	2
16:30	16:45	0	0	0	3	0	3	3
17:15	17:30	1	0	1	0	1	1	2
08:30	08:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	1	1	2	2
15:15	15:30	0	0	0	2	0	2	2
15:30	15:45	0	0	0	1	1	2	2
16:00	16:15	0	1	1	0	0	0	1
16:15	16:30	0	0	0	0	1	1	1
16:45	17:00	0	0	0	0	2	2	2
17:00	17:15	0	0	0	0	0	0	0
17:30	17:45	0	1	1	0	0	0	1
17:45	18:00	0	0	0	0	1	1	1
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	1	1	2	2
07:45	08:00	0	0	0	1	1	2	2
08:00	08:15	0	0	0	0	0	0	0
09:00	09:15	0	2	2	1	0	1	3
08:15	08:30	0	0	0	0	0	0	0
08:45	09:00	0	2	2	3	0	3	5
09:15	09:30	1	0	1	0	2	2	3
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	1	1	1
11:45	12:00	1	0	1	0	1	1	2
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	1	0	1	0	1	1	2
12:30	12:45	0	0	0	2	0	2	2
Total		7	7	14	16	14	30	44



Transportation Services - Traffic Services

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

140 E OF POULIN AVE

RICHMOND 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
13:00 13:15	4	1	5	7	10	17	22
13:15 13:30	13	0	13	10	4	14	27
15:00 15:15	5	1	6	5	5	10	16
15:45 16:00	7	1	8	6	8	14	22
16:30 16:45	4	5	9	11	13	24	33
17:15 17:30	4	5	9	3	9	12	21
08:30 08:45	1	2	3	5	1	6	9
12:45 13:00	3	3	6	13	9	22	28
15:15 15:30	1	5	6	6	7	13	19
15:30 15:45	9	3	12	11	7	18	30
16:00 16:15	4	4	8	7	11	18	26
16:15 16:30	0	3	3	3	10	13	16
16:45 17:00	4	1	5	8	4	12	17
17:00 17:15	2	1	3	4	3	7	10
17:30 17:45	2	2	4	4	4	8	12
17:45 18:00	6	6	12	8	14	22	34
07:00 07:15	0	0	0	1	0	1	1
07:15 07:30	0	0	0	3	0	3	3
07:30 07:45	1	3	4	0	4	4	8
07:45 08:00	0	0	0	1	4	5	5
08:00 08:15	1	1	2	2	2	4	6
09:00 09:15	4	0	4	6	4	10	14
08:15 08:30	1	2	3	1	2	3	6
08:45 09:00	1	0	1	0	2	2	3
09:15 09:30	1	1	2	5	5	10	12
09:30 09:45	4	1	5	4	7	11	16
09:45 10:00	2	2	4	4	4	8	12
11:30 11:45	3	1	4	2	5	7	11
11:45 12:00	2	1	3	7	4	11	14
12:00 12:15	4	5	9	6	9	15	24
12:15 12:30	7	2	9	4	6	10	19
12:30 12:45	8	7	15	6	7	13	28
Total	108	69	177	163	184	347	524



Transportation Services - Traffic Services

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

140 E OF POULIN AVE

RICHMOND RD

Northbound

Southbound

Eastbound

Westbound

Time Period		Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total
		LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT			
13:00	13:15	0	0	1	1	0	0	0	0	1	0	3	0	3	0	5	0	5	8	9
13:15	13:30	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6	6
15:00	15:15	1	0	0	1	0	0	0	0	1	0	0	0	0	0	3	0	3	3	4
15:45	16:00	0	0	0	0	0	0	0	0	0	0	4	0	4	0	6	0	6	10	10
16:30	16:45	0	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4	5	5
17:15	17:30	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
08:30	08:45	1	0	0	1	0	0	0	0	1	0	3	1	4	0	4	0	4	8	9
12:45	13:00	1	0	0	1	0	0	0	0	1	0	1	0	1	0	4	0	4	5	6
15:15	15:30	0	0	0	0	0	0	0	0	0	0	5	0	5	0	3	0	3	8	8
15:30	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7	7
16:00	16:15	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4	4
16:15	16:30	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5	5
16:45	17:00	0	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5	5
17:00	17:15	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5	5
17:30	17:45	1	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	2	2	3
17:45	18:00	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4	4
07:00	07:15	0	0	1	1	0	0	0	0	1	0	4	1	5	0	1	0	1	6	7
07:15	07:30	1	0	0	1	0	0	0	0	1	0	4	0	4	0	5	0	5	9	10
07:30	07:45	1	0	0	1	0	0	0	0	1	0	5	0	5	0	2	0	2	7	8
07:45	08:00	0	0	0	0	0	0	0	0	0	0	7	0	7	0	1	0	1	8	8
08:00	08:15	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5	5
09:00	09:15	0	0	0	0	0	0	0	0	0	0	6	0	6	0	4	0	4	10	10
08:15	08:30	0	0	0	0	0	0	0	0	0	1	5	0	6	0	5	0	5	11	11
08:45	09:00	0	0	0	0	0	0	0	0	0	0	6	0	6	1	6	0	7	13	13
09:15	09:30	0	0	0	0	0	0	0	0	0	0	5	0	5	0	3	0	3	8	8
09:30	09:45	0	0	0	0	0	0	0	0	0	1	3	0	4	0	2	0	2	6	6
09:45	10:00	1	0	0	1	0	0	0	0	1	0	6	1	7	0	1	0	1	8	9
11:30	11:45	2	0	0	2	0	0	0	0	2	0	3	2	5	0	1	0	1	6	8
11:45	12:00	2	0	0	2	0	0	0	0	2	1	2	0	3	1	1	0	2	5	7
12:00	12:15	0	0	0	0	0	0	0	0	0	1	2	1	4	0	2	0	2	6	6
12:15	12:30	0	0	0	0	0	0	1	1	1	0	1	0	1	0	4	0	4	5	6
12:30	12:45	0	0	2	2	0	0	0	0	2	0	5	2	7	0	5	0	5	12	14
Total:	None	11	0	4	15	0	0	1	1	16	4	100	8	112	3	97	0	100	212	228

Transportation Services - Traffic Services

Turning Movement Count - Study Results

RICHMOND RD @ 140 E OF POULIN AVE

Survey Date: Wednesday, October 09, 2024

WO No: 42279

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

140 E OF POULIN AVE

RICHMOND RD

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

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

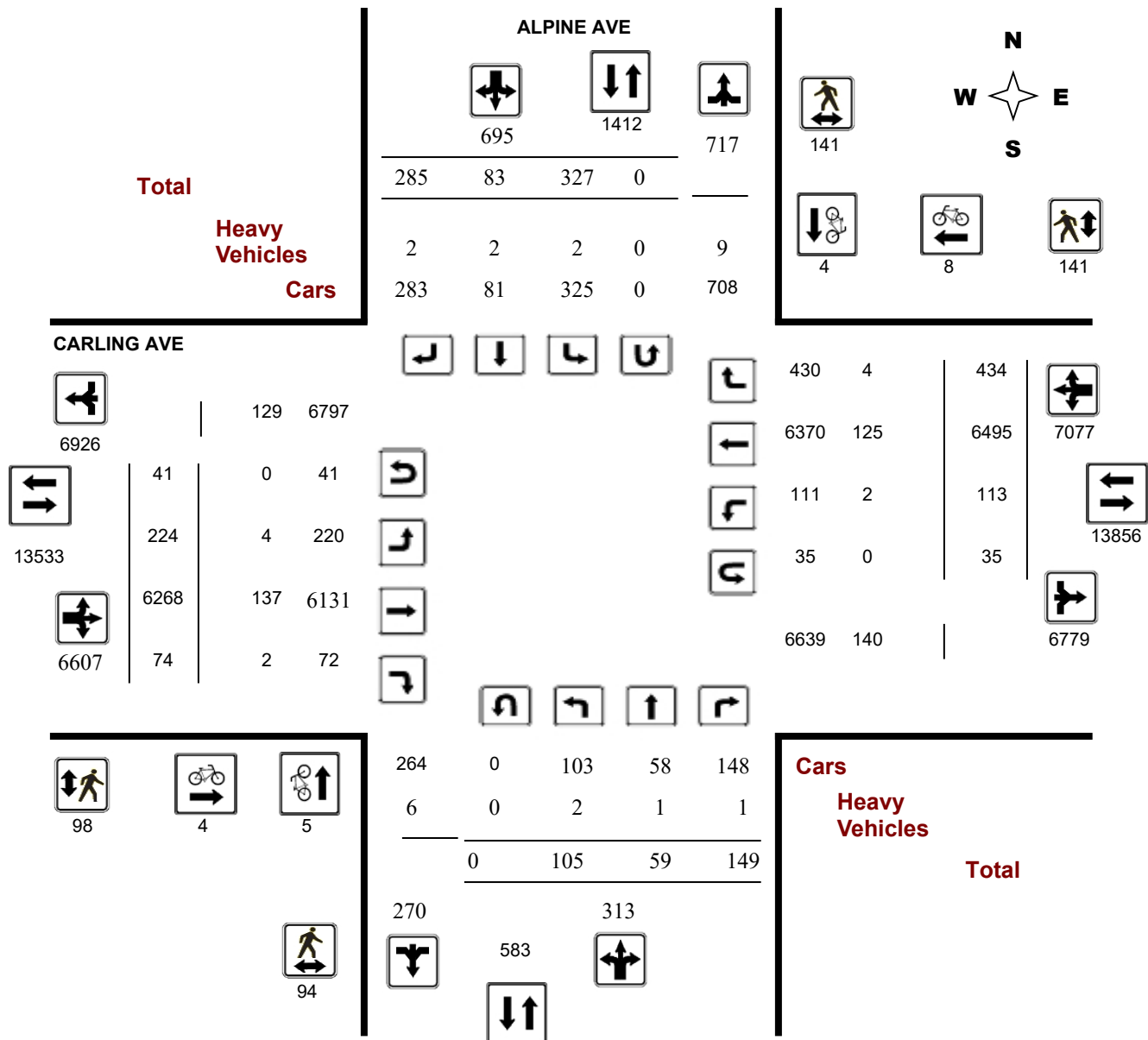
Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

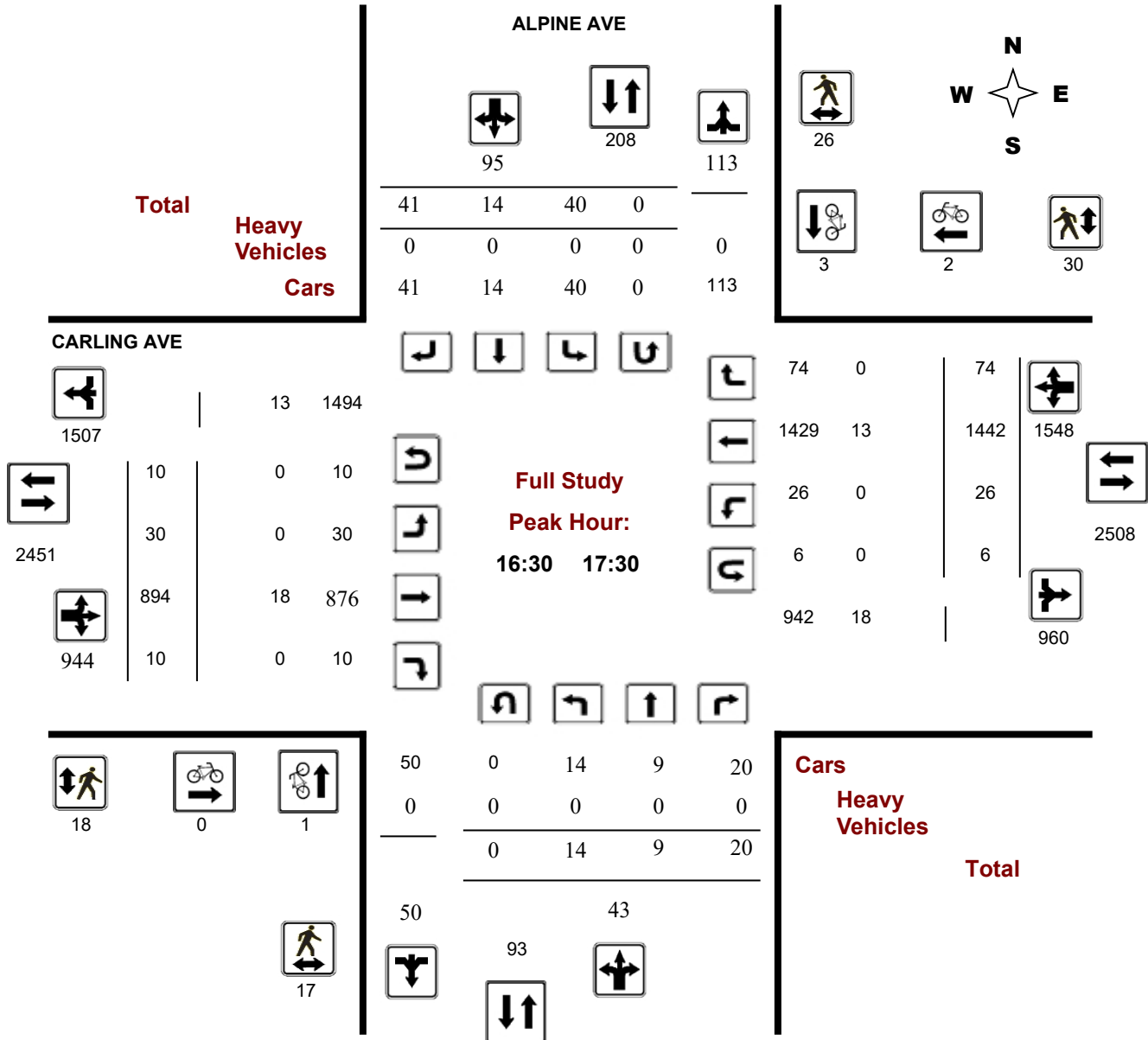
Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

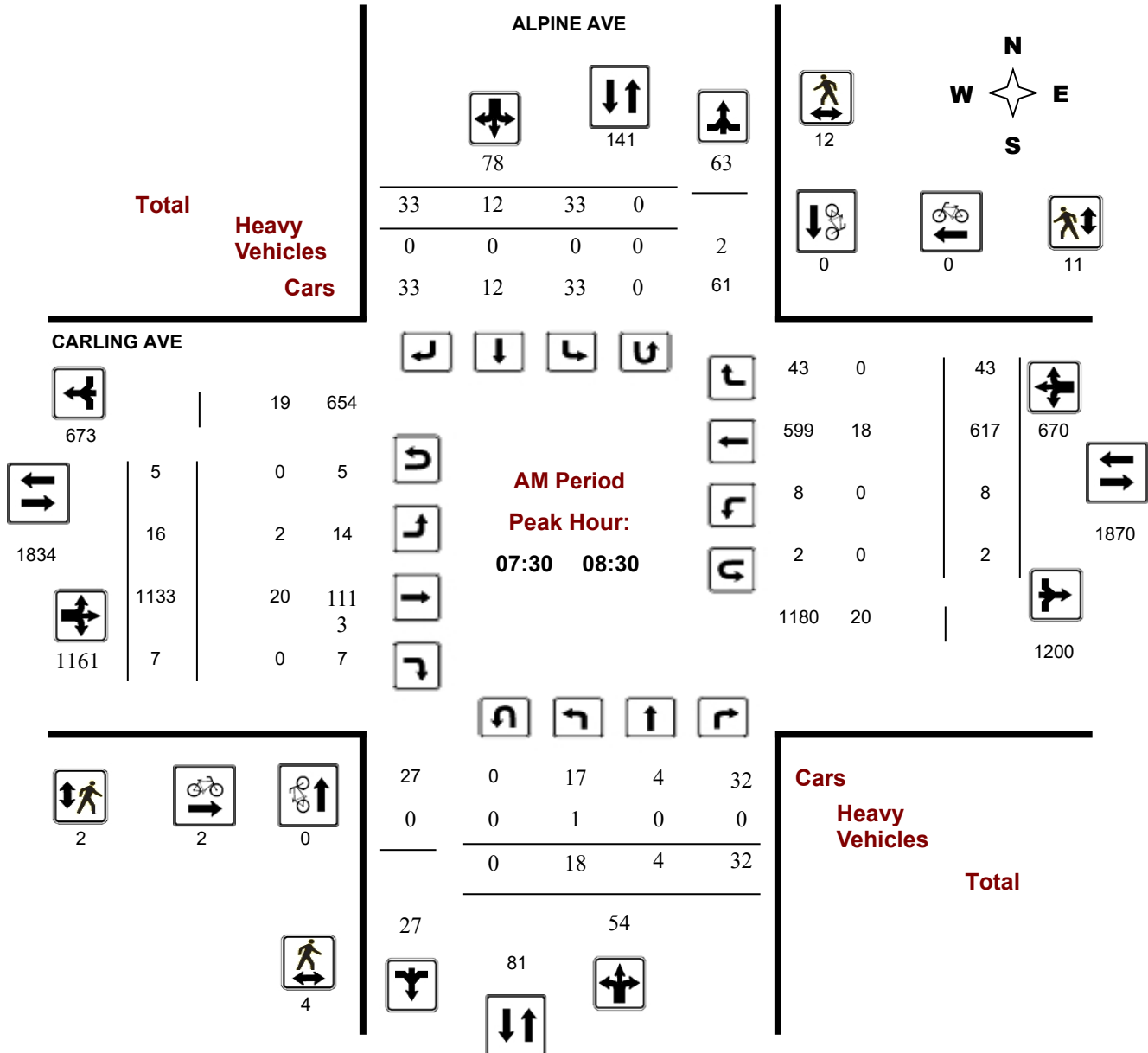
Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

