



1660 Merivale Rd

TIA Strategy Report

Final

December 2025



TIA Plan Reports

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

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

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

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered² professional in good standing, whose field of expertise [check ☒ appropriate field(s)] is either transportation engineering ☒ or transportation planning ☐.

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

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1660 Merivale Rd

TIA Strategy Report

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December 19, 2025

478765-01000

DOCUMENT CONTROL PAGE

CLIENT:	Harnois Énergies Inc.
PROJECT NAME:	1660 Merivale Rd
REPORT TITLE:	TIA Step 3 – Strategy Report
PARSONS PROJECT NO:	478765 - 01000
VERSION:	Site Plan Application (SPA)
DIGITAL MASTER:	https://parsons365can.sharepoint.com/sites/OttawaHub/Projects/Projects/478765 - 1660 Merivale Traffic (Harnois)/4. 01000 - TIA/Documents/Step 3.2 - Restaurant Added Again/1660 Merivale SPA - TIA Strategy Report w Restaurant Final.docx
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HISTORY:	• TIA Step 1 Screening Form – September 28, 2023 • TIA Step 2 Scoping & Forecasting Report – September 28, 2023 • TIA Step 3 Strategy Report – February 5, 2024 • TIA Step 3 Strategy Report (New Site Plan) – February 13, 2025 • TIA Step 3 Strategy Report (Restaurant added) – August 28, 2025 • TIA Step 3 Strategy Report (Edits to SP and Circulation) – December 19, 2025

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REVISED TIA REFLECTING NEW SITE PLAN

Parsons had previously submitted a Step 3 TIA for this development on February 5th, 2024, then February 13th, 2025 and lastly August 28th, 2025. Since then, the developer has proposed changes which have been reflected within this revised TIA. This TIA reflects the latest Site Plan dated December 11th, 2025. Some of the key changes include:

- The coffee shop/restaurant land-use has increased in size compared to the 2024 and August 2025 submissions, from 167 m² (1,800 ft²) to 214 m² (2,300 ft²).
- The convenience store has decreased from 465 m² (5,005 ft²) to 288 m² (3,105 ft²) and most recently to 251 m² (2,700 ft²), excluding the mechanical room and washroom.
- The drive-thru facility has been re-added similar to August 2025 submission.
- The garbage bins have been relocated to the back side of the drive-thru similar to August 2025 submission.
- The gas tanks will be kept at a similar location to today, resulting in new truck turning templates and routing compared to the August 2025 submission.
- The quantity of vehicle pumps remains the same, at six.
- The quantity of vehicle parking spaces has increased from 21 to 22 spaces.
- The quantity of bike parking spaces has been reduced from 14 to 2 spaces.
- The pedestrian crossing from Viewmount Dr has not changed and zebra crosswalks have been maintained from Merivale Rd to the convenience and restaurant building.

STRATEGY REPORT

Parsons has been retained by Harnois Énergies Inc. to prepare a TIA in support of a Site Plan Control Application for a proposed mixed-use commercial building consisting of a gas station/convenience store and restaurant with drive-through facilities. This document follows the TIA process as outlined in the City of Ottawa Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 3 – Strategy Report. The Screening Form has been provided in **Appendix A**.

1.0 SCREENING FORM

The Screening Form confirmed the need for a TIA Report based on the Trip Generation Trigger and the Location Trigger, and the Safety Trigger. The Trip Generation Trigger was met as the development is anticipated to generate more than 60 person trips during peak hours; the Location Trigger was met as the development is located within a Design Priority Area; and the Safety Trigger was met due to an access proposed within 150m of a signalized intersection and the addition of a drive-thru facility.

2.0 SCOPING REPORT

2.1. Existing and Planned Conditions

2.1.1. Proposed Development

The proposed development is located at the municipal address of 1660 Merivale Rd, bounded by Merivale Rd to the east and Viewmount Dr to the north. The site is currently zoned as Arterial Mainstreet (AM10). The site context is illustrated in **Figure 1**.

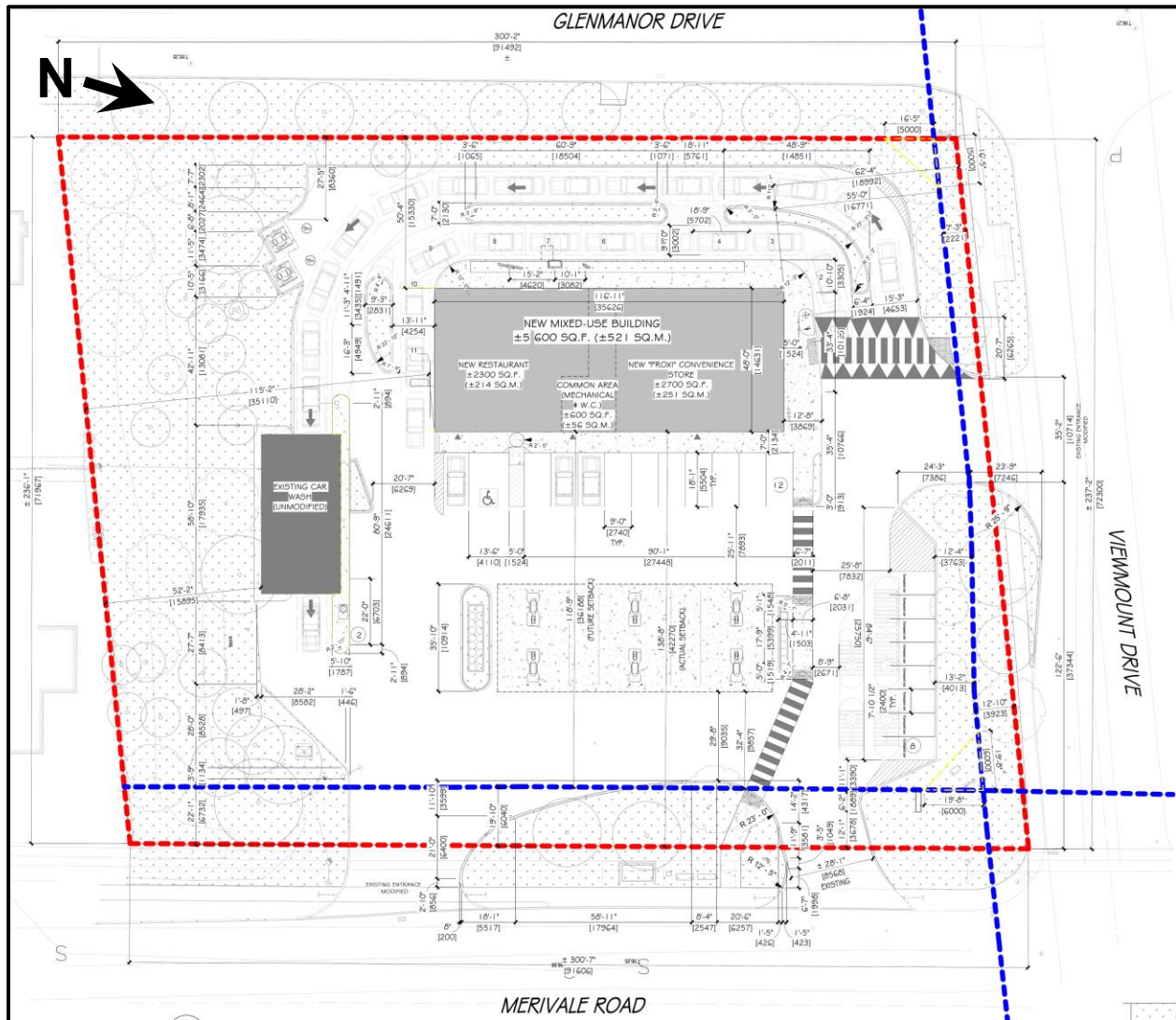
The proposed development includes the demolition of the existing convenience store and gas bars for a new gas bar, 251 m² convenience store and new fast food restaurant with drive-thru. The proposed development will retain the existing car wash located on the south side of the property, relocate the convenience store to the west

side of the lot, and reposition the gas bars, all of which will reduce the number of available parking spaces from 27 to 22. The current development has three site accesses: two on Merivale Rd and one on Viewmount Dr. The proposed future plan includes two two-way accesses on Merivale Rd, located approximately 20 m and 65 m south of Viewmount Dr and a two-way access on Viewmount Dr located approximately 50 m west of Merivale Rd.

Figure 1: Local Context



Figure 2: Proposed Site Plan



2.1.2. Existing Conditions

Area Road Network

The following roads were included in the TIA, with descriptions for each road provided below:

Merivale Rd is a north-south arterial road that extends from Island Park Dr in the north to Prince of Wales Dr in the south. Within the study area, the roadway consists of a two-way four-lane urban cross-section with a posted speed limit of 60 km/h and a protected right-of-way (ROW) of 44.5 m. The roadway is divided north of Viewmount Dr while undivided to the south.

Viewmount Dr is an east-west collector roadway that extends from Meadowlands Dr in the west to Fisher Ave in the east. Within the study area, the roadway typically operates as a two-way two-lane urban cross-section with a posted speed limit of 40 km/h and a protected right-of-way of 24 m. The roadway is divided by a painted island east of Merivale Rd and undivided to the west.

Existing Study Area Intersections

Merivale Rd/Viewmount Dr

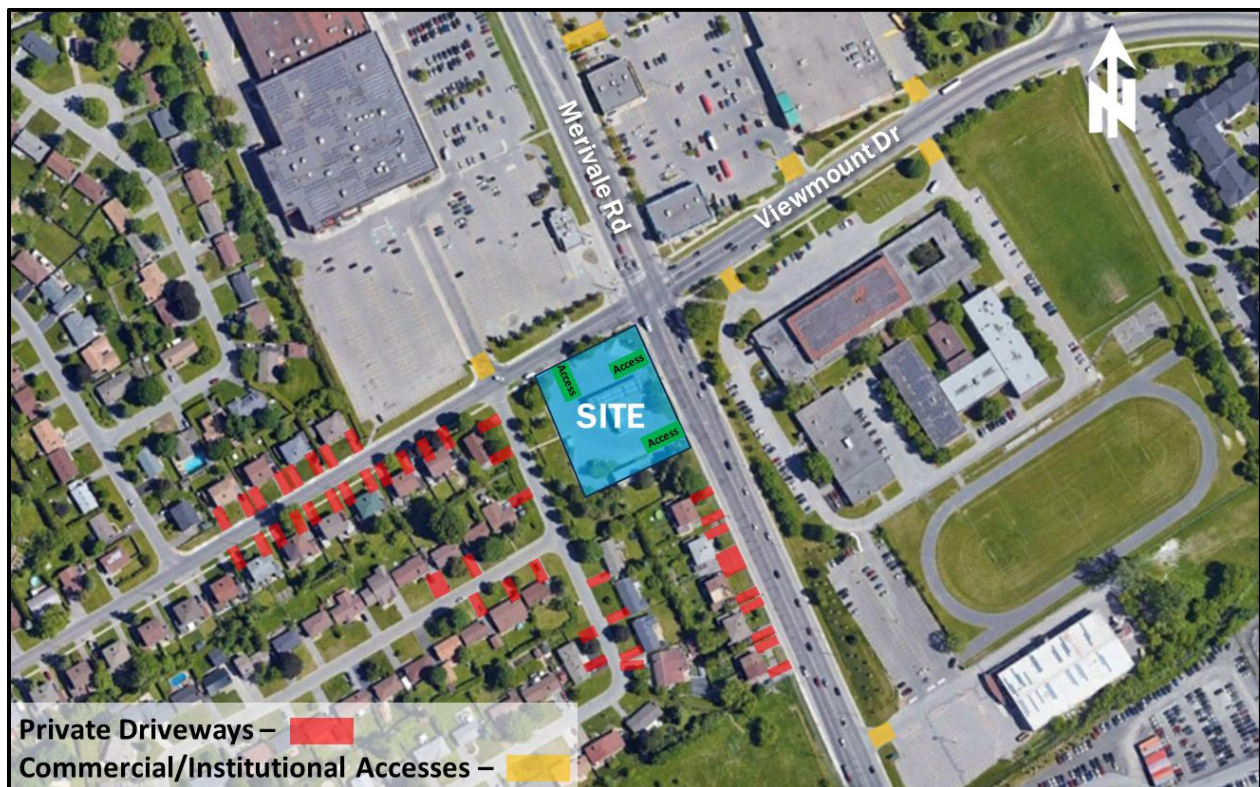
The Merivale/Viewmount intersection is a four-legged signalized intersection. The northbound and southbound approaches consist of one left-turn lane, one through lane, and one through/right-turn lane. The westbound and eastbound approaches consist of one left-turn lane and one through/right-turn lane. Pedestrian crossing facilities are provided on all approaches. All movements are allowed at this intersection; however, trucks are not permitted on Viewmount Dr.



Existing Driveways to Adjacent Developments

There are approximately 50 adjacent driveways within 200 m of the proposed development accesses along Merivale Rd, Viewmount Dr, Glenmanor Dr and Kingsbury Ave. 43 of which are private driveways that lead to detached homes and 7 driveways/accesses that lead to either a shopping mall, high school, or an ice hockey arena.

Figure 3: Adjacent Driveways within 200m of Site Access



Existing Area Traffic Management Measures

Existing area traffic management measures within the study area include school zone signs at various points down Viewmount Dr, 40 km/h reduced speed areas and heavy trucks restriction signs along Viewmount Dr.

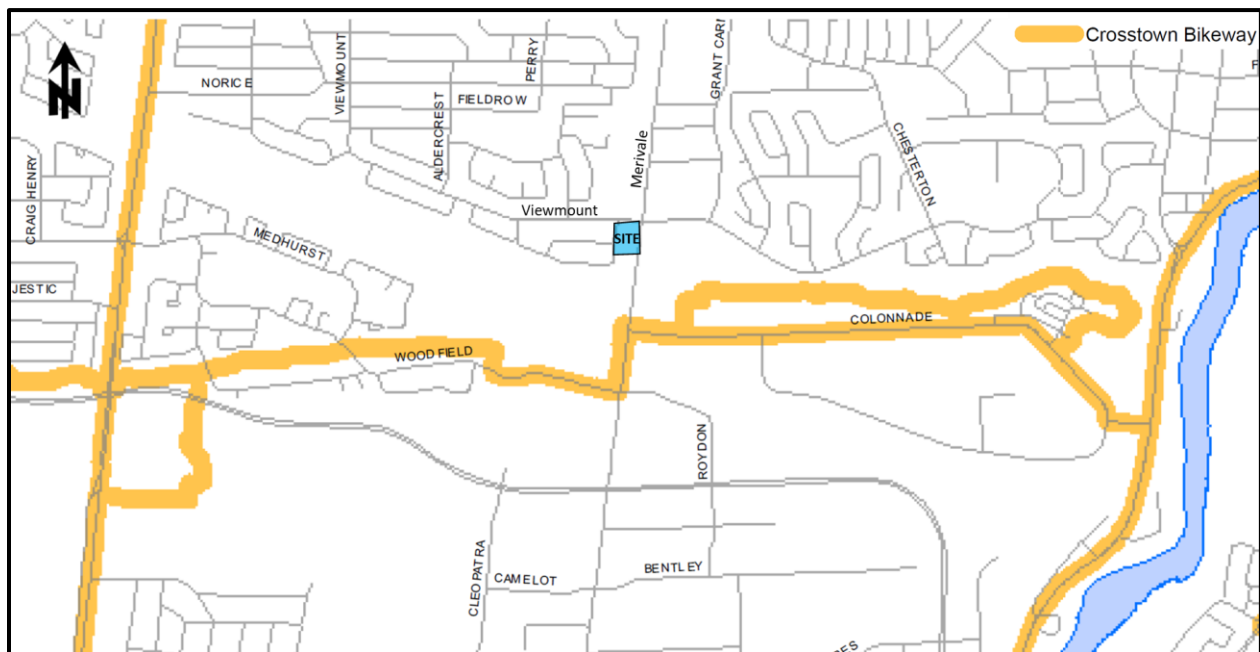
Existing Pedestrian/Cycling Network

The following pedestrian/cycling facilities currently exist within the study area include:

- 2.0 m sidewalk on both sides of Merivale Rd. An asphalt boulevard is present on the east side of Merivale Rd from Viewmount Dr to Basil MacDonald Way. An asphalt boulevard is present on both sides of Merivale Rd approximately 65 m south of Viewmount Dr.
- 1.5 m sidewalks on the south side of Viewmount and 2 m sidewalk along the north side – sidewalks east of Merivale Rd are separated by a boulevard on both sides and south sidewalk separated by boulevard west of Merivale.
- Curbside bike lanes are present on both sides of Viewmount Dr, approximately 100 m east of Merivale Dr.
- Neither Merivale Rd nor Viewmount Dr are part of the Transportation Master Plan (TMP) Crosstown Bikeway Network. Colonnade Dr and Woodfield Dr located approximately 400 and 600 m south of Viewmount Dr are part of the Crosstown Bikeway Network as shown in **Figure 4**.

The March 2023 Active Transportation Projects as part of the ongoing TMP does not identify any future projects within the study area.

Figure 4: TMP Crosstown Bikeway Network



Transit Network

The following description of OC Transpo routes within the study area reflect the current bus operations:

- **Route #80 (Barrhaven Centre <-> Tunney's Pasture):** identified by OC Transpo as a "Frequent Route", this route operates every 15 minutes all day, 7 days a week in all time periods. This route provides connectivity to the Confederation LRT Line at Tunney's Pasture and Barrhaven Centre. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.

- **Route #53 (Baseline <-> Viewmount):** identified by OC Transpo as a “Local Route”, this route operates 7 days a week with a custom routing to local destinations (with average headways of 15 minutes during weekdays) and provides connectivity to Baseline Station, Tunney’s Pasture LRT Station and the Civic Hospital. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.
- **Route #112 (Billings Bridge <-> Baseline):** identified by OC Transpo as a “local”, this route operates 7 days a week with a custom routing to local destinations. This route provides connectivity to Baseline Station, Mooney’s Bay LRT Station, and Billings Bridge. The nearest bus stop is located on the northern site boundary approximately 10 m west of the Viewmount Dr site access.
- **Route #189 (Baseline <-> Colonnade):** identified by OC Transpo as a “Local Route”, this route operates 7 days a week with a custom routing to local destinations (with average headways of 30 minutes during weekdays) and provides connectivity to Baseline Station and Colonnade commercial business park. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.
- **Route #610 (St. Piux <-> Baseline):** identified by OC Transpo as a “School Route”, this route operates during typical secondary school peak hours with a custom routing between Baseline Station to St. Piux School. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.
- **Route #680 (Merivale H.S <-> Riverside South):** identified by OC Transpo as a “School Route”, this route operates with a custom routing and provides connectivity to Riverside South. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.
- **Route #687 (Merivale H.S <-> Merivale Gardens):** identified by OC Transpo as a “School Route”, this route operates with a custom routing and provides connectivity to the adjacent neighbourhoods. The nearest bus stop is located on the eastern site boundary between the two Merivale site accesses.
- **Route #688 (Merivale H.S <-> Terry Fox):** identified by OC Transpo as a “School Route”, this route operates with a custom routing and provides connectivity to Terry Fox, Teron, and Baseline Stations. The nearest bus stop is located approximately 15 m north of the site on the north side Viewmount Dr.

The transit network for the study area is illustrated in **Figure 5** and the transit route maps are provided in **Appendix B**. **Figure 6** illustrates the bus stop locations.

Figure 5: Area Transit Network

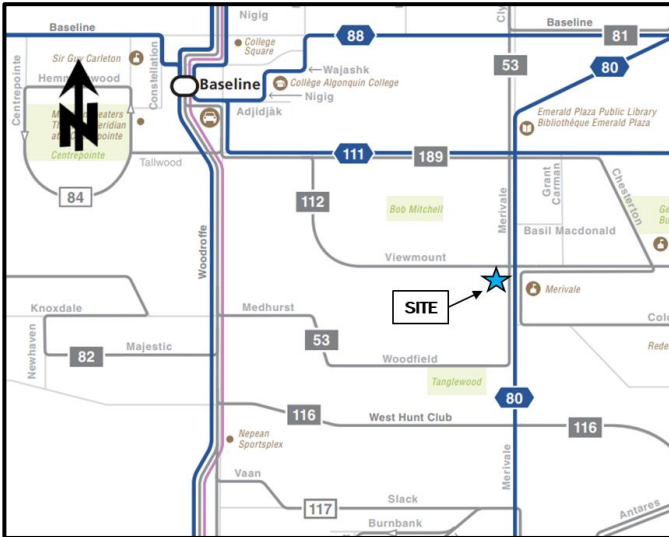
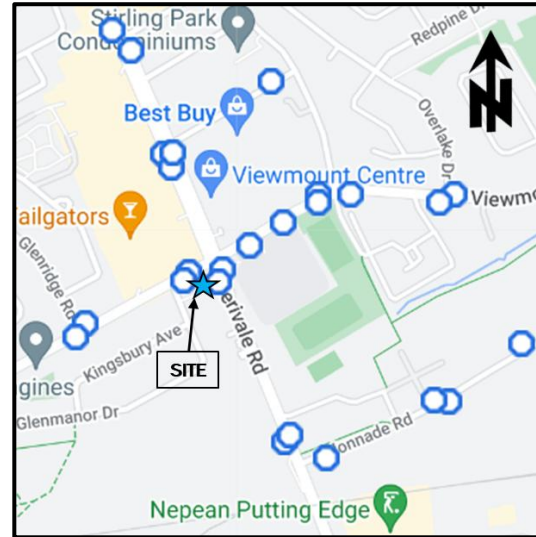


Figure 6: Bus Stop Locations



Peak Hour Travel Demands

The existing peak hour vehicle and pedestrian volumes within the study area were obtained for the following intersections:

- Merivale Rd/Viewmount Dr – Conducted by the City of Ottawa on Tuesday, October 1st, 2019

The traffic volumes at study area intersections are illustrated in **Figure 7**, with raw traffic count data provided in **Appendix C**. Existing active transportation volumes have been provided in **Figure 8**.

