

1009 Trim Road

Transportation Impact Study Report

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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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Strategy Report

Parsons has been retained by 9378-0633 Quebec Inc. to prepare a Transportation Impact Assessment (TIA) in support of a Zoning By-Law Amendment (ZBLA) for a mixed-use development located at 1009 Trim Road in Orléans. This document follows the new TIA process, as outlined in the City Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 5 – Transportation Impact Study Report. Note that a previous version was submitted on November 16th, 2020. This new version includes updates to the proposed site plan which include the addition of a new tower with additional units, commercial land uses and changes to internal roads.

1. Screening Form

The screening form confirmed the need for a TIA Report based on the Trip Generation trigger, given that the proposed development consists of four 24 to 32-storey buildings with approximately 960 residential units and commercial uses; The Location trigger given that the development is located within a Transit Oriented Development Zone (TOD) and within 600m of the future Trim LRT Station; and Safety trigger given that the proposed driveway is in the influence area of an adjacent intersection and there is documented safety concerns on boundary streets within 500m of the development. The Screening Form as well as City Comments and correspondence has been provided in **Appendix A**.

2. Scoping Report

2.1. Existing and Planned Conditions

2.1.1. PROPOSED DEVELOPMENT

As of August 2021, the intersection of Trim/Hwy 174 was permanently shifted approximately 250 meters to the east of its former location as part of the Confederation LRT Line expansion.

The proposed development is located at the municipal address of 1009 Trim Road at the north-east corner of the Tweddle Road and Jeanne D'Arc Boulevard intersection, with the eastern quadrant of the site fronting the new shifted Trim/Jeanne D'Arc intersection. The proposed study area includes the former intersection of Trim/Jeanne D'Arc (to be referred as Tweddle/Jeanne D'Arc from herein), the new realigned Trim/Jeanne D'Arc intersection and the new realigned Trim/Hwy 174 intersection, along with roadway segments adjacent to site or between intersections as shown in **Figure 1**. More details regarding the study area found in **Section 2.1.2**.

The site is located approximately within 250m of Highway 174, where there is an at-grade signalized intersection with Trim Road. It has a developable area of approximately 3.3 acres next to Jeanne D'Arc Boulevard. The land elevation was raised above the floodplain with necessary approvals from Rideau Valley Conservation Authority and is now above the floodplain. The site has full servicing capabilities from Jeanne D'Arc Boulevard and has road access from Jeanne D'Arc Boulevard and Trim Road.

Figure 1: Local Context



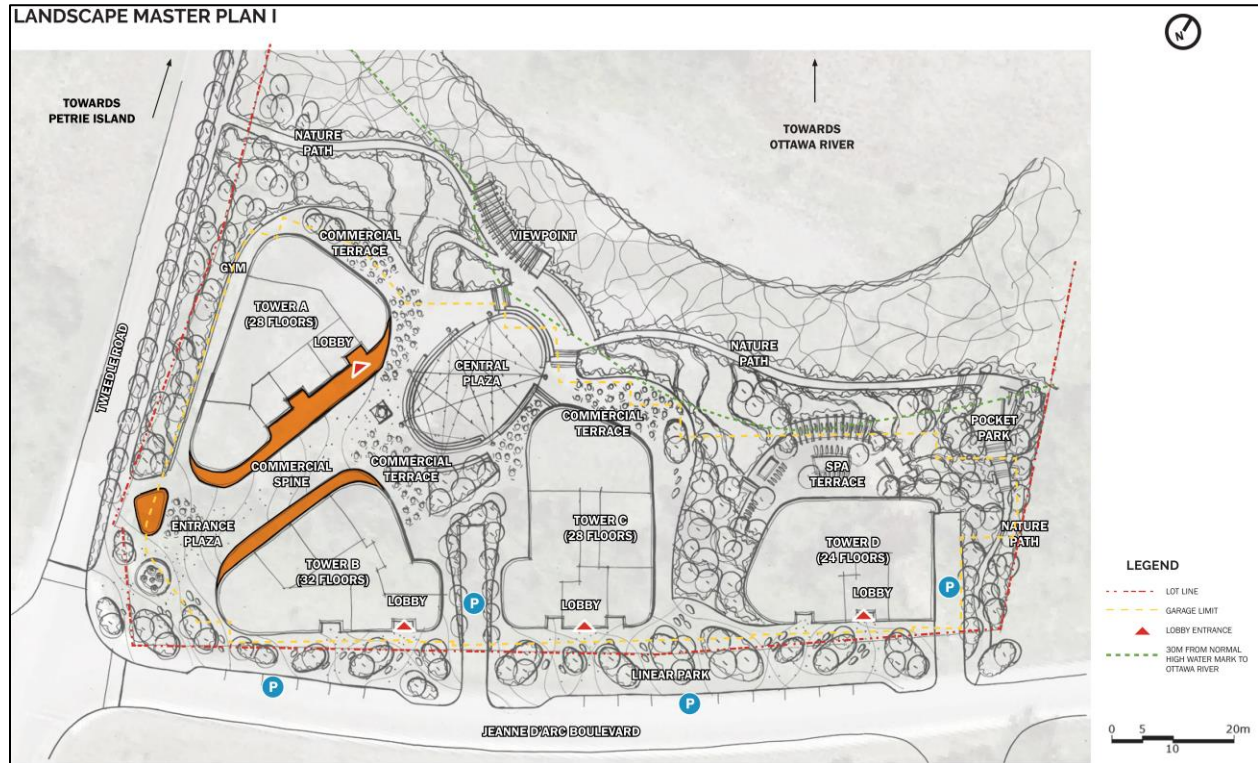
The existing site is vacant, and the property is currently zoned as DR (Development Reserve), which triggers the re-zoning application to allow high rise mixed-use buildings. The owners are currently seeking planning approvals for four apartment buildings of 24 to 32-storeys each connected by a pedestrian courtyard and a shared underground parking garage. The first and second floors propose multiple different commercial, retail and office uses as summarized in **Table 1**. For the purposes of this study, full buildout of the site has been assumed by 2029. Note, this estimate is highly dependent on market forces, but is considered the earliest possible date.

Table 1: Summary of Proposed Land Uses, Size and Location

Land Use	Unit or Size	Floor	Location
Residential	956 units	Levels 2+	Towers A, B, C and D
Retail	14,723 ft ²	Ground Floor	Towers A, B, C
Restaurant/Cafe	9,754 ft ²	Ground Floor	Towers A, B, C
General Office	19,850 ft ²	Level 2	Towers A, B
Spa/Health Club	11,433 ft ²	Ground Floor	Towers A, D

The proposed plan provides two two-way accesses off Jeanne D'arc Boulevard, leading to the underground parking garage. There are currently no surface parking spaces proposed. The accesses are proposed directly on to the Trim/Jeanne D'Arc intersection as a fourth leg (north leg), and the second access proposed approximately 75 meters east of the Tweddle/Jeanne D'Arc intersection. Approximately 575 parking spaces are expected within 2 levels of underground parking at this time. Onsite parking and design components have yet to be finalized and will be confirmed during the Site Plan Application. The current site plan concept is shown in **Figure 2**.