AM Period Peak Hour Diagram



Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

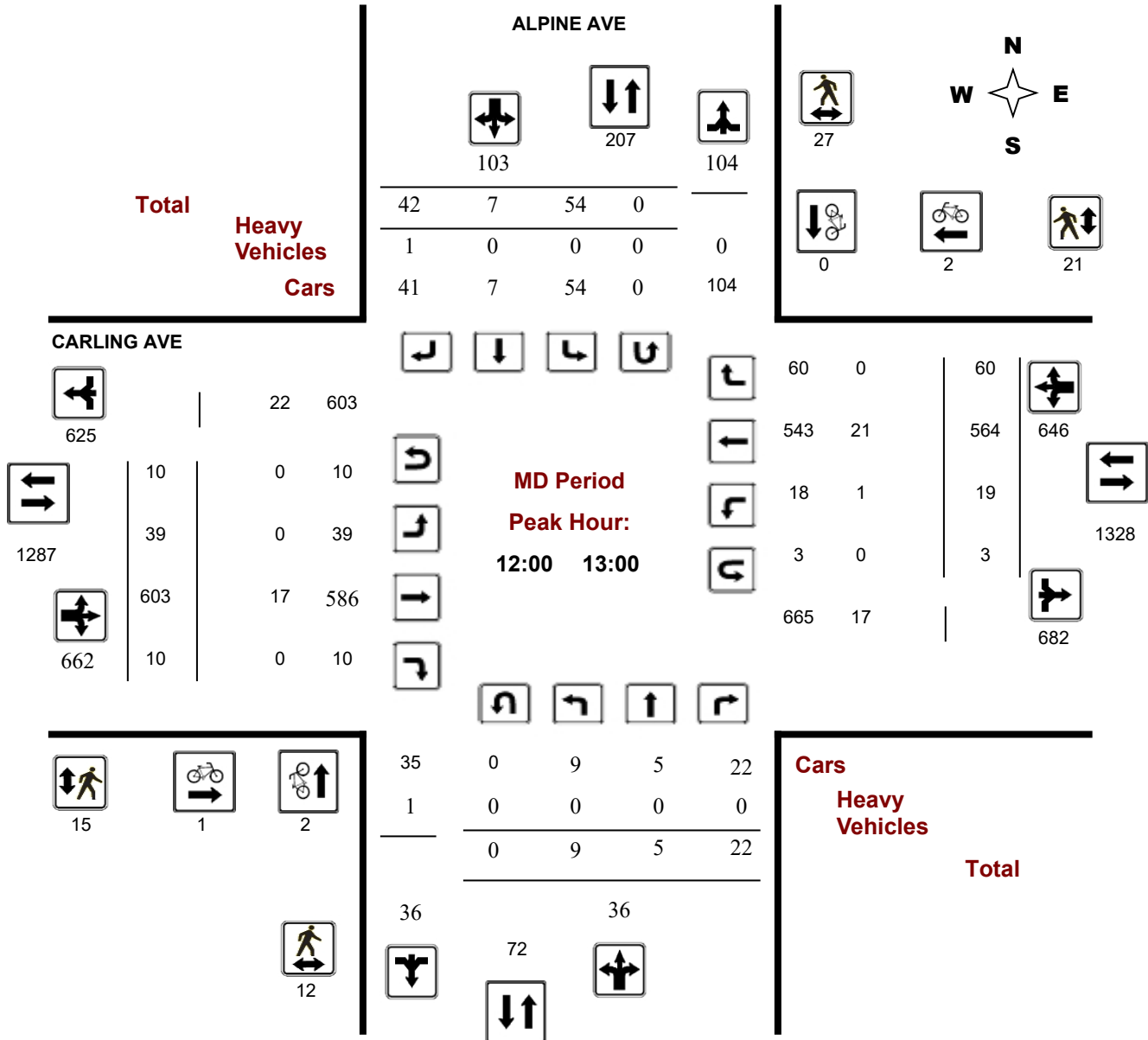
Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

MD Period Peak Hour Diagram



Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

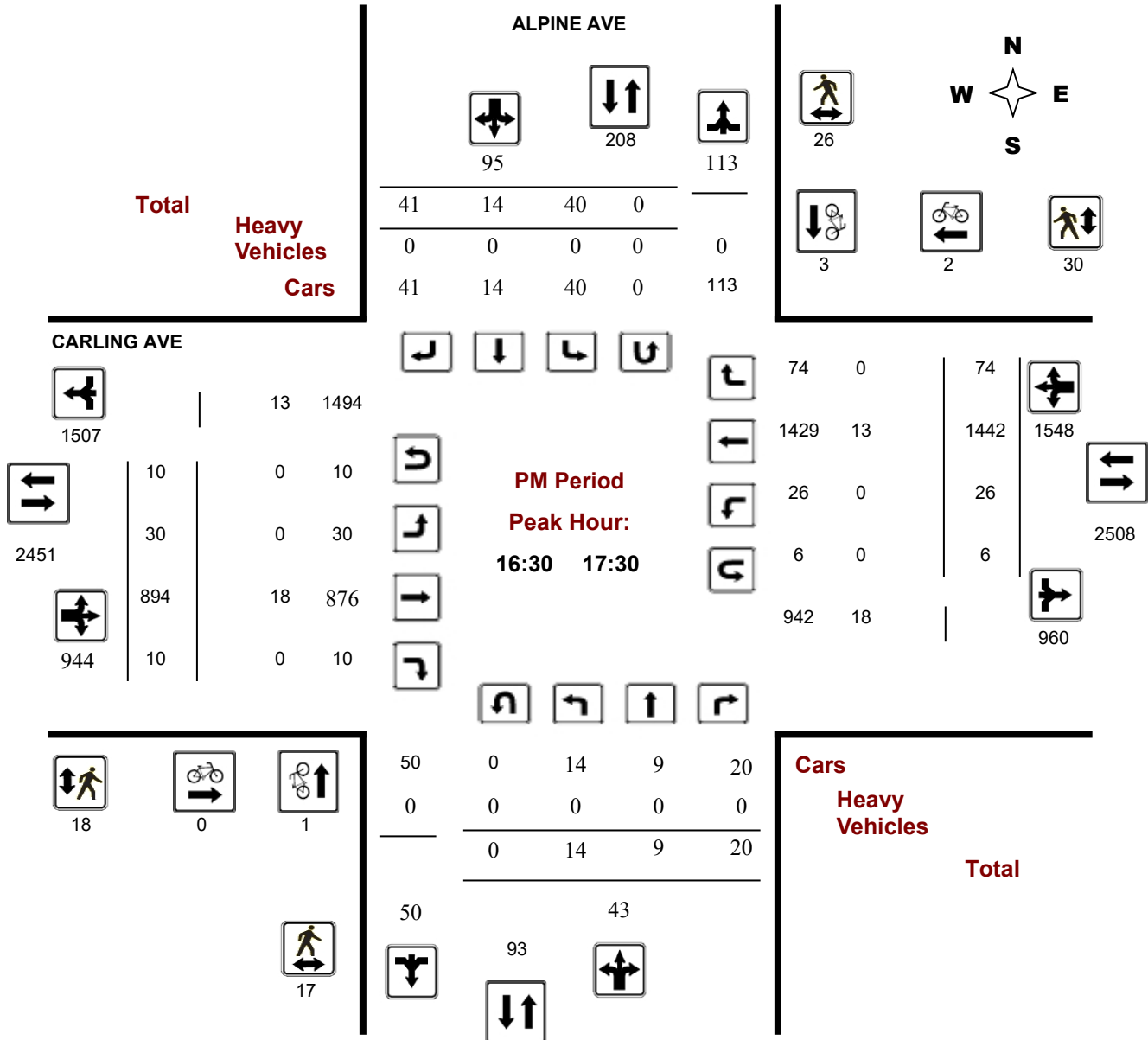
Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

PM Period Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, March 13, 2024

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0
Eastbound: 41 Westbound: 35

1.00

ALPINE AVE

CARLING AVE

		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	3	7	29	39	31	5	33	69	108	13	973	7	993	4	540	36	580	1573	1681				
08:00	09:00	22	9	23	54	27	9	32	68	122	18	988	15	1021	10	617	44	671	1692	1814				
09:00	10:00	11	11	20	42	30	8	27	65	107	32	571	7	610	9	482	36	527	1137	1244				
11:30	12:30	11	9	14	34	51	12	41	104	138	29	551	7	587	14	581	61	656	1243	1381				
12:30	13:30	5	3	13	21	57	10	37	104	125	40	608	7	655	17	542	60	619	1274	1399				
15:00	16:00	18	2	21	41	39	12	34	85	126	28	897	13	938	18	1105	61	1184	2122	2248				
16:00	17:00	23	10	9	42	46	13	45	104	146	27	880	11	918	20	1343	73	1436	2354	2500				
17:00	18:00	12	8	20	40	46	14	36	96	136	37	800	7	844	21	1285	63	1369	2213	2349				
Sub Total		105	59	149	313	327	83	285	695	1008	224	6268	74	6566	113	6495	434	7042	13608	14616				
U Turns		0								0	0	41								35	76	76		
Total		105	59	149	313	327	83	285	695	1008	224	6268	74	6607	113	6495	434	7077	13684	14692				
EQ 12Hr		146	82	207	435	455	115	396	966	1401	311	8713	103	9184	157	9028	603	9837	19021	20422				
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.															1.39									
AVG 12Hr		146	82	207	435	455	151	519	966	1401	311	8713	103	9184	157	9028	603	9837	19021	20422				
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.															1.00									
AVG 24Hr		191	107	271	570	596	198	680	1265	1835	407	11414	135	12031	206	11827	790	12886	24918	26753				
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

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

ALPINE AVE

CARLING AVE

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
09:00 09:15	6	1	4	11	5	1	7	13	24	3	158	3	164	1	129	8	141	305	329
09:15 09:30	2	1	7	10	7	3	6	16	26	10	140	1	151	3	116	4	124	275	301
11:45 12:00	1	2	2	5	12	4	11	27	32	8	135	3	147	3	150	20	174	321	353
15:45 16:00	8	0	7	15	8	7	5	20	35	8	207	2	218	3	335	19	358	576	611
07:00 07:15	0	3	4	7	6	1	9	16	23	2	186	1	189	0	97	5	102	291	314
08:45 09:00	4	3	6	13	4	1	8	13	26	3	213	9	225	2	158	8	169	394	420
09:30 09:45	1	3	6	10	9	2	8	19	29	13	147	2	162	4	132	13	149	311	340
09:45 10:00	2	6	3	11	9	2	6	17	28	6	126	1	134	1	105	11	118	252	280
11:30 11:45	4	3	1	8	17	4	9	30	38	7	121	0	128	3	138	12	155	283	321
12:00 12:15	2	2	6	10	12	1	10	23	33	9	144	2	158	3	141	14	159	317	350
12:15 12:30	4	2	5	11	10	3	11	24	35	5	151	2	159	5	152	15	172	331	366
12:30 12:45	2	0	4	6	14	2	9	25	31	15	145	3	165	5	132	18	156	321	352
12:45 13:00	1	1	7	9	18	1	12	31	40	10	163	3	180	6	139	13	159	339	379
13:00 13:15	2	1	0	3	10	5	8	23	26	4	138	1	144	3	124	16	143	287	313
13:15 13:30	0	1	2	3	15	2	8	25	28	11	162	0	174	3	147	13	165	339	367
15:00 15:15	4	1	4	9	9	2	7	18	27	7	239	2	249	6	217	11	236	485	512
15:15 15:30	3	0	6	9	11	1	11	23	32	6	247	3	256	5	253	17	279	535	567
15:30 15:45	3	1	4	8	11	2	11	24	32	7	204	6	219	4	300	14	320	539	571
16:00 16:15	6	1	3	10	9	2	15	26	36	6	208	4	218	5	293	18	316	534	570
16:15 16:30	8	3	0	11	10	5	9	24	35	10	208	3	223	3	352	16	372	595	630
16:30 16:45	2	3	1	6	15	3	9	27	33	4	226	2	237	7	357	28	394	631	664
16:45 17:00	7	3	5	15	12	3	12	27	42	7	238	2	249	5	341	11	359	608	650
17:00 17:15	2	2	6	10	3	4	7	14	24	12	223	4	241	7	368	14	391	632	656
17:15 17:30	3	1	8	12	10	4	13	27	39	7	207	2	217	7	376	21	404	621	660
17:30 17:45	5	2	4	11	13	2	11	26	37	9	207	1	219	4	304	14	323	542	579
17:45 18:00	2	3	2	7	20	4	5	29	36	9	163	0	174	3	237	14	255	429	465
07:15 07:30	0	2	5	7	4	0	6	10	17	4	205	2	212	1	144	11	156	368	385
07:30 07:45	0	1	12	13	11	2	12	25	38	7	306	2	315	2	140	10	152	467	505
07:45 08:00	3	1	8	12	10	2	6	18	30	0	276	2	280	1	159	10	171	451	481
08:00 08:15	8	0	1	9	7	4	9	20	29	3	269	3	277	4	165	9	179	456	485
08:15 08:30	7	2	11	20	5	4	6	15	35	6	282	0	289	1	153	14	168	457	492
08:30 08:45	3	4	5	12	11	0	9	20	32	6	224	3	234	3	141	13	158	392	424
Total:	105	59	149	313	327	83	285	695	1008	224	6268	74	6607	113	6495	434	7077	13684	14,692

Note: U-Turns are included in Totals, cyclist volume is not included in totals. For cyclist volumes refer to Cyclist Volume report.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

		ALPINE AVE			CARLING AVE			Grand Total
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	
09:00	09:15	0	0	0	0	0	0	0
09:15	09:30	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	1	1	1
07:00	07:15	0	0	0	0	0	0	0
08:45	09:00	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
11:30	11:45	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	2	0	2	1	1	2	4
12:30	12:45	0	0	0	0	1	1	1
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	1	1	1
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	1	0	1	0	0	0	1
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	1	0	1	1
16:00	16:15	1	1	2	0	0	0	2
16:15	16:30	0	0	0	0	1	1	1
16:30	16:45	1	0	1	0	1	1	2
16:45	17:00	0	1	1	0	0	0	1
17:00	17:15	0	2	2	0	0	0	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	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	2	0	2	2
08:15	08:30	0	0	0	0	0	0	0
08:30	08:45	0	0	0	0	0	0	0
Total		5	4	9	4	8	12	21



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

ALPINE AVE

CARLING AVE

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
09:00 09:15	2	8	10	0	5	5	15
09:15 09:30	1	3	4	1	2	3	7
11:45 12:00	9	4	13	1	4	5	18
15:45 16:00	3	6	9	14	3	17	26
07:00 07:15	0	5	5	0	4	4	9
08:45 09:00	1	3	4	0	1	1	5
09:30 09:45	3	4	7	0	5	5	12
09:45 10:00	3	4	7	1	1	2	9
11:30 11:45	1	4	5	0	4	4	9
12:00 12:15	4	7	11	3	8	11	22
12:15 12:30	1	9	10	9	4	13	23
12:30 12:45	3	1	4	1	3	4	8
12:45 13:00	4	10	14	2	6	8	22
13:00 13:15	2	2	4	0	3	3	7
13:15 13:30	0	0	0	4	2	6	6
15:00 15:15	1	2	3	0	7	7	10
15:15 15:30	5	5	10	9	4	13	23
15:30 15:45	2	2	4	0	5	5	9
16:00 16:15	6	6	12	6	3	9	21
16:15 16:30	5	5	10	9	9	18	28
16:30 16:45	5	9	14	3	2	5	19
16:45 17:00	6	8	14	5	14	19	33
17:00 17:15	1	4	5	5	5	10	15
17:15 17:30	5	5	10	5	9	14	24
17:30 17:45	3	5	8	3	6	9	17
17:45 18:00	8	5	13	8	9	17	30
07:15 07:30	3	0	3	2	0	2	5
07:30 07:45	0	1	1	1	2	3	4
07:45 08:00	2	3	5	1	3	4	9
08:00 08:15	0	3	3	0	2	2	5
08:15 08:30	2	5	7	0	4	4	11
08:30 08:45	3	3	6	5	2	7	13
Total	94	141	235	98	141	239	474