Figure 7: Existing Peak Hour Traffic Volumes

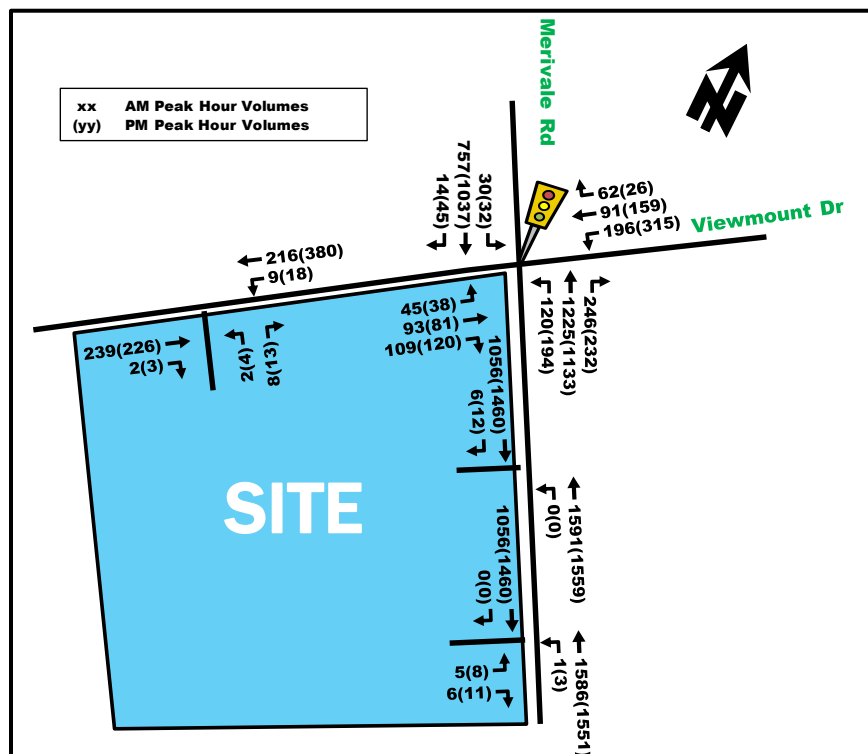
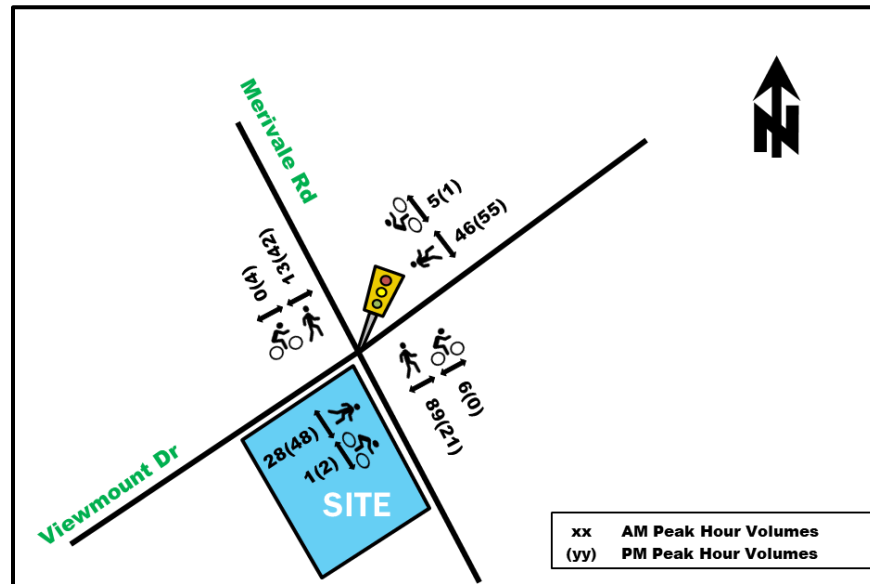


Figure 8: Existing Pedestrian and Cyclists Peak Hour Volumes



Existing Road Safety Conditions

A five-year collision history data (2017-2021, inclusive) was obtained from the City of Ottawa Open Data Source for all intersections and road segments within the study area. Upon review of the collision data, it was determined that a total of 132 collisions have occurred within the five-year period. Of the reported collisions, 51 (38%) were from rear-ends, 35 (27%) from turning movements, 20 (15%) from angled collisions, 15 (11%) from sideswipes, 9 (7%) from single vehicle (other), and 2 (2%) from other. Furthermore, 110 (84%) collisions resulted in property damage, 21 (16%) resulted in non-fatal injuries, and 1 (0.01%) resulted in a fatal injury.

Within the study area, the quantity of collisions and distance of mid-block at each location has occurred at a rate of:

- Viewmount Dr/Merivale Rd: 86
- Mid-block Viewmount Dr, Grant Carman Dr to Merivale Rd: 18 (270 m)
- Mid-block Merivale Rd, Colonnade Rd to Viewmount Dr: 23 (450 m)
- Mid-block Viewmount Dr, Glenmanor Dr to Merivale Rd: 5 (100 m)

Of the 86 collisions that occurred at the Viewmount Dr/Merivale Rd intersection, 38 (44%) were a result of rear-ends, 19 (22%) of turning movements, 13 (15%) sideswipes, and 10 (12%) of angle collisions. Of the highest reported accident type at the intersection (rear-ends), 12 collisions occurred approximately within the 2:30 - 3:30pm time range, consistent with the time range in which the adjacent Merivale Highschool day ceases. The higher rate of collision occurring at the same time as the school finish hours may suggest an increase of activity in the area with higher pedestrian crossings and vehicular turning movements towards the school and from the school which may increase driver attention demand and decision-making tasks. This higher task-load on drivers may result in confusion and/or loss of focus in what is ahead of them. For example, a driver may be distracted by nearby pedestrians and not react in time to a vehicle suddenly stopping to turn towards the school site, resulting in a rear-end type collision. Of the total collisions, 72 (84%) resulted in property damage only while the remainder resulted in non-fatal injuries, suggesting lower speed collisions.

Of the 23 collisions that occurred at the mid-block segment of Merivale Rd between Colonnade Rd and Viewmount Dr, 12 (52%) were from rear-ends and 6 (26%) were from turning movements. A predominant rate of rear-ends and turning movement collisions is expected on Merivale Rd due to the number of lanes, high vehicle volumes and multiple minor accesses and driveways within the road segments. Of these collision types, there were no other identifiable patterns.

One fatal collision occurred in 2018 that resulted in two fatalities at the mid-block segment of Merivale Rd between Colonnade Rd and Viewmount Dr. The collision was deemed a result of stunt driving (>50 km/h over the speed limit) and negligence during late night hours where traffic volumes are very low relative to peak hour volumes, therefore the collision does not suggest any recurring safety concerns that require changes in transportation infrastructure.

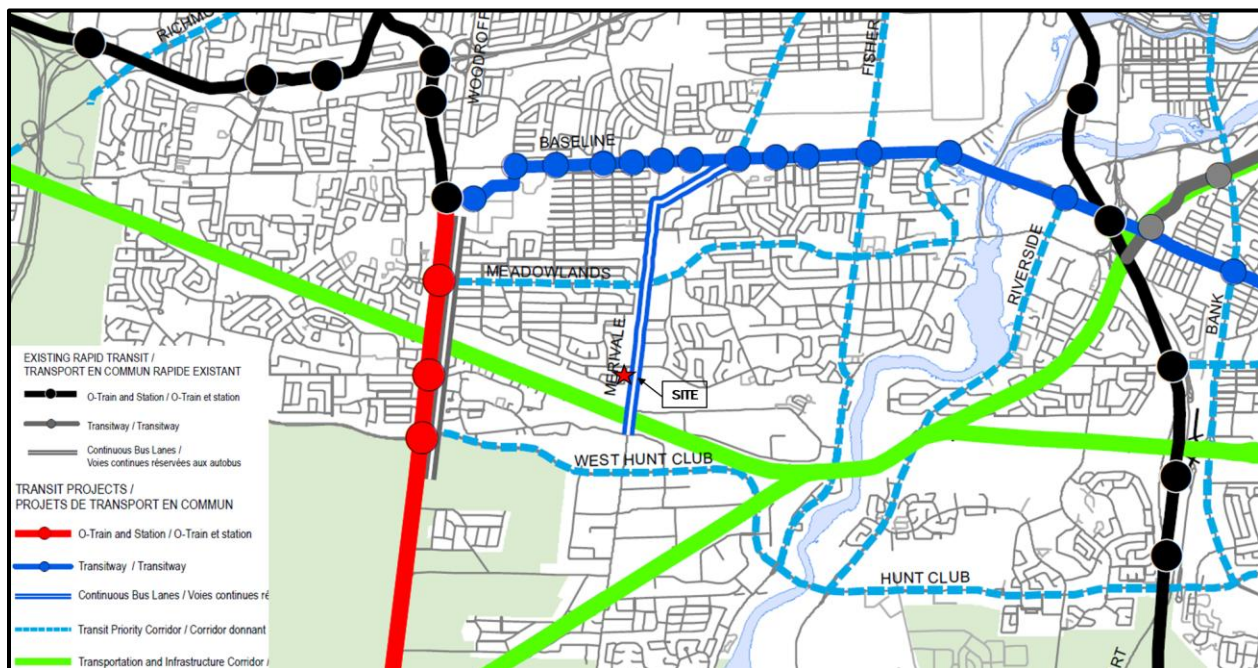
With regards to active transportation, there were no collisions that involved either a pedestrian or cyclist. Despite this, the city may investigate the need to designate Viewmount Dr along the Highschool frontage a community safety zone. The source collision data provided by the City of Ottawa and the detailed analysis results are provided in **Appendix D**.

2.1.3. Planned Conditions

Future Transportation Network Changes

On July 2025, the City of Ottawa released Phase 2 of the Transportation Master Plan (TMP) which identified Merivale Rd adjacent to the site with “continuous bus lanes” from the future Baseline Rd transitway to Colonnade Rd within both the Transit Network “Needs-Based” and “Priority”. However, the project ranks 6th of 7 on the continuous bus lane priority and is therefore unlikely that a transit priority corridor fronting the site on Merivale Rd will be established by 2031 horizon. **Figure 9** shows the “Transit Network Priority” near to the site.

Figure 9: TMP Transit Network Priority (July 2025)



The TMP update did not identify any road projects or pedestrian improvements near to the site, however it did identify three new cycling connections or improvements within the “Cycling Projects with Prioritization” which include the descriptions below and illustrated in **Figure 10**:

- Improvements to Colonnade Rd from the existing MUP (from Merivale Rd to the Dow Honda driveway) to Prince of Wales Dr (27 in figure below)
- Passage from Crestview to Tanglewood via the rail corridor (29 in figure below)
- Extension of the existing trails along the Nepean Creek Pathway to Merivale Rd (86 in figure below)

Figure 11 illustrates the ultimate cycling network based on the TMP update. The site is well situated between existing and future cycling networks and major pathway links.

Figure 10: TMP Cycling Projects with Prioritization (July 2025)

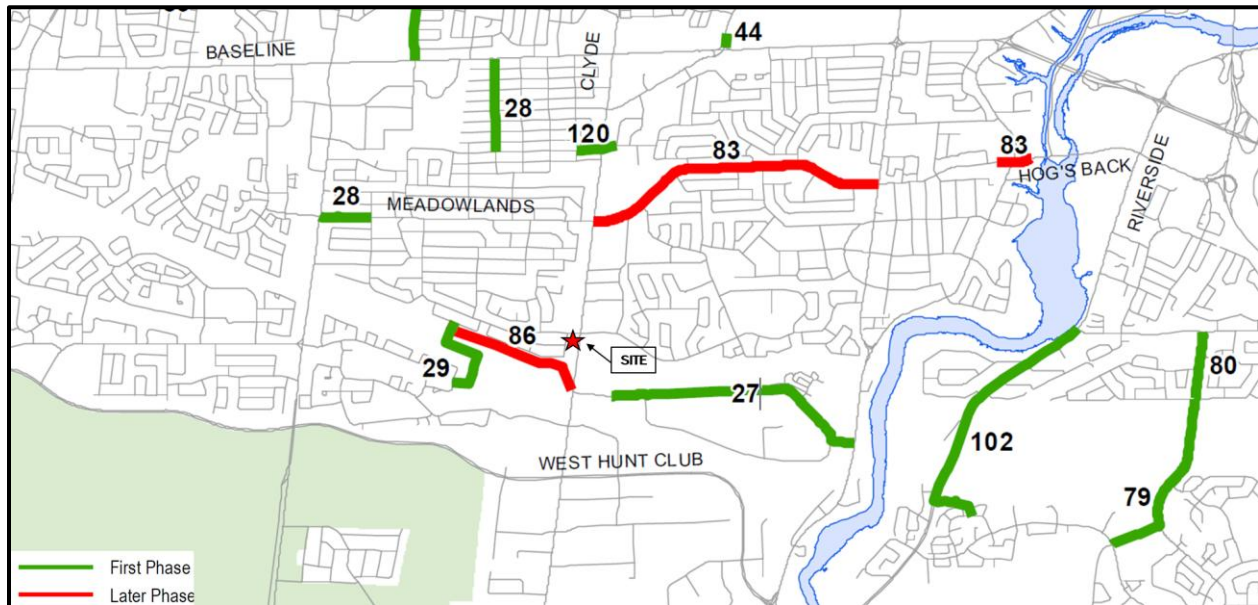
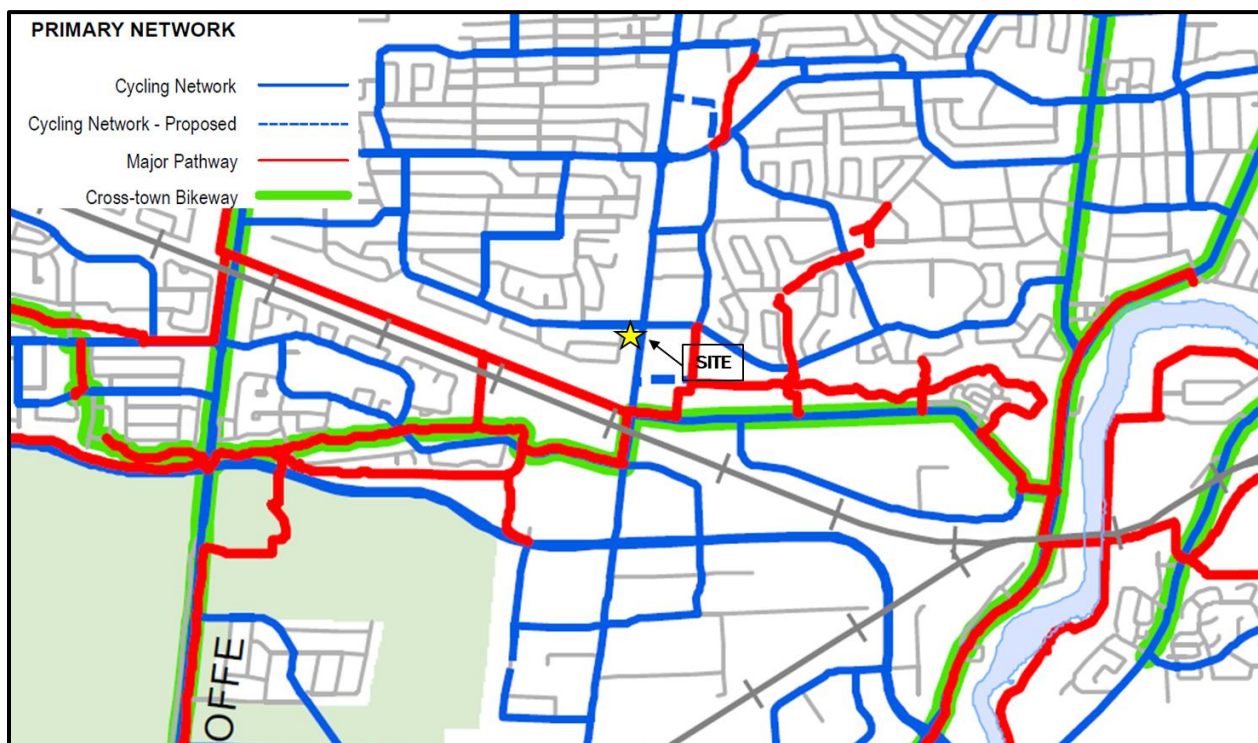


Figure 11: Ultimate Cycling Plan (2025 TMP Update)



Within the New Official Plan, Merivale Rd is identified as a transit priority corridor and Corridor - Mainstreet within a Design Priority Area. The designation identifies the band of land surrounding Merivale as an area whose planned function permits a mix of land-uses including offices with a higher level of transit services.

Other Area Developments

The future developments summarized below are planned near the subject site based on the latest information from the City of Ottawa development application tool. The location of the site and the adjacent future developments are illustrated below in **Figure 12**.

9 & 17 Colonnade Rd

BBS Construction Ltd. is proposing the construction of a 1,552 m² one-storey automobile body shop and surface parking lot with 185 parking spaces. The TIA (prepared by McIntosh Perry) projected the development to generate 22 veh/h and 36 veh/h during the morning and afternoon peak hours. The site generated traffic will be layered onto the future background volumes due to the site's close proximity to the proposed development.

7 Rossland Ave

Julian of Norwich Anglican Church is proposing the construction of two stacked townhouse buildings, an eight-storey residential building with ground floor institutional uses and an attached single storey worship place. The development would include a total of 84 new dwellings, 219 m² of institutional/office use and 200m² of worship space. The TIA (prepared by Parsons) projected the development to generate 10 veh/h during the morning and afternoon peak hours. The site generated traffic will not be layered onto the future background volumes due to a negligible increase in traffic to the road network and the site being located 1.4 km away from the proposed development.

1509 Merivale Rd

Katasa Group is proposing the construction of a nine-storey residential building consisting of 202 dwelling units with two levels of underground parking providing approximately 202 parking spaces. The TIA (prepared by CGH) projected the development to generate 81 veh/h during both the morning and afternoon peak hours. The site generated traffic will not be layered onto the future background volumes due to a negligible forecasted increase in traffic to the study area and to the site being located 1.6 km away from the proposed development.

1545A Merivale Rd

1545 Merivale Road Inc. is proposing the construction of 27,700 ft² (2575 m²) medical imaging clinic. The TIA (prepared by Parsons) projected the development to generate 66 veh/h and 58 veh/h during the morning and afternoon peak hours. The site generated traffic will not be layered onto the future background volumes due to a negligible forecasted increase in traffic to the study area and to the site being located 1.4 km away from the proposed development.

1881 Merivale

Z.V. Holdings Corp. is proposing the construction of two single-storey warehouse buildings of approximately 38,000 ft² (3530 m²) and 33,000 ft² (3065 m²). The TIA (prepared by Parsons) projected the development to generate 38 veh/h and 32 veh/h during the morning and afternoon peak hours. The site-generated traffic will be layered on to the future background volumes.

Figure 12: Other Area Developments



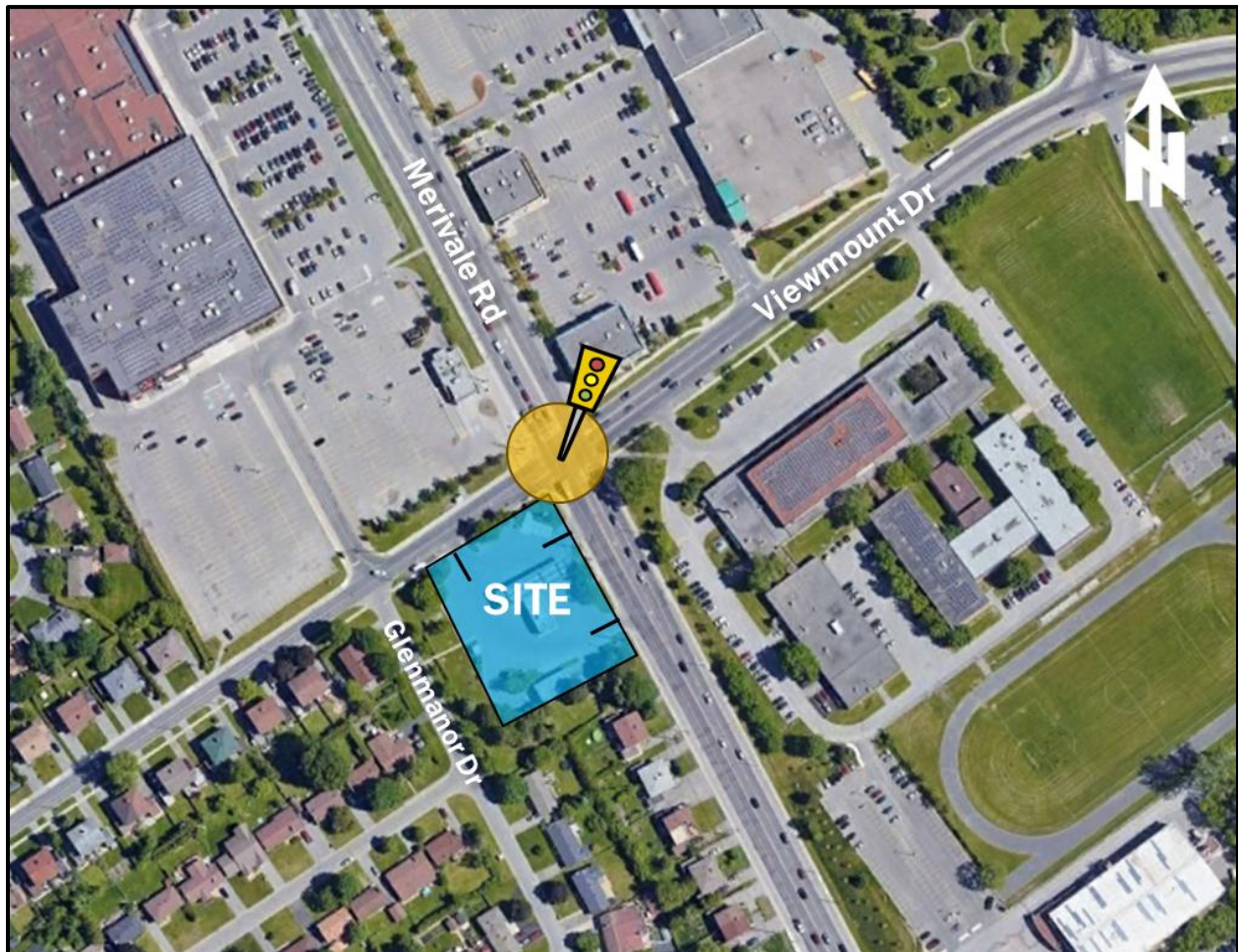
2.2. Study Area and Time Periods

For the purposes of this report, the proposed development is assumed to be fully constructed by 2026. The buildout year and five-years after development buildout will be analyzed, 2026 and 2031.