Figure 2: Proposed Site Plan



2.1.2. EXISTING CONDITIONS

Area Road Network

Ottawa Regional Road 174 (Hwy 174) is an east-west City-owned freeway, which extends from Hwy 417 in the west to Trim Road and continues east. Within the study area, Hwy 174 has a four-lane cross section and auxiliary turn lanes are provided at its intersection with the recently realigned Trim Road. The posted speed limit within the study area is 90 km/h.

Trim Road is classified as an arterial roadway which extends from Jeanne D'Arc Boulevard (formerly known as North Service Road) to beyond the town of Navan. Trim Road was recently realigned, being shifted approximately 250 meters east of its former location, displaced by the new location of future Trim LRT Station. Within the study area, Trim Road has a two-lane cross section north of Hwy 174 and a three-lane cross section south of Hwy 174 (two northbound, one southbound). The former Trim Road alignments towards Hwy 174 have been closed off and function as cul-de-sac driveways. The posted speed limit is 50 km/h.

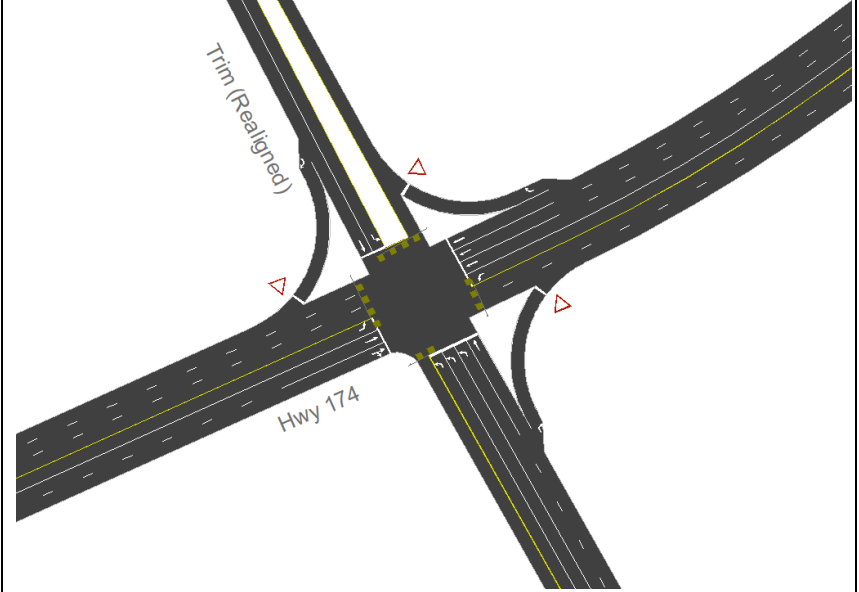
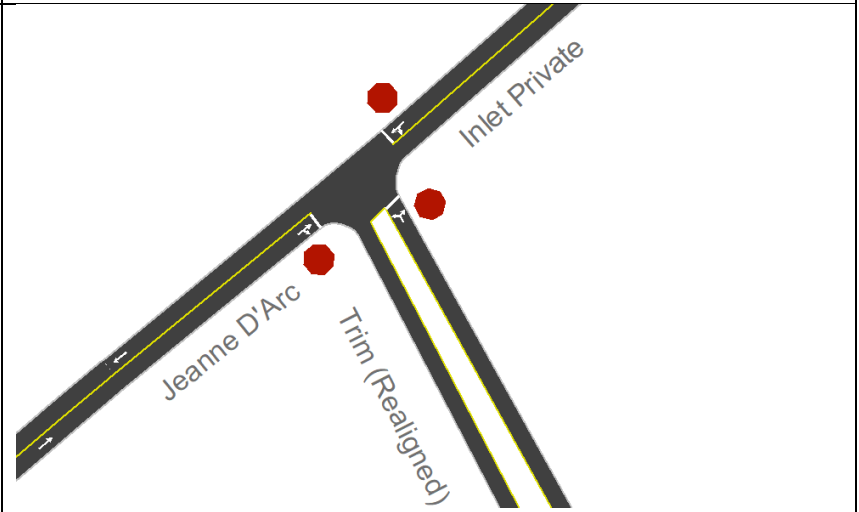
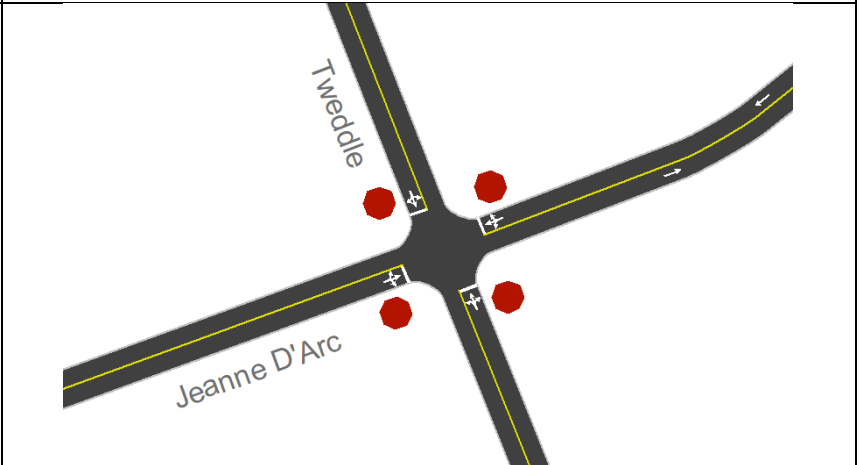
Jeanne D'Arc Boulevard is a major collector roadway west of the realigned Trim Road. East of Trim Road, Jeanne D'Arc Boulevard continues as Inlet Private as a local road. Within the study area, Jeanne D'Arc Boulevard has a two-lane cross section. The posted speed limit is 60 km/h.

Inlet Private is the continuation of Jeanne D'Arc Boulevard east of the realigned Trim Road and extends for about 200m to the east to Brigl Petrie's Landing I Towers. Inlet Private is a local roadway with an unposted speed limit assumed to be 50km/h.

Tweddle Road is the northern continuation of former Trim Road, extending from Jeanne D'Arc Boulevard to Petrie Island Beach. South of Jeanne D'Arc Boulevard, Tweddle Road operates as a cul-de-sac. Tweddle Road is a local road with a posted speed limit of 40km/h.

Existing Study Area Intersections

The Trim/Hwy 174 was recently relocated approximately 250 meters east of the former location. The design shown and described below shows the ultimate buildout design, however it is acknowledged that the existing intersection is mostly the same with the exception that it has a double northbound left instead of triple left and the westbound approach has a double through lane and two receiving lanes as opposed to three.