Transportation Services - Traffic Services

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

ALPINE AVE

CARLING AVE

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
09:00 09:15	0	0	0	0	0	0	0	0	0	0	7	0	7	0	6	1	7	14	14
09:15 09:30	0	0	0	0	0	1	0	1	1	0	3	0	3	0	5	0	5	8	9
11:45 12:00	0	0	0	0	0	0	0	0	0	0	2	0	2	0	5	1	6	8	8
15:45 16:00	0	0	0	0	0	0	0	0	0	0	6	0	6	0	4	0	4	10	10
07:00 07:15	0	0	0	0	0	0	0	0	0	0	5	0	5	0	2	0	2	7	7
08:45 09:00	0	0	0	0	0	0	0	0	0	0	3	1	4	0	3	0	3	7	7
09:30 09:45	0	1	0	1	0	0	0	0	1	1	7	1	9	0	5	0	5	14	15
09:45 10:00	0	0	0	0	2	1	1	4	4	0	4	0	4	0	4	1	5	9	13
11:30 11:45	0	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3	9	9
12:00 12:15	0	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	11	11
12:15 12:30	0	0	0	0	0	0	0	0	0	0	5	0	5	1	6	0	7	12	12
12:30 12:45	0	0	0	0	0	0	1	1	1	0	3	0	3	0	2	0	2	5	6
12:45 13:00	0	0	0	0	0	0	0	0	0	0	4	0	4	0	7	0	7	11	11
13:00 13:15	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2	2
13:15 13:30	0	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	11	11
15:00 15:15	0	0	0	0	0	0	0	0	0	0	8	0	8	0	3	0	3	11	11
15:15 15:30	0	0	0	0	0	0	0	0	0	0	3	0	3	1	2	0	3	6	6
15:30 15:45	1	0	0	1	0	0	0	0	1	0	2	0	2	0	5	0	5	7	8
16:00 16:15	0	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5	5
16:15 16:30	0	0	0	0	0	0	0	0	0	0	4	0	4	0	4	0	4	8	8
16:30 16:45	0	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	4	4
16:45 17:00	0	0	0	0	0	0	0	0	0	0	8	0	8	0	4	0	4	12	12
17:00 17:15	0	0	0	0	0	0	0	0	0	0	4	0	4	0	6	0	6	10	10
17:15 17:30	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5	5
17:30 17:45	0	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0	3	7	7
17:45 18:00	0	0	0	0	0	0	0	0	0	0	2	0	2	0	4	0	4	6	6
07:15 07:30	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3	4	4
07:30 07:45	0	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5	5
07:45 08:00	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6	6
08:00 08:15	0	0	0	0	0	0	0	0	0	2	9	0	11	0	6	0	6	17	17
08:15 08:30	1	0	0	1	0	0	0	0	1	0	5	0	5	0	7	0	7	12	13
08:30 08:45	0	0	1	1	0	0	0	0	1	1	7	0	8	0	2	1	3	11	12
Total: None	2	1	1	4	2	2	2	6	10	4	137	2	143	2	125	4	131	274	284

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ALPINE AVE @ CARLING AVE

Survey Date: Wednesday, March 13, 2024

WO No: 42454

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

ALPINE AVE

CARLING AVE

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
09:00	09:15	0	0	0	3	3
09:15	09:30	0	0	0	1	1
11:45	12:00	0	0	1	1	2
15:45	16:00	0	0	1	1	2
07:00	07:15	0	0	0	0	0
08:45	09:00	0	0	0	1	1
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	1	1	2
11:30	11:45	0	0	0	2	2
12:00	12:15	0	0	3	1	4
12:15	12:30	0	0	1	0	1
12:30	12:45	0	0	2	1	3
12:45	13:00	0	0	4	1	5
13:00	13:15	0	0	1	0	1
13:15	13:30	0	0	1	2	3
15:00	15:15	0	0	1	2	3
15:15	15:30	0	0	0	4	4
15:30	15:45	0	0	2	2	4
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	2	1	3
16:30	16:45	0	0	5	2	7
16:45	17:00	0	0	2	2	4
17:00	17:15	0	0	2	2	4
17:15	17:30	0	0	1	0	1
17:30	17:45	0	0	2	1	3
17:45	18:00	0	0	2	1	3
07:15	07:30	0	0	1	0	1
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	2	1	3
08:00	08:15	0	0	2	1	3
08:15	08:30	0	0	1	0	1
08:30	08:45	0	0	1	1	2
Total		0	0	41	35	76

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Lanes, Volumes, Timings

1: Town & Country Plaza/Farm Boy & Richmond /Richmond

Existing
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	496	33	316	13	31	11	27	7
Future Volume (vph)	9	496	33	316	13	31	11	27	7
Lane Group Flow (vph)	10	605	37	351	14	34	55	30	14
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	36.0	36.0	36.0	36.0	36.0	29.0	29.0	29.0	29.0
Total Split (%)	55.4%	55.4%	55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	30.1	30.1	30.1	30.1	30.1	23.3	23.3	23.3	23.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	7	7	4	4	4	9	9	12	12
Act Effect Green (s)	49.4	49.4	49.4	49.4	49.4	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.19	0.19	0.19	0.19
v/c Ratio	0.01	0.47	0.07	0.27	0.01	0.14	0.17	0.12	0.04
Control Delay	7.0	9.1	7.1	6.7	0.5	20.8	9.6	20.6	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	9.1	7.1	6.7	0.5	20.8	9.6	20.6	14.7
LOS	A	A	A	A	A	C	A	C	B
Approach Delay		9.1		6.5			13.9		18.7
Approach LOS		A		A			B		B
Queue Length 50th (m)	0.3	30.4	1.3	14.7	0.0	3.6	1.3	3.2	0.8
Queue Length 95th (m)	2.8	#99.4	7.1	45.8	0.6	7.8	7.1	7.1	3.8
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	670	1285	516	1277	1109	455	565	445	579
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	0.01	0.47	0.07	0.27	0.01	0.07	0.10	0.07	0.02

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 53 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings 1: Town & Country Plaza/Farm Boy & Richmond /Richmond

Existing
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 8.9

Intersection LOS: A

Intersection Capacity Utilization 52.4%

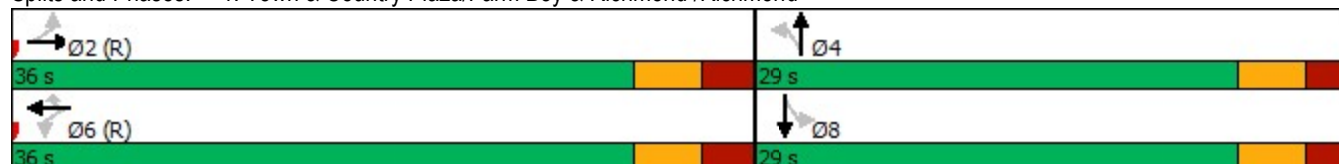
ICU Level of Service A

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond /Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

Existing
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	21	1133	10	617	18	4	33	12		
Future Volume (vph)	21	1133	10	617	18	4	33	12		
Lane Group Flow (vph)	23	1267	11	734	0	60	0	87		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	21.0	66.0	21.0	66.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	16.2%	50.8%	16.2%	50.8%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	15.1	60.1	15.1	60.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		4		12	11	11	2	2	11	2
Act Effect Green (s)	7.5	94.0	6.5	88.1		17.8		19.2		
Actuated g/C Ratio	0.06	0.72	0.05	0.68		0.14		0.15		
v/c Ratio	0.26	0.37	0.13	0.23		0.28		0.38		
Control Delay	65.0	9.7	62.0	11.0		24.7		36.9		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	65.0	9.7	62.0	11.0		24.7		36.9		
LOS	E	A	E	B		C		D		
Approach Delay		10.7		11.8		24.7		36.9		
Approach LOS		B		B		C		D		
Queue Length 50th (m)	5.8	23.8	2.8	20.5		5.8		15.2		
Queue Length 95th (m)	14.8	88.2	9.0	47.8		16.6		27.8		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	178	3440	192	3159		334		347		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.13	0.37	0.06	0.23		0.18		0.25		

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 40 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

Existing
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 12.5

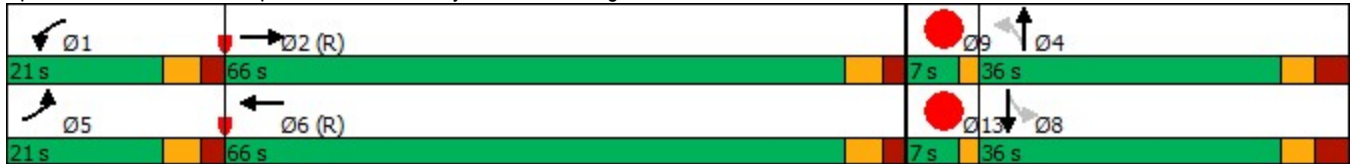
Intersection LOS: B

Intersection Capacity Utilization 47.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

Existing
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	23	413	34	522	56	67	30	53	29
Future Volume (vph)	23	413	34	522	56	67	30	53	29
Lane Group Flow (vph)	26	526	38	580	62	74	90	59	66
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%
Maximum Green (s)	53.1	53.1	53.1	53.1	53.1	25.3	25.3	25.3	25.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	12	12	9	9	9	20	20	19	19
Act Effect Green (s)	67.3	67.3	67.3	67.3	67.3	15.4	15.4	15.4	15.4
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.17	0.17	0.17	0.17
v/c Ratio	0.05	0.41	0.07	0.44	0.06	0.36	0.29	0.29	0.22
Control Delay	6.3	7.6	6.4	8.2	2.1	35.8	15.5	33.9	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.6	6.4	8.2	2.1	35.8	15.5	33.9	18.3
LOS	A	A	A	A	A	D	B	C	B
Approach Delay		7.6		7.5			24.6		25.7
Approach LOS		A		A			C		C
Queue Length 50th (m)	1.0	25.6	1.4	30.3	0.0	12.2	5.2	9.6	5.0
Queue Length 95th (m)	4.8	68.3	6.3	79.0	4.3	21.6	15.7	18.0	14.1
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	525	1277	559	1305	1081	338	468	331	463
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	0.05	0.41	0.07	0.44	0.06	0.22	0.19	0.18	0.14

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings 1: Town & Country Plaza/Farm Boy & Richmond

Existing
 PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 10.9

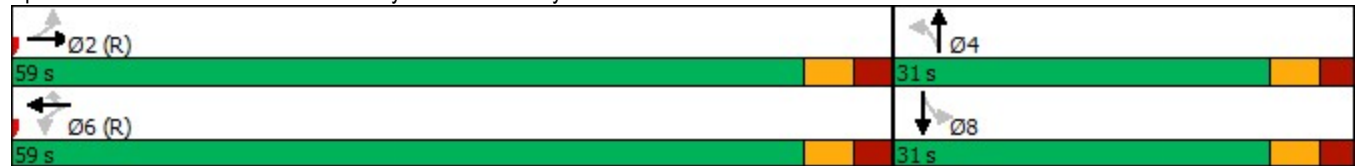
Intersection LOS: B

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

Existing
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	40	894	32	1442	14	9	40	14		
Future Volume (vph)	40	894	32	1442	14	9	40	14		
Lane Group Flow (vph)	44	1004	36	1684	0	48	0	106		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	16.0	71.0	16.0	71.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	12.3%	54.6%	12.3%	54.6%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	10.1	65.1	10.1	65.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		17		26	30	30	18	18	30	18
Act Effect Green (s)	8.5	82.6	8.1	79.7		21.5		22.9		
Actuated g/C Ratio	0.07	0.64	0.06	0.61		0.17		0.18		
v/c Ratio	0.41	0.33	0.35	0.58		0.19		0.40		
Control Delay	69.0	14.6	67.0	19.4		27.9		37.5		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	69.0	14.6	67.0	19.4		27.9		37.5		
LOS	E	B	E	B		C		D		
Approach Delay		16.9		20.4		27.9		37.5		
Approach LOS		B		C		C		D		
Queue Length 50th (m)	11.0	55.6	9.0	115.5		5.3		15.6		
Queue Length 95th (m)	23.1	68.9	19.9	136.1		15.9		33.9		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	129	3019	129	2891		333		342		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.34	0.33	0.28	0.58		0.14		0.31		

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

Existing
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 19.9

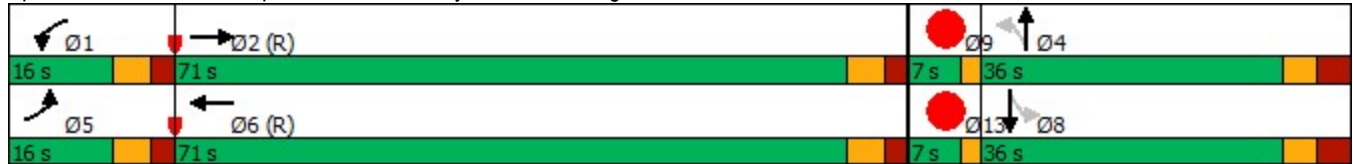
Intersection LOS: B

Intersection Capacity Utilization 63.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Appendix D

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
2018-02-24	2018	9:27	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2018-05-03	2018	17:45	ALPINE AVE @ CARLING AVE (0011382)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	02 - Wet	2	0	0	0
2018-05-28	2018	15:58	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-07-16	2018	16:07	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-07-20	2018	8:35	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-08-20	2018	16:21	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2018-09-04	2018	7:38	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	3	0	0	0
2018-09-21	2018	17:10	ALPINE AVE @ CARLING AVE (0011382)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
2018-10-12	2018	15:30	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-11-28	2018	11:12	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-11-29	2018	14:24	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2018-11-30	2018	22:07	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-01-03	2019	14:33	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	02 - Wet	2	0	0	0
2019-01-21	2019	17:12	ALPINE AVE @ CARLING AVE (0011382)	06 - Strong wind	05 - Dusk	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	05 - Packed snow	2	0	0	1
2019-01-29	2019	9:38	ALPINE AVE @ CARLING AVE (0011382)	03 - Snow	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	03 - Loose snow	2	0	0	0
2019-02-28	2019	6:47	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	3	0	0	0
2019-03-28	2019	12:32	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	0	0
2019-05-22	2019	16:27	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-06-08	2019	10:10	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-07-23	2019	13:44	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
2019-07-24	2019	9:03	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	0	0	0
2019-08-22	2019	16:22	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	3	0	0	0
2019-08-24	2019	16:44	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-09-05	2019	18:42	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-09-06	2019	17:18	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2019-10-10	2019	8:17	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	1
2019-11-28	2019	7:00	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
2020-05-07	2020	9:30	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2020-06-16	2020	15:28	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2020-09-19	2020	8:23	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	2	0	0	0
2020-11-27	2020	10:17	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	02 - Wet	2	0	0	0
2021-07-12	2021	11:14	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	2	1	0	0
2021-09-03	2021	17:15	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2021-09-16	2021	20:30	ALPINE AVE @ CARLING AVE (0011382)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0
2022-08-31	2022	16:13	ALPINE AVE @ CARLING AVE (0011382)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	2	0	0	0
2020-09-14	2020	18:00	CARLING AVE EB btwn ALPINE AVE & FOREST ST S (_3200KQ)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-05-30	2019	16:59	CARLING AVE EB btwn IVANHOE AVE & ALPINE AVE (_3200KP)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2020-10-24	2020	20:20	CARLING AVE EB btwn IVANHOE AVE & ALPINE AVE (_3200KP)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2018-04-20	2018	17:22	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2018-06-19	2018	17:35	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	4	0	0	0
2018-12-04	2018	17:17	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2018-12-12	2018	17:45	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-03-27	2019	16:18	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	01 - Daylight	10 - No control	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	2	0	0	0
2021-04-28	2021	19:20	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	02 - Rain	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	02 - Wet	2	0	0	0
2021-12-23	2021	18:55	CARLING AVE WB btwn POULIN AVE & ALPINE AVE (_3200KN)	01 - Clear	07 - Dark	10 - No control	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	4	0	0	0
2019-11-11	2019	22:02	CARLING AVE EB btwn DUNDEE AVE & IVANHOE AVE (_3200KQ)	03 - Snow	07 - Dark	10 - No control	0	03 - P.D. only	07 - SMV other	05 - Packed snow	1	0	0	0
2018-05-18	2018	17:23	CARLING AVE @ FOREST ST (0002640)	01 - Clear	01 - Daylight	02 - Stop sign	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2022-06-13	2022	8:56	CARLING AVE @ FOREST ST (0002640)	01 - Clear	01 - Daylight	02 - Stop sign	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-05-08	2019	7:10	CARLING AVE EB btwn FOREST ST & NORTON AVE (_3200KR)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	3	0	0	0
2018-10-15	2018	9:09	CARLING AVE WB btwn FOREST ST & CROYDON AVE (_3200KS)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2019-12-13	2019	16:00	CARLING AVE WB btwn FOREST ST & CROYDON AVE (_3200KS)	01 - Clear	05 - Dusk	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2020-01-27	2020	14:35	CARLING AVE WB btwn FOREST ST & CROYDON AVE (_3200KS)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	2	0	0	0
2021-06-01	2021	18:00	CARLING AVE WB btwn FOREST ST & CROYDON AVE (_3200KS)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2021-12-03	2021	13:45	CARLING AVE WB btwn FOREST ST & CROYDON AVE (_3200KS)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2018-03-08	2018	16:30	RICHMOND RD @ 140 E OF POULIN AVE (0012124)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	1	0	0	1
2019-06-17	2019	16:45	RICHMOND RD @ 140 E OF POULIN AVE (0012124)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2019-11-06	2019	1:30	RICHMOND RD @ 140 E OF POULIN AVE (0012124)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	01 - Dry	1	0	0	0
2019-10-21	2019	20:48	RICHMOND RD btwn 140 E OF POULIN AVE & FOREST ST (_3209ACB)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2018-09-05	2018	9:40	RICHMOND RD btwn POULIN AVE & 140 E OF POULIN AVE (_3209ACA)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	04 - Sideswipe	01 - Dry	2	0	0	0
2022-05-24	2022	23:45	RICHMOND RD btwn POULIN AVE & 140 E OF POULIN AVE (_3209ACA)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	05 - Turning movement	01 - Dry	2	0	0	0

Collision Summary Report

Location: 140 E OF POULIN AVE @ RICHMOND RD
Municipality: Ottawa
Traffic Control: Traffic signal