The future horizon years analyzed will use weekday morning and afternoon peak hour traffic volumes from the proposed study area intersections as listed below and illustrated in **Figure 13**.

- Merivale Rd/Viewmount Dr
- Site Accesses

Figure 13: Study Area



2.3. Exemption Review

The modules/elements of the TIA process provided in **Table 1** are recommended to be exempt in the subsequent steps of the TIA process, based on the City's TIA guidelines and the subject site. A full comprehensive table of all inclusions and exemptions have been provided in **Appendix E**.

Table 1: Exemptions Review Summary

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Street Network	Only required for plans of subdivision
4.5 Transportation Demand Management	All Elements	Although > 60 person trips will be generated, most are pass-by driving trips due to nature of development
4.6 Neighbourhood Traffic Calming	All Elements	Does not meet all criteria within revisions to TIA Guidelines (June 14, 2023).
4.7 Transit	4.7.1 Transit Route Capacity	Development to generate < 75 transit trips
4.8 Network Concept	All Elements	Only required for ZBLA applications.

3.0 FORECASTING

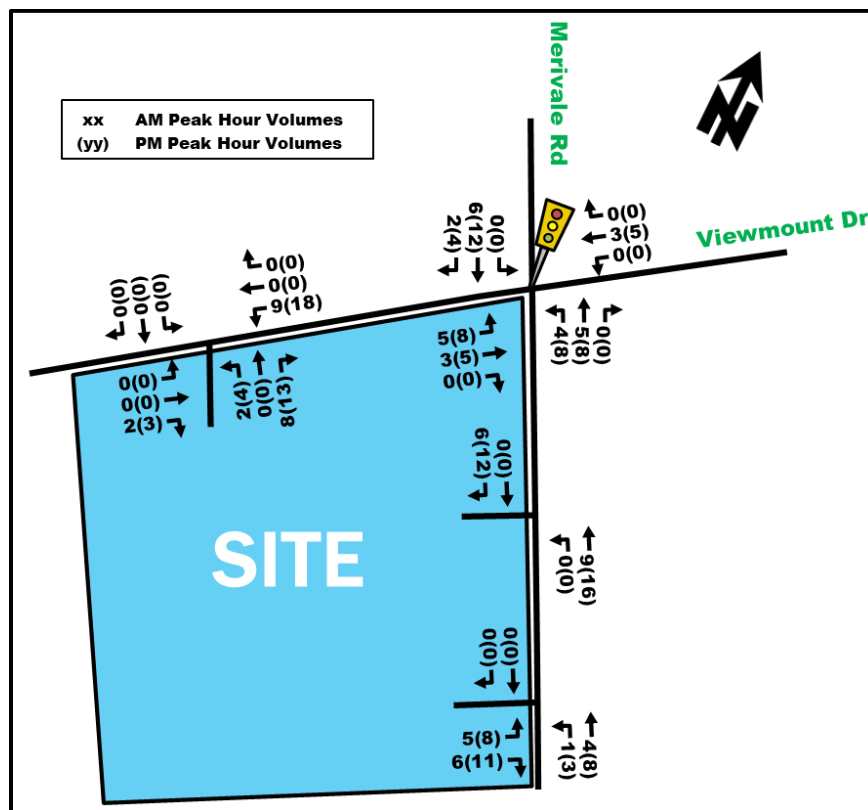
3.1. Development Generated Travel Demand

3.1.1. Trip Generation and mode shares

Trip Generation Rates

Manual counts were conducted at the existing site by Parsons on August 29th, 2023, during the morning and afternoon peak hours to determine the existing trip generation. The existing site vehicle trips will be subtracted from existing traffic volumes prior to adding the forecasted development trip generation volumes, to accurately reflect future travel demand. The existing trip generation by the gas station has been illustrated in **Figure 14**.

Figure 14: Existing Site Generated Trips To be Removed



The proposed development will consist of 6 new gas pumps and a new 251 m² convenience store, a 214 m² fast food restaurant with drive-thru, while maintaining the existing car wash facility. The appropriate trip generation rates for each land-use were obtained from the ITE Trip Generation Manual 11th Edition. The peak hour vehicle trip rates are summarized in **Table 2** below, for both vehicle pumping positions and gross floor area. The following analysis will use whichever methodology provides a more conservative estimate.

Table 2: Proposed Development Vehicle Trip Rates

Land Use	Size	Data Source	Trip Rates	
			AM Peak	PM Peak
Convenience Store/Gas Station – VFP (9-15)	251 m ² (2,700 ft ²)	ITE 945	T = 56.52(x);	T = 54.52(x);
	12 vehicle fuel positions		T = 16.06(p)	T = 18.42(p)
Fast Food with Drive-Thru	214 m ² (2,300 ft ²)	ITE 934	T = 44.61(x)	T = 33.03(x)

Note: T = Average Vehicle Trip Ends; x = 1000 ft²; p = number of VFP

Based on the rates shown above, the gross floor area independent variable has a more conservative trip rate and will be carried forward. The total number of person trips per hour generated by the proposed development are calculated by multiplying the vehicle trip rates from **Table 2** by 1.28 factor, as per the ITE Trip Generation Manual to account for typical North American auto occupancy, transit use and non-motorized mode. The resulting person trips per peak hour shown in **Table 3** below.

Table 3: Peak Hour Person Trip Generation

Land Use	Size	AM Peak Person Trips	PM Peak Person Trips
Convenience Store/Gas Station – VFP (9-15) and 2-4K GFA	12 Fuel Positions	247	283
Fast Food with Drive-Thru	2,300 ft ²	131	97
Combined Total		378	380

The proposed development is anticipated to generate a total of approximately 380 person trips during the morning and afternoon peak hours, respectively. **Table 4** provides the mode share percentages obtained from the 2020 TRANS Manual for the “Merivale” district and anticipated custom mode share breakdown for this development with rationales as to why they were modified.

Table 4: Mode Share Breakdown

Travel Mode	TRANS 2020 Mode Share		Custom Mode Share		Rationale
	AM	PM	Gas Store	Fast Food	
Auto Driver	71%	61%	80%	70%	The gas station is expected to attract a large proportion of drivers, while the restaurant will be closer to TRANS
Auto Passenger	19%	16%	15%	15%	
Transit	1%	8%	0%	3%	Gas station expected to generate negligible transit trips but restaurant could attract some clients
Cycling	0%	1%	0%	2%	Viewmount Dr has cycling facilities, but the gas station is unlikely to attract many non-auto trips
Walking	9%	14%	5%	10%	Potential trips from adjacent community, places of employment and nearby school
Total Person Trips	100%	100%	100%	100%	–

Internal Trip Reduction

Internal trips are multi-purpose trips, where more than one land-use within the same development is captured by the same person trip. For example, someone whose primary trip purpose was to get gas may also decide to get food from the restaurant afterwards. An estimated modest share of 25% was determined to be suitable for the morning and afternoon peak hour based on Internal Capture Rates from Section 6.5 of the ITE Trip Generation Handbook. The trip reductions will be applied to the auto-driver trips for their respective peak hours.

Pass-By Trip Reduction

Pass-by trips are intermediate ‘destinations’ along the original route between the primary origin and destination, such as a stop at a gas station between someone’s workplace and home. Based on the nature and location of

the development with the site frontage along a busy commuter arterial road, pass-by trips are expected to account for a significant portion of the site generated trips. The average pass-by rates as per the ITE 2021 Pass-By Tables for the ITE 945 (Convenience Store/Gas Station) land use is 75%. The restaurant pass-by rate proposed is 35% for both AM and PM peak hour.

Due to the site's location on the corner of a major intersection with accesses to/from two adjacent roadways, the path in which some vehicles enter/exit the site may vary. Specifically, a portion of the northbound vehicles were observed to enter/exit the site via the Viewmount access, which would result in a single trip accounting for a northbound left upon entering the site and eastbound left upon exiting the site at the intersection.

The total peak hour person trips from **Table 3** were divided into different travel modes using the custom mode shares shown above in **Table 4** and using the assumed internal reduction and pass-by trip reductions. The resultant trips per mode share for the new convenience store/gas station has been summarized in **Table 5**, the restaurant trip generation in **Table 6** and the combined site trip generation in **Table 7**.

Table 5: New Convenience Store/ Gas Station Peak Hour Trips Generated

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	80%	75	73	148	85	85	170
-Pre-Internal Reduction		100	98	198	113	114	227
-Vehicles Reduced -25%		-25	-25	-50	-28	-29	-57
Auto Passenger	15%	19	18	37	21	21	42
Transit	0%	0	0	0	0	0	0
Cycling	0%	0	0	0	0	0	0
Walking	5%	6	6	12	7	7	14
Total Person Trips	100%	125	122	247	141	142	283
Less Pass-by 75%		-56	-56	-111	-64	-64	-128
Total 'New' Site Auto Trips		19	17	37	21	21	42

Table 6: New Fast Food Peak Hour Trips Generated

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	70%	35	34	70	26	25	51
-Pre-Internal Reduction		47	46	93	35	33	68
-Vehicles Reduced -25%		-12	-12	-23	-9	-8	-17
Auto Passenger	15%	10	10	20	8	8	16
Transit	3%	2	2	4	1	1	2
Cycling	2%	1	1	2	1	1	2
Walking	10%	6	6	12	5	4	9
Total Person Trips	100%	66	46	93	35	33	68
Less Pass-by 35%		-13	-13	-25	-9	-9	-18
Total 'New' Site Auto Trips		22	21	45	17	16	33

Table 7: New Combined Total Peak Hour Trips Generated by the Site

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	110	107	218	111	110	221
-Pre-Internal Reduction	147	144	291	148	147	295
-Vehicles Reduced -25%	-37	-37	-73	-37	-37	-74
Auto Passenger	29	28	57	29	29	58
Transit	2	2	4	1	1	2
Cycling	1	1	2	1	1	2
Walking	12	12	24	12	11	23
Total Person Trips	191	168	340	176	175	351
Less Pass-by		-69	-69	-73	-73	-146
Total 'New' Site Auto Trips		41	38	82	38	75

As shown above in **Table 7**, the proposed development is anticipated to generate 340 to 350 total person trips, 220 vehicle trips, less than 5 transit and cycling trips, and 25 walking trips during the AM and PM peak hours respectively. Once pass-by trips have been considered, the development is anticipated to generate approximately 80 to 75 'new' auto driver trips during the morning and afternoon peak hours, respectively.

3.1.2. Trip Distribution and Assignment

Based on the 2011 OD Survey (Merivale district) and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes was estimated as shown in **Figure 15**. The site generated trips were then assigned to the road network as shown in **Figure 17**.

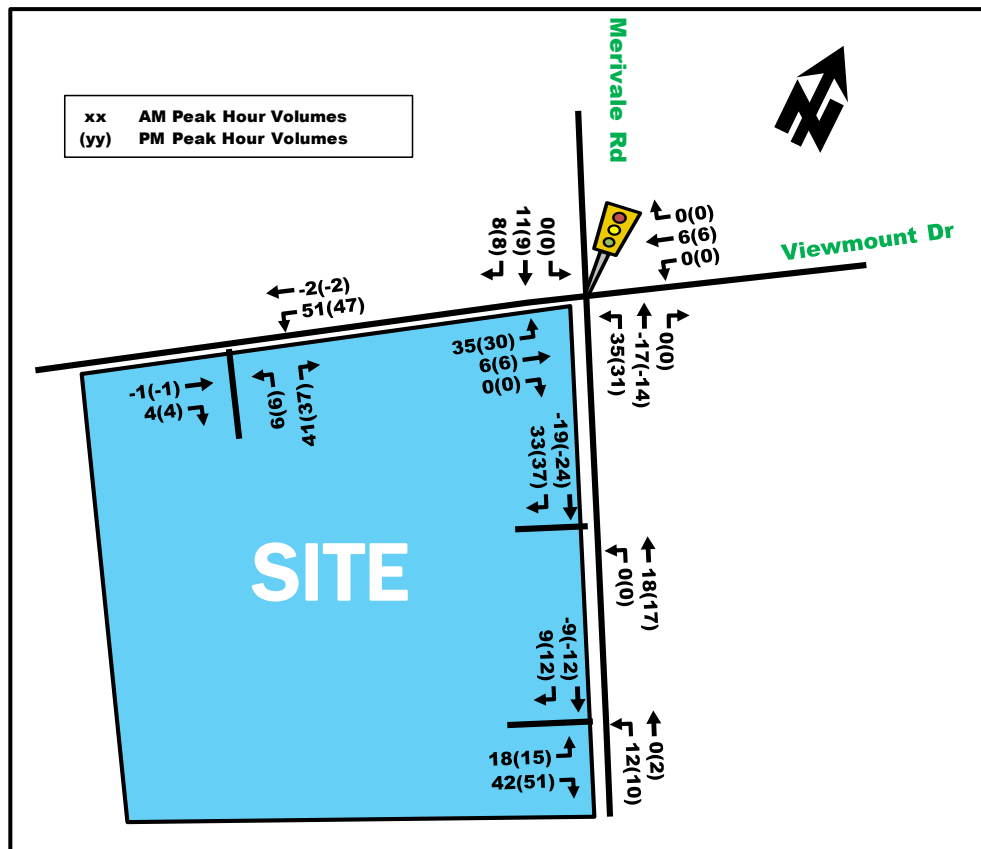
Figure 15: 'New' Site Generated Primary Traffic Trip Distribution



Figure 16: Pass-By Trip Distribution AM(PM)



Figure 17: Total Site-Generated Traffic with Pass-By Trips



Note: Negative numbers reflect pass-by trips.

3.2. Background Network Traffic

3.2.1. Transportation network plans

Refer to **Section 2.1.3** for future transportation network changes.

3.2.2. Background Growth and Other Area Developments

The Merivale district and the areas surrounding the development are already well established and have limited opportunities for growth as part of greenfield developments. As described in **Section 2.1.3**, there are a few proposed developments within a 1.5km radius, where most of these future developments will be layered on individually.

Table 8: Merivale Rd & Viewmount Dr Traffic Growth Rate

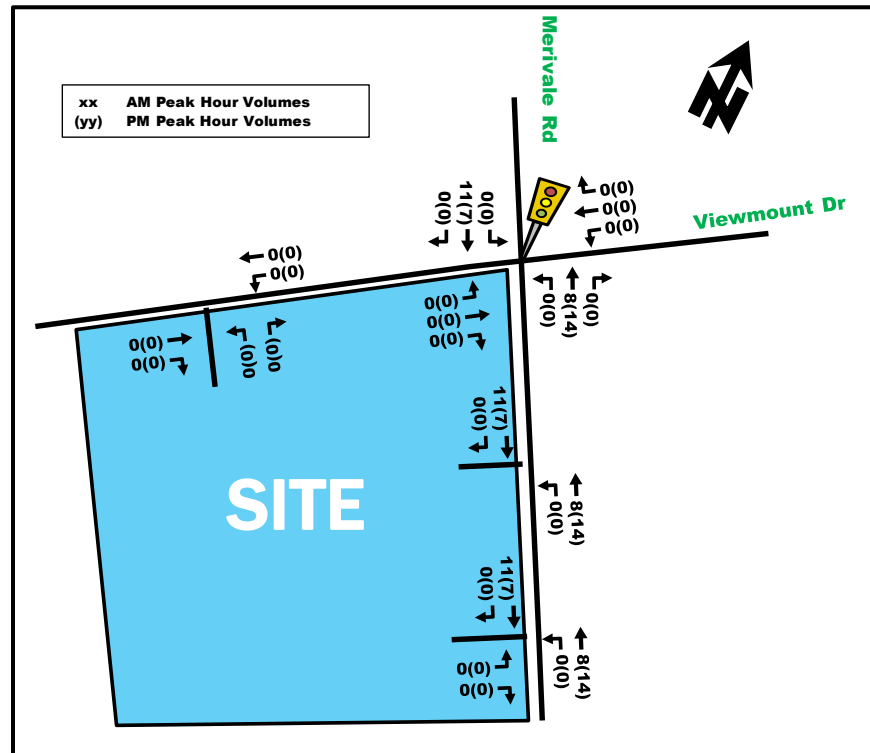
Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	-0.08%	0.19%	0.67%	-0.53%	0.09%
AM Peak	0.52%	0.62%	-0.36%	-0.35%	0.39%
PM Peak	-0.53%	-0.16%	0.62%	-0.87%	-0.25%

A linear regression analysis was conducted to determine the traffic growth rate for the Merivale/Viewmount intersection using count data from 2000, 2001, 2004, 2005, and 2019. As shown in **Table 8**, the overall traffic growth rate was shown to be near 0% between the morning peak, afternoon peak, and 8-hour counts. However, an average annual growth rate of 0.57% was shown along Merivale Rd during the morning peak hours (north and south legs). For the following analysis, a 0.5% annual growth rate will be applied to only the northbound and southbound through movements. Other area development volumes will also be layered on top.

3.2.3. Future Background Volumes

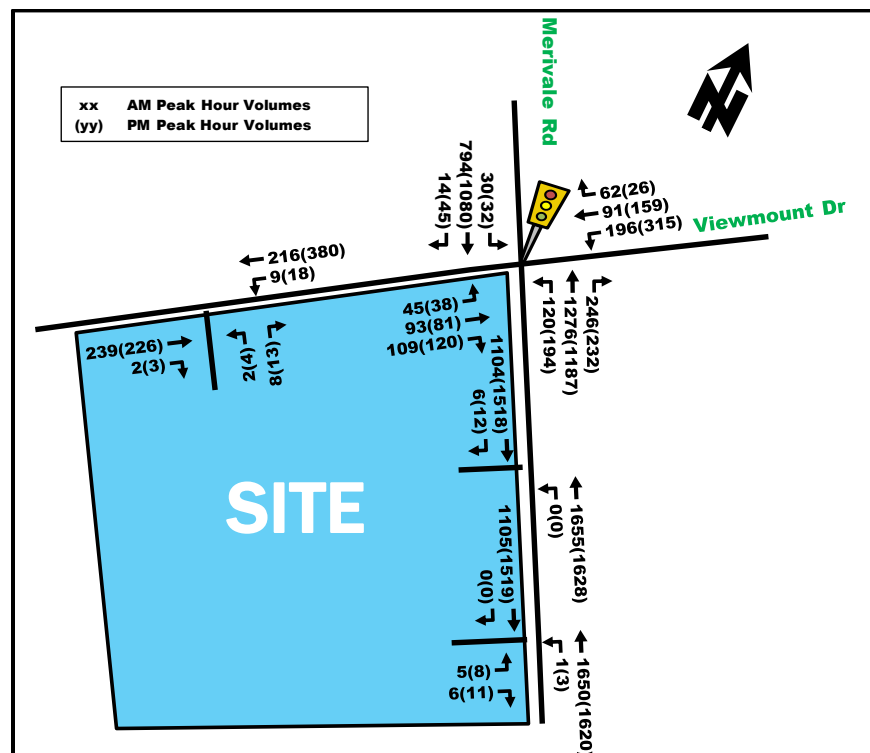
Future background volumes were generated by growing existing volumes by 0.5% per annum and layering on traffic volumes generated by other area developments to their respective horizon years. Of the developments outlined in **Section 2.1.3**, only 9 & 17 Colonnade Rd and 1881 Merivale Rd will be layered on to existing volumes for the 2026 and 2031 horizon years. As a result, given the 0.5% annual growth rate and previously mentioned other developments, the 2026 horizon will yield slightly lower but similar volumes to the 2031 horizon year and therefore will be omitted on future analysis. The total number of new other area development vehicle trips projected to use study area intersections have been illustrated in **Figure 18**.