<p>Trim/Hwy 174 (realigned – ultimate)</p> <p>The Trim/ Hwy 174 intersection is a signalized four-legged intersection. The eastbound approach consists of a single left-turn lane and two through lanes. The westbound approach consists of a single left-turn lane, a triple through lane and a channelized right-turn lane. The northbound approach consists of a triple left-turn lane, a single through lane and a channelized right-turn lane. The southbound approach consists of a single left-turn lane, a single through lane and a channelized right-turn lane. A bi-directional cross-ride is proposed on the east leg of the intersection.</p>	
<p>Trim/Jeanne D’Arc (realigned)</p> <p>The Trim/Jeanne D’Arc intersection is a three-legged intersection with all-way STOP control. All approaches consist of a single full-movement lane. The south approach proposes a bi-directional cross-ride facility which connects the proposed MUP on the east side of Trim Road to the MUP on the south side of Jeanne D’Arc Boulevard.</p>	
<p>Tweddle/Jeanne D’Arc</p> <p>The Tweddle/Jeanne D’Arc intersection is a four-legged intersection with all-way STOP control. All approaches consist of a single full-movement lane. Bi-directional cross-ride facilities are proposed on the east approach and north approach, connecting the MUP on the south side of Jeanne D’Arc east of Tweddle to the MUP on the north side of Jeanne D’Arc Boulevard west of Tweddle Road.</p>	

Existing Driveways to Adjacent Developments

Within 200m of the proposed site, there are only 4 driveways as shown in lime green boxes in **Figure 3**, which include:

- Brigil sales center – located on the south side of Jeanne D’Arc Boulevard, approximately 50m west of the Tweddle/Jeanne D’Arc intersection. Assumed to be temporary.
- City of Ottawa Maintenance Facility – located on the east side of former Trim Road, approximately 110m south of the Tweddle/Jeanne D’Arc intersection.
- Brigil Petrie’s Landing I Towers (2 accesses) – located on the north side of Inlet Private, approximately 160m east of the most eastern site point.

Figure 3: Existing Driveways Adjacent to Development



Existing Area Traffic Management Measures

Below are the existing area traffic management measures within the study area:

- Two “Prepare to Stop when Flashing” signals on Hwy 174, each approximately 600m to the west of Old Trim Road and 600m to the east of Trim Road; and,
- One High Deer Collision Corridor signal on Hwy 174 westbound approximately 300m to the west of Old Trim Road.

Pedestrian/Cycling Network

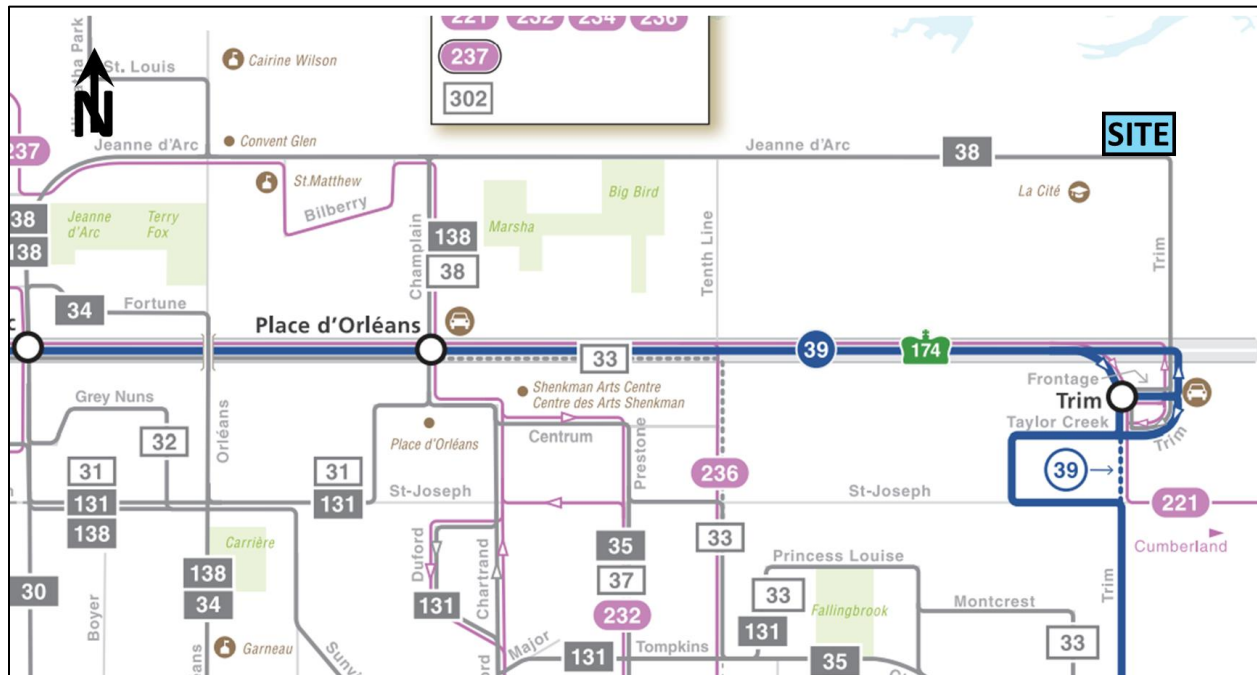
A sidewalk is provided on the south side of Jeanne D’Arc Boulevard and Inlet Private. The north side of Jeanne D’Arc Boulevard has a paved, separated multi-use pathway (MUP) which extends from Tweddle Road westward, but no facilities on the north side of Jeanne D’Arc Boulevard east of Tweddle Road. Sidewalk facilities were provided on the west side of former Trim Road on the north side of Hwy 174. South of Hwy 174, the east and west sides of former Trim Road have paved multi-use pathways (MUPs). Since the realignment of Trim/Hwy 174 intersection, these facilities have become fragmented with no connection crossing Hwy 174. New facilities have been incorporated on the realigned Trim Road, including a MUP on the east side from Jeanne D’Arc Boulevard to the most southernly point of Trim Road within the study area. The south side of Jeanne D’Arc Boulevard is currently under construction, with the addition of a new MUP.

The existing cycling map shows cycle tracks on the former Trim Road. Jeanne D'Arc Boulevard east of Tweddle has paved shoulders and a Multi-Use Pathway (MUP) on the north side of the road.

Transit Network

The transit network for the study area is illustrated in **Figure 4**. The following OC Transpo routes currently operate within 600m radius of the site frontage:

Figure 4: Area Transit Network

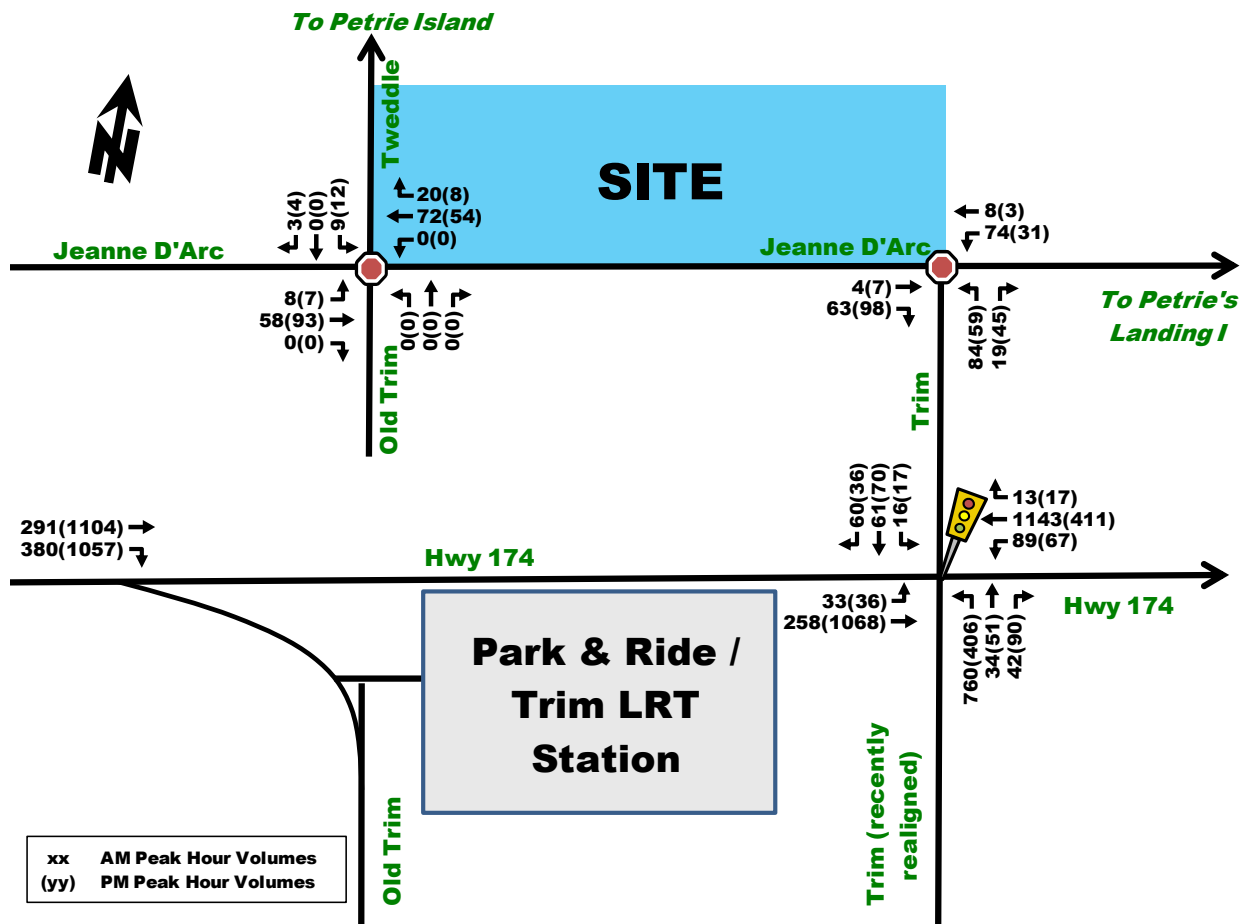


- **Route #38 (Blair <-> Jeanne D'Arc/Trim):** identified by OC Transpo as a “Local Route”, this route operates on customized routing and schedules, to serve local destinations with connection to the Confederation LRT Line. Route #38 operates at an average rate of every 30 minutes during weekdays. Bus stops for this route are available on both sides of Jeanne D'Arc Boulevard, adjacent to the site (stops #6353 and #6354).
- **Route #39 (Blair <-> Millenium):** identified by OC Transpo as a “Rapid Route”, this route operates at a high frequency with connection to the Confederation LRT Line. Route #39 operates 7 days a week, at an average rate of every 15 minutes or less during weekday peak hours. Bus stops for this route are available at Trim Station, located approximately 600m walk from the proposed site.

Peak Hour Travel Demands

The existing peak hour traffic volumes within the study area, as illustrated in **Figure 5**, were obtained from the City of Ottawa or conducted by Parsons. Note that counts were performed at the former Trim/Hwy 174 intersection and former Trim/Jeanne D'Arc intersection. The volumes were maintained but re-routed through the recently realigned intersections. Volumes from Petrie's Landing I, Tower 2 were also layered on top as it is fully occupied by now. The raw peak hour traffic volume count data has been provided in **Appendix B**.

Figure 5: Existing Peak Hour Traffic Volumes



Existing Road Safety Conditions

A five-year collision history data (2014-2018, inclusive) was requested and obtained from the City of Ottawa for all intersections and road segments within the study area. Upon analyzing the collision data, the total number of collisions observed within the study area was determined to be 104 collisions within the past five-years. The majority of the collisions 85 (82%) resulted in property damage only, 18 (17%) resulted in non-fatal injury and 1 (1%) resulted in a fatal injury. The fatal injury occurred on a clear, dark, dry night when a single vehicle ran off the road near the intersection of Trim/Hwy 174. The types of impact were broken down into the following: 57 (55%) rear end, 18 (17%) sideswipes, 12 (12%) single vehicle (other), 10 (10%) angled, 4 (4%) turning movement, 2 (2%) other and 1 (1%) approaching.

To help quantify the relative safety risk at intersections within the study area, an industry standard unit of measure for assessing collisions at an intersection was used based on the number collisions per million entering vehicles (MEV). An MEV value greater than 1.00 indicates a relatively high frequency of collisions; however, it does not explain the type or severity of collision. A secondary analysis is done to determine the severity of collision by representing the number of personal injuries as a percentage of the total number of collisions at a given intersection.

Locations with more than 6 recorded collisions were evaluated for MEV's and/or personal injury rates. A high propensity (MEV > 1.00 or %PIR > 30%) would signal a potential intersection design deficiency or other contributing factor, such as poor intersection geometry, blind spots, poor lighting, excessive speeds, high amount of entry/exit driveways etc.

At intersections within the study area, reported collisions have historically taken place at a rate of:

- 0.99 Collisions/MEV with 15% causing injury and 2% causing a fatality at the intersection of Trim/Hwy 174 (total of 62 collisions with 43 or 69% of all collisions involving rear end, likely to do with high operating speeds on Hwy 174 and high vehicle volumes). Note that the fatality is included within this intersection; however, it actually occurred on Hwy 174 where a vehicle ran off the road
- 0.98 Collisions/MEV with 22% causing injury at the intersection of Trim/Dairy/Taylor Creek (total of 32 collisions with 11 of them being sideswipes and 7 being angle, for a total of 56% of all collisions at this intersection, a more common type of collision witnessed at roundabouts)
- No collisions were recorded at the intersection of Trim/Jeanne D'Arc
- Both Trim/Hwy 174 and Trim/Dairy/Taylor Creek experienced Collision/MEV approaching 1 which is considered medium to high risk. It is likely that the medium to high MEV are due to the quantity of vehicles entering the intersections, high turning movements and operating speeds. None of the intersections had high injury rates (above 30% of all collisions) meaning that most collisions were not severe

Other collisions within the study area include:

- There was a total of 10 collisions between intersections (mid-block segments)
- Out of all collisions, only 2 involved cyclists and they both occurred between intersections in mid-block segments on Trim Road
- There were no registered collisions with pedestrians

Overall, there are no safety concerns along the frontage of the proposed development and the planned Trim Road realignment is expected to significantly alter the roadway landscape within the broader study area. Therefore, no mitigation measures were considered. The source collision data as provided by the City of Ottawa and related analysis is provided as **Appendix C**.

2.1.3. PLANNED CONDITIONS

Planned Study Area Transportation Network Changes

Stage 2 LRT and Hwy 174 Modifications

Stage 2 of the City of Ottawa LRT system is currently under construction. Stage 2, as shown in **Figure 6**, is a package of three extensions – south, east and west – totaling 44 km of new rail and 24 new LRT stations. The subject site will be located within 300m of Trim Station, the east-most station along Confederation Line.

Construction of the new Trim LRT Station is currently underway. As part of the construction, the former Trim/Hwy 174 at-grade intersection was relocated approximately 250 meters east to allow for the new LRT station to be located at the former location of the intersection. **Section 4.1** will provide further detail on active transportation facilities proposed at the new intersection once built to full buildout. At the moment, the new relocated Trim/Hwy 174 intersection has been built to interim conditions while the construction of the future Trim LRT Station is ongoing.