Geo ID: 0012124
Jurisdiction: Regional Municipality
Total Collisions: 3

Collision ID	Date/Time	Env	Impact Type	Classification	Direction	Surface Cond'n	Vehicle Manoeuvre	Vehicle Type	First Event	Driver Action	No. Ped
240916515	2024-Dec-3, Tue, 16:15	Clear	Turning movement	P.D. only	South	Dry	Turning right	Automobile, station wagon	Other motor vehicle	Unknown	0
Comments:					West	Unknown	Going ahead	Automobile, station wagon		Driving properly	
190295677	2019-Nov-6, Wed, 1:30	Clear	SMV other	P.D. only	East	Dry	Turning right	Automobile, station wagon	Curb	Speed too fast for condition	0
Comments:									Pole (utility, power)		
190153752	2019-Jun-17, Mon, 16:45	Clear	Sideswipe	P.D. only	West	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Improper lane change	0
Comments:					West	Dry	Stopped	Automobile, station wagon		Driving properly	

Location: ALPINE AVE @ CARLING AVE
Municipality: Ottawa
Traffic Control: Traffic signal

Geo ID: 0011382
Jurisdiction: Regional Municipality
Total Collisions: 25

Collision ID	Date/Time	Env	Impact Type	Classification	Direction	Surface Cond'n	Vehicle Manoeuvre	Vehicle Type	First Event	Driver Action	No. Ped
240911903	2024-Sep-5, Thu, 15:40	Clear	Rear end	P.D. only	West	Dry	Stopped	Automobile, station wagon	Other motor vehicle	Driving properly	0
Comments:					West	Dry	Going ahead	Automobile, station wagon	Other motor vehicle	Unknown	
240905445	2024-Apr-5, Fri, 0:30	Snow	Sideswipe	P.D. only	West	Loose snow	Going ahead	Automobile, station wagon	Other motor vehicle	Driving properly	0
Comments:					West	Loose snow	Merging	Automobile, station wagon		Unknown	
220231472	2022-Aug-31, Wed, 16:13	Rain	Rear end	P.D. only	West	Wet	Going ahead	Automobile, station wagon	Other motor vehicle	Following too close	0
Comments:					West	Wet	Stopped	Automobile, station wagon		Driving properly	
210235879	2021-Sep-16, Thu, 20:30	Clear	Turning movement	P.D. only	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Dry	Going ahead	Pick-up truck		Driving properly	
210222618	2021-Sep-3, Fri, 17:15	Clear	Turning movement	P.D. only	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0

Comments:					West	Dry	Going ahead	Automobile, station wagon		Driving properly	
210167963	2021-Jul-12, Mon, 11:14	Clear	Turning movement	Non-fatal injury	West	Dry	Turning left	Pick-up truck	Other motor vehicle	Failed to yield right-of-way	0
Comments:					East	Dry	Going ahead	Motorcycle		Driving properly	
200288039	2020-Nov-27, Fri, 10:17	Clear	Turning movement	Non-fatal injury	West	Wet	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					East	Wet	Going ahead	Automobile, station wagon		Driving properly	
200230447	2020-Sep-19, Sat, 8:23	Clear	Angle	P.D. only	West	Dry	Going ahead	Pick-up truck	Other motor vehicle	Disobeyed traffic control	0
Comments:					South	Dry	Going ahead	Automobile, station wagon		Driving properly	
200143745	2020-Jun-16, Tue, 15:28	Clear	Angle	P.D. only	South	Dry	Unknown	Unknown	Other motor vehicle	Unknown	0
Comments:					East	Dry	Going ahead	Automobile, station wagon		Driving properly	
200121197	2020-May-7, Thu, 9:30	Clear	Rear end	P.D. only	West	Dry	Going ahead	Automobile, station wagon	Other motor vehicle	Following too close	0
Comments:					West	Dry	Stopped	Automobile, station wagon		Driving properly	
190315485	2019-Nov-28, Thu, 7:00	Clear	Sideswipe	P.D. only	West	Wet	Changing lanes	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Wet	Going ahead	Automobile, station wagon		Driving properly	
190267733	2019-Oct-10, Thu, 8:17	Clear	SMV other	Non-fatal injury	South	Dry	Turning left	Automobile, station wagon	Pedestrian	Failed to yield right-of-way	1
Comments:											
190234796	2019-Sep-6, Fri, 17:18	Clear	Turning movement	P.D. only	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Dry	Going ahead	Automobile, station wagon		Driving properly	
190233769	2019-Sep-5, Thu, 18:42	Clear	Turning movement	P.D. only	West	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					East	Dry	Going ahead	Automobile, station wagon		Driving properly	
190221644	2019-Aug-24, Sat, 16:44	Clear	Rear end	P.D. only	West	Dry	Going ahead	Automobile, station wagon	Other motor vehicle	Following too close	0
Comments:					West	Dry	Stopped	Automobile, station wagon		Driving properly	
190219730	2019-Aug-22, Thu, 16:22	Clear	Rear end	Non-fatal injury	West	Dry	Going ahead	Passenger van	Other motor vehicle	Following too close	0

Comments:					West	Dry	Slowing or stopping	Automobile, station wagon		Unknown	
190190284	2019-Jul-24, Wed, 9:03	Clear	Turning movement	Non-fatal injury	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Driving properly	0
Comments:					West	Dry	Going ahead	Pick-up truck		Failed to yield right-of-way	
190189580	2019-Jul-23, Tue, 13:44	Clear	Rear end	Non-fatal injury	West	Dry	Slowing or stopping	Pick-up truck	Other motor vehicle	Following too close	0
Comments:					West	Dry	Turning right	Automobile, station wagon		Driving properly	
190143467	2019-Jun-8, Sat, 10:10	Clear	Sideswipe	P.D. only	West	Dry	Changing lanes	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Dry	Going ahead	Automobile, station wagon		Driving properly	
190126785	2019-May-22, Wed, 16:27	Clear	Turning movement	P.D. only	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Improper turn	0
Comments:					West	Dry	Going ahead	Automobile, station wagon		Driving properly	
190076394	2019-Mar-28, Thu, 12:32	Clear	Turning movement	Non-fatal injury	West	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					East	Dry	Going ahead	Automobile, station wagon		Driving properly	
190050569	2019-Feb-28, Thu, 6:47	Clear	Turning movement	P.D. only	East	Dry	Turning left	Automobile, station wagon	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Dry	Going ahead	Municipal transit bus		Driving properly	
190024729	2019-Jan-29, Tue, 9:38	Snow	Turning movement	P.D. only	West	Loose snow	Going ahead	Passenger van	Other motor vehicle	Driving properly	0
Comments:					East	Slush	Turning left	Automobile, station wagon		Failed to yield right-of-way	
190018105	2019-Jan-21, Mon, 17:12	Strong wind	Rear end	Non-fatal injury	West	Packed snow	Slowing or stopping	Automobile, station wagon	Other motor vehicle	Exceeding speed limit	1
Comments:					West	Packed snow	Stopped	Automobile, station wagon		Driving properly	
194012235	2019-Jan-3, Thu, 14:33	Clear	Turning movement	P.D. only	East	Wet	Turning left	Passenger van	Other motor vehicle	Failed to yield right-of-way	0
Comments:					West	Wet	Going ahead	Automobile, station wagon		Driving properly	

Appendix E

TDM Checklist

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: <i>Non-residential developments</i>		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	☐
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
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	☒
2.2 Bicycle skills training		
<i>Commuter travel</i>		
BETTER ★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
2.3 Valet bike parking		
<i>Visitor travel</i>		
BETTER	2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances	☒
BASIC	3.1.2 Provide online links to OC Transpo and STO information	☐
BETTER	3.1.3 Provide real-time arrival information display at entrances	☐
3.2 Transit fare incentives		
<i>Commuter travel</i>		
BETTER	3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	☒
BETTER ★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	☐
<i>Visitor travel</i>		
BETTER	3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
3.3 Enhanced public transit service		
<i>Commuter travel</i>		
BETTER	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
<i>Visitor travel</i>		
BETTER	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
3.4 Private transit service		
<i>Commuter travel</i>		
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)	☐
<i>Visitor travel</i>		
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)	☐

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

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

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 <i>Official Plan policy 4.3.3</i>)	☒
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 <i>Official Plan policy 4.3.12</i>)	☒

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 <i>Official Plan policy 4.3.10</i>)	☒
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 <i>Official Plan policy 4.3.10</i>)	☒
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 <i>Official Plan policy 4.3.11</i>)	☒
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	☐
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	☐
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)	☐

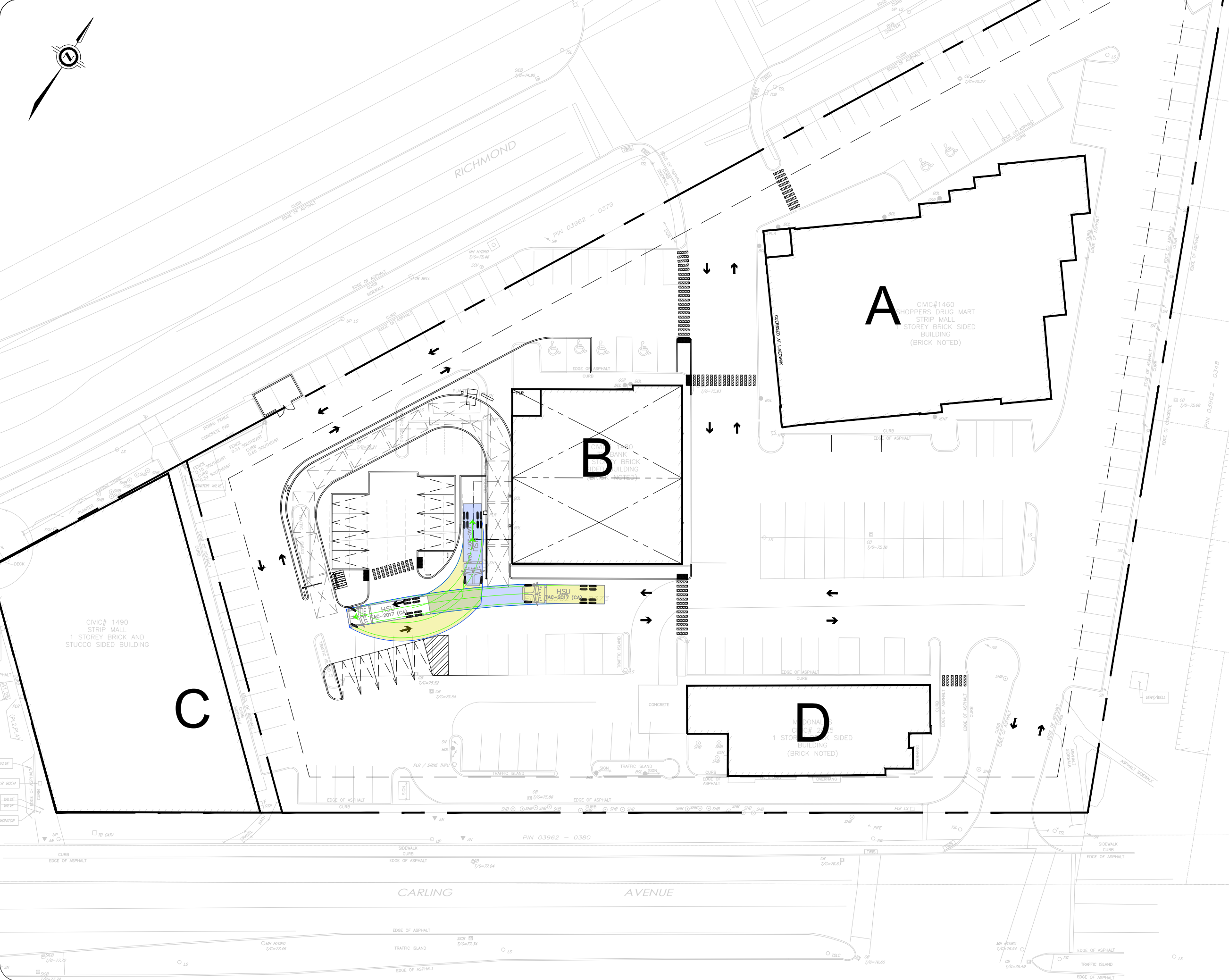
TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
2. WALKING & CYCLING: END-OF-TRIP FACILITIES		
2.1 Bicycle parking		
REQUIRED	2.1.1 Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible (<i>see Official Plan policy 4.3.6</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☒
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 (<i>see Zoning By-law Section 111</i>)	☒
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 (<i>see Zoning By-law Section 111</i>)	☐
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)	☐
2.3 Shower & change facilities		
BASIC	2.3.1 Provide shower and change facilities for the use of active commuters	☐
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)	☐

TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		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	☐
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	☐
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	☐
BETTER	4.2.2 At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
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 (<i>see Zoning By-law Section 94</i>)	☐
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	☐

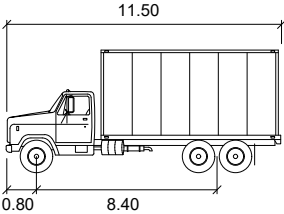
TDM-supportive design & infrastructure measures: <i>Non-residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
6. PARKING		
6.1 Number of parking spaces		
REQUIRED	6.1.1 Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☒
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	☐
BASIC	6.1.3 Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly (<i>see Zoning By-law Section 104</i>)	☐
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 (<i>see Zoning By-law Section 111</i>)	☐
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)	☐
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	☐

Appendix F

Turning Templates



Notes:



HSU		units
Width	: 2.60	meters
Track	: 2.60	meters
Lock to Lock Time	: 6.0	seconds
Steering Angle	: 40.0	degrees

LEGEND:

- FORWARD MOVEMENT
- REVERSE MOVEMENT
- PROPOSED MODIFICATIONS

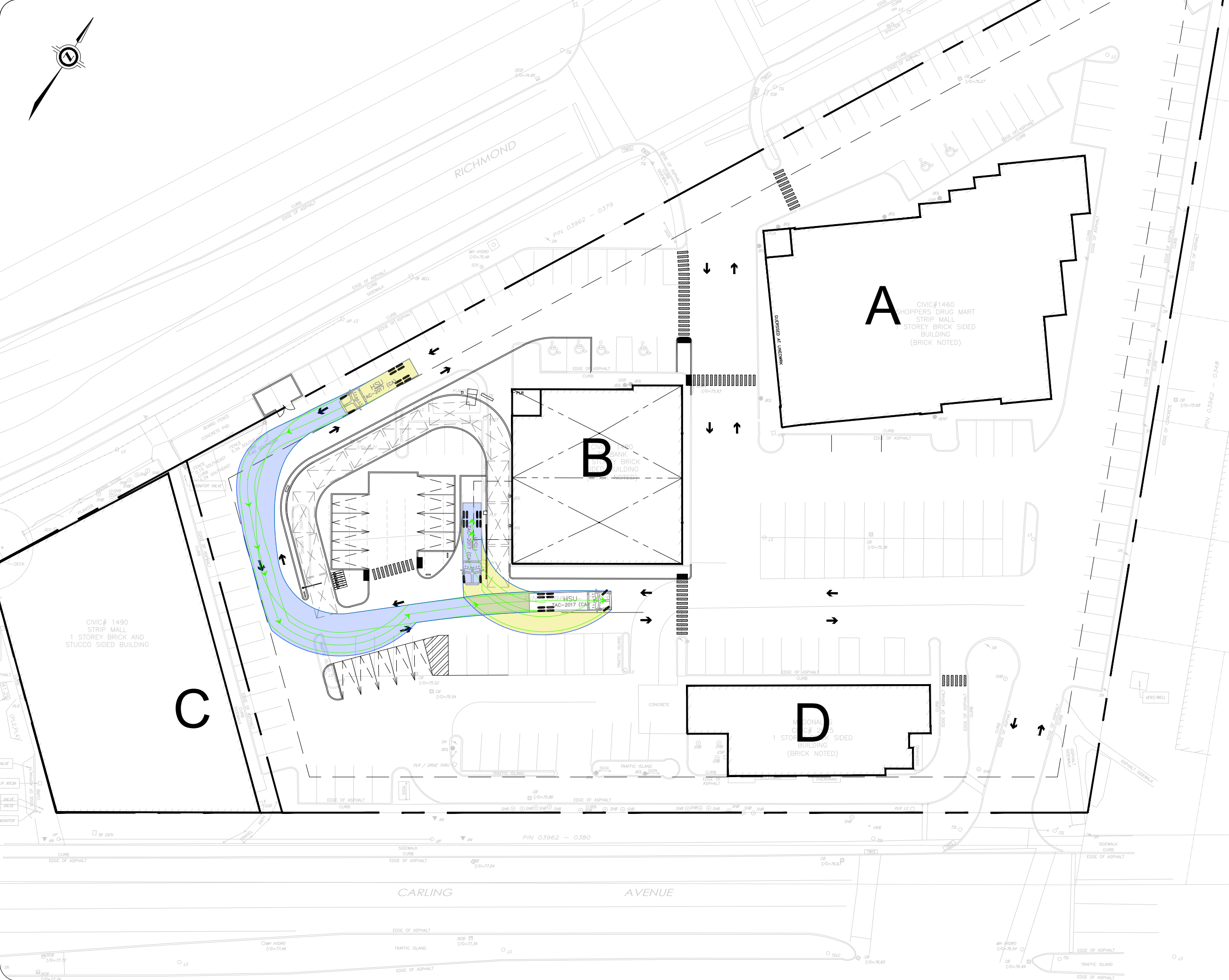
01	Issued for Review	YP	2026-06-26
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation

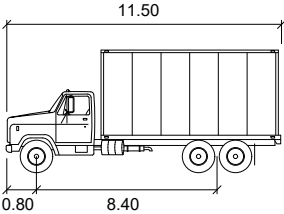
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:	Zail Properties
ARCHITECT:	