Figure 18: Other Area Development – Vehicle Trips Generated



The other area development volumes were then layered on to existing volumes and grown by 0.5% per annum on the north-south movements of Merivale Rd, resulting in the final combined background volumes for 2031 illustrated in **Figure 19**.

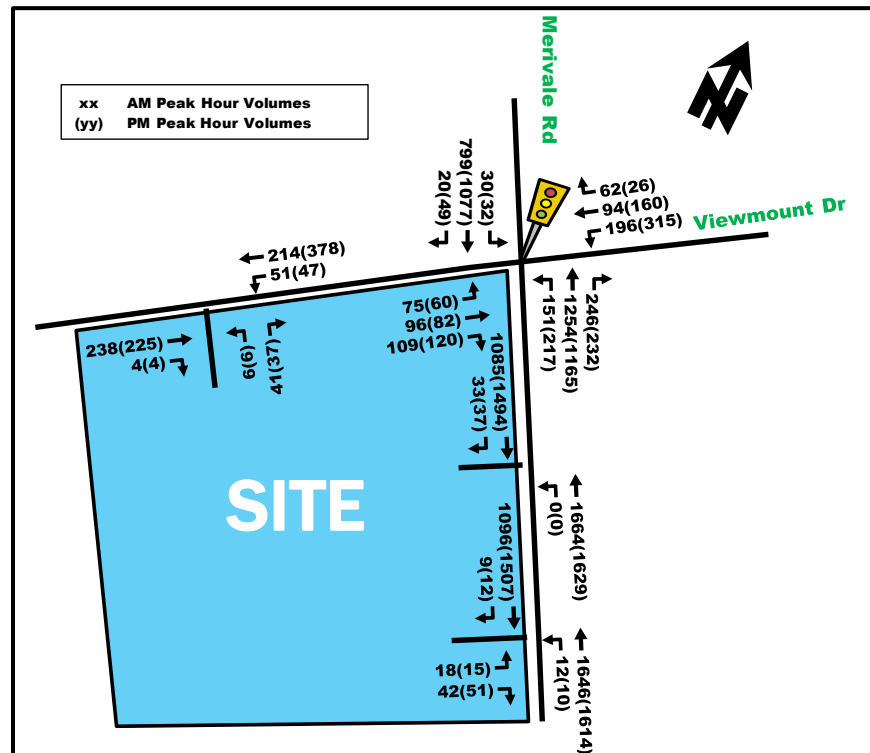
Figure 19: Background 2031 Traffic Volumes



3.3. Demand Rationalization

The total projected 2031 traffic volumes can be calculated by superimposing the site-generated traffic volumes illustrated in **Figure 17**, onto the background traffic volumes in **Figure 19**. The total projected 2031 traffic volumes are illustrated in **Figure 20**.

Figure 20: Total Projected 2031 Traffic Volumes



The proposed development is anticipated to add 80 to 75 'new' auto-driver trips to the surrounding road network during the morning and afternoon peak hours, respectively. The majority of the trips generated by this site will be auto-driver and pass-by trips, therefore the addition of the small number of new trips is expected to have a negligible impact on the Merivale/Viewmount intersection. As a result, no demand rationalization is proposed for the site trip generation or surrounding traffic.

4.0 ANALYSIS

4.1. Development Design

4.1.1. Design for Sustainable Modes

The latest site plan for the proposed development outlines various pedestrian connections and facilities, featuring a new raised crossing at the car wash and drive-thru entrance, providing a dedicated north-south pedestrian link from Viewmount Dr to the main building. New sidewalks and zebra stripe crossings will be provided across the site in the east-west direction that will connect the convenience store to Merivale Rd via the main building, integrating with existing pathways around the building.

4.1.2. Circulation and Access

The site will retain access through its three existing driveways, with one situated on the northern boundary connecting to Viewmount Dr approximately 50 m west of Merivale Rd, and the other two along the eastern

boundary leading to Merivale Rd approximately 20 m and 65 m south of Viewmount Dr. All accesses had their curb radii widened to accommodate turning movements for garbage and fuel trucks for easier circulation.

Garbage pickup is proposed on the northwest quadrant of the site, accessed via the drive-thru facility. After collection, the truck will do a minor reverse movement internally to the site and continue to a by-pass slip lane to exit the drive-thru and leave the site as required.

The existing fuel tanks will be relocated slightly southwest of their current location. It is understood that if the tanks were to be placed elsewhere, that a different tank structure would be needed significantly increasing the costs of reconstruction and possibly resulting in removal of different fuel grades/types. Given that fuel trucks normally offload fuel from the right side of the truck, the trucks will need to enter via Merivale Rd and exit via Viewmount Dr.

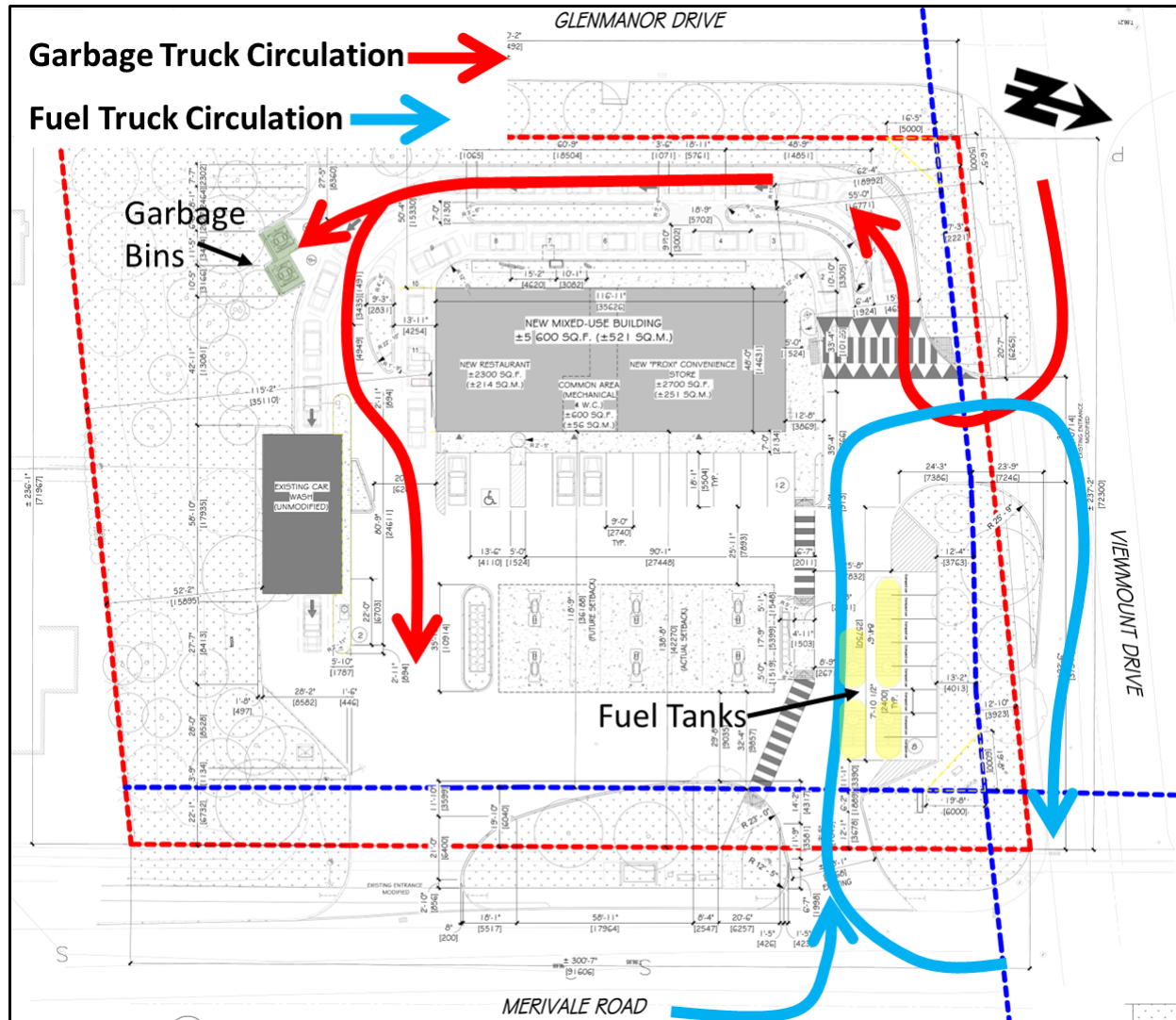
A review of truck turning templates using a BTD twin trailer truck (82 ft long) demonstrated that this maneuver can be accomplished under a few conditions:

- The southern Merivale access cannot accommodate the inbound movement
- Trucks entering from the northern Merivale access can do so by performing a northbound left turn or a southbound right turn using the inside northbound turn lane
- During fueling operations, the truck will likely block all 8 compact vehicle parking spaces on the south side of the property. It is understood that fueling operations would likely occur during the nighttime when the fast-food restaurant is closed and the demand for these parking spaces are lower
- Upon departure, the fuel truck will encroach on the opposing lane at Viewmount Dr to exit towards Merivale Rd which is a truck route. It is understood that fueling operations would likely occur during the nighttime when vehicular volumes on Viewmount Dr are low

Truck turning templates are available in **Appendix F** and a site circulation concept has been shown in **Figure 21**.

Due to the existing car wash and new restaurant drive-thru, the City of Ottawa requires that the development adhere to the Provisions for Drive-Through Operations By-Law (Section 112). Specifically, the latest site plan exceeds the minimum 10 vehicle queuing space required before the car wash, with approximate space for 14 vehicles, and 11 vehicles for the restaurant. The minimum queuing space dimensions of 3 m wide and 5.7 m long were considered upon the design of the proposed drive-throughs.

Figure 21: Proposed Internal Truck Circulation



4.2. Parking

4.2.1. Parking Supply

Based on the City of Ottawa Parking Provisions, the proposed development is located in “Area C”, where off-street motor vehicle and bicycle parking must be provided. Based on Table 101, 104, and Table 111A within the parking provisions, the minimum required parking is summarized in **Table 9** below. Note that the net GFA was used, which excludes the mechanical room and washroom space.

Table 9: Minimum Required Parking

Land Use	Net GFA	Vehicle		Bicycle	
		Rate	Minimum Required Parking	Rate	Minimum Required Parking
N27 Convenience Store	251 m ²	3.4/100m ²	9	1/250 m ²	1
N75 Restaurant	214 m ²	10/100m ²	21	1/250 m ²	1
N39 Gas Bar	442 m ²	0	0	–	–
Total			30	–	2

As shown in **Table 9**, the site requires a minimum of 30 vehicle parking spaces and 2 bike parking spaces. The site currently proposes 22 surface-level parking spaces and 2 bike parking spaces. The site is therefore short of 8 vehicle parking spaces. The restaurant land use proposed intends to leverage the high school across the road and nearby community which would likely occur as active transportation trips rather than driving. While unlikely, if spillover parking were to occur, adjacent Glenmanor Dr can accommodate temporary overflow parking. Additionally, when the fueling truck is on site, the 8 parking spaces located along the southern site boundary will be blocked; however, it is understood that these operations would occur during nighttime hours when the restaurant is closed and the demand for parking is lower.

4.3. Boundary Street Design

Multi-Modal Level of Service (MMLOS) analysis was conducted for the proposed developments boundary streets, Merivale Rd, Viewmount Dr, and Glenmanor Dr, based on the City of Ottawa's MMLOS Analysis Guidelines. The following features of each road are listed below:

Merivale Rd (arterial road classification)

- 2 vehicle travel lanes in each direction
- Approximately 2.0 m on both sides of the road
- No dedicated cycling facilities
- Greater than 3000 average daily curbside traffic
- No on-street parking
- Posted speed limit of 60 km/h
- Approximately 3.5 m wide lanes

Viewmount Dr (collector road classification)

- 1 vehicle travel lane in each direction
- Approximately 2.0 m wide sidewalks with a boulevard on the south side (site frontage)
- No dedicated cycling facilities
- Greater than 3000 average daily curbside traffic
- No on-street parking
- Posted speed limit of 40 km/h
- Approximately 3.5 m wide lanes

Glenmanor Dr (local road classification)

- 1 vehicle travel lane in each direction
- Approximately 1 m wide asphalt path on the west side
- No dedicated cycling facilities
- Less than 3000 average daily curbside traffic
- No on-street parking on the west side
- Posted speed limit of 40 km/h
- Approximately 3.5 m wide lanes

The multi-modal level of service analysis for Merivale Rd, Viewmount Dr, and Glenmanor Dr is summarized in **Table 10**, with detailed analysis provided in **Appendix G**. The table also identifies the target LOS, based on the land-use designation and road classification of the development site and the boundary streets. The Official Plan Designation/Policy Area identifies the development as a General Urban Area within 300 m of a school. The road classifications of each of the boundary streets were noted in the descriptions of features above.

Table 10: MMLOS Segment Results

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TkLOS)	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Merivale Rd	F	A	F	C	D	C	A	D
Viewmount Dr	D ¹ / C	A	E	B	N/A	N/A	N/A	N/A
Glenmanor Dr	F	A	D	D	N/A	N/A	N/A	N/A
1. Refers to the north side of the road which does not have a boulevard separation.								

As shown in **Table 10**, the target pedestrian LOS 'A' was not met for any of the boundary streets. This discrepancy can be attributed to various factors including high curbside lane traffic volumes for Merivale Rd and Viewmount Dr, high operating speeds along Merivale Rd, narrow southside sidewalks along Viewmount Dr, no sidewalk facilities along Glenmanor Dr.

The minimum desirable bicycle LOS targets are not met on Merivale Rd and Viewmount Dr primarily due to the lack of any cycling facilities and high operating speeds along Merivale Rd.

The Transit LOS targets were not met along Merivale Rd as a result of the corridors Transit Priority – Continuous Lanes designation as per the Transportation Master Plan and the lack of any existing transit priority infrastructure.

4.4. Access Intersection Design

4.4.1. Access Location and Design

As previously mentioned in **Section 4.1.2.**, the three existing site accesses will remain operational and will all function as two-way accesses.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Road Chapter 8 (Access) provides general recommendations for private approach clear throat lengths based on land use. As per Table 8.9.3, there is no suggested minimum clear throat length for gas station land uses. The primary function of the site is to accommodate typical gas station maneuvering, therefore concerns regarding queues backing out onto either Viewmount Dr or Merivale Rd are unlikely given the sites high-turnover nature, open layout, and minimally restricted driving behavior that typically occurs at gas stations. Furthermore, there are three access into the site which distributes the incoming demands and provides entry options.

The TAC Geometric Design Guide for Canadian Roads Chapter 8 also provides suggested minimum corner clearances to accesses near major intersections. As per Figure 8.8.2 within the design guide, the suggested minimum clearance for the northern Merivale access is 40 m, which is not met at the existing and future site access which is approximately 20 m from the intersection (note: the future access is not being relocated, these are existing conditions). For the Viewmount access, the suggested minimum clearance of 25 m is met, given the existing corner clearance of 40 m. TAC states that a lesser corner clearance can be provided if a corner lot is small, or it is not feasible to include such a corner clearance distance.

Additionally, the City of Ottawa Private Approach by laws were reviewed with the following notes:

- Section 25 (1) (a) (iv) – The site provides approximately 75 m of frontage along the northern site boundary and 85 m along the western boundary which permits two two-way private approaches along each boundary.
- Section 25 (1) (c) – The Viewmount Dr and southern Merivale Rd accesses exceed the maximum 9 m private approach width, however, due to fuel and garbage truck site circulation requirements, the exceeded width is considered acceptable.
- Section 25 (1) (g) – The distance between the nearest limits of all private approaches exceeds the 9 m minimum requirement.
- Section 25 (1) (p) – All private approaches are located 3 m or further from a property line as required.

- Section 25 (1) (t) – The existing grades on all of the private approaches do not exceed 2% for a distance of 6 m from the street line.

Due to the size of the lot and location constraints that exist for this development, the current access configuration, location and respective widenings is considered acceptable to maintain ease of access, provide safe maneuvering for fuel and garbage trucks, and provide efficient access and circulation opportunities to/from the gas pump islands. The accesses will remain at the same location as existing but will have minor adjustments to accommodate large vehicle turning maneuvers. The type of access arrangements proposed are common for gas-stations located at the corner of major intersections. The access designs are in conformance with the City of Ottawa Private Approach By-law 2003-447.

4.5. Transportation Demand Management

Exempt – See Table 2

4.6. Neighbourhood Traffic Calming

Exempt – See Table 2

4.7. Transit

4.7.1. Transit Route Capacity

Exempt – See Table 2

4.7.2. Transit Priority Requirements

The quantity of vehicle trips generated by the future site are anticipated to be slightly higher than the site's existing trip generation and is expected to have a negligible impact on the corridor performance. The site is also forecasted to generate less than 5 new transit trips. The quantity of driveways provided will be the same as existing conditions which is expected to result in no discernible impacts on transit travel times or passenger demands.

4.8. Network Concept

Exempt – See Table 2

4.9. Intersection Design

4.9.1. Intersection Controls

Given that the forecasted site generated vehicle traffic volumes are minimal and spread over three driveway access options, the need for a higher traffic control than currently existing is not warranted.

4.9.2. Intersection Design

Multi-Modal Level of Service

As stated in the MMLOS Guidelines, only signalized intersections are considered for the intersection Level of Service measures. The MMLOS analysis is summarized in **Table 11**, with detailed analyses provided in **Appendix H**. Note that since this is an update to a former TIA submission, the former MMLOS analysis that was completed was retained.

Table 11: MMLoS – Existing and Future Adjacent Signalized Intersections

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TkLOS)	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Merivale/Viewmount	F	A	F	C	F	D	E	D

Pedestrians face the challenge of crossing seven and six vehicle travel lanes on the north and south crossings (Merivale Rd), while the east and west (Viewmount) crossings present four and six lanes to cross, respectively. There are no viable options to significantly enhance the Pedestrian Level of Service (PLOS) to meet the target PLOS 'A' without significantly altering capacity on Merivale Rd which is designated as an arterial roadway.

The failure to meet the Bicycle Level of Service (BLOS) target is attributed to the absence of cycling facilities on all of the intersection approaches. Achieving the target BLOS 'C' would necessitate the implementation of separated cycling facilities, including two-stage left turn boxes.

The failure to meet the Target Level of Service (TLOS) 'D' is attributed to high average signal delays (>40s) on the westbound and eastbound approaches. Additionally, the Truck Level of Service (TkLOS) target 'D' was not achieved for the northbound and southbound approaches, primarily due to the single receiving lanes along Viewmount Dr, despite trucks being prohibited on this route.

Existing Conditions Intersection Performance

Synchro 11 Software was used to analyze intersection performance. Critical movements were assessed based on the movement with the highest volume-to-capacity ratio (for signalized intersections). It should be noted that, as per the TIA Guidelines, the Peak Hour Factor (PHF) used for analysis was 0.90 in existing conditions and 1.0 in all future scenario conditions. All Synchro report outputs for existing and future conditions have been provided in **Appendix I**.

Table 12 below summarizes the intersection performance at the Merivale/Viewmount intersection, based on the existing condition traffic volumes illustrated in **Figure 7**.

Table 12: Existing Conditions Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Merivale/Viewmount	D(F)	0.88(1.36)	NBT(WBL)	27.6(52.1)	D(E)	0.84(0.92)

Note: Analysis of signalized intersections assumes a PHF of 0.9 and a saturation flow rate of 1800 veh/h/lane.

As shown in **Table 12**, the Merivale/Viewmount intersection currently performs overall within acceptable performance, but with the critical movement westbound left operating above capacity at a LOS of 'F' during the afternoon peak hour.

The analysis identified the westbound left-turn 95th percentile queue extends up to 120 m during the afternoon peak hour. This queue would exceed storage lengths for the westbound left by approximately 45 m, and result in blockages of the westbound through/right movements. Similarly, the northbound left 95th percentile queues were 75 m in the afternoon peak hour and exceeds the available storage length by 25 m, however, this is considered a minor issue due to the availability of an additional lane that can accommodate northbound through/right traffic.

Future Background 2031 Intersection Performance

The future background 2031 conditions represent the increases in existing traffic volumes as a result of layering known adjacent future development traffic volumes and forecasted growth in the northbound and southbound through volumes by 0.5% annually. Only the 2031 horizon year will be analyzed since there is no anticipated change to the intersection layout between 2026 and 2031 horizon years and because it represents a more

critical scenario as it has been grown for more years. The future background volumes are illustrated in **Figure 19** with the corresponding intersection performance results summarized below in **Table 13**.

Table 13: Future Background 2031 Conditions Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Merivale/Viewmount	D(F)	0.81(1.03)	NBT(WBL)	24.1(38.8)	C(D)	0.77(0.84)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As shown in the table above, the Merivale/Viewmount intersection performs better overall during the morning and afternoon with an overall LOS of 'D' and for the morning critical movement with a LOS 'D'. Similarly, 95th percentile queueing results indicate shorter queues for the westbound left and northbound left movements. These results can be attributed to the use of a higher peak hour factor (1.0) for future conditions as per the City of Ottawa TIA Guidelines.

Total Projected 2031 Intersection Performance

The total projected 2031 conditions represent 2031 future background conditions plus the site generated traffic. The total projected volumes are illustrated in **Figure 20** and the corresponding intersection performance results shown below in **Table 14**.

Table 14: Total Projected 2031 Conditions Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Merivale/Viewmount	D(F)	0.81(1.03)	NBT(WBL)	24.5(39.9)	C(D)	0.77(0.84)
Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.						