The Trim Road Park and Ride Facility will be modified to include a new bus loop, bus lay-bys, and bus station platforms. It is noteworthy that the subject site is located approximately 500m from the future Trim Road LRT Station and is therefore considered to be within the Trim Station TOD area.

Figure 7 illustrates the planned LRT station location and recently constructed interchange at Trim/Hwy 174. This new intersection location accommodates the LRT rail tracks. Trim Road was truncated both north and south of Hwy 174 to accommodate the new station. Trim Road to the south of Hwy 174 has been realigned to the realigned Trim Road roundabout connection with Taylor Creek Drive.

Figure 6: Stage 2 LRT System Map

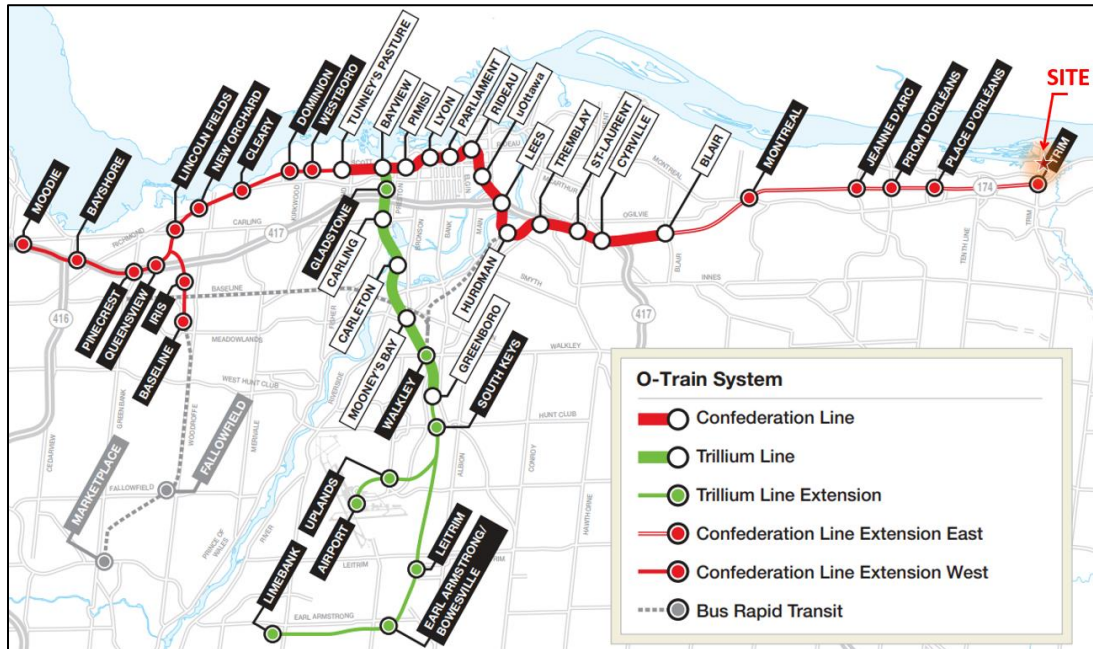
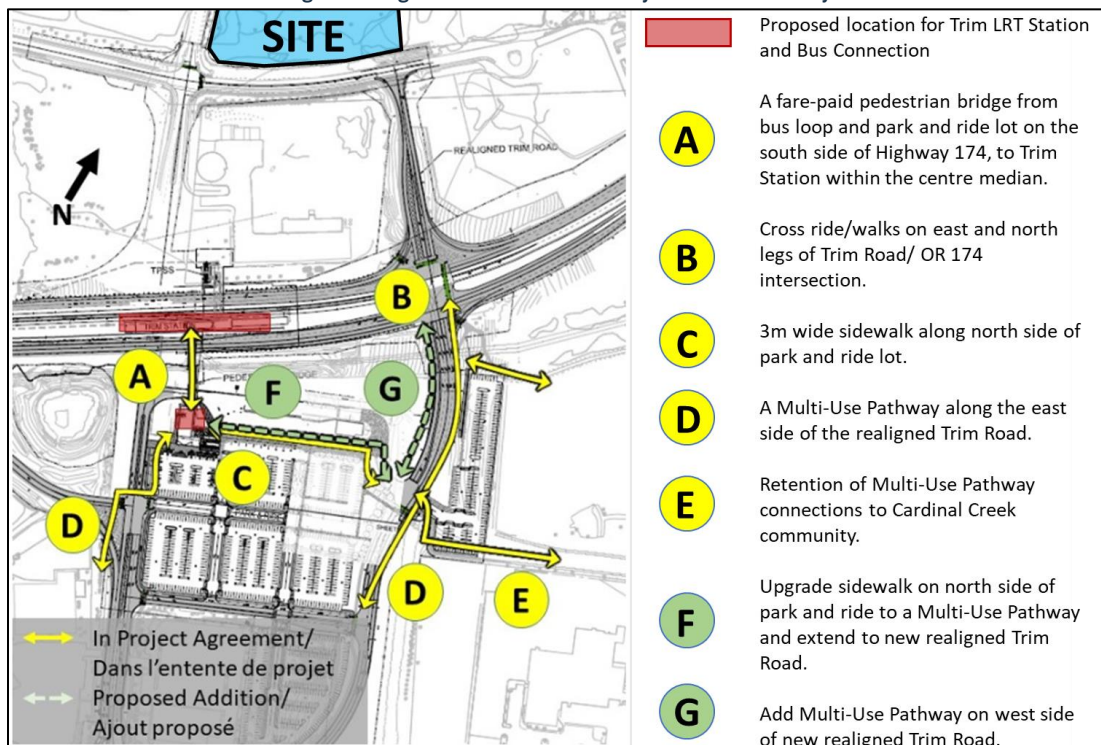


Figure 7: Stage 2 LRT Station Connectivity Enhancement Study



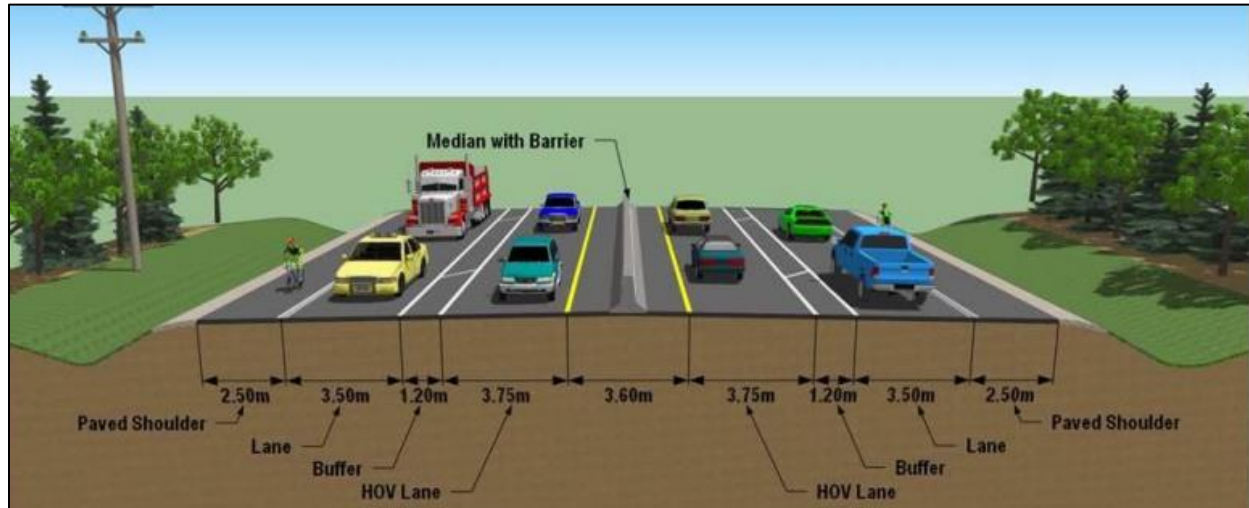
Source: <https://ottawa.ca/en/city-hall/public-engagement/projects/stage-2-lrt-station-connectivity-enhancement-study>

Figure 7 is only a preliminary design and subject to change as the detailed design of the realignment is still ongoing. The precise location and types of facilities proposed by the new realigned Trim/Hwy 174 and new Trim/Jeanne D'Arc have yet to be finalized within the final detailed design plan. **Section 4.1** will provide additional details.