SITE: 1480 Richmond Road			
TITLE: Turning Movement Analysis HSU to Loading Space (1)			
SCALE AT A3: 1:500	DATE: 2026-06-26	DRAWN: YP	CHECKED: AL
PROJECT NO: 2026-042	DRAWING NO: 001	REVISION: 01	



Notes:



HSU		units
Width	: 2.60	meters
Track	: 2.60	meters
Lock to Lock Time	: 6.0	seconds
Steering Angle	: 40.0	degrees

LEGEND:

- FORWARD MOVEMENT
- REVERSE MOVEMENT
- PROPOSED MODIFICATIONS

01	Issued for Review	YP	2026-06-26
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

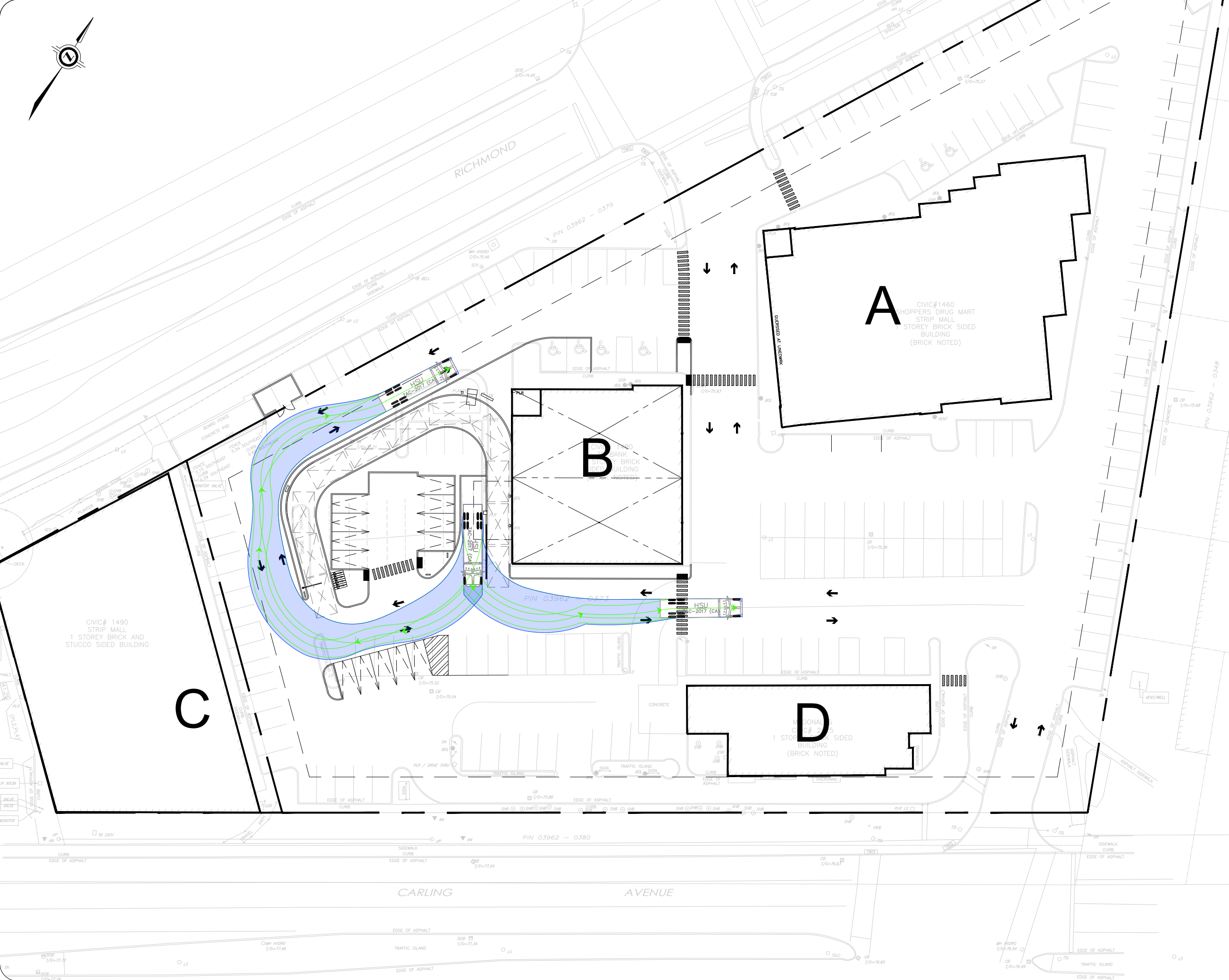


CGH Transportation

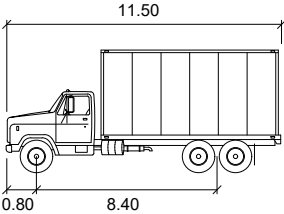
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:	Zail Properties
ARCHITECT:	

SITE:				1480 Richmond Road	
TITLE: Turning Movement Analysis HSU to Loading Space (2)					
SCALE AT A3: 1:500		DATE: 2026-06-26		DRAWN: YP	
PROJECT NO: 2026-042		DRAWING NO: 002		CHECKED: AL	
				REVISION: 01	



Notes:



HSU	
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

LEGEND:

- FORWARD MOVEMENT
- REVERSE MOVEMENT
- PROPOSED MODIFICATIONS

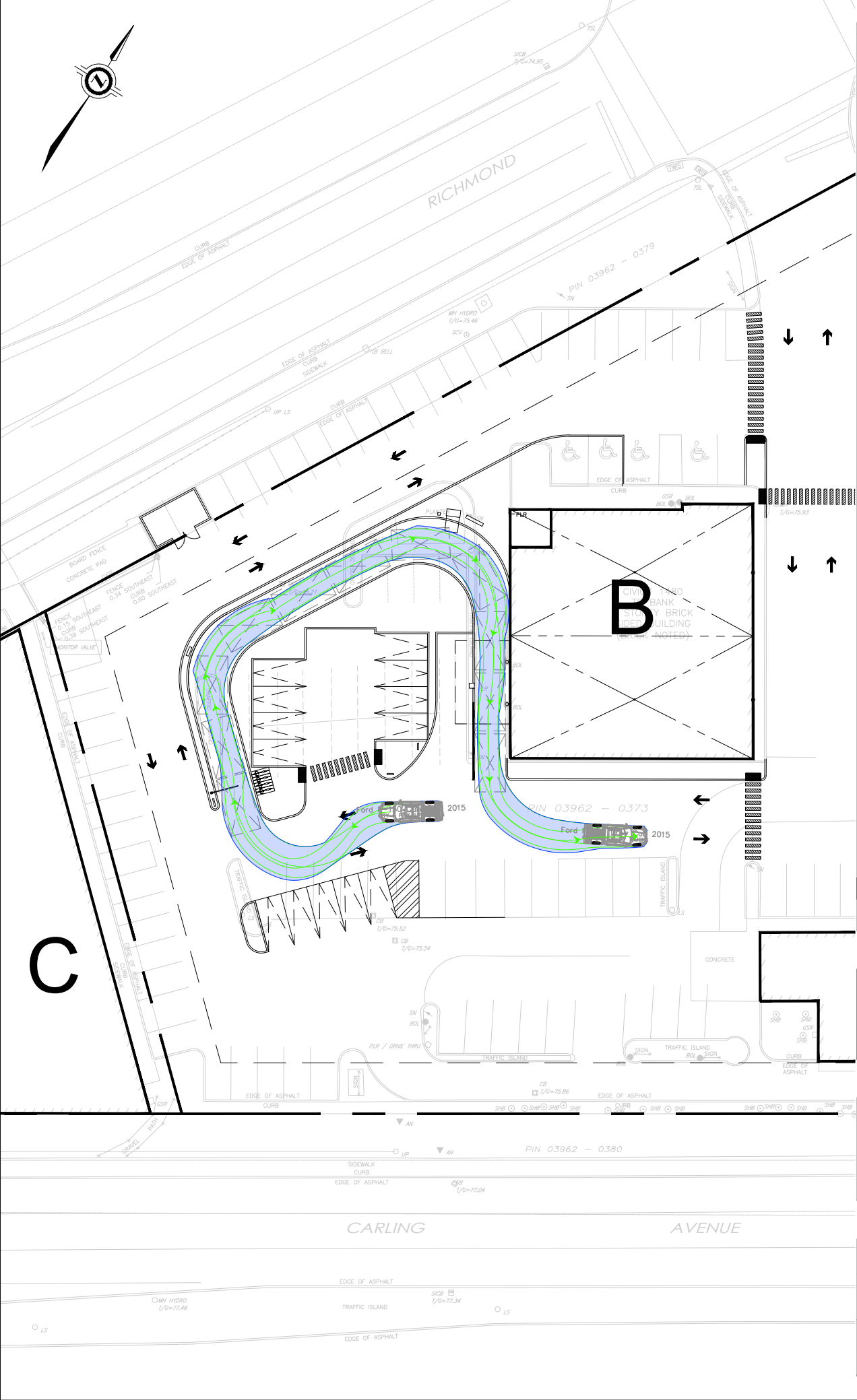
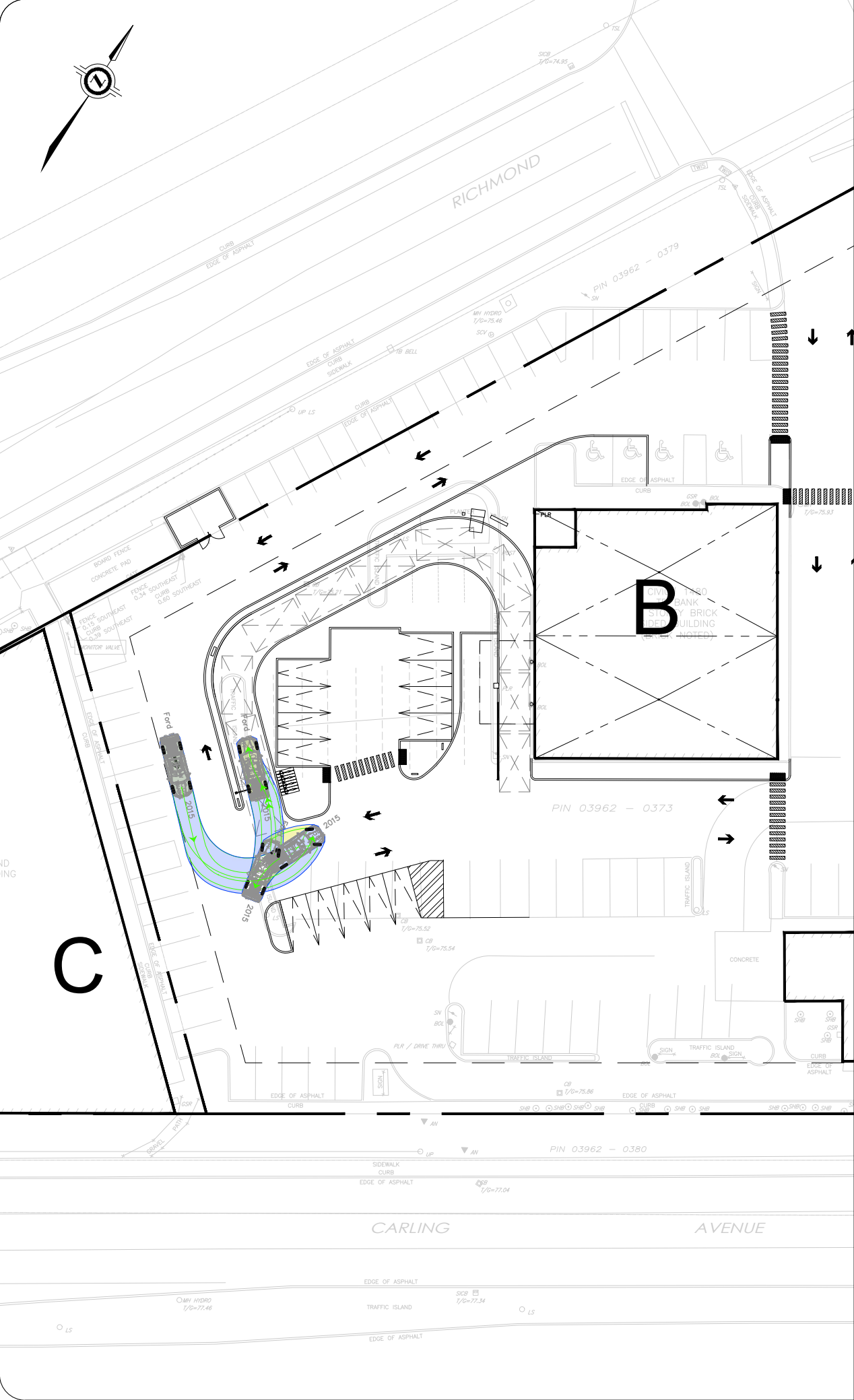
01	Issued for Review	YP	2026-06-26
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

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Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT:	Zail Properties
ARCHITECT:	

SITE: 1480 Richmond Road			
TITLE: Turning Movement Analysis HSU Exiting Loading Space			
SCALE AT A3: 1:500	DATE: 2026-06-26	DRAWN: YP	CHECKED: AL
PROJECT NO: 2026-042	DRAWING NO: 003	REVISION: 01	



Notes:

6.19
0.96 3.99

Ford F-150 Crew Cab 2015

Width	: 2.03
Track	: 1.98
Lock to Lock Time	: 6.0
Steering Angle	: 35.0

LEGEND:

FORWARD MOVEMENT

REVERSE MOVEMENT

PROPOSED MODIFICATIONS

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REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

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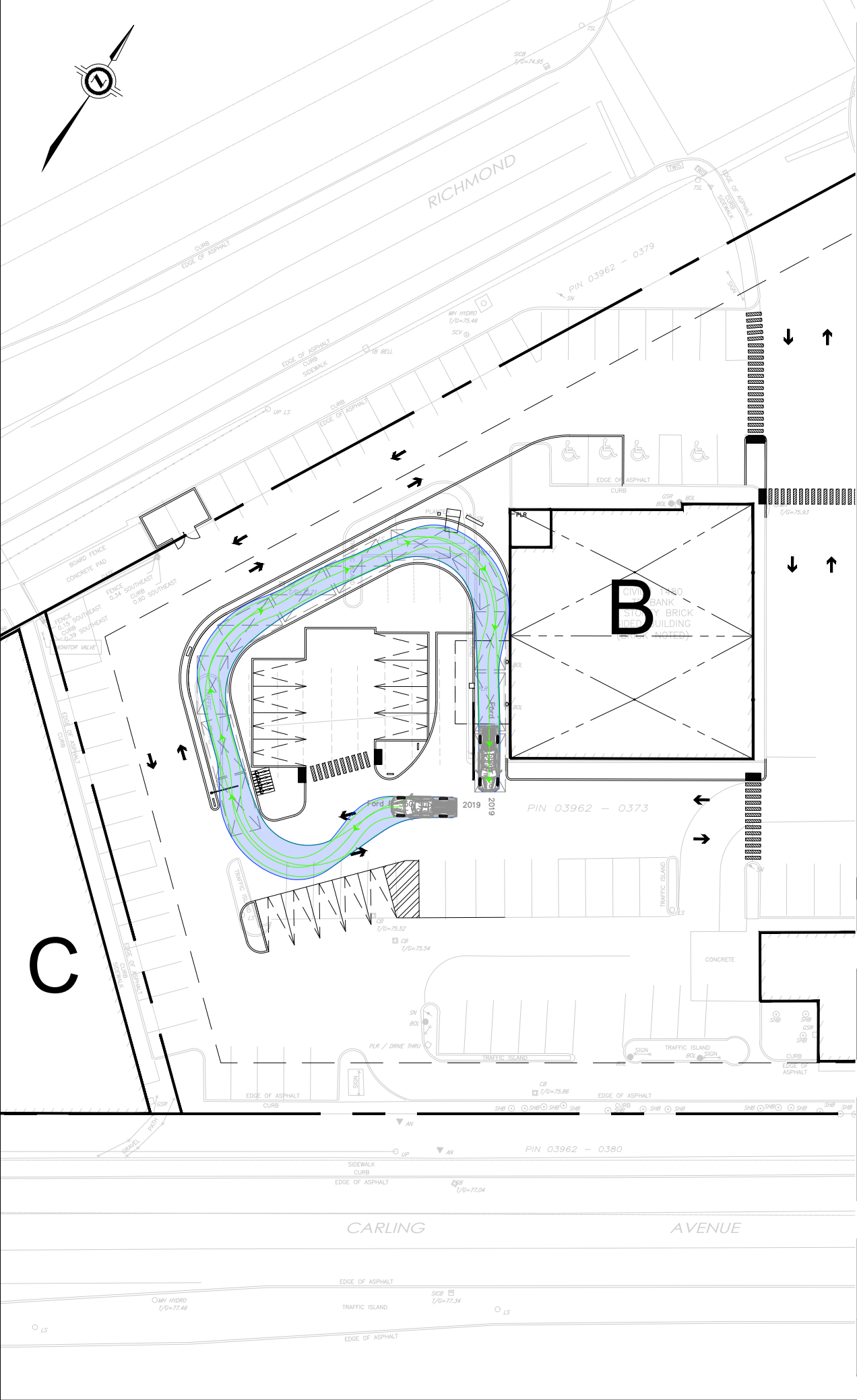
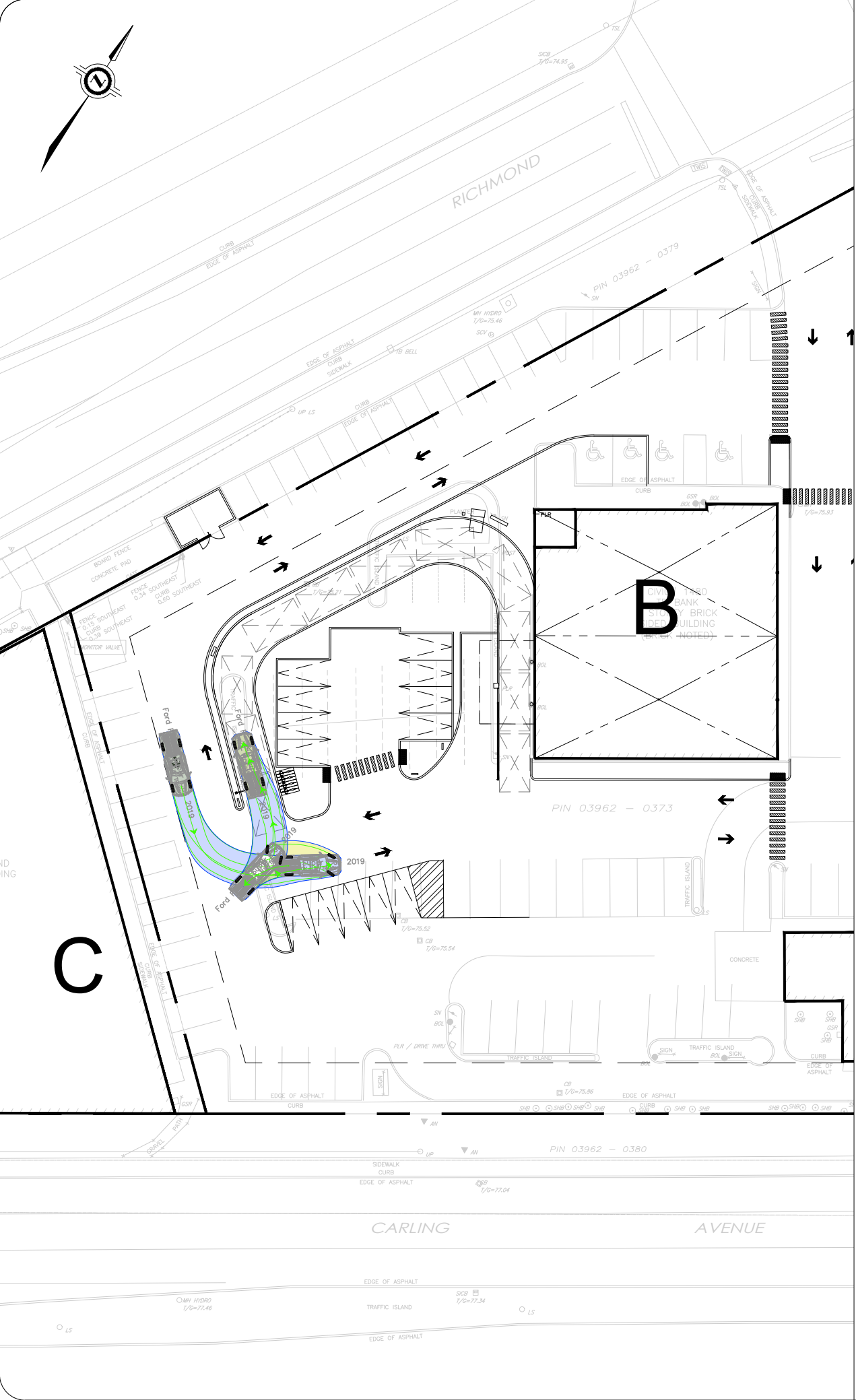
CLIENT: Zail Properties