As summarized in the table above, the overall intersection performance is shown to operate similarly in the morning and afternoon peaks compared to background conditions. The 95th percentile queue lengths are still anticipated to spillback, but less pronounced than existing conditions. These conditions are only anticipated during the critical peak hours and are not anticipated to last long. The average queues were observed to be within the available storage lanes.

In general, traffic volumes generated by the proposed development were shown to have a negligible impact on the study area intersection, and congestion observed is attributed to pre-existing conditions.

5.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the results summarized herein the following findings and recommendations are provided:

Existing Conditions

- Harnois Energies Inc. is proposing to replace an existing gas station with a new gas station plus a convenience store and restaurant with drive-thru at the municipal address of 1660 Merivale Rd.
- The proposed development is located in a well-established area and shares lot boundaries with the adjoining eastbound and northbound approach legs of the Merivale Rd/Viewmount Dr intersection.
- There are currently several bus routes operating along Merivale Rd and Viewmount Dr, with the two nearest bus stops serving routes located directly along the northern and eastern site boundaries.
- The Merivale Rd/Viewmount Dr intersection currently operates at overall LOS 'D and E', with critical movements operating at LoS 'D and F' for the morning and afternoon respectively. The westbound left and northbound left queues were observed to exceed the storage lane capacity within the 95th percentile queue.

Proposed Development

- The development is assumed to be fully constructed by the year 2026.
- The Official Plan highlights Merivale Rd as a future transit priority and the new TMP indicates continuous bus lanes as part of the "Transit Network Priority" however, there are no planned transit projects within the study area. The new TMP also highlights improvements to the cycling network under the Cycling Network with Prioritization.
- The TRANS mode share for the 'Merivale' district from the Origin Destination Survey were considered and adjusted to favor auto-vehicle trips based on the nature of the development. Using these mode shares, it was forecasted approximately 80 and 75 'new' two-way vehicle trips, less than 5 'new' two-way transit trips and 20 'new' two-way non-motorized trips would be generated by this development.
- The site is slightly deficient on vehicle parking quantities but due to the adjacent land uses, it is forecasted that some tenants will use active transportation to get to the site rather than driving (predominantly for the restaurant which requires more parking be provided). When the fuel truck is on site, the 8 parking spaces provided along the southern perimeter will be blocked, however these operations are anticipated to take place during nighttime hours when the restaurant is closed and parking demands are lower.
- The site will maintain access through the three existing driveways, including one on the northern boundary to Viewmount Dr and two along the eastern boundary to Merivale Rd.
- To accommodate truck movements, the access points have been widened. Attached vehicle turn templates confirm all vehicle types can circulate without conflict within the site. Fuel vehicles will be required to turn right into the site using the inside southbound Merivale lane or via a left turn from Merivale Rd to avoid hitting curbs. Upon departure, the truck will need to perform a U-turn like maneuver which would utilize the opposing travel lane on Viewmount Dr. Operations are anticipated to occur during nighttime hours and will have a lesser impact on the municipal network.

Future Conditions

- The development is located within a well-established urban area. A 0.5% annual volume growth rate was applied to the Merivale Rd through movements to account for future growth potential as well as all layering of known future development projected volumes.

- The MMLOS road segment analysis showed that only the truck LOS and bicycle LOS along Glenmanor were met. The sites close proximity to Merivale High school, limited active transportation facilities, and high vehicle volumes are the primary reasons for all other bicycle, pedestrian, and transit LOS targets being not met.
- The MMLOS intersection analysis showed that none of the target LOS goals were met. For pedestrians, this is largely because of the 6 to 7 equivalent vehicle travel lanes they are required to cross. The transit targets were also not met as the westbound and eastbound approach delays are forecasted to be greater than 40s.
- Overall intersection and critical movement performance demonstrated improvements from existing conditions to future projected 2030 conditions including the development. However, this is a result of different peak hour factors used for modelling existing and future conditions, as outlined within the TIA Guidelines. A comparison of background future conditions and future conditions with the development layered on top showed negligible changes to intersection performance. The future conditions were considered acceptable.
- The westbound movement at the Merivale/Viewmount intersection demonstrated sensitivities particularly during afternoon peak hours. In all analysis conditions, including existing conditions, the 95th percentile queue lengths exceeded the available storage capacity, that would result in blockages of westbound through/right movements. Extending the westbound left-turn storage capacity and optimizing signal timing could effectively reduce this risk of spillback, however, is not considered urgent since westbound through/right volumes are relatively low and the average queues demonstrate that spillback is only isolated to short periods of times during the peak hours only.
- The latest site plan proposes significant improvements to pedestrian accessibility by including raised crosswalks and pathways that permeate the site, which will improve safety and comfort for pedestrians within the site, including local neighbours, pedestrians heading to the convenience store or restaurant after pumping gas, and those headed to transit stops at the north and east quadrants of the site.

Based on the preceding report, the proposed development located at 1660 Merivale Rd is recommended from a transportation perspective.

Prepared By:



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Transportation Analyst



Juan Lavin, P.Eng.
Transportation Engineer

Reviewed By:



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Senior Transportation Engineer

Appendix A:

TIA Screening Form and Site Plan

City of Ottawa 2017 TIA Guidelines

Date

22-Aug-23

TIA Screening Form

Project

1660 Merivale Rd

Project Number

478765

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

Module 1.1 - Description of Proposed Development

Municipal Address	1660 Merivale Rd
Description of location	Existing gas station, to demolish existing store and pump islands to construct multi tenant building with drive through service
Land Use	Gas Station/Convenience Store/Drive-Through Car Wash
Development Size	465m2 Convenience Store
Number of Accesses and Locations	3
Development Phasing	One Phase
Buildout Year	Assumed 2025
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger

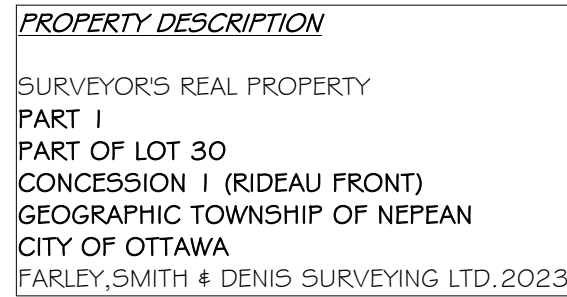
Land Use Type	Gas Station with Convenience
Development Size	465 sq. m
Trip Generation Trigger Met?	Yes

Module 1.3 - Location Triggers

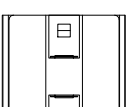
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	No
Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3)	Yes
Location Trigger Met?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

Module 1.4 - Safety Triggers

Posted Speed Limit on any boundary road	<80 km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes
A proposed driveway makes use of an existing median break that serves an existing site	No
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	No
The development includes a drive-thru facility	Yes
Safety Trigger Met?	Yes



1 SITE PLAN - ANNOTATIONS
A-100 1" = 20'-0"

SITE PLAN LEGEND		SITE PLAN LEGEND	
	LANDSCAPING PROCEED TO LANDSCAPE PLANNING AS REFERENCE PLANS AND DRAWINGS UP TO THE STREET LINE. THE LANDSCAPE CONTRACTOR SHALL PROVIDE AND LAY OFF THE LAWN TO THE EDGE OF THE STREET OR SIDEWALK.		ACCESS TO BUILDING
	NEW LIGHT STANDARD (L5) (SEE ELECTRICAL PLANS)		HIGH-DENSITY BIKE RACK, MODEL: ____ GALVANIZED FINISH PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR
	EXISTING PROPERTY LINE		SEMI BURIED CONTAINERS BY: DURABAC : URBIN MODEL OR EQUIVALENT PROVIDED AND INSTALLED BY GENERAL CONTRACTOR
	PROPOSED FUTURE PROPERTY LINE		
	NEW CONCRETE CURBS, SEE CIVIL PLANS		
FOR THE SEMI-BURIED CONTAINER DETAIL, SEE 2/A-100 FOR THE SEMI-BURIED CONTAINERS SECTION, SEE 3/A-100 FOR THE TYPICAL STEEL BOLLARD DETAIL, SEE 4/A-100			

 **Proxi**

 **Harnois**
Énergies

80, Route 150 - Saint-Thomas - QC - J1K 3L0
Tél. 450.759.7779 • Fax. 450.759.7091 •
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mra architecture
+ design

equation



CEAU :

CHARGÉ DE PROJET MRA : MRA PROJECT MANAGER : C.C.-MÉNARD	SIGNÉ PAR : APPROVED : M. RENAUD
--	--

HARNOIS ÉNERGIES INC.

PROJET / PROJECT	BASE BUILDING
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Nepean, Ontario

ARCHITECTURE

TITRE DU DESSIN / DRAWING TITLE

SITE PLAN - ANNOTATIONS AND ZONING COMPLIANCE TABLE

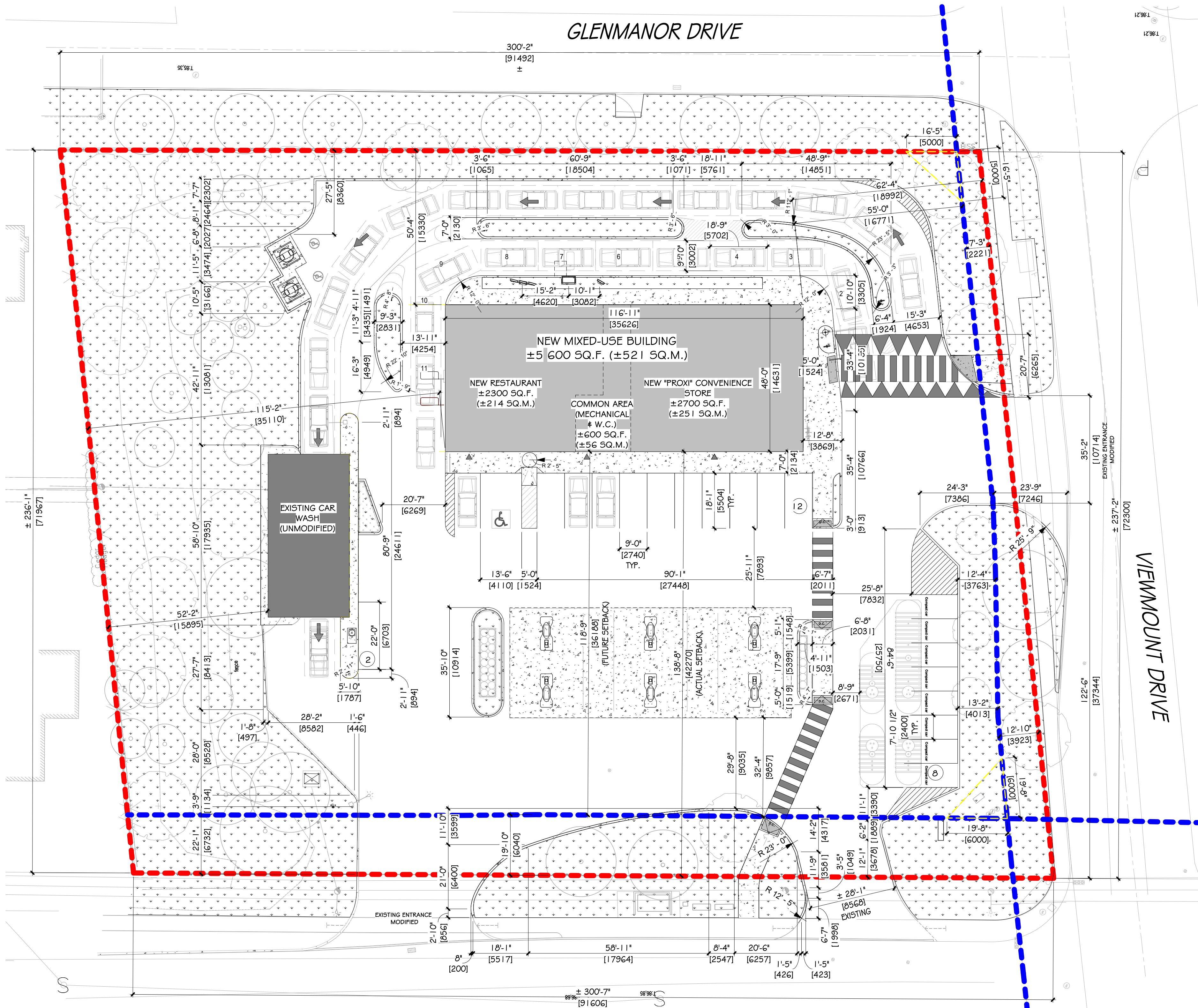
CHÈLLE / SCALE	DESSINÉ PAR / DRAWN BY
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As Shown	N.H.
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11 Decembre 2025

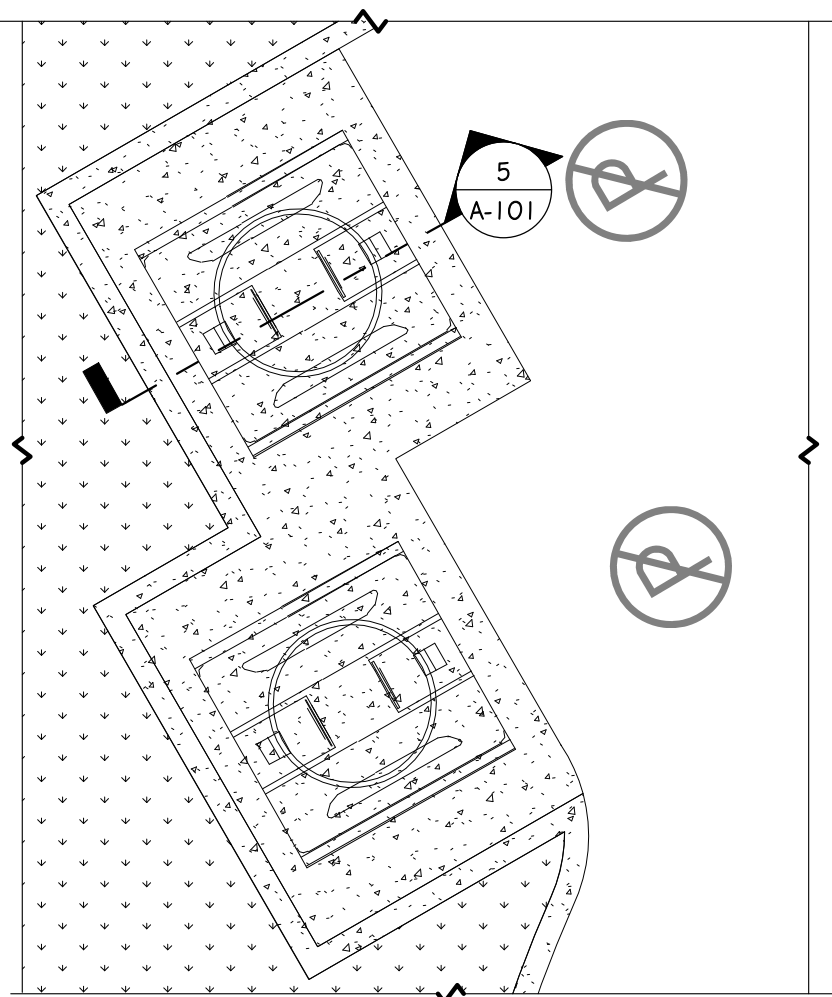
lb. C-757 A-100 2

PROJECT No.	ARC 2304-1010
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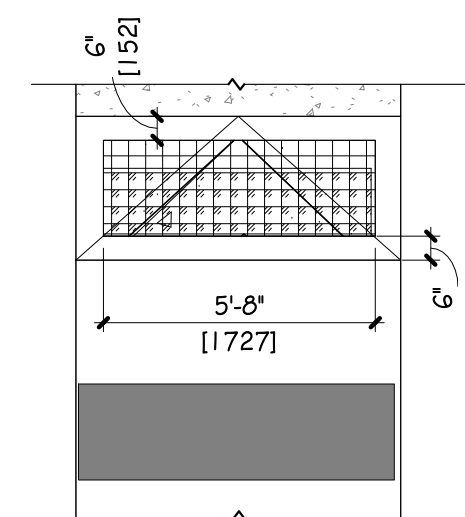