Hwy 174 Widening

An Environmental Assessment for the potential widening of Hwy 174 was conducted by the Townships of Prescott-Russell/City of Ottawa. The widening of Hwy 174 to six-lanes from Hwy 417 to Trim Road and to four-lanes from Trim Road to the City boundary is identified as a road project in the current 2013 City of Ottawa Transportation Master Plan. However, the widening of Hwy 174 is not identified as part of the Affordable Network Plan within the TMP. Therefore, the road widening of Hwy 174 east of Trim Road is unlikely within the foreseeable future. A potential cross-section is illustrated in **Figure 8**.

Figure 8: Hwy 174 Widening Potential Cross-Section East of the Site

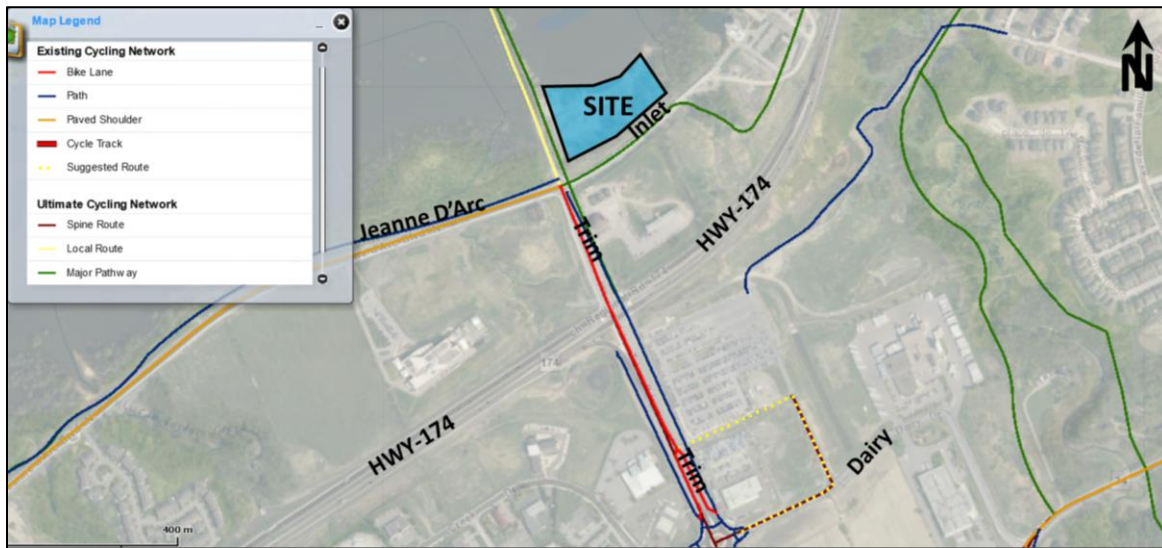


Source: <http://ottwatch.ca/meetings/file/366361>

Cycling Network

Within the Ottawa 2013 Cycling Plan, Tweddle Road is classified as a 'local route'. A major pathway is proposed on the south side of Jeanne D'Arc Boulevard east of Tweddle Road, extending beyond the Trim/Jeanne D'Arc intersection and continuing between Brigil Petrie's Landing I development and Hwy 174 towards the Cardinal Creek pathways. A connection between the pathway on the south side of Jeanne D'Arc Boulevard to the Trim LRT Station is proposed on the east side of Trim Road from Jeanne D'Arc Boulevard to the park and ride signalized intersection, where it continues on the west side of Trim Road to the former cycle facilities. The MUP on the north side of Jeanne D'Arc Boulevard, west of Tweddle Road is classified as a major pathway, while the on-road facilities are classified as a spine route. Trim Road facilities are also classified as spine route. **Figure 9** depicts the existing and future network. Note that the latest information on GeoOttawa does not reflect the realignment of Trim Road. Cycle facilities are proposed on the realigned Trim Road. It is assumed the realigned Trim Road will maintain the same cycling classification and facilities as the former Trim Road proposes.

Figure 9: Existing and Future ‘Ultimate Cycling Network’

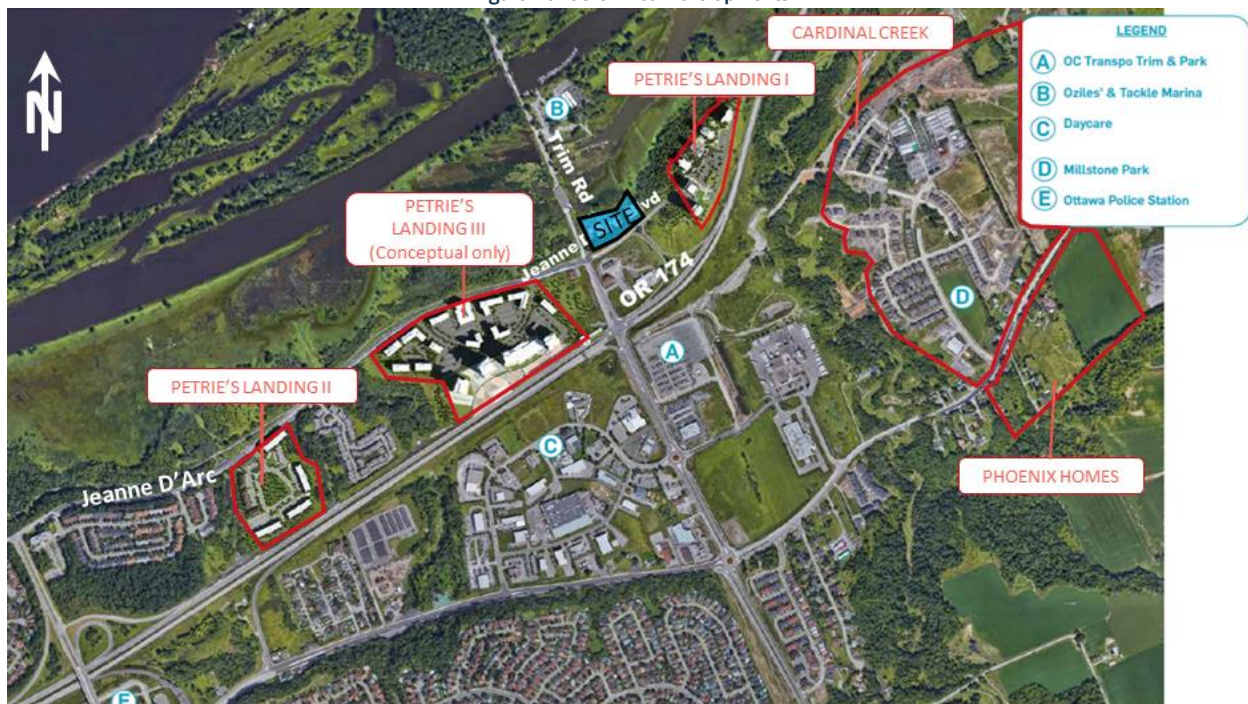


Source: Geoottawa.ca

Other Area Developments

The following section outlines adjacent developments in the general area that were considered in the TIA. The criteria for inclusion of other area developments are either approved developments or developments that have an active planning application in the City. **Figure 10** illustrates the location and relative size of relevant other area developments.