ARCHITECT:

SITE: 1480 Richmond Road

TITLE: Turning Movement Analysis
F-150 Through Drive-Thru

SCALE AT A3: 1:500	DATE: 2026-06-26	DRAWN: YP	CHECKED: AL
PROJECT NO: 2026-042	DRAWING NO: 004	REVISION: 01	



Notes:

Ford F-350 Super Cab 2019

Width	: 2.03	meters
Track	: 1.98	
Lock to Lock Time	: 6.0	
Steering Angle	: 33.9	

LEGEND:

FORWARD MOVEMENT

REVERSE MOVEMENT

PROPOSED MODIFICATIONS

01	Issued for Review	YP	2026-06-26
REV:	DESCRIPTION:	BY:	DATE:
STATUS:			

CGH Transportation

6 Plaza Court

Ottawa, ON

K2H 7W1

(343) 999-9117

CLIENT: Zail Properties

ARCHITECT:

SITE: 1480 Richmond Road

TITLE: Turning Movement Analysis
F-350 Through Drive-Thru

SCALE AT A3: 1:500	DATE: 2026-06-26	DRAWN: YP	CHECKED: AL
PROJECT NO: 2026-042	DRAWING NO: 005	REVISION: 01	

Appendix G

MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Project: 2625 Carling Avenue 1480 Richmond Road

Consultant: CGH Transportation

Date: 2026-05-27

Scenario: Existing/Future

Segment Name		Carling (Existing)		Carling (Future)		Richmond (Existing/Future)	
OP Transect / Policy Area		wn Core, Inner Urban,Hub and/or Special		wn Core, Inner Urban,Hub and/or Special		wn Core, Inner Urban,Hub and/or Special	
Segment Component		Majority (>50%)		Majority (>50%)		Majority (>50%)	
Side of Street		N		N		S	
Pedestrian	PLOS Inputs						
	Posted Speed (km/h)	60 km/h		60 km/h		50 km/h	
	Two-Way ADT	24,400		24,820		11,200	
	Pedestrian Facility	Sidewalk		Sidewalk		Sidewalk	
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users, AND are pedestrian volumes likely less than 20% of total users?	Yes		Yes		Yes	
	Facility Width (m)	2.00m		2.00m		2.00m	
	Offset from Motor Vehicle Travel Lanes (m)	< 0.5m		1.5-2.99m		1.5-2.99m	
	Presence of Adjacent Parking?	-		-		-	
	General Purpose Curb Lane ADT	> 3000		> 3000		> 3000	
	Max. Distance between Controlled Crossings (m)	≤ 200m		≤ 200m		≤ 200m	
Score		2.75	-	4.25	-	5.00	-
PLOS		C	-	B	-	A	-
Target PLOS		A		A		A	
Bicycle	BLOS Inputs						
	Cycling Route Classification	Elsewhere		Elsewhere		Cross-Town Bikeway	
	Cycling Facility	Shared Operating Space	Input PLOS First	Cycle Track	Input PLOS First	Painted or Physically Separated Bike Lanes	Input PLOS First
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)	-		-		-	
	Facility Operation	-		Unidirectional		Unidirectional	
	Pedestrian/Cyclist Volume	-		-		-	
	Facility Width	-		1.8m-2.09m		1.8-1.99m	
	Boulevard/Buffer Width (excluding curb)	-		< 0.6m and no adjacent parking		< 1.0m and no vertical measure or < 0.6m with adjacent parking	
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)	None		None		None	
	Number of Travel Lanes at Crossing	-		-		-	
	Crossing includes Median Refuge (≥ 2.7m)	-		-		-	
	Cross-street Posted Speed (km/h)	-		-		-	
	Cycling Path Blockages (e.g. bus stops and/or loading zones)	Frequent, Short Duration		-		Frequent, Short Duration	
	Score	0.45	-	2.50	-	2.15	-
	BLOS	F	-	C	-	D	-
	Target BLOS	B		B		A	
Transit	TLOS Inputs						
	Transit Facility	TP - Isolated Measures		TP - Isolated Measures		Mixed Traffic	
	Facility Type	Mixed Traffic		Mixed Traffic		Mixed Traffic	
	Expected Transit Running Time	Moderately Impeded		Moderately Impeded		Moderately Impeded	
	Transit Travel Speed (if available)	Enter Speed (if available)		Enter Speed (if available)		Enter Speed (if available)	
	TLOS	D	-	D	-	D	-
	Target TLOS	C		C		E (D for frequent transit routes)	
Public Realm	PRLOS Inputs						
	Context	Mainstreet or active frontage street within a Hub, Special District, or Village	Input PLOS and BLOS First	Mainstreet or active frontage street within a Hub, Special District, or Village	Input PLOS and BLOS First	Mainstreet or active frontage street within a Hub, Special District, or Village	Input PLOS and BLOS First
	Inner Boulevard Width	≤ 0.6m		≤ 0.6m		≤ 0.6m	
	Middle Boulevard Width	≥ 3.0m		≥ 3.0m		≤ 0.5m	
	Outer Boulevard (Frontage) Width	-		-		-	
	Transit Route on Segment?	Yes		Yes		Yes	
	Bus Stop Elements	Curbside landing zone with no shelter		Curbside landing zone with no shelter		Curbside landing zone with no shelter	
	Number of Midblock Traffic Lanes (both travel directions)	≥ 6		≥ 6		≤ 2	
	Score	18.00	-	21.00	-	21.30	-
	PRLOS	C	-	B	-	B	-
		C		B		B	

Multi-Modal Level of Service - Intersections Form
Project: 2625 Carling Avenue 1480 Richmond Road
Consultant: CGH Transportation
Date: 2026-05-27
Scenario: Existing/Future

Intersection Name		Richmond Road at Town and Country Plaza Access/Farm Boy Access				Carling Avenue at Alpine Avenue/ Town and Country Plaza Access (Existing)				Carling Avenue at Alpine Avenue/ Town and Country Plaza Access (Future)			
OP Transect / Policy Area		Downtown Core, Inner Urban,Hub and/or Special District				Downtown Core, Inner Urban,Hub and/or Special District				Downtown Core, Inner Urban,Hub and/or Special District			
Pedestrian	PLOS Inputs												
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	4	4	4	1-3	1-3	1-3	7	7	1-3	1-3	6	6
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	No	No	No	No	No
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Zebra Stripe Hi-Vis Markings	Std Transverse Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Std Transverse Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings
	Signal Cycle Length (sec)	90.0				130.0				130.0			
	Effective Walk Time (sec)	12.0	12.0	41.0	41.0	7.0	7.0	48.0	48.0	7.0	7.0	48.0	48.0
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel
	Right-Turn Signal Phasing	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
	Right-Turn Volume	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h
	Right-Turn Effective Corner Radius	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m	≤ 8m
	Cross-street Posted Speed (km/h)	50 km/h		40 km/h		60 km/h		50 km/h		60 km/h		50 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL
PLOS	Left-Turn Signal Phasing	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm
	Left-Turn Volume	≤ 50 veh/h	≤ 50 veh/h	> 50 to 100 veh/h	> 50 to 100 veh/h	-	-	> 50 to 100 veh/h	≤ 50 veh/h	-	-	> 50 to 100 veh/h	≤ 50 veh/h
	Left-Turn Opposing Lanes	-	-	≤ 1	≤ 1	-	-	≤ 1	-	-	-	≤ 1	-
	Score	3.70	3.70	4.00	4.60	4.20	4.15	2.10	2.10	4.20	4.15	2.70	2.70
	PLOS	B	B	B	A	B	B	D	D	B	B	C	C
Target PLOS		A				A				A			
Bicycle	BLOS Inputs												
	Cycling Route Classification	Cross-Town Bikeway				Elsewhere				Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Crossside	Crossside
	Two-Way ADT (in Cyclist Travel Direction)	2,700		13,450		1,400		24,920		1,550		25,250	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	Yes	Yes	No	No	No	No	No	No	No	No
	Crossside Operation	-	-	-	-	-	-	-	-	-	-	Unidirectional	Unidirectional
	Target Crossside Setback Met?	-	-	-	-	-	-	-	-	-	-	Yes	Yes
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL
BLOS	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane
	Vehicle Lanes Crossed by Cyclists	No Lane Crossed	No Lane Crossed	No Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed
	Score	60	60	65	65	40	40	60	60	40	40	110	110
	BLOS	D	D	C	C	D	D	D	D	D	D	B	B
	Target BLOS	A				B				B			
Transit	TLOS Inputs												
	Transit Facility	Mixed Traffic				TP - Isolated Measures				TP - Isolated Measures			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)	Unavailable	Unavailable	≤ 10 sec	11-20 sec	Unavailable	Unavailable	11-20 sec	11-20 sec	Unavailable	Unavailable	11-20 sec	11-20 sec
	Example Transit Priority Treatment	No transit priority measures and long cycle length	No transit priority measures and long cycle length	-	-	No transit priority measures and long cycle length	No transit priority measures and long cycle length	-	-	No transit priority measures and long cycle length	No transit priority measures and long cycle length	-	-
	TLOS	E	E	A	B	E	E	B	B	E	E	B	B
Target TLOS		E (D for frequent transit routes)				C				C			
Auto	AutoLOS Inputs												
	Overall Intersection Volume to Capacity Ratio	0 to 0.60				0 to 0.60				0 to 0.60			
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	A				A				A			
	Target AutoLOS	E				E				E			

Appendix H

TRANS Model

TRANS Regional Model

Version 1.01 - Assigned December, 2024

AM Peak Hour Total Traffic Volume

Richmond Rd/Carling Avenue

2022 Model - Basecase

N/A

User Initials: TIMW

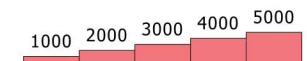
Plot Prepared: May 2026

EMME Scenario: 22002

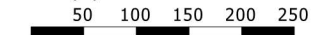


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

Made with OpenPaths™

TRANS Regional Model

Version 1.01 - Assigned December, 2025

AM Peak Hour Total Traffic Volume

Richmond Rd/Carling Avenue

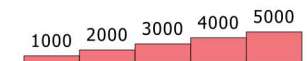
2046 Model - Priority Network

User Initials: TIMW
Plot Prepared: May 2026
EMME Scenario: 46011

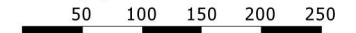


Legend

AM Peak Hour Total Traffic Volume



Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

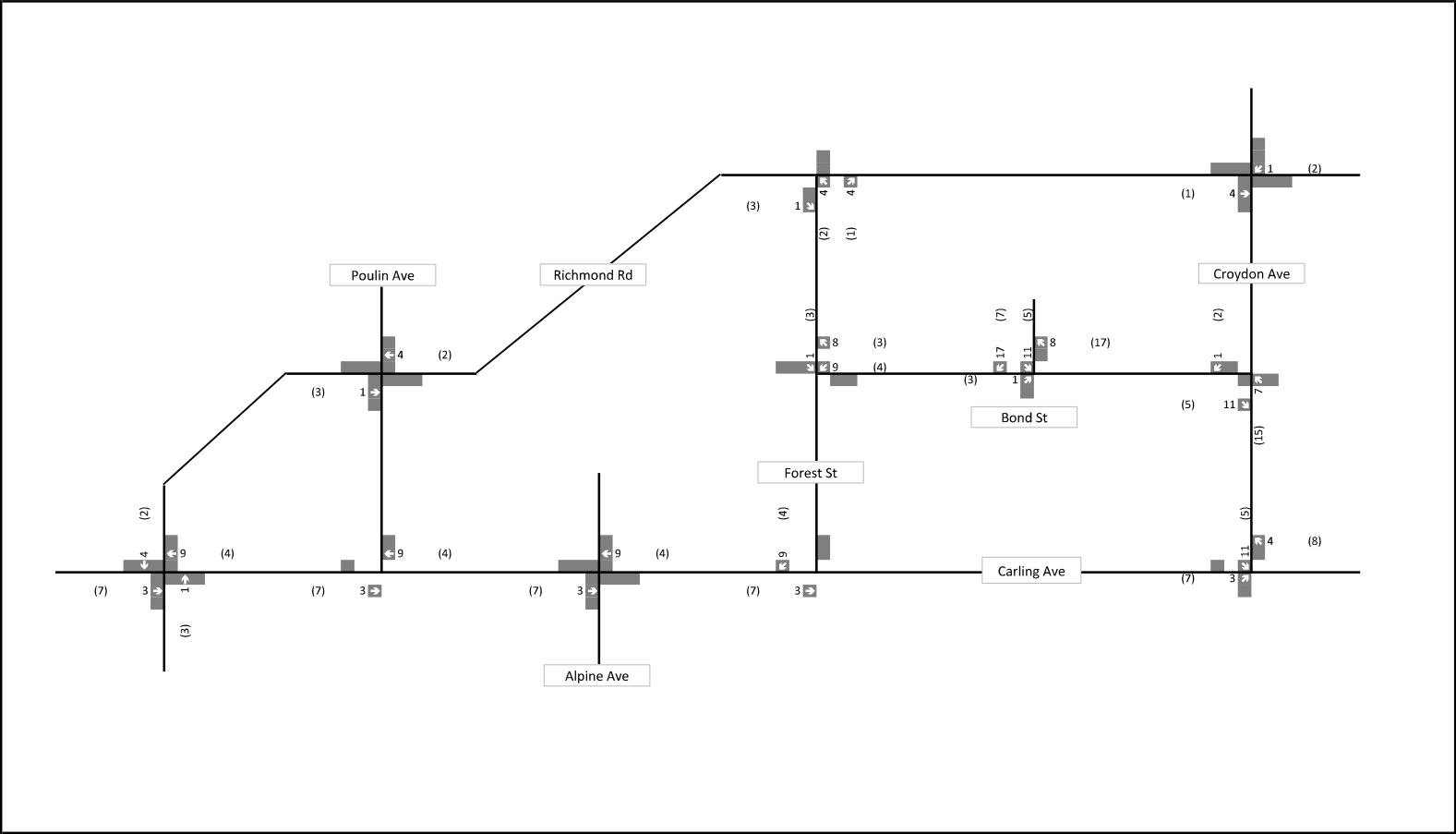
As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