1 SITE PLAN - DIMENSIONS
A-101 1" = 20'-0"

4 SEMI-BURIED CONTAINERS
A-101 3/16" = 1'-0"

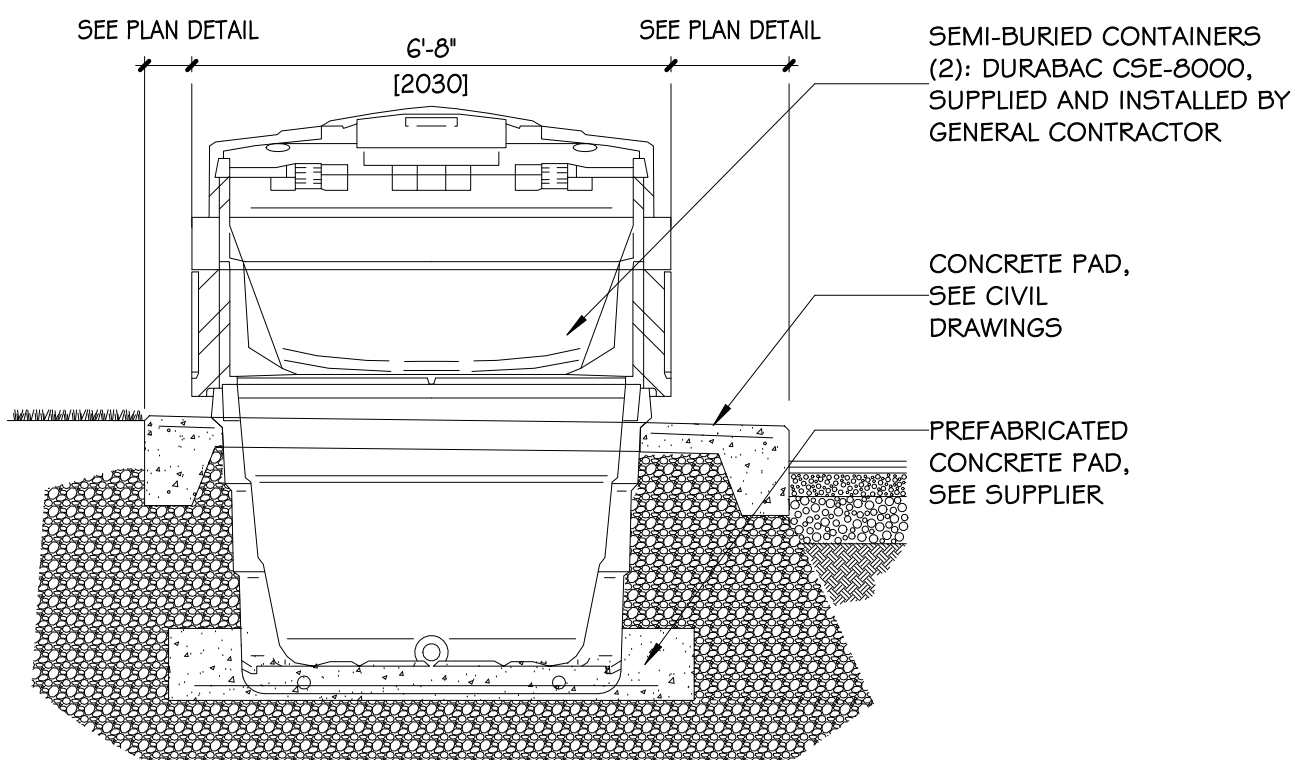


2 FIRE ROUTE
A-101 1" = 40'-0"

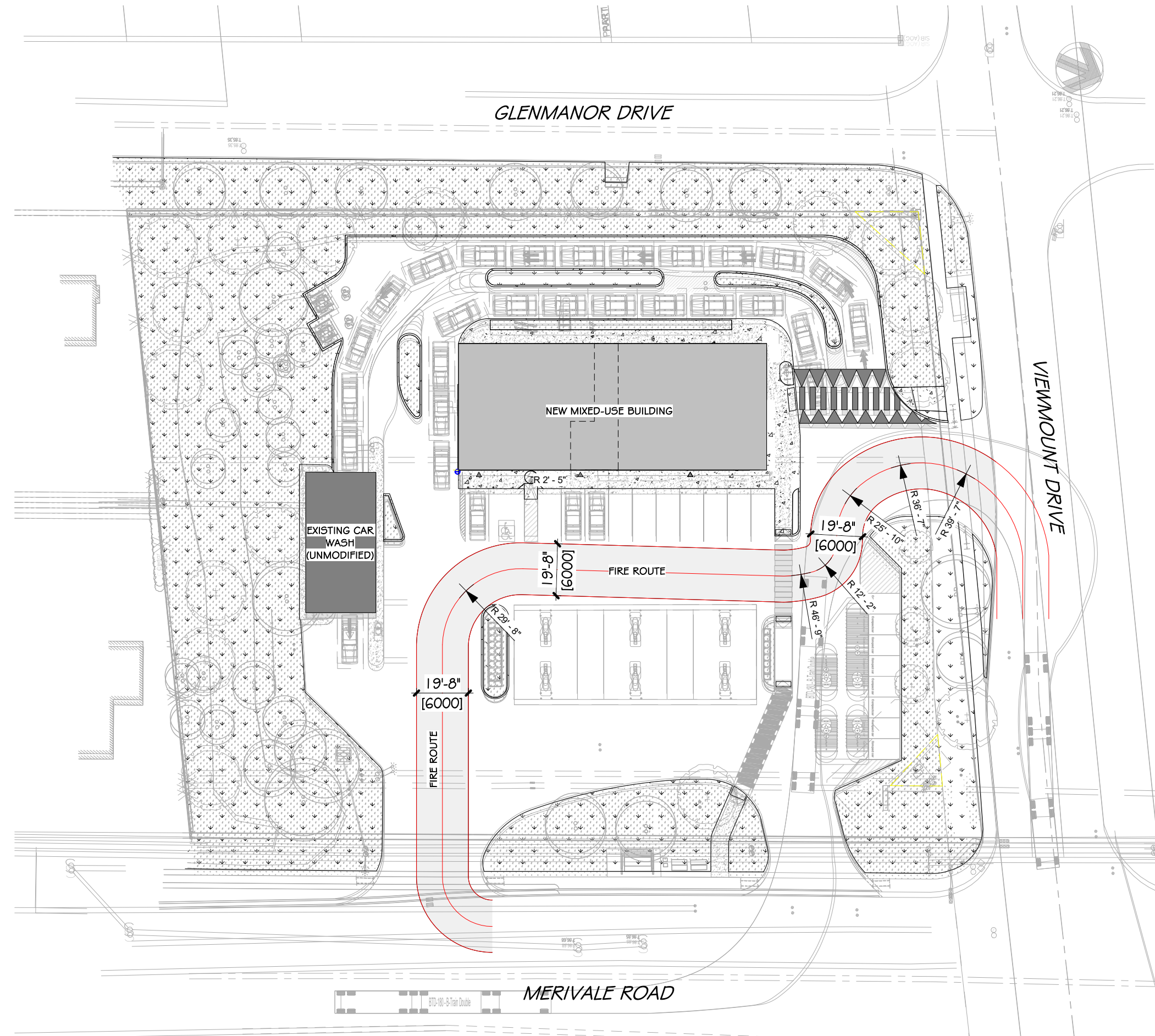


6 TWSI DETAIL
A-101 1/4" = 1'-0"

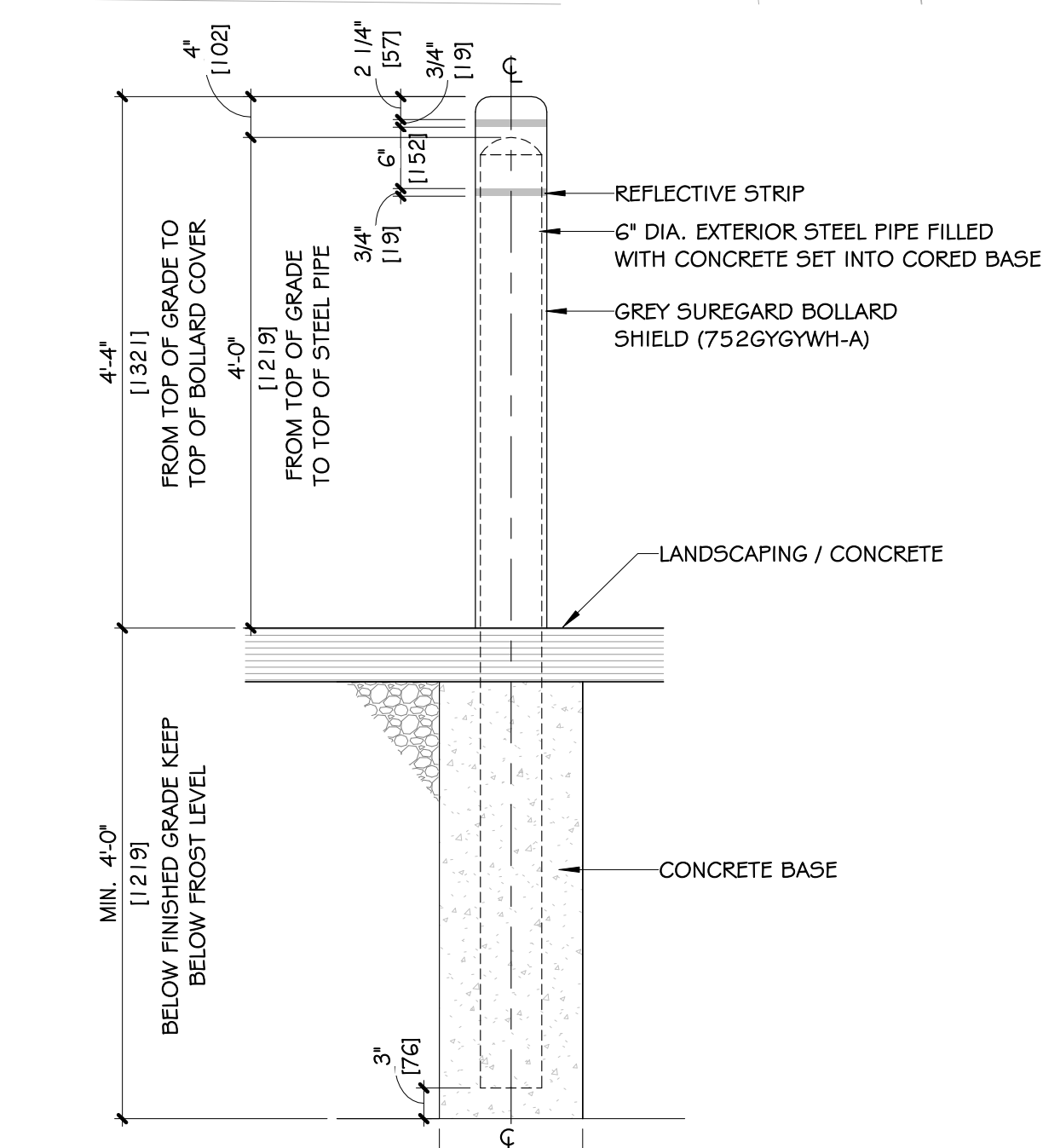
3 TYPICAL STEEL BOLLARD DETAIL
A-101 3/4" = 1'-0"



5 SECTION DETAIL - SEMI-BURIED CONTAINER
A-101 3/8" = 1'-0"



2 FIRE ROUTE
A-101 1" = 40'-0"



3 TYPICAL STEEL BOLLARD DETAIL
A-101 3/4" = 1'-0"

IMPORTANT

NE PAS MESURER LES PLANS, LIRE LES COTES SEULEMENT.
L'ENTREPRENEUR DEVRA VÉRIFIER TOUS LES DÉTAILS, LES
SPÉCIFICATIONS, DIMENSIONS ET MESURES AVANT QUE LES CONDITIONS
DU LOCAL OU DU CHANTIER, ET SIGNALER TOUTES ERREURS, OMISSIONS
ET / OU ANOMALIES AVANT DE COMMENCER LES TRAVAUX. TOUS LES
CHANGEMENTS OU SUBSTITUTIONS DE DÉTAILS ET DE MATÉRIEL À
CEUX SPÉCIFIÉS SUR CE PLAN DEVONT ÊTRE APPROUVÉS PAR
L'ARCHITECTE OU LE CONCEPTEUR.

DO NOT SCALE DRAWINGS, READ DIMENSIONS FIGURES ONLY.
CONTRACTOR SHALL VERIFY ALL DRAWINGS, DETAILS, SPECIFICATIONS,
DIMENSIONS AND MEASUREMENTS AS WELL AS SITE OR PREMISES
CONDITIONS AND NOTIFY THE DESIGNER OF ALL ERRORS, OMISSIONS AND
OR ANOMALIES BEFORE BEGINNING THE WORK. ANY CHANGES OR
SUBSTITUTIONS TO DETAILS OR SPECIFIED MATERIALS SHOW ON THIS
DRAWING MUST BE APPROVED BY THE ARCHITECT OR THE DESIGNER.

#	DATE	DESCRIPTION	PAR
1	2024-10-02	PRELIMINARY PLANS	B.L.
2	2024-10-11	50% COORDINATION	B.L.
3	2024-10-17	75% COORDINATION	B.L.
4	2024-11-01	ISSUED FOR PERMIT - CITY	B.L.
5	2024-12-11	REISSUED FOR PERMIT - CITY REQUEST	M.R.

Proxi

Harnois Energies

80, Route 159 • Saint-Thomas • QC • J0K 3J0
Tél. 450.759.7979 • Fax. 450.759.7001 •
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Québec H2T 1B6

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Laval (Québec) H7P 6G5

DOSSIER No. / FILE No.:

GENIE CIVIL:

PARSONS

100-1223 Michael St North,
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DOSSIER No. / FILE No.:

SCÉAU / SEAL:

CHARGE DE PROJET MRA:
MRA PROJECT MANAGER:

SCÉAU PAR:
APPROVED:

C.C-MÉNARD

M. RENAUD

CLIENT:

PROJET / PROJECT:

DEPARTEMENT / DEPARTMENT:

TITRE DU DESSIN / DRAWING TITLE:

HARNOIS ÉNERGIES INC.

BASE BUILDING
PROXI / HARNOS ENERGIES
1600 Merivale Road
Nepean, Ontario

ARCHITECTURE

SITE PLAN - DIMENSIONS AND DETAILS

ÉCHELLE / SCALE:

DATE:

NO SITE / SITE NO.:

PROJET No.:

A0 Shown

11 Decembre 2025

C-757

ARC 2304-1010

DESSINÉ PAR / DRAWN BY:

B.L.

A-101

2

FEUILLE / SHEET

OF

NE PAS MEURER LES PLANS, LIRE LES COTES SEULEMENT.
L'ENTREPRENEUR DEVRA VÉRIFIER TOUS LES DESSINS, DÉTAILS,
SPÉCIFICATIONS, DIMENSIONS ET MESURES AINSI QUE LES CONDITIONS
DU LOCAL OU DU CHANTIER, ET SIGNALER TOUTES ERREURS, OMISSIONS
ET / OU ANOMALIES AVANT DE COMMENCER LES TRAVAUX. TOUS LES
CHANGEMENTS OU SUBSTITUTIONS DE DÉTAILS ET DE MATÉRIAUX À
CEUX SPÉCIFIÉS SUR CE PLAN DEVONT ÊTRE APPROUVÉS PAR
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DOSSIER No. / FILE No. :

GÉNIE CIVIL :



100-1223 Michael St North,
Ottawa, Ontario K1J 1T2

DOSSIER No. / FILE No. :

SCEAU :
SEAL :

CHARGÉ DE PROJET MRA :
MRA PROJECT MANAGER :
C.C.-MÉNARD

SIGNÉ PAR : APPROVED :	M. RENAUD
---------------------------	-----------

CLIENT	HARNOIS ÉNERGIES INC.
--------	-----------------------

PROJET / PROJECT	BASE BUILDING PROXI / HARNOIS ENERGIES
------------------	---

1660 Merrivale Road
Neyaan, Ontario

DÉPARTEMENT / DEPARTMENT
ARCHITECTURE

TITRE DU DESSIN / DRAWING TITLE

VEHICLE TRACKING

ÉCHELLE / SCALE
As indicated

DESSINÉ PAR / DRAWN BY
N.H.

DATE 11 December 2011

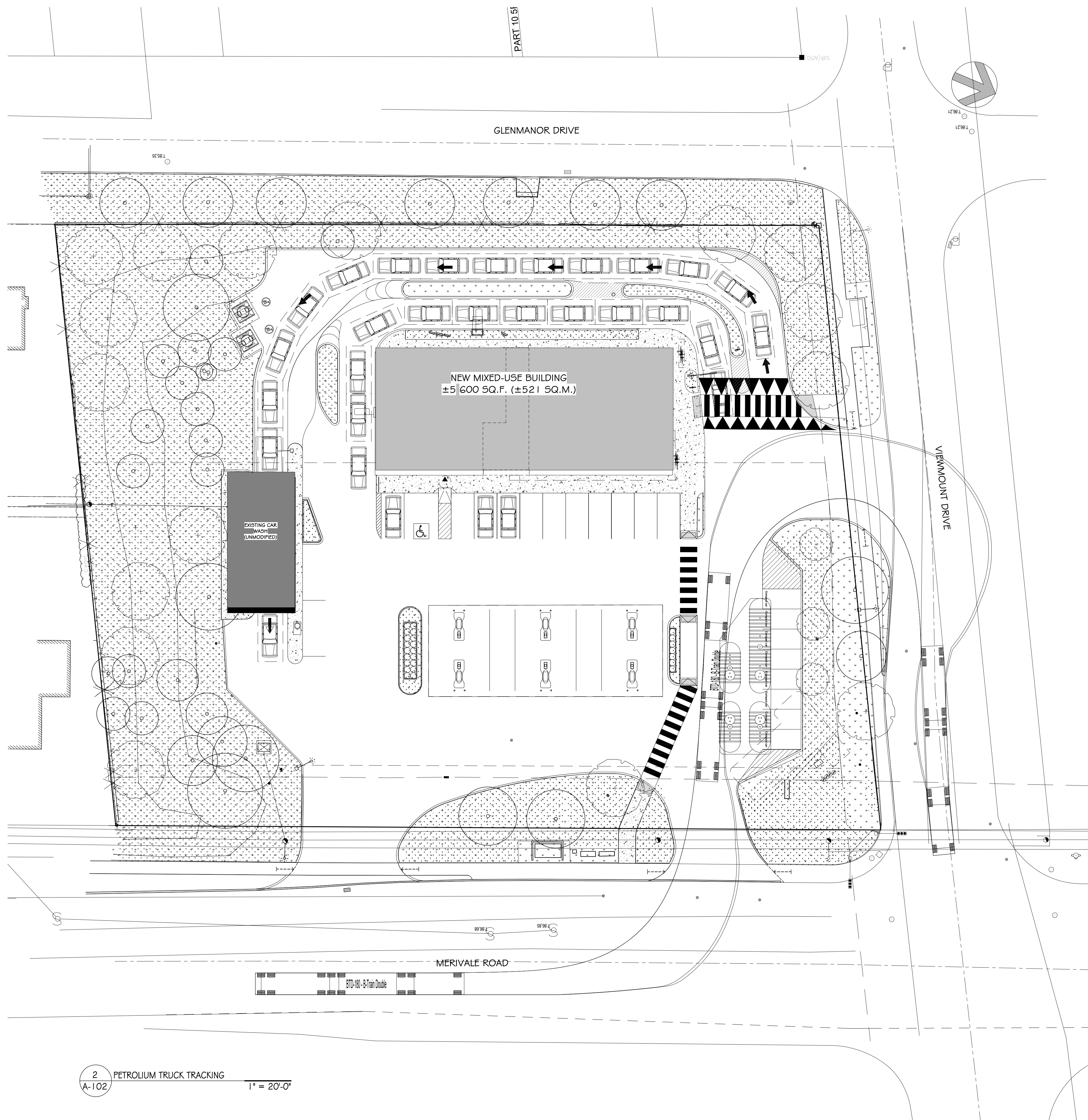
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11 Decembre	
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Nb. **C-757**

A-102 2



Appendix B:

Transit Route Maps

TUNNEY'S PASTURE

Tunney's Pasture



BASELINE

Baseline



C. Algonquin C.

Adjidjak

Mail Merivale Mall

Merivale H.S./É.S.