Figure 10: Other Area Developments



*Note: The above image shows the previous Trim/Jeanne D'Arc design concept as part of Stage 2 LRT, which was an overpass. This has since been modified into an at-grade intersection located approximately 250 meters east of the shown interchange. Refer to **Figure 7** for additional details.*

Petrie's Landing I

Brigil is proposing the construction of a residential development consisting of approximately 1,130 residential units total within 5 towers (including the increase of 44 units for tower 4 captured in the June 23rd, 2021, addendum by Parsons). At the time this report was written, towers 1 and 2 are occupied and tower 3 is under construction; however, the most recent count reflects trip volumes from tower 1 only and will have the remainder tower volumes layered on separately. The proposed Petrie's Landing I is located off of Inlet Private and is located approximately 300m east of the subject site, as illustrated in **Figure 11**. The projected two-way vehicle trips to be layered on for this proposed residential development are approximately 300 to 270 veh/h during the AM and PM peak hours respectively according to a TIA prepared by Parsons (July 2019) plus addendum (June 2021). The most recent site plan for Petrie's Landing I has been provided in **Appendix D**.

Petrie's Landing II

Brigil is proposing the construction of a residential development consisting of approximately 460 residential units total within 8 block buildings. At the time this report was written, blocks 1 through 5 are occupied, blocks 6 and 7 are under construction and block 8 has been decreased from 214 to 113 units as per the latest update done by Parsons on February 23, 2021. The most recent count reflects trip volumes from blocks 1 through 5 only and will have the remainder block volumes layered on separately. The proposed Petrie's Landing II is located south of Jeanne D'Arc Boulevard, approximately 1.2 km west of the subject site, as illustrated in **Figure 11**. The projected two-way vehicle trips to be layered on for this proposed residential development are approximately 155 to 130 veh/h during the AM and PM peak hours, respectively according to a TIA prepared by Parsons (February 2021). The most recent site plan for Petrie's Landing II has been provided in **Appendix D**.

Petrie's Landing III

Brigil is proposing the construction of a mixed-use development consisting of approximately 370,000 ft² of office, 23,000 ft² of retail and up to 790 residential units. The proposed Petrie's Landing III is located south of Jeanne D'Arc Boulevard, approximately 600m west of the subject site, as illustrated in **Figure 11**. The projected two-way vehicle trips for this proposed mixed-use development is approximately 660 and 685 veh/h during the morning and afternoon peak hours respectively, was derived within the approved Petrie's Landing I Report completed in July 2019, by Parsons.

Figure 11: Petrie's Landing I, II & III Concept Plan

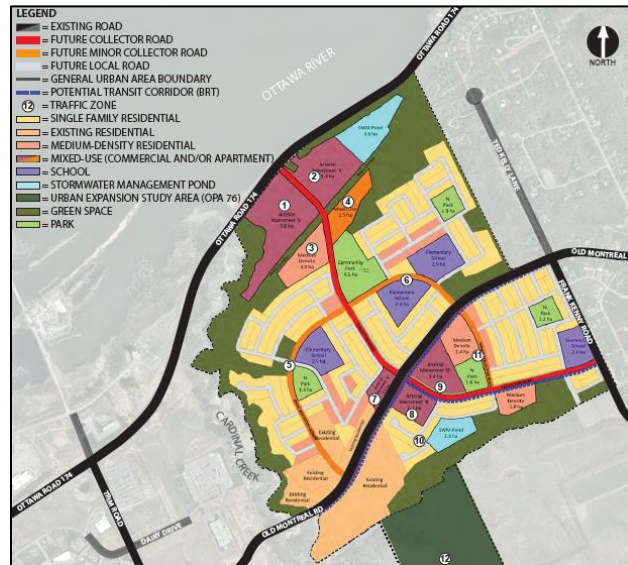


Note: The above image shows the previous Trim/Jeanne D'Arc design concept as part of Stage 2 LRT, which was an overpass. This has since been modified into an at-grade intersection. Refer to **Figure 7** for additional details.

Cardinal Creek

Tamarack Homes is currently constructing a 1,446-unit subdivision and a 430,000 ft² shopping centre, south of Hwy 174 and east of Cardinal Creek, as illustrated in **Figure 12**. The Transportation Impact Study (prepared by IBI Group, October 2013) projected approximately 1,460 veh/h and 2,619 veh/h by horizon year 2031 (full build-out) during the morning and afternoon peak hours, respectively.

Figure 12: Cardinal Creek Village



Phoenix Homes

Phoenix Homes is currently constructing a subdivision consisting of 432 terrace flats, 35 townhomes and 16 semi-detached homes along Old Montreal Road, within Cardinal Creek Village. The Transportation Impact Study (prepared by WSP Group, March 2018) projected approximately 251 veh/h and 295 veh/h by horizon year 2022 (full build-out) during the morning and afternoon peak hours, respectively.

2.2. Study Area and Time Periods

Full buildout of the proposed residential development is forecasted by 2029. Given that this is a Zoning By-Law Amendment only (ZBLA) and the 2029 horizon plus 5 years exceeds the 2031 TMP horizon, then only the 2029 horizon for target mode shares and TRANS 2020 mode shares will be analyzed, using the weekday morning and afternoon peak hour time periods. Once Site Plan Applications (SPA) are individually filed for each tower, then the horizon plus 5 years for each phase will be analyzed.

Considering construction trends of the past years, the following phasing has been assumed for other area developments (the earliest possible assumed buildout):

Year 2029:

- Estimated Full Buildout
- Stage 2 LRT - Trim Station open
- Petrie's Landing I – 100% built;
- Petrie's Landing II – 100% built;
- Petrie's Landing III – 50% built;
- Cardinal Creek – 90% built; and,
- Phoenix Homes – 100% built.

3. Forecasting Report

3.1. Development Generated Travel Demand

3.1.1. TRIP GENERATION AND MODE SHARES

Appropriate trip generation rates for the proposed residential aspect of the development consisting of approximately 960 high-rise condominium units within four towers were obtained from the City's newly revised 2020 TRANS Trip Generation Manual. The commercial uses were obtained from ITE's Trip Generation Manual 10th edition. These rates have been summarized in **Table 3**. Note that for the purpose of this assessment, retail was assumed as shopping center, the food land uses as quality restaurant, and the spa/health treated as a health/fitness club within acceptable ITE land uses available.