Made with OpenPaths™

Appendix I

Background Development

2583 & 2589 Bond Street, 365 Forest Street, 1420 Richmond Road



Legend
xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes



Figure 6
Site Trips - Subject Site

Appendix J

Synchro Intersection Worksheets – 2026 Future Background Conditions



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	520	33	337	13	31	11	27	7
Future Volume (vph)	9	520	33	337	13	31	11	27	7
Lane Group Flow (vph)	9	569	33	337	13	31	50	27	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	36.0	36.0	36.0	36.0	36.0	29.0	29.0	29.0	29.0
Total Split (%)	55.4%	55.4%	55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	30.1	30.1	30.1	30.1	30.1	23.3	23.3	23.3	23.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	7	7	4	4	4	9	9	12	12
Act Effect Green (s)	49.4	49.4	49.4	49.4	49.4	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.19	0.19	0.19	0.19
v/c Ratio	0.01	0.44	0.06	0.26	0.01	0.13	0.16	0.11	0.04
Control Delay	7.0	8.3	6.9	6.6	0.2	20.5	9.7	20.3	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.3	6.9	6.6	0.2	20.5	9.7	20.3	14.8
LOS	A	A	A	A	A	C	A	C	B
Approach Delay		8.3		6.4			13.8		18.6
Approach LOS		A		A			B		B
Queue Length 50th (m)	0.3	27.6	1.2	13.9	0.0	3.3	1.2	2.9	0.7
Queue Length 95th (m)	2.6	85.4	6.5	43.8	0.4	7.3	6.8	6.7	3.4
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	678	1285	544	1277	1109	457	563	447	579
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	0.01	0.44	0.06	0.26	0.01	0.07	0.09	0.06	0.02

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 53 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond /Richmond

FB2026
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 8.4

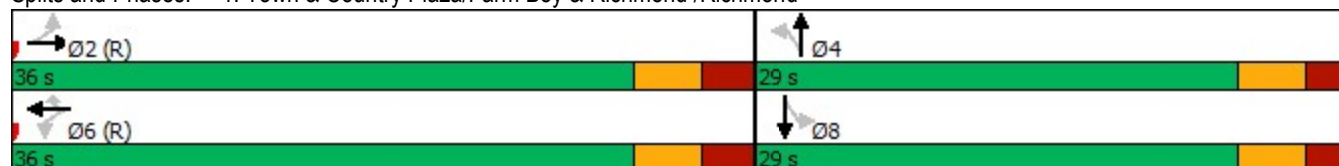
Intersection LOS: A

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

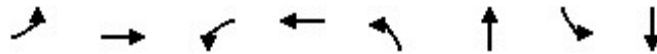
Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond /Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

FB2026
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations	←	↑↑↑	←	↑↑↑		↑		↑		
Traffic Volume (vph)	21	1135	10	626	18	4	33	12		
Future Volume (vph)	21	1135	10	626	18	4	33	12		
Lane Group Flow (vph)	21	1142	10	669	0	54	0	78		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	21.0	66.0	21.0	66.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	16.2%	50.8%	16.2%	50.8%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	15.1	60.1	15.1	60.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		4		12	11	11	2	2	11	2
Act Effect Green (s)	7.4	98.7	6.4	92.9		17.7		19.1		
Actuated g/C Ratio	0.06	0.76	0.05	0.71		0.14		0.15		
v/c Ratio	0.24	0.32	0.12	0.20		0.25		0.34		
Control Delay	64.6	8.9	61.9	10.4		25.2		35.1		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	64.6	8.9	61.9	10.4		25.2		35.1		
LOS	E	A	E	B		C		D		
Approach Delay		9.9		11.2		25.2		35.1		
Approach LOS		A		B		C		D		
Queue Length 50th (m)	5.3	19.6	2.5	17.8		5.4		13.0		
Queue Length 95th (m)	13.8	77.2	8.3	43.1		15.7		24.8		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	178	3613	192	3331		331		349		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.12	0.32	0.05	0.20		0.16		0.22		

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 40 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FB2026
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 11.7

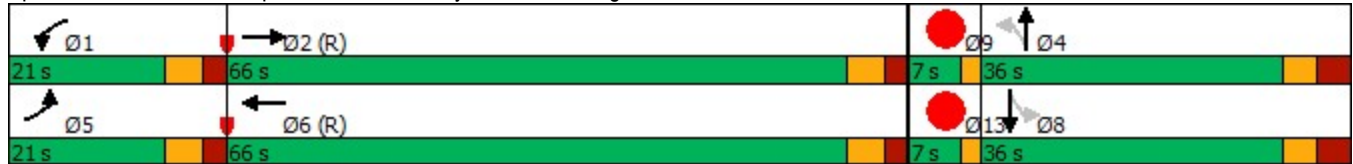
Intersection LOS: B

Intersection Capacity Utilization 47.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FB2026
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	23	438	34	548	56	67	30	53	29
Future Volume (vph)	23	438	34	548	56	67	30	53	29
Lane Group Flow (vph)	23	498	34	548	56	67	81	53	60
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%
Maximum Green (s)	53.1	53.1	53.1	53.1	53.1	25.3	25.3	25.3	25.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	12	12	9	9	9	20	20	19	19
Act Effect Green (s)	67.5	67.5	67.5	67.5	67.5	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.17	0.17	0.17	0.17
v/c Ratio	0.04	0.39	0.06	0.42	0.05	0.33	0.27	0.26	0.21
Control Delay	6.3	7.3	6.3	7.8	2.2	34.9	15.5	33.2	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.3	6.3	7.8	2.2	34.9	15.5	33.2	18.1
LOS	A	A	A	A	A	C	B	C	B
Approach Delay		7.3		7.3			24.3		25.2
Approach LOS		A		A			C		C
Queue Length 50th (m)	0.8	22.8	1.2	26.9	0.0	11.1	4.8	8.6	4.6
Queue Length 95th (m)	4.4	63.1	5.9	72.9	4.1	19.9	14.8	16.6	13.2
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	551	1281	582	1308	1081	340	464	333	461
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	0.04	0.39	0.06	0.42	0.05	0.20	0.17	0.16	0.13

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FB2026
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 10.5

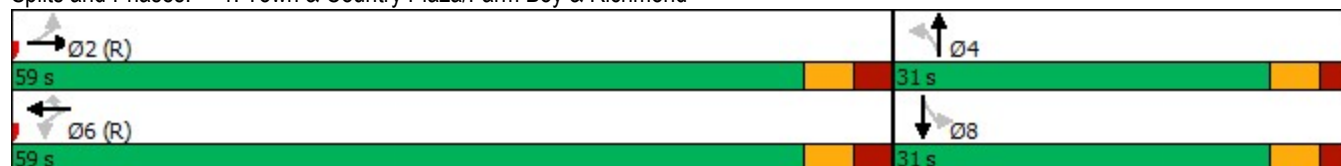
Intersection LOS: B

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

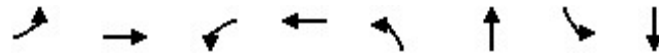
Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

FB2026
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations	↰	↱↱↱	↰	↱↱↱		↱		↱		
Traffic Volume (vph)	40	902	32	1445	14	9	40	14		
Future Volume (vph)	40	902	32	1445	14	9	40	14		
Lane Group Flow (vph)	40	912	32	1519	0	43	0	95		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	16.0	71.0	16.0	71.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	12.3%	54.6%	12.3%	54.6%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	10.1	65.1	10.1	65.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		17		26	30	30	18	18	30	18
Act Effect Green (s)	8.3	82.8	7.9	79.9		21.4		22.8		
Actuated g/C Ratio	0.06	0.64	0.06	0.61		0.16		0.18		
v/c Ratio	0.38	0.30	0.32	0.52		0.17		0.37		
Control Delay	68.1	14.2	66.0	18.1		27.5		35.0		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	68.1	14.2	66.0	18.1		27.5		35.0		
LOS	E	B	E	B		C		C		
Approach Delay		16.5		19.1		27.5		35.0		
Approach LOS		B		B		C		C		
Queue Length 50th (m)	10.0	49.0	8.0	98.1		4.7		13.3		
Queue Length 95th (m)	21.8	61.7	18.3	117.1		14.8		30.1		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	129	3026	129	2899		334		340		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.31	0.30	0.25	0.52		0.13		0.28		

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FB2026
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 18.8

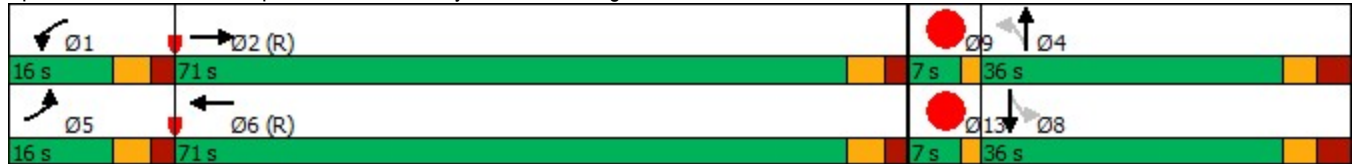
Intersection LOS: B

Intersection Capacity Utilization 63.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Appendix K

Synchro Intersection Worksheets – 2031 Future Background Conditions



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	581	33	385	13	31	11	27	7
Future Volume (vph)	9	581	33	385	13	31	11	27	7
Lane Group Flow (vph)	9	630	33	385	13	31	50	27	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	36.0	36.0	36.0	36.0	36.0	29.0	29.0	29.0	29.0
Total Split (%)	55.4%	55.4%	55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	30.1	30.1	30.1	30.1	30.1	23.3	23.3	23.3	23.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	7	7	4	4	4	9	9	12	12
Act Effect Green (s)	49.4	49.4	49.4	49.4	49.4	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.19	0.19	0.19	0.19
v/c Ratio	0.01	0.49	0.07	0.30	0.01	0.13	0.16	0.11	0.04
Control Delay	7.0	9.6	7.1	6.9	0.2	20.5	9.7	20.3	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	9.6	7.1	6.9	0.2	20.5	9.7	20.3	14.8
LOS	A	A	A	A	A	C	A	C	B
Approach Delay		9.6		6.7			13.8		18.6
Approach LOS		A		A			B		B
Queue Length 50th (m)	0.3	32.5	1.2	16.5	0.0	3.3	1.2	2.9	0.7
Queue Length 95th (m)	2.6	#114.6	6.6	51.2	0.4	7.3	6.8	6.7	3.4
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	649	1286	495	1277	1109	457	563	447	579
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	0.01	0.49	0.07	0.30	0.01	0.07	0.09	0.06	0.02

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 53 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 57.0%

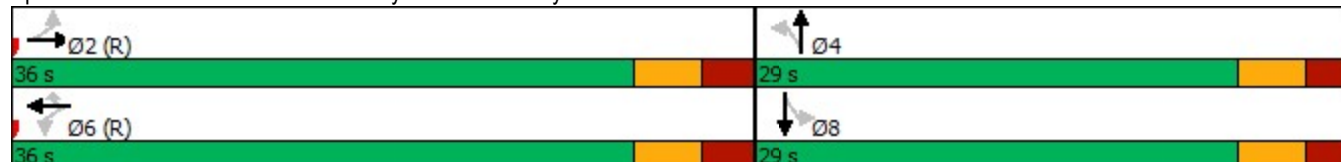
ICU Level of Service B

Analysis Period (min) 15

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

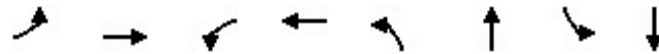
Queue shown is maximum after two cycles.

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond /Richmond



Lanes, Volumes, Timings
2: Alpine/Town & Country Plaza & Carling

FB2031
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations	←	↑↑↑	←	↑↑↑		↑		↑		
Traffic Volume (vph)	21	1135	10	634	18	4	33	12		
Future Volume (vph)	21	1135	10	634	18	4	33	12		
Lane Group Flow (vph)	21	1142	10	677	0	54	0	78		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	21.0	66.0	21.0	66.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	16.2%	50.8%	16.2%	50.8%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	15.1	60.1	15.1	60.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		4		12	11	11	2	2	11	2
Act Effect Green (s)	7.4	98.7	6.4	92.9		17.7		19.1		
Actuated g/C Ratio	0.06	0.76	0.05	0.71		0.14		0.15		
v/c Ratio	0.24	0.32	0.12	0.20		0.25		0.34		
Control Delay	64.6	8.9	61.9	10.4		25.2		35.1		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	64.6	8.9	61.9	10.4		25.2		35.1		
LOS	E	A	E	B		C		D		
Approach Delay		9.9		11.2		25.2		35.1		
Approach LOS		A		B		C		D		
Queue Length 50th (m)	5.3	19.6	2.5	18.0		5.4		13.0		
Queue Length 95th (m)	13.8	77.2	8.3	43.6		15.7		24.8		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	178	3613	192	3331		331		349		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.12	0.32	0.05	0.20		0.16		0.22		

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 40 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FB2031
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.34

Intersection Signal Delay: 11.8

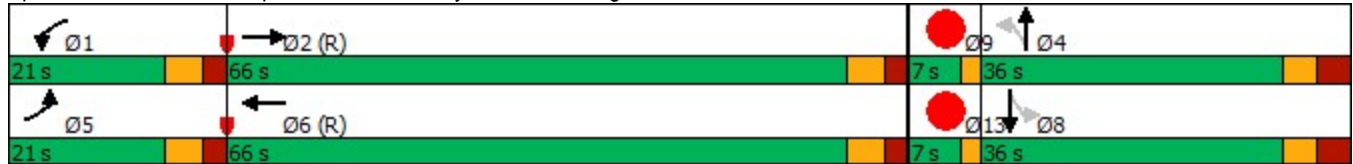
Intersection LOS: B

Intersection Capacity Utilization 47.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FB2031
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	23	501	34	612	56	67	30	53	29
Future Volume (vph)	23	501	34	612	56	67	30	53	29
Lane Group Flow (vph)	23	561	34	612	56	67	81	53	60
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%
Maximum Green (s)	53.1	53.1	53.1	53.1	53.1	25.3	25.3	25.3	25.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	12	12	9	9	9	20	20	19	19
Act Effect Green (s)	67.5	67.5	67.5	67.5	67.5	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.17	0.17	0.17	0.17
v/c Ratio	0.05	0.44	0.06	0.47	0.05	0.33	0.27	0.26	0.21
Control Delay	6.3	7.9	6.4	8.5	2.2	34.9	15.5	33.2	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.9	6.4	8.5	2.2	34.9	15.5	33.2	18.1
LOS	A	A	A	A	A	C	B	C	B
Approach Delay		7.9		7.9			24.3		25.2
Approach LOS		A		A			C		C
Queue Length 50th (m)	0.8	27.2	1.2	31.7	0.0	11.1	4.8	8.6	4.6
Queue Length 95th (m)	4.4	74.8	5.9	85.6	4.1	19.9	14.8	16.6	13.2
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	503	1284	534	1308	1081	340	464	333	461
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	0.05	0.44	0.06	0.47	0.05	0.20	0.17	0.16	0.13

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FB2031
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.7

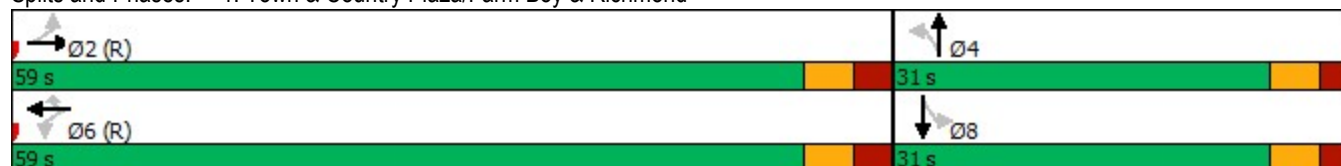
Intersection LOS: B

Intersection Capacity Utilization 58.4%

ICU Level of Service B

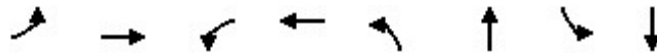
Analysis Period (min) 15

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond



Lanes, Volumes, Timings
2: Alpine/Town & Country Plaza & Carling

FB2031
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	40	914	32	1445	14	9	40	14		
Future Volume (vph)	40	914	32	1445	14	9	40	14		
Lane Group Flow (vph)	40	924	32	1519	0	43	0	95		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	16.0	71.0	16.0	71.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	12.3%	54.6%	12.3%	54.6%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	10.1	65.1	10.1	65.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		17		26	30	30	18	18	30	18
Act Effect Green (s)	8.3	82.8	7.9	79.9		21.4		22.8		
Actuated g/C Ratio	0.06	0.64	0.06	0.61		0.16		0.18		
v/c Ratio	0.38	0.31	0.32	0.52		0.17		0.37		
Control Delay	68.1	14.2	66.0	18.1		27.5		35.0		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	68.1	14.2	66.0	18.1		27.5		35.0		
LOS	E	B	E	B		C		C		
Approach Delay		16.5		19.1		27.5		35.0		
Approach LOS		B		B		C		C		
Queue Length 50th (m)	10.0	49.9	8.0	98.1		4.7		13.3		
Queue Length 95th (m)	21.8	62.6	18.3	117.1		14.8		30.1		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	129	3026	129	2899		334		340		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.31	0.31	0.25	0.52		0.13		0.28		

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FB2031
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 18.8