Viewmount

Colonnade

W. Hunt Club

Antares

Medhurst

Woodfield

Knoxdale

Woodroffe

Meadowlands

Merivale

Baseline

Maitland

Woodward

Clyde

Laperriere

Kirkwood

Shillington

Admiral

Hollington

Summerville

Merivale

Carling

Crerar

Fisher

Holland

Parkdale

Wellington

Scott

417

417

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Station



Sunday only / Dimanche seulement



Park & Ride / Parc relais

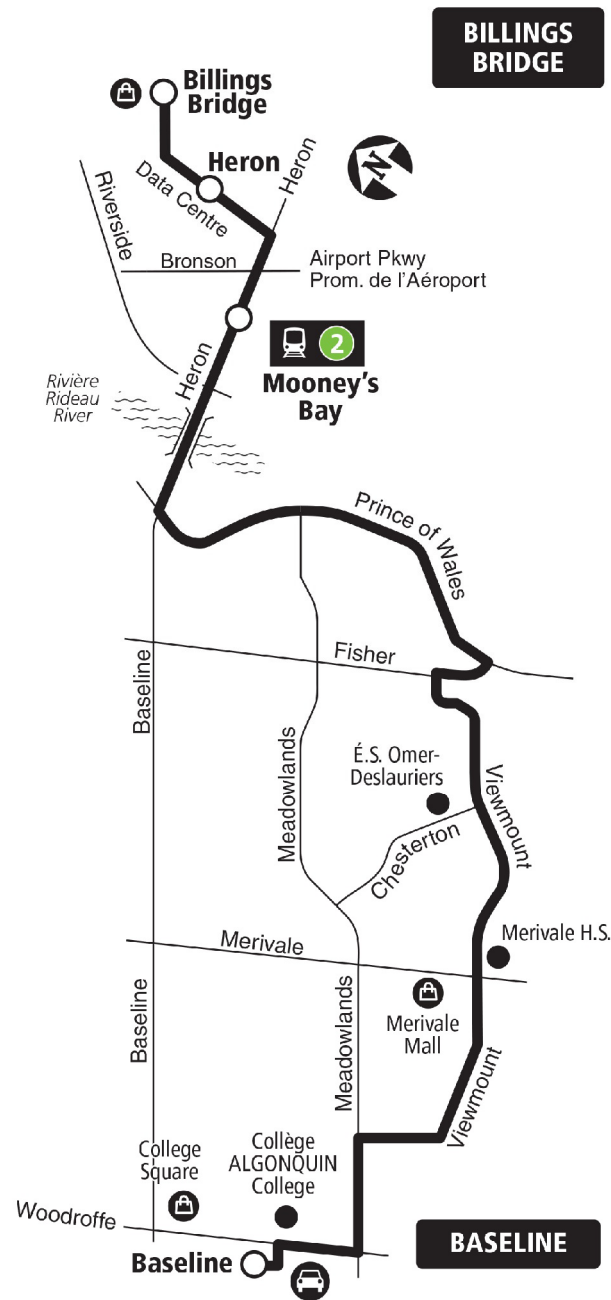


Shopping Centre / Centre commercial

04.2025

2025.04





Station

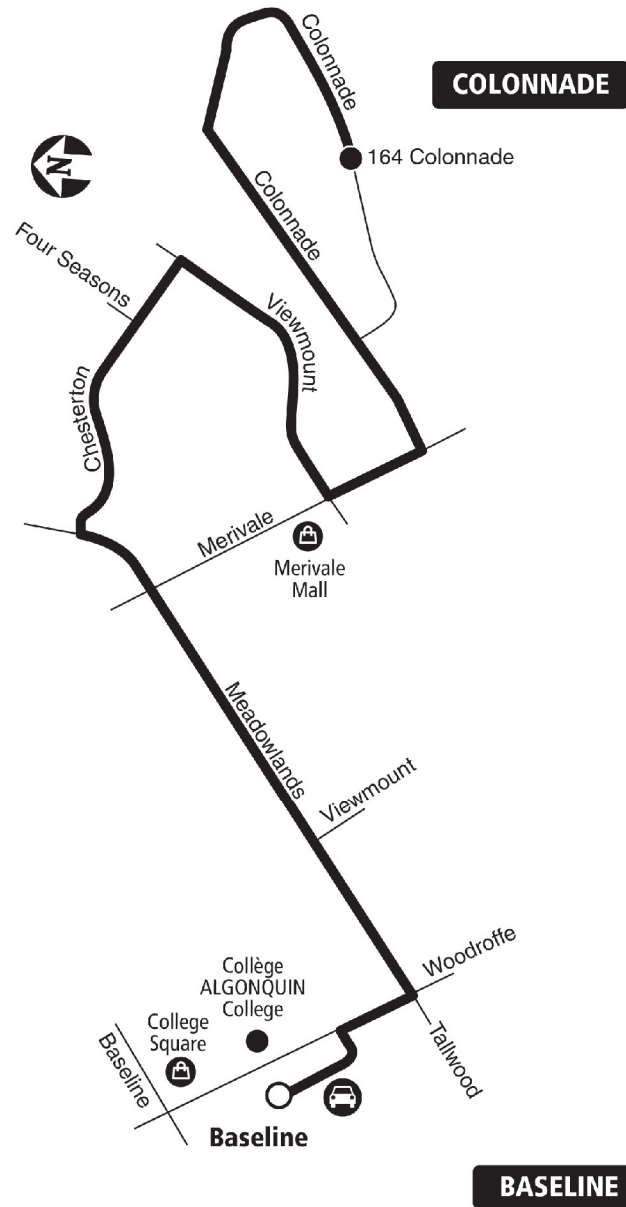


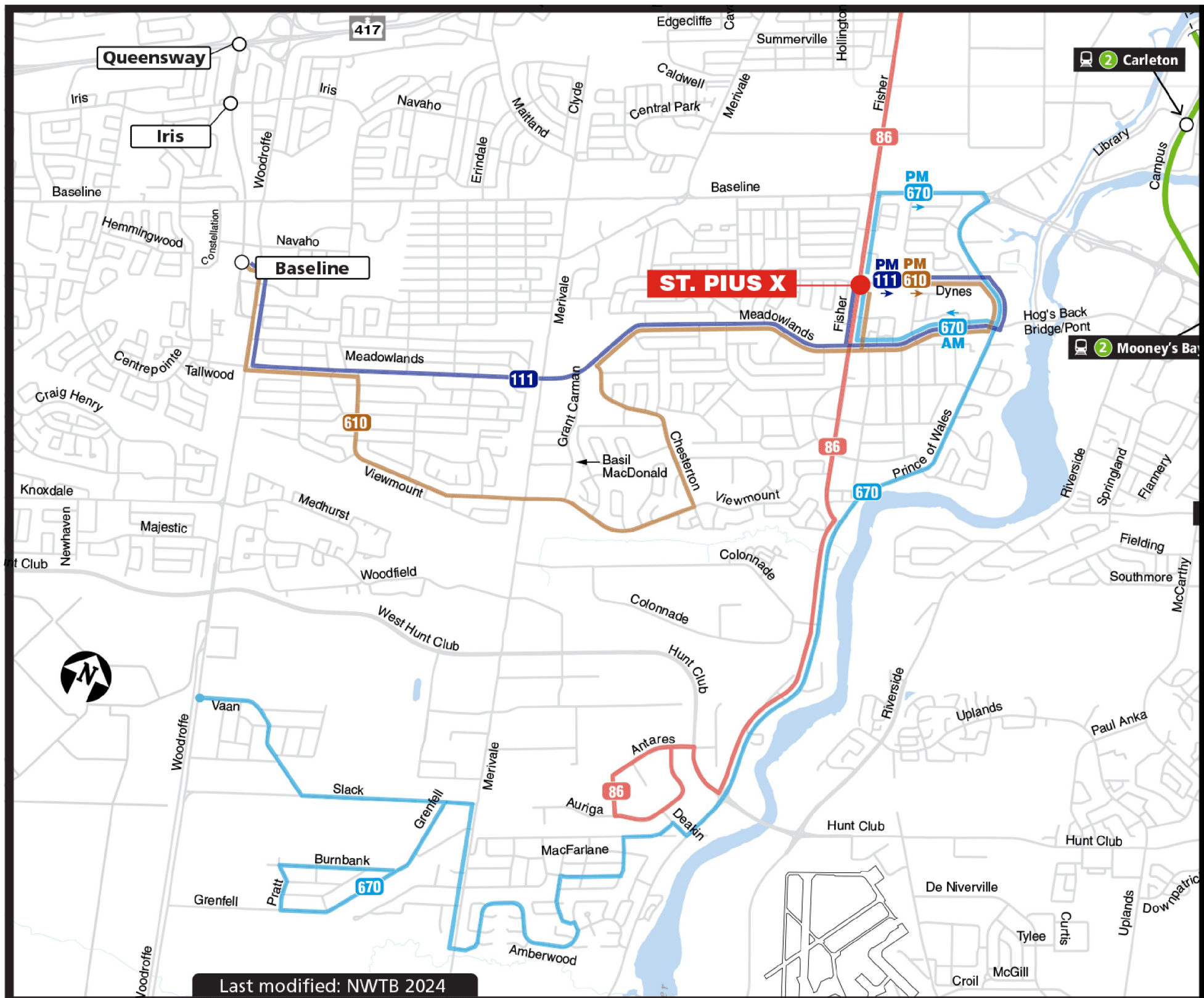
Park & Ride / Parc relais

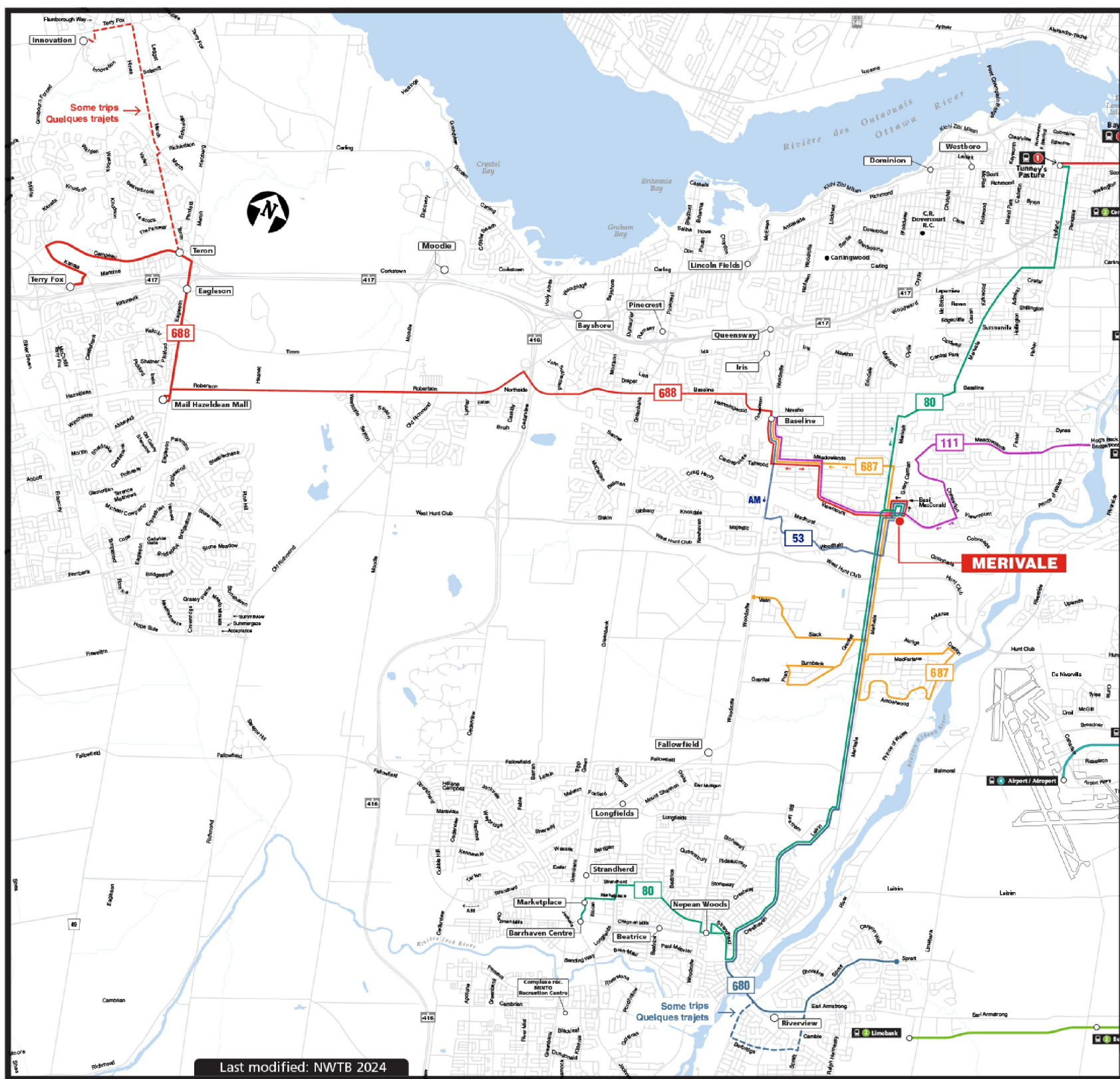


Shopping Centre / Centre commercial

04.2025







Appendix C:

Existing Peak Hour Volumes

Turning Movement Count - Peak Hour Diagram

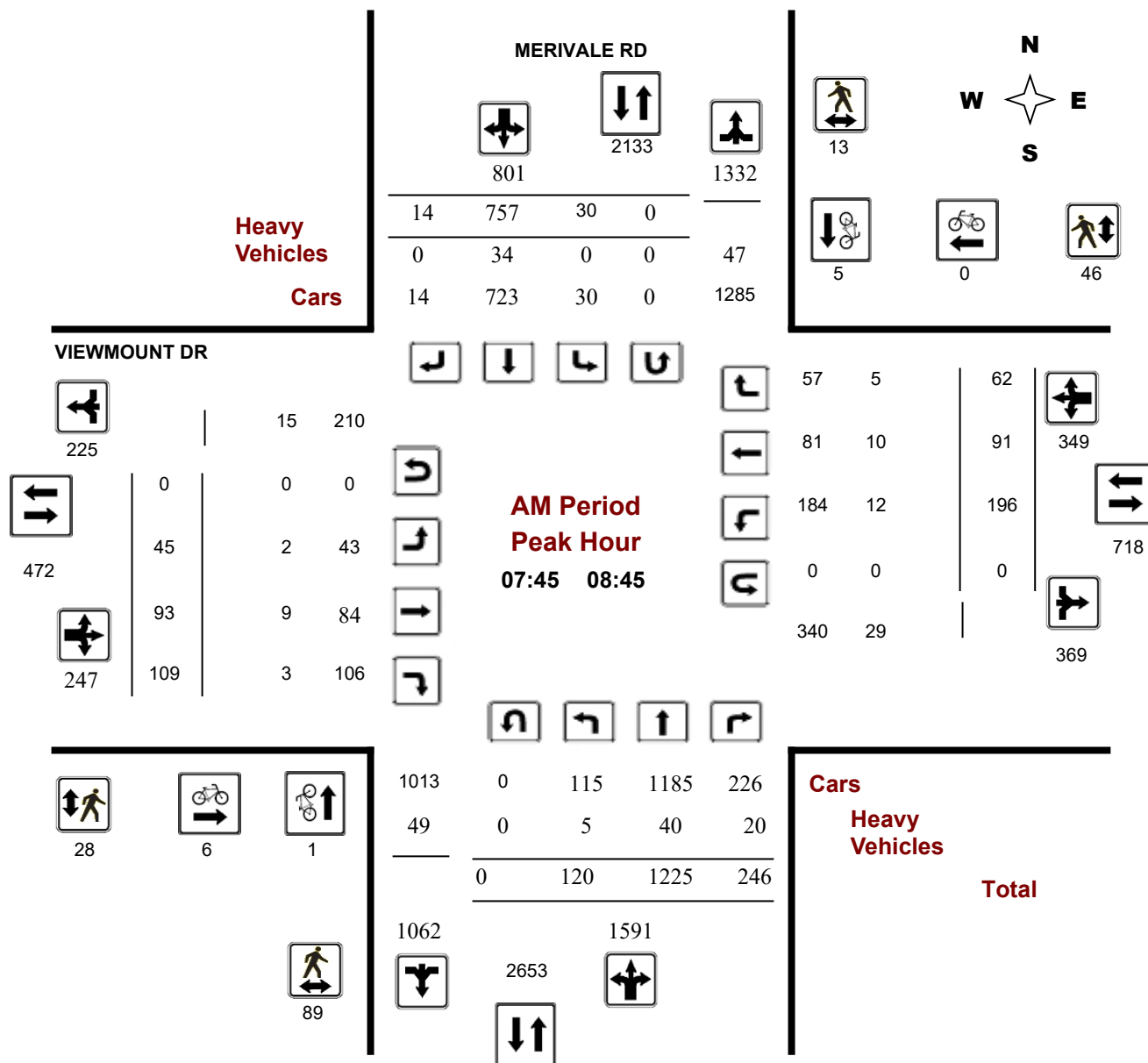
VIEWMOUNT DR @ MERIVALE RD

Survey Date: Tuesday, October 01, 2019

Start Time: 07:00

WO No: 38788

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

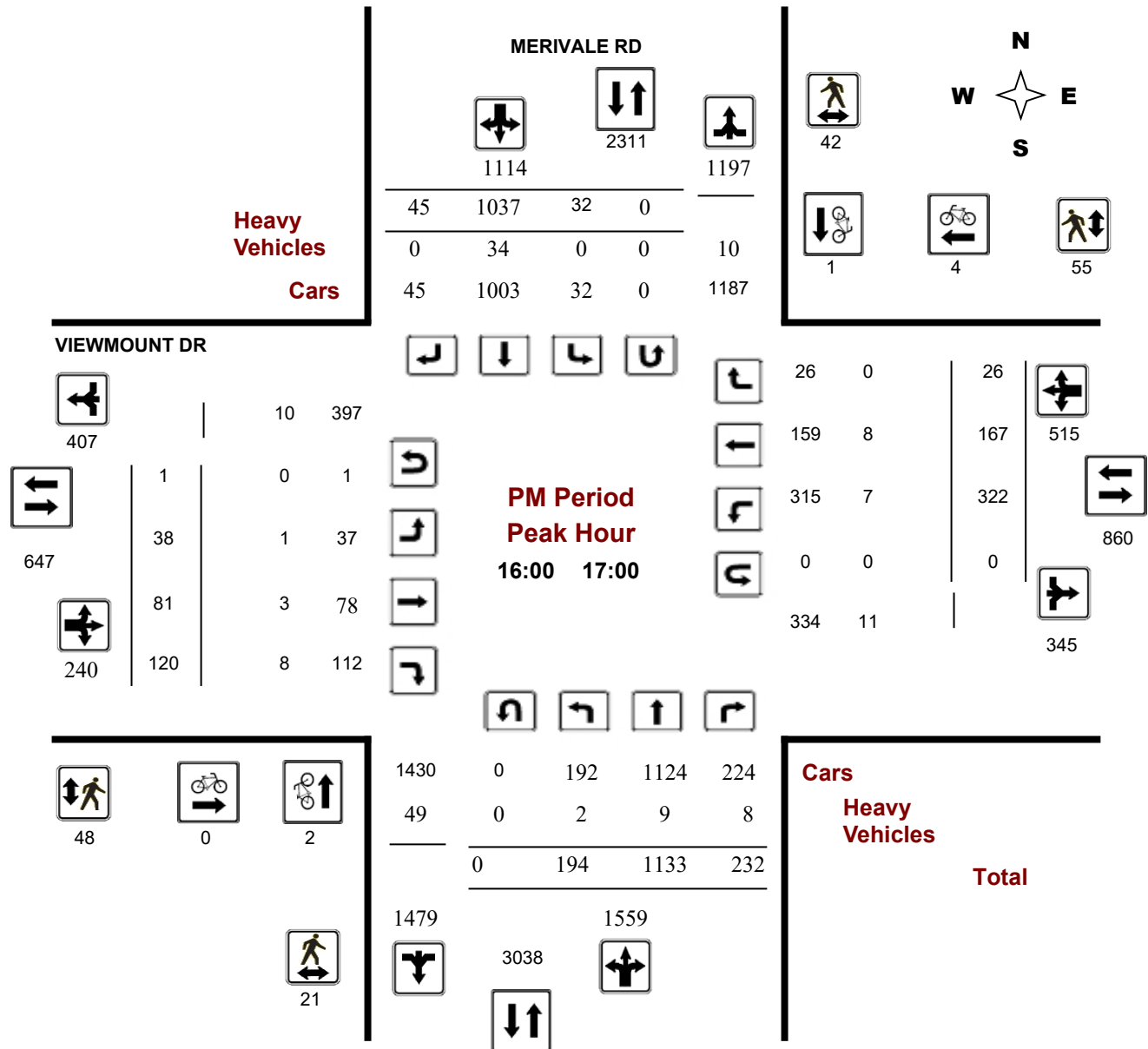
VIEWMOUNT DR @ MERIVALE RD

Survey Date: Tuesday, October 01, 2019

Start Time: 07:00

WO No: 38788

Device: Miovision



Appendix D:

Historic Collision Data

Total Area

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total
P.D. only	45	25	14	17	0	7	0	2	110
Non-fatal injury	6	9	1	3	0	2	0	0	21
Non-reportable	0	0	0	0	0	0	0	0	0
Fatal injury	0	1	0	0	0	0	0	0	1
Total	51	35	15	20	0	9	0	2	132
	#1 or 39%	#2 or 27%	#4 or 11%	#3 or 15%	#7 or 0%	#5 or 7%	#7 or 0%	#6 or 2%	

83%
16%
0%
1%
99%

MERIVALE RD, COLONNADE RD to VIEWMOUNT DR

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	23	n/a	1825	n/a

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total
P.D. only	8	3	1	0	0	4	0	0	16
Non-fatal injury	4	2	0	0	0	0	0	0	6
Non-reportable	0	0	0	0	0	0	0	0	0
Fatal injury	0	1	0	0	0	0	0	0	1
Total	12	6	1	0	0	4	0	0	23
	52%	26%	4%	0%	0%	17%	0%	0%	

70%
26%
0%
4%
96%

VIEWMOUNT DR/MERIVALE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	86	39,225	1825	1.20

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total
P.D. only	36	13	12	7	0	2	0	2	72
Non-fatal injury	2	6	1	3	0	2	0	0	14
Non-reportable	0	0	0	0	0	0	0	0	0
Total	38	19	13	10	0	4	0	2	86
	44%	22%	15%	12%	0%	5%	0%	2%	

84%
16%
0%
100%

VIEWMOUNT DR, GLENMANOR DR to MERIVALE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	5	n/a	1825	n/a

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total
P.D. only	1	0	1	3	0	0	0	0	5
Non-fatal injury	0	0	0	0	0	0	0	0	0
Non-reportable	0	0	0	0	0	0	0	0	0
Total	1	0	1	3	0	0	0	0	5
	20%	0%	20%	60%	0%	0%	0%	0%	

100%
0%
0%
100%

VIEWMOUNT DR, GRANT CARMAN DR to MERIVALE RD

Years	Total # Collisions	24 Hr AADT Veh Volume	Days	Collisions/MEV
2017-2021	18	n/a	1825	n/a

Classification of Accident	Rear End	Turning Movement	Sideswipe	Angle	Approaching	SMV other	SMV unattended vehicle	Other	Total
P.D. only	0	9	0	7	0	1	0	0	17
Non-fatal injury	0	1	0	0	0	0	0	0	1
Non-reportable	0	0	0	0	0	0	0	0	0
Total	0	10	0	7	0	1	0	0	18
	0%	56%	0%	39%	0%	6%	0%	0%	

94%
6%
0%
100%

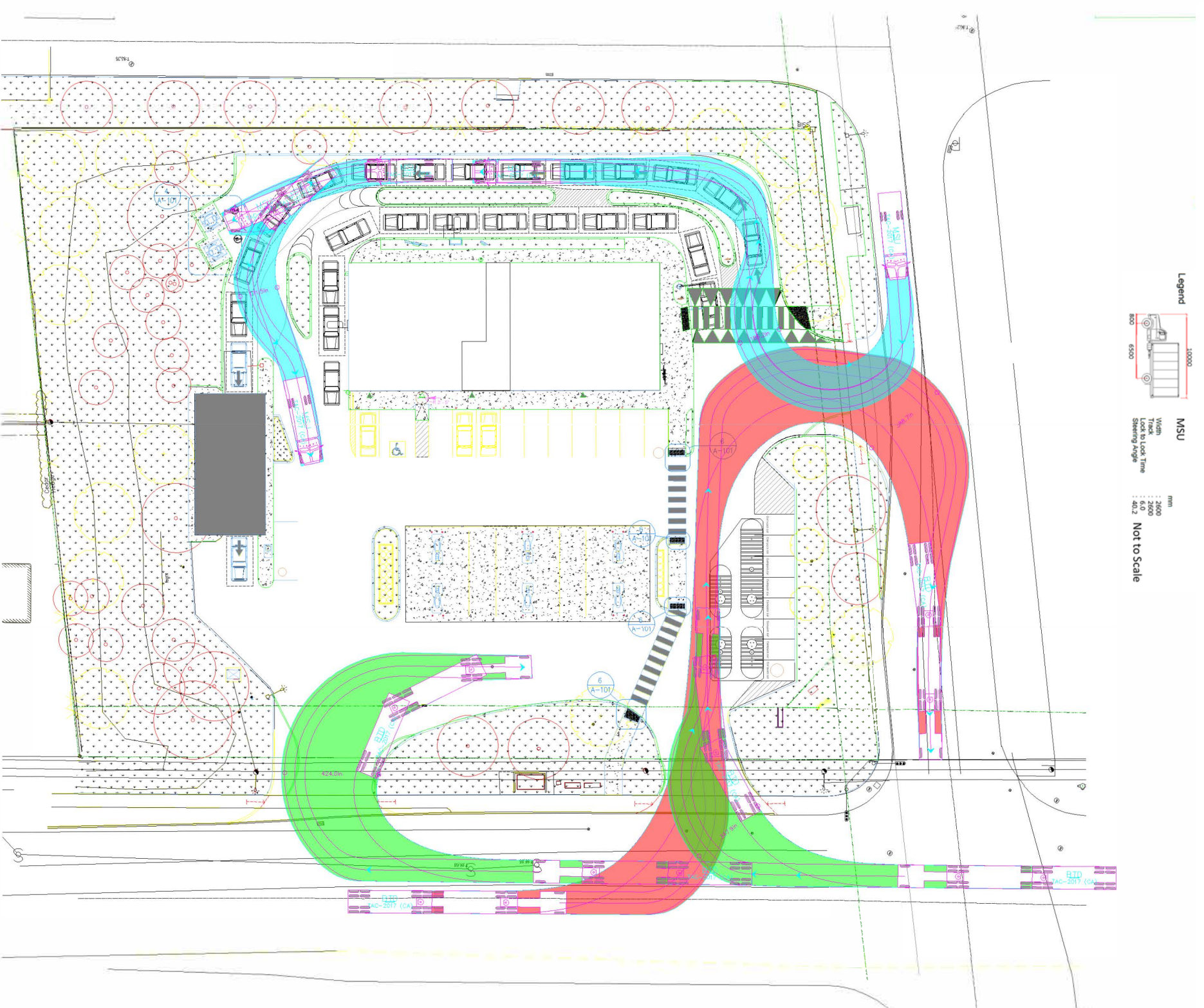
Appendix E:

Exemption Table

Module	Criteria	Inclusion
Design Review Component		
4.1.1: Development for Sustainable Modes	All	Yes
4.1.2: Circulation and Access	All site plan and zoning by-law applications	Yes
4.1.3: New Street Networks	Subdivisions Only	No
4.2.1: Parking Supply	All site plan and zoning by-law applications	Yes
4.2.2: Spillover	Deleted	No
4.3: Boundary Street Design	All	Yes
4.5.1: Context for TDM	All	No
4.5.2: Need and Opportunity	All	No
4.5.3: TDM Program	All	No
3.2: Background Network Travel Demands	> 75 auto and/or transit trips	Yes
3.3: Demand Rationalization	> 75 auto trips	Yes
Network Impact Component		
4.6: Neighborhood Traffic Calming	Reference criteria	No
4.7.1: Transit Route Capacity	> 75 transit trips	No
4.7.2: Transit Priority Requirements	> 75 auto trips	Yes
4.8: Network Concept	> 200 person trips > zoning	No
4.9.1: Intersection Controls & 4.4.2: Access Control)	> 75 auto trips	Yes
4.9.2: Intersection Design & 4.4.3: Access Design	> 75 auto trips	Yes

Appendix F:

Truck Turning Templates



Appendix G:

MMLOS: Road Segments

Multi-Modal Level of Service - Segments Form

Consultant

Scenario

Comments

Parsons

Existing and Future

Project

Date

560 Merivale

1/22/2024

SEGMENTS		Street	Merivale	Vmnt (N side)	Vmnt (S side)	Glnmnr (E)	Glnmnr (W)	Section	Section	Section	Section
			Vwmnt to Clnde	Mrvle to Glnmnr	Mrvle to Glnmnr	Vmnt to Kngsbry	Vmnt to Kngsbry	6	7	8	9
Pedestrian	Sidewalk Width	F	≥ 2 m	≥ 2 m	1.5 m	no sidewalk	< 1.5 m				
	Boulevard Width		< 0.5	< 0.5	> 2 m	n/a	n/a				
	Avg Daily Curb Lane Traffic Volume		> 3000	> 3000	> 3000	≤ 3000	≤ 3000				
	Operating Speed		> 60 km/h	> 30 to 50 km/h	> 30 to 50 km/h	> 30 to 50 km/h	> 30 to 50 km/h				
	On-Street Parking		no	no	no	yes	yes				
	Exposure to Traffic PLoS		F	C	D	F	F	-	-	-	-
	Effective Sidewalk Width		3.5 m	2.0 m	1.5 m		1.2 m				
	Pedestrian Volume		250 ped/hr	250 ped/hr	250 ped/hr		250 ped/hr				
	Crowding PLoS		A	B	B	-	B	-	-	-	-
Level of Service	F	C	D	-	F	-	-	-	-		
Bicycle	Type of Cycling Facility	F	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic				
	Number of Travel Lanes		4-5 lanes total	2-3 lanes total	2-3 lanes total	≤ 2 (no centreline)	≤ 2 (no centreline)				
	Operating Speed		≥ 60 km/h	≥ 50 to 60 km/h	≥ 50 to 60 km/h	≥ 50 to 60 km/h	≥ 50 to 60 km/h				
	# of Lanes & Operating Speed LoS		F	E	E	D	D	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge	< 1.8 m refuge				
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes	≤ 3 lanes				
	Sidestreet Operating Speed		≤ 40 km/h	>40 to 50 km/h	>40 to 50 km/h	>40 to 50 km/h	>40 to 50 km/h				
	Unsignalized Crossing - Lowest LoS		A	B	B	B	B	-	-	-	-
	Level of Service		F	E	E	D	D	-	-	-	-
	Transit		Facility Type	D	Mixed Traffic						
Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8									
Level of Service		D	-		-	-	-	-	-	-	-
Truck	Truck Lane Width	A	≤ 3.5 m								
	Travel Lanes per Direction		> 1								
	Level of Service		A	-	-	-	-	-	-	-	-

Appendix H:

MMLOS: Intersections

Multi-Modal Level of Service - Intersections Form

Consultant

Scenario

Comments

Parsons

Existing and Future

Project

Date

Merivale 478765

1/22/2024

Unlocked Rows for Replicating

INTERSECTIONS		Merivale/Viewmount (Existing)				Merivale/Viewmount (Future)				Intersection C			
Crossing Side		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	7	6	4	6	7	6	4	6				
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m				
	Conflicting Left Turns	Protected/ Permissive	Protected/ Permissive	Permissive	Protected/ Permissive	Protected/ Permissive	Protected/ Permissive	Permissive	Protected/ Permissive				
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control				
	Right Turns on Red (RTor) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed				
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No				
	Right Turn Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel	No Channel				
	Corner Radius	10-15m	10-15m	5-10m	5-10m	10-15m	10-15m	5-10m	5-10m				
	Crosswalk Type	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings	Zebra stripe hi-vis markings				
	PETSI Score	7	23	57	24	7	23	57	24				
	Ped. Exposure to Traffic LoS	F	F	D	F	F	F	D	F	-	-	-	-
	Cycle Length	120	120	120	120	120	120	120	120				
	Effective Walk Time	24	24	21	21	24	24	21	21				
Average Pedestrian Delay	38	38	41	41	38	38	41	41					
Pedestrian Delay LoS	D	D	E	E	D	D	E	E	-	-	-	-	
Level of Service	F	F	E	F	F	F	E	F	-	-	-	-	
	F				F				-				
Approach From		NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic				
	Right Turn Lane Configuration												
	Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h				
	Cyclist relative to RT motorists	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-	-	-	-
	Separated or Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	-	-	-	-
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed				
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h				
	Left Turning Cyclist	F	F	D	D	F	F	D	D	-	-	-	-
	Level of Service	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	-	-	-	-
#N/A				#N/A				-					
Transit	Average Signal Delay	≤ 40 sec	≤ 40 sec	> 40 sec	> 40 sec	≤ 40 sec	> 40 sec	> 40 sec	> 40 sec				
	Level of Service	E	E	F	F	E	F	F	F	-	-	-	-
		F				F				-			
Truck	Effective Corner Radius	10 - 15 m	10 - 15 m	< 10 m	< 10 m	10 - 15 m	10 - 15 m	< 10 m	< 10 m				
	Number of Receiving Lanes on Departure from Intersection	1	1	≥ 2	≥ 2	1	1	≥ 2	≥ 2				
	Level of Service	E	E	D	D	E	E	D	D	-	-	-	-
		E				E				-			
Auto	Volume to Capacity Ratio												
	Level of Service	-				-				-			

Appendix I:

Synchro Analysis Results

Lanes, Volumes, Timings

1: Merivale & Viewmount

Existing AM

12/18/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	93	109	196	91	62	120	1225	246	30	757	14
Future Volume (vph)	45	93	109	196	91	62	120	1225	246	30	757	14
Satd. Flow (prot)	1712	1534	0	1712	1672	0	1712	3259	0	1712	3408	0
Flt Permitted	0.650			0.307			0.275			0.065		
Satd. Flow (perm)	1155	1534	0	516	1672	0	488	3259	0	117	3408	0
Satd. Flow (RTOR)		50			23			31			2	
Lane Group Flow (vph)	50	224	0	218	170	0	133	1634	0	33	857	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.9	29.9		17.0	29.9		26.7	26.7		26.7	26.7	
Total Split (s)	31.0	31.0		17.0	48.0		62.0	62.0		62.0	62.0	
Total Split (%)	28.2%	28.2%		15.5%	43.6%		56.4%	56.4%		56.4%	56.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9		2.9	2.9		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)	19.6	19.6		36.5	36.5		61.9	61.9		61.9	61.9	
Actuated g/C Ratio	0.18	0.18		0.33	0.33		0.56	0.56		0.56	0.56	
v/c Ratio	0.24	0.71		0.75	0.30		0.49	0.88		0.51	0.45	
Control Delay	39.2	44.8		44.5	23.5		24.2	29.1		50.2	15.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.2	44.8		44.5	23.5		24.2	29.1		50.2	15.9	
LOS	D	D		D	C		C	C		D	B	
Approach Delay		43.8			35.3			28.7			17.2	
Approach LOS		D			D			C			B	
Queue Length 50th (m)	8.1	31.0		30.6	19.7		16.6	153.1		4.2	54.4	
Queue Length 95th (m)	17.7	53.8		#48.2	34.2		36.6	#209.6		#19.8	70.8	
Internal Link Dist (m)		79.0			150.7			219.4			126.3	
Turn Bay Length (m)	20.0			77.0			50.0			100.0		
Base Capacity (vph)	263	388		291	654		274	1848		65	1919	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.58		0.75	0.26		0.49	0.88		0.51	0.45	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 27.6

Intersection LOS: C

Intersection Capacity Utilization 103.5%

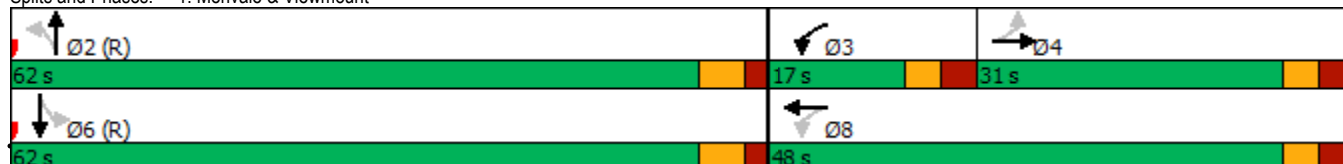
ICU Level of Service G

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Viewmount



Existing AM 10:51 am 01/19/2024 Baseline

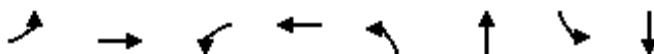
Synchro 11 Report

Page 1

Lanes, Volumes, Timings

1: Merivale & Viewmount

Existing PM
01/23/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	38	81	315	159	194	1133	32	1037
Future Volume (vph)	38	81	315	159	194	1133	32	1037
Lane Group Flow (vph)	42	223	350	206	216	1517	36	1202
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	29.9	29.9	10.9	29.9	10.7	26.7	10.7	26.7
Total Split (s)	31.0	31.0	18.0	49.0	17.0	60.0	11.0	54.0
Total Split (%)	25.8%	25.8%	15.0%	40.8%	14.2%	50.0%	9.2%	45.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.7	3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	2.9	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	5.9	5.7	5.7	5.7	5.7
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)	18.0	18.0	36.0	36.0	72.4	65.2	57.6	51.5
Actuated g/C Ratio	0.15	0.15	0.30	0.30	0.60	0.54	0.48	0.43
v/c Ratio	0.26	0.78	1.36	0.39	0.75	0.86	0.24	0.83
Control Delay	46.8	54.1	214.3	33.2	42.6	31.3	16.7	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	54.1	214.3	33.2	42.6	31.3	16.7	37.0
LOS	D	D	F	C	D	C	B	D
Approach Delay		53.0		147.2		32.7		36.4
Approach LOS		D		F		C		D
Queue Length 50th (m)	8.2	35.4	~79.0	33.8	28.3	154.8	3.0	125.0
Queue Length 95th (m)	17.0	56.8	#121.8	48.9	#75.0	#222.7	8.1	153.0
Internal Link Dist (m)		79.0		150.7		106.5		126.3
Turn Bay Length (m)	20.0		77.0		50.0		100.0	
Base Capacity (vph)	225	378	258	631	287	1770	147	1454
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.59	1.36	0.33	0.75	0.86	0.24	0.83

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 52.1

Intersection LOS: D

Intersection Capacity Utilization 100.3%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Viewmount

	Ø1		Ø2 (R)		Ø3		Ø4
11 s		60 s		18 s		31 s	
	Ø5		Ø6 (R)		Ø7		Ø8
17 s		54 s		49 s			

Lanes, Volumes, Timings

1: Merivale & Viewmount

BG 2031 AM

12/18/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	93	109	196	91	62	120	1276	246	30	794	14
Future Volume (vph)	45	93	109	196	91	62	120	1276	246	30	794	14
Satd. Flow (prot)	1712	1534	0	1712	1672	0	1712	3265	0	1712	3408	0
Flt Permitted	0.660			0.338			0.297			0.082		
Satd. Flow (perm)	1172	1534	0	565	1672	0	526	3265	0	148	3408	0
Satd. Flow (RTOR)		50			29			30			2	
Lane Group Flow (vph)	45	202	0	196	153	0	120	1522	0	30	808	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.9	29.9		17.0	29.9		26.7	26.7		26.7	26.7	
Total Split (s)	31.0	31.0		17.0	48.0		62.0	62.0		62.0	62.0	
Total Split (%)	28.2%	28.2%		15.5%	43.6%		56.4%	56.4%		56.4%	56.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9		2.9	2.9		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)	18.9	18.9		35.9	35.9		62.5	62.5		62.5	62.5	
Actuated g/C Ratio	0.17	0.17		0.33	0.33		0.57	0.57		0.57	0.57	
v/c Ratio	0.23	0.66		0.65	0.27		0.40	0.81		0.36	0.42	
Control Delay	39.3	41.6		38.1	21.8		20.4	24.6		31.0	15.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.3	41.6		38.1	21.8		20.4	24.6		31.0	15.2	
LOS	D	D		D	C		C	C		C	B	
Approach Delay		41.2			30.9			24.3			15.8	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	7.3	26.6		27.1	16.4		14.1	133.0		3.4	50.4	
Queue Length 95th (m)	16.5	48.1		43.7	30.1		29.5	166.0		13.4	64.4	
Internal Link Dist (m)		256.8			250.7			358.1			391.4	
Turn Bay Length (m)	20.0			77.0			50.0			100.0		
Base Capacity (vph)	267	388		303	657		298	1868		84	1938	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.52		0.65	0.23		0.40	0.81		0.36	0.42	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.81												
Intersection Signal Delay: 24.1						Intersection LOS: C						
Intersection Capacity Utilization 105.0%						ICU Level of Service G						
Analysis Period (min) 15												

Splits and Phases: 1: Merivale & Viewmount

 Ø2 (R)	 Ø3	 Ø4
62 s	17 s	31 s
 Ø5 (R)	 Ø6	
62 s	48 s	

Lanes, Volumes, Timings

1: Merivale & Viewmount

BG 2031 PM

08/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	81	120	315	159	26	194	1187	232	32	1080	45
Future Volume (vph)	38	81	120	315	159	26	194	1187	232	32	1080	45
Satd. Flow (prot)	1712	1598	0	1712	1745	0	1712	3243	0	1712	3382	0
Fit Permitted	0.641			0.265			0.106			0.091		
Satd. Flow (perm)	1099	1598	0	469	1745	0	191	3243	0	164	3382	0
Satd. Flow (RTOR)		56			8			25			4	
Lane Group Flow (vph)	38	201	0	315	185	0	194	1419	0	32	1125	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.9	29.9		10.9	29.9		10.7	26.7		10.7	26.7	
Total Split (s)	31.0	31.0		18.0	49.0		17.0	60.0		11.0	54.0	
Total Split (%)	25.8%	25.8%		15.0%	40.8%		14.2%	50.0%		9.2%	45.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9		2.9	2.9		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Act Effct Green (s)	16.5	16.5		37.7	37.7		70.7	63.3		58.1	51.9	
Actuated g/C Ratio	0.14	0.14		0.31	0.31		0.59	0.53		0.48	0.43	
v/c Ratio	0.25	0.75		1.03	0.33		0.70	0.82		0.20	0.77	
Control Delay	47.8	52.1		97.5	31.5		31.9	29.8		15.1	33.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	47.8	52.1		97.5	31.5		31.9	29.8		15.1	33.9	
LOS	D	D		F	C		C	C		B	C	
Approach Delay		51.4			73.1			30.1			33.4	
Approach LOS		D			E			C			C	
Queue Length 50th (m)	7.5	30.7		~63.2	30.5		17.5	132.0		2.5	103.4	
Queue Length 95th (m)	16.1	50.7		#100.1	44.6		#50.7	#198.5		7.3	138.7	
Internal Link Dist (m)		256.8			250.7			358.1			391.4	
Turn Bay Length (m)	20.0			77.0			50.0			100.0		
Base Capacity (vph)	229	378		306	631		282	1723		159	1465	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.53		1.03	0.29		0.69	0.82		0.20	0.77	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 38.8

Intersection LOS: D

Intersection Capacity Utilization 101.8%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Merivale & Viewmount

														
Ø1	Ø2 (R)		Ø3	Ø4		Ø5	Ø6 (R)		Ø7	Ø8		Ø9	Ø10	
11 s	60 s		18 s	31 s		17 s	54 s							

Lanes, Volumes, Timings

1: Merivale & Viewmount

Projected 2031 AM

12/18/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	96	109	196	94	62	151	1254	246	30	799	20
Future Volume (vph)	75	96	109	196	94	62	151	1254	246	30	799	20
Satd. Flow (prot)	1712	1524	0	1712	1672	0	1712	3250	0	1712	3402	0
Flt Permitted	0.658			0.335			0.292			0.086		
Satd. Flow (perm)	1166	1524	0	555	1672	0	516	3250	0	155	3402	0
Satd. Flow (RTOR)		48			30			30			3	
Lane Group Flow (vph)	75	205	0	196	156	0	151	1500	0	30	819	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	29.9	29.9		17.0	29.9		26.7	26.7		26.7	26.7	
Total Split (s)	31.0	31.0		17.0	48.0		62.0	62.0		62.0	62.0	
Total Split (%)	28.2%	28.2%		15.5%	43.6%		56.4%	56.4%		56.4%	56.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9		2.9	2.9		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)	19.1	19.1		36.1	36.1		62.3	62.3		62.3	62.3	
Actuated g/C Ratio	0.17	0.17		0.33	0.33		0.57	0.57		0.57	0.57	
v/c Ratio	0.37	0.67		0.66	0.27		0.52	0.81		0.34	0.43	
Control Delay	43.3	42.5		38.0	21.6		24.8	24.5		29.6	15.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	43.3	42.5		38.0	21.6		24.8	24.5		29.6	15.4	
LOS	D	D		D	C		C	C		C	B	
Approach Delay		42.7			30.8			24.6			15.9	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	12.5	27.6		27.1	16.7		19.3	129.8		3.4	51.2	
Queue Length 95th (m)	24.6	49.2		43.4	30.6		41.1	164.0		13.0	66.0	
Internal Link Dist (m)		256.8			250.7			358.1			391.4	
Turn Bay Length (m)	20.0			77.0			50.0			100.0		
Base Capacity (vph)	266	384		301	658		292	1853		87	1927	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.28	0.53		0.65	0.24		0.52	0.81		0.34	0.43	
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.81												
Intersection Signal Delay: 24.5						Intersection LOS: C						
Intersection Capacity Utilization 104.5%						ICU Level of Service G						
Analysis Period (min) 15												

Splits and Phases: 1: Merivale & Viewmount

					
Ø2 (R)			Ø3		Ø4
62 s			17 s		31 s
					
Ø6 (R)			Ø8		
62 s			48 s		

Lanes, Volumes, Timings

1: Merivale & Viewmount

Projected 2031 PM

12/18/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	82	120	315	160	26	217	1165	232	32	1077	49
Future Volume (vph)	60	82	120	315	160	26	217	1165	232	32	1077	49
Satd. Flow (prot)	1712	1588	0	1712	1745	0	1712	3235	0	1712	3376	0
Flt Permitted	0.640			0.266			0.096			0.099		
Satd. Flow (perm)	1094	1588	0	468	1745	0	173	3235	0	178	3376	0
Satd. Flow (RTOR)		56			8			25			5	
Lane Group Flow (vph)	60	202	0	315	186	0	217	1397	0	32	1126	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)	29.9	29.9		10.9	29.9		10.7	26.7		10.7	26.7	
Total Split (s)	31.0	31.0		18.0	49.0		17.0	60.0		11.0	54.0	
Total Split (%)	25.8%	25.8%		15.0%	40.8%		14.2%	50.0%		9.2%	45.0%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9		2.9	2.9		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9	5.9		5.9	5.9		5.7	5.7		5.7	5.7	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min		None	C-Min	
Act Effct Green (s)	16.7	16.7		38.0	38.0		70.4	63.1		56.0	49.8	
Actuated g/C Ratio	0.14	0.14		0.32	0.32		0.59	0.53		0.47	0.42	
v/c Ratio	0.39	0.75		1.03	0.33		0.74	0.82		0.20	0.80	
Control Delay	52.8	52.3		95.9	31.4		38.4	29.5		15.2	36.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.8	52.3		95.9	31.4		38.4	29.5		15.2	36.5	
LOS	D	D		F	C		D	C		B	D	
Approach Delay		52.4			71.9			30.7			35.9	
Approach LOS		D			E			C			D	
Queue Length 50th (m)	12.0	30.9		~62.9	30.6		25.0	129.1		2.6	109.3	
Queue Length 95th (m)	22.9	50.9		#99.9	44.7		#68.0	#193.9		7.3	138.8	
Internal Link Dist (m)		256.8			250.7			358.1			391.4	
Turn Bay Length (m)	20.0			77.0			50.0			100.0		
Base Capacity (vph)	228	376		307	631		292	1713		161	1425	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.26	0.54		1.03	0.29		0.74	0.82		0.20	0.79	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 116 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 1.03												
Intersection Signal Delay: 39.9						Intersection LOS: D						
Intersection Capacity Utilization 102.1%						ICU Level of Service G						
Analysis Period (min) 15												
~ Volume exceeds capacity, queue is theoretically infinite.												
Queue shown is maximum after two cycles.												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Splits and Phases: 1: Merivale & Viewmount

														
Ø1	Ø2 (R)		Ø3	Ø4		Ø5	Ø6 (R)		Ø7	Ø8		Ø9	Ø10	Ø11
11 s	60 s		18 s	31 s		17 s	54 s							