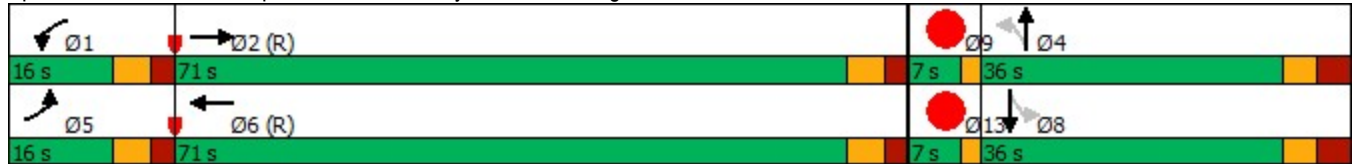
Intersection LOS: B

Intersection Capacity Utilization 63.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Appendix L

Synchro Intersection Worksheets – 2026 Future Total Conditions



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	513	41	333	13	43	11	27	7
Future Volume (vph)	9	513	41	333	13	43	11	27	7
Lane Group Flow (vph)	9	576	41	333	13	43	62	27	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	36.0	36.0	36.0	36.0	36.0	29.0	29.0	29.0	29.0
Total Split (%)	55.4%	55.4%	55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	30.1	30.1	30.1	30.1	30.1	23.3	23.3	23.3	23.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	7	7	4	4	4	9	9	12	12
Act Effect Green (s)	45.1	45.1	45.1	45.1	45.1	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.19	0.19	0.19	0.19
v/c Ratio	0.01	0.49	0.09	0.29	0.01	0.17	0.19	0.11	0.04
Control Delay	7.0	9.6	7.4	7.3	0.2	21.5	9.0	20.3	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	9.6	7.4	7.3	0.2	21.5	9.0	20.3	14.8
LOS	A	A	A	A	A	C	A	C	B
Approach Delay		9.6		7.1			14.1		18.6
Approach LOS		A		A			B		B
Queue Length 50th (m)	0.3	27.9	1.4	13.8	0.0	4.6	1.2	2.9	0.7
Queue Length 95th (m)	2.6	86.7	7.7	43.0	0.4	9.3	7.4	6.7	3.4
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	621	1171	478	1165	1016	457	566	443	579
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	0.01	0.49	0.09	0.29	0.01	0.09	0.11	0.06	0.02

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 53 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond /Richmond

FT2026
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 57.5%

ICU Level of Service B

Analysis Period (min) 15

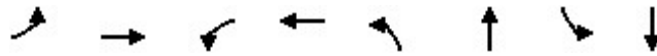
Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond /Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

FT2026
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	40	1120	10	617	18	4	57	12		
Future Volume (vph)	40	1120	10	617	18	4	57	12		
Lane Group Flow (vph)	40	1127	10	679	0	54	0	115		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	21.0	66.0	21.0	66.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	16.2%	50.8%	16.2%	50.8%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	15.1	60.1	15.1	60.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		4		12	11	11	2	2	11	2
Act Effect Green (s)	8.8	93.1	6.4	83.4		18.7		20.1		
Actuated g/C Ratio	0.07	0.72	0.05	0.64		0.14		0.15		
v/c Ratio	0.38	0.33	0.12	0.23		0.24		0.50		
Control Delay	67.6	9.5	61.9	12.4		24.5		44.5		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	67.6	9.5	61.9	12.4		24.5		44.5		
LOS	E	A	E	B		C		D		
Approach Delay		11.5		13.1		24.5		44.5		
Approach LOS		B		B		C		D		
Queue Length 50th (m)	10.0	23.9	2.5	21.2		5.2		22.7		
Queue Length 95th (m)	21.5	75.8	8.3	45.4		15.7		37.5		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	178	3408	192	2980		336		340		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.22	0.33	0.05	0.23		0.16		0.34		

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 40 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FT2026
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 14.3

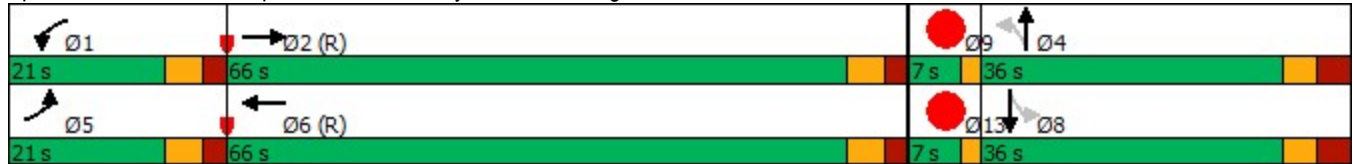
Intersection LOS: B

Intersection Capacity Utilization 56.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FT2026
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	23	435	39	544	56	71	30	53	29
Future Volume (vph)	23	435	39	544	56	71	30	53	29
Lane Group Flow (vph)	23	499	39	544	56	71	84	53	60
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%
Maximum Green (s)	53.1	53.1	53.1	53.1	53.1	25.3	25.3	25.3	25.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	12	12	9	9	9	20	20	19	19
Act Effect Green (s)	67.4	67.4	67.4	67.4	67.4	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.17	0.17	0.17	0.17
v/c Ratio	0.04	0.39	0.07	0.42	0.05	0.34	0.28	0.26	0.21
Control Delay	6.3	7.4	6.3	7.8	2.2	35.3	15.2	33.2	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	7.4	6.3	7.8	2.2	35.3	15.2	33.2	18.1
LOS	A	A	A	A	A	D	B	C	B
Approach Delay		7.3		7.2			24.4		25.2
Approach LOS		A		A			C		C
Queue Length 50th (m)	0.8	23.2	1.4	27.1	0.0	11.7	4.7	8.6	4.6
Queue Length 95th (m)	4.4	63.1	6.5	72.1	4.1	20.9	14.8	16.6	13.2
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	553	1278	582	1307	1080	340	465	332	461
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	0.04	0.39	0.07	0.42	0.05	0.21	0.18	0.16	0.13

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FT2026
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

FT2026
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	47	896	32	1435	14	9	46	14		
Future Volume (vph)	47	896	32	1435	14	9	46	14		
Lane Group Flow (vph)	47	906	32	1521	0	43	0	111		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	16.0	71.0	16.0	71.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	12.3%	54.6%	12.3%	54.6%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	10.1	65.1	10.1	65.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		17		26	30	30	18	18	30	18
Act Effect Green (s)	8.6	82.7	7.9	79.5		21.5		22.9		
Actuated g/C Ratio	0.07	0.64	0.06	0.61		0.17		0.18		
v/c Ratio	0.43	0.30	0.32	0.53		0.17		0.42		
Control Delay	69.9	14.2	66.0	18.4		27.5		37.1		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	69.9	14.2	66.0	18.4		27.5		37.1		
LOS	E	B	E	B		C		D		
Approach Delay		16.9		19.4		27.5		37.1		
Approach LOS		B		B		C		D		
Queue Length 50th (m)	11.8	48.7	8.0	99.4		4.7		16.0		
Queue Length 95th (m)	24.2	61.2	18.3	117.5		14.8		34.7		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	130	3023	129	2880		333		345		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.36	0.30	0.25	0.53		0.13		0.32		

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FT2026
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 19.4

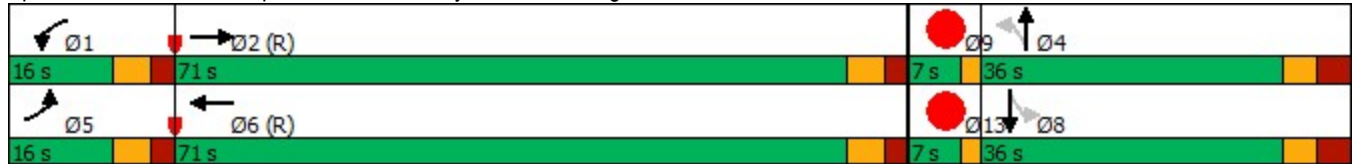
Intersection LOS: B

Intersection Capacity Utilization 69.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Appendix M

Synchro Intersection Worksheets – 2031 Future Total Conditions



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	574	41	381	13	43	11	27	7
Future Volume (vph)	9	574	41	381	13	43	11	27	7
Lane Group Flow (vph)	9	637	41	381	13	43	62	27	12
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	36.0	36.0	36.0	36.0	36.0	29.0	29.0	29.0	29.0
Total Split (%)	55.4%	55.4%	55.4%	55.4%	55.4%	44.6%	44.6%	44.6%	44.6%
Maximum Green (s)	30.1	30.1	30.1	30.1	30.1	23.3	23.3	23.3	23.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	7	7	4	4	4	9	9	12	12
Act Effect Green (s)	45.1	45.1	45.1	45.1	45.1	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.19	0.19	0.19	0.19
v/c Ratio	0.02	0.54	0.10	0.33	0.01	0.17	0.19	0.11	0.04
Control Delay	7.0	11.1	7.6	7.7	0.2	21.5	9.0	20.3	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	11.1	7.6	7.7	0.2	21.5	9.0	20.3	14.8
LOS	A	B	A	A	A	C	A	C	B
Approach Delay		11.0		7.5			14.1		18.6
Approach LOS		B		A			B		B
Queue Length 50th (m)	0.3	33.1	1.4	16.3	0.0	4.6	1.2	2.9	0.7
Queue Length 95th (m)	2.6	#116.8	7.8	50.6	0.4	9.3	7.4	6.7	3.4
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	593	1172	431	1165	1016	457	566	443	579
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	0.02	0.54	0.10	0.33	0.01	0.09	0.11	0.06	0.02

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 53 (82%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.3

Intersection LOS: B

Intersection Capacity Utilization 57.6%

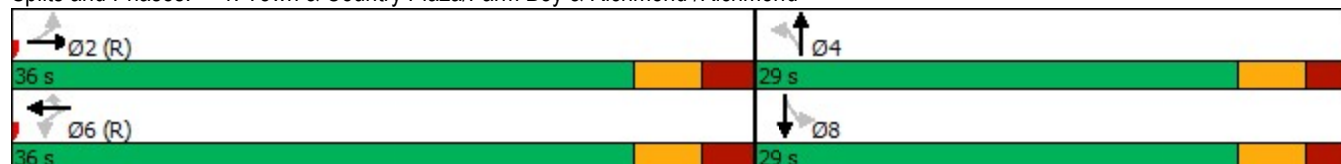
ICU Level of Service B

Analysis Period (min) 15

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

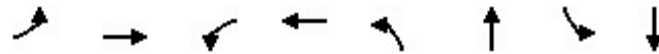
Queue shown is maximum after two cycles.

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond /Richmond



Lanes, Volumes, Timings
2: Alpine/Town & Country Plaza & Carling

FT2031
AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	40	1120	10	625	18	4	57	12		
Future Volume (vph)	40	1120	10	625	18	4	57	12		
Lane Group Flow (vph)	40	1127	10	687	0	54	0	115		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	21.0	66.0	21.0	66.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	16.2%	50.8%	16.2%	50.8%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	15.1	60.1	15.1	60.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		4		12	11	11	2	2	11	2
Act Effect Green (s)	8.8	93.1	6.4	83.4		18.7		20.1		
Actuated g/C Ratio	0.07	0.72	0.05	0.64		0.14		0.15		
v/c Ratio	0.38	0.33	0.12	0.23		0.24		0.50		
Control Delay	67.6	9.5	61.9	12.4		24.5		44.5		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	67.6	9.5	61.9	12.4		24.5		44.5		
LOS	E	A	E	B		C		D		
Approach Delay		11.5		13.1		24.5		44.5		
Approach LOS		B		B		C		D		
Queue Length 50th (m)	10.0	23.9	2.5	21.5		5.2		22.7		
Queue Length 95th (m)	21.5	75.8	8.3	46.0		15.7		37.5		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	178	3408	192	2980		336		340		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.22	0.33	0.05	0.23		0.16		0.34		

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 40 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FT2031
AM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 14.3

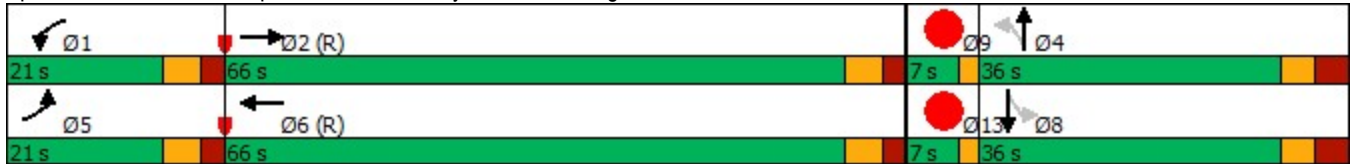
Intersection LOS: B

Intersection Capacity Utilization 56.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling



Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FT2031
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	23	498	39	608	56	71	30	53	29
Future Volume (vph)	23	498	39	608	56	71	30	53	29
Lane Group Flow (vph)	23	562	39	608	56	71	84	53	60
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		2		6			4		8
Permitted Phases	2		6		6	4		8	
Detector Phase	2	2	6	6	6	4	4	8	8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	27.9	27.9	27.9	27.9	27.9	28.7	28.7	28.7	28.7
Total Split (s)	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%
Maximum Green (s)	53.1	53.1	53.1	53.1	53.1	25.3	25.3	25.3	25.3
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.4	2.4	2.4	2.4
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)	5.9	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag									
Lead-Lag Optimize?									
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0	12.0	12.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	12	12	9	9	9	20	20	19	19
Act Effect Green (s)	67.4	67.4	67.4	67.4	67.4	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.17	0.17	0.17	0.17
v/c Ratio	0.05	0.44	0.07	0.47	0.05	0.34	0.28	0.26	0.21
Control Delay	6.3	8.0	6.4	8.5	2.2	35.3	15.2	33.2	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	8.0	6.4	8.5	2.2	35.3	15.2	33.2	18.1
LOS	A	A	A	A	A	D	B	C	B
Approach Delay		7.9		7.8			24.4		25.2
Approach LOS		A		A			C		C
Queue Length 50th (m)	0.8	27.8	1.4	31.9	0.0	11.7	4.7	8.6	4.6
Queue Length 95th (m)	4.4	75.1	6.5	85.1	4.1	20.9	14.8	16.6	13.2
Internal Link Dist (m)		111.9		124.3			20.3		4.6
Turn Bay Length (m)	35.0		60.0		40.0	12.0		8.0	
Base Capacity (vph)	505	1281	533	1307	1080	340	465	332	461
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	0.05	0.44	0.07	0.47	0.05	0.21	0.18	0.16	0.13

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Lanes, Volumes, Timings
1: Town & Country Plaza/Farm Boy & Richmond

FT2031
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Town & Country Plaza/Farm Boy & Richmond



Lanes, Volumes, Timings

2: Alpine/Town & Country Plaza & Carling

FT2031
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	Ø9	Ø13
Lane Configurations										
Traffic Volume (vph)	47	908	32	1435	14	9	46	14		
Future Volume (vph)	47	908	32	1435	14	9	46	14		
Lane Group Flow (vph)	47	918	32	1521	0	43	0	111		
Turn Type	Prot	NA	Prot	NA	Perm	NA	Perm	NA		
Protected Phases	5	2	1	6		4		8	9	13
Permitted Phases					4		8			
Detector Phase	5	2	1	6	4	4	8	8		
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	1.0	1.0
Minimum Split (s)	10.9	33.9	10.9	33.9	35.7	35.7	35.7	35.7	7.0	7.0
Total Split (s)	16.0	71.0	16.0	71.0	36.0	36.0	36.0	36.0	7.0	7.0
Total Split (%)	12.3%	54.6%	12.3%	54.6%	27.7%	27.7%	27.7%	27.7%	5%	5%
Maximum Green (s)	10.1	65.1	10.1	65.1	29.3	29.3	29.3	29.3	5.0	5.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3	2.0	2.0
All-Red Time (s)	2.2	2.2	2.2	2.2	3.4	3.4	3.4	3.4	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0		
Total Lost Time (s)	5.9	5.9	5.9	5.9		6.7		6.7		
Lead/Lag	Lead	Lag	Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0		16.0	0.0	0.0	0.0	0.0	5.0	5.0
Flash Dont Walk (s)		12.0		12.0	29.0	29.0	29.0	29.0	0.0	0.0
Pedestrian Calls (#/hr)		17		26	30	30	18	18	30	18
Act Effect Green (s)	8.6	82.7	7.9	79.5		21.5		22.9		
Actuated g/C Ratio	0.07	0.64	0.06	0.61		0.17		0.18		
v/c Ratio	0.43	0.30	0.32	0.53		0.17		0.42		
Control Delay	69.9	14.2	66.0	18.4		27.5		37.1		
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0		
Total Delay	69.9	14.2	66.0	18.4		27.5		37.1		
LOS	E	B	E	B		C		D		
Approach Delay		16.9		19.4		27.5		37.1		
Approach LOS		B		B		C		D		
Queue Length 50th (m)	11.8	49.5	8.0	99.4		4.7		16.0		
Queue Length 95th (m)	24.2	62.1	18.3	117.5		14.8		34.7		
Internal Link Dist (m)		157.2		162.1		98.4		17.5		
Turn Bay Length (m)	40.0		30.0							
Base Capacity (vph)	130	3023	129	2880		333		345		
Starvation Cap Reductn	0	0	0	0		0		0		
Spillback Cap Reductn	0	0	0	0		0		0		
Storage Cap Reductn	0	0	0	0		0		0		
Reduced v/c Ratio	0.36	0.30	0.25	0.53		0.13		0.32		

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 9 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Lanes, Volumes, Timings 2: Alpine/Town & Country Plaza & Carling

FT2031
PM Peak Hour

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 19.3

Intersection LOS: B

Intersection Capacity Utilization 69.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Alpine/Town & Country Plaza & Carling