Table 3: 2020 TRANS Residential Trip Generation Rates & ITE Commercial Rates

Land Use	Data Source	Units or Size	Trip Rates	
			AM Peak	PM Peak
High Rise Condos	TRANS 2020	956 units	$T = 0.80(du)$	$T = 0.90(du)$
Shopping Center	ITE 820	14,723 ft ²	$T = 0.94(x)$	$T = 3.81(x)$
Quality Restaurant	ITE 931	9,754 ft ²	$T = 0.73(x)$	$T = 7.80(x)$
General Office	ITE 710	19,850 ft ²	$\ln(T) = 0.72\ln(x) + 0.56$	$T = 0.27(x) + 23.57$
Health/Fitness Club	ITE 492	11,433 ft ²	$T = 1.31(x)$	$\ln(T) = 0.67\ln(x) + 2.44$

Note: T = Average Vehicle Trip Ends; du = dwelling units; x = GFA in 1,000 ft²

Using the TRANS Trip Generation rates, the total amount of person trips generated by the proposed 956 residential units was calculated. The results are summarized in **Table 4**.

Table 4: Projected Residential Peak Period Person Trip Generation – TRANS Model

Land Use	Dwelling Units	AM Peak Period Person Trips	PM Peak Period Person Trips
Four Residential Towers	956	765	860

The projected site peak period person trips were then divided based on the mode shares for Orléans according to TRANS 2020 table 5, as summarized in **Table 5**.

Table 5: Residential Peak Period Trips using TRANS 2020 Mode Shares

Travel Mode	AM Peak Period		PM Peak Period	
	Mode Share	Person Trip	Mode Share	Person Trips
Auto Driver	54%	414	61%	521
Auto Passenger	7%	54	12%	109
Transit	29%	219	21%	181
Cycling	0%	0	0%	0
Walking	10%	77	6%	51
Total Person Trips	100%	765	100%	860

Standard traffic analysis is usually conducted using the morning and afternoon peak hour trips as they represent a worst-case scenario. The 2020 TRANS Manual uses peak periods which can exceed the peak hours. Table 4 within the 2020 TRANS Manual includes factors for converting peak periods into peak hour traffic volumes as seen in **Table 6**. Note that conversion factors for passenger trips are assumed to be the same as auto driver.

Table 6: Peak Period to Peak Hour Conversion Factor (2020 TRANS Manual)

Travel Mode	Peak Period to Peak Hour Conversion Factors	
	AM	PM
Auto Driver	0.48	0.44
Passenger	0.48	0.44
Transit	0.55	0.47
Bike	0.58	0.48
Walk	0.58	0.52

Using the peak period to peak hour conversion rates from **Table 6**, the derived peak period trips by mode shares from **Table 5**, and the inbound and outbound splits from table 9 within the TRANS 2020 Manual, then the residential peak hour trips generated by the site for TRANS 2020 Orléans mode share can be calculated, as seen summarized in **Table 7**.

Table 7: Residential Peak Hour Trips Generated using TRANS 2020 Mode Shares

Travel Mode	Mode Share	AM Peak Hour (Trips/h)			Mode Share	PM Peak Hour (Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	54%	62	137	199	61%	133	96	229
Auto Passenger	7%	8	18	26	12%	28	20	48
Transit	29%	37	83	121	21%	49	36	85
Cycling	0%	0	0	0	0%	0	0	0
Walking	10%	14	31	45	6%	15	11	26
Total Person Trips	100%	121	269	390	100%	225	163	388
Total 'New' Residential Auto Trips		62	137	199	-	133	96	229

The commercial aspect of this development is mainly catered to local trips, be it from residents in this development or nearby high-density developments such as Petrie's Landing I and III, La Cité Collegial, Cardinal Creek, to name a few. Additionally, another market that this development plans to cater to are cyclists using the nearby MUP or pedestrians walking to/from the Trim LRT Station to Petrie Island, a high attraction nature reserve and beach, as a pass-by trip or new trip using the facilities adjacent to the site. For those reasons, a reduction in auto dependency for commercial uses as recommended within TRANS 2020 for Orléans is proposed, particularly for retail and food related land uses, as shown in **Table 8**. The spa/health club and office uses are expected to rely slightly more on vehicles than retail/restaurant customers as they are likelier to be primary/main reason for the trip. The proposed mode shares for commercial uses will be used for the following commercial trip generation.

Table 8: Future Mode Share Targets for the Development

Travel Mode	TRANS Commercial Mode Shares		Commercial Target Mode Share (AM & PM)			Target Rationale
	AM	PM	Retail / Restaurant	Spa/Health	Office	
Auto Driver	77%	71%	40%	60%	35%	A reduction in driver mode share from TRANS is justifiable given the close proximity to future LRT station, high density located nearby (promoting walking), and nearby MUP to attract cyclists.
Auto Passenger	14%	20%	8%	15%	10%	
Transit	3%	2%	30%	15%	50%	Development is located within 600m of a future LRT station, with an attractive desire line at Petrie Island passing adjacent to the site, making it an attractive candidate for pass-by trips or primary trips.
Cycling	0%	1%	5%	3%	2%	Nearby high density and MUP expected to attract some clients or office workers to walk/bike.
Walking	6%	5%	17%	7%	3%	

Given the mixture of land uses, an internal reduction rate is applicable based on mixed-use parameters described in Section 6.5 of the ITE Trip Generation Manual 3rd Edition, to account for multi-purpose trips such as a local resident shopping, heading to the health club or dining out prior to travelling to work. These trips may be reduced to reflect double counted trips, which has been incorporated in the trip generation tables that follow. The base calculation for determining the quantity of internal reductions has been provided in **Appendix E**. Note that the trips for the spa/health club were added to the retail category as they provide a service which could be used by local residents.

Pass-by trips were also considered for commercial uses. Pass-by trips are intermediate trips along the original route between the primary origin and destination, such as a trip to the café or retail between home and another destination such as recreation at Petrie Island. These are not considered 'new' trips, but existing trips already on the network. Appendix E of the ITE Trip Generation Manual 3rd edition was used to determine pass-by rates. Pass-by trips were calculated after the internal reduction factor was applied.

The trip generation rates for commercial uses from **Table 3** were used along with the proposed sizes for each commercial land use and respective mode share as described in **Table 8** to estimate new commercial trips as shown in **Tables 9 to 13**.

Table 9: Shopping Center Peak Hour Trips Generated by Mode

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	4	2	6	12	9	21
Pre-Internal Reduction		5	3	8	14	16	30
Vehicles Reduced		-1	-1	-2	-2	-7	-9
Auto Passenger	8%	1	1	2	3	3	6
Transit	30%	3	2	5	10	11	21
Cycling	5%	0	0	1	2	2	3
Walking	15%	2	1	2	5	6	12
Total Person Trips	100%	11	7	18	34	38	72
Less Pass-by 0% AM (34% PM)		0	0	0	-4	-4	-8
Total 'New' Shopping Auto Trips		4	2	6	8	5	13

Table 10: Quality Restaurant Peak Hour Trips Generated by Mode

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	40%	1	1	2	14	5	19
Pre-Internal Reduction		2	2	4	26	14	40
Vehicles Reduced		-1	-1	-2	-12	-9	-21
Auto Passenger	8%	1	1	2	5	3	8
Transit	30%	1	1	2	19	9	28
Cycling	5%	0	0	0	3	2	5
Walking	15%	0	1	1	11	5	16
Total Person Trips	100%	4	5	9	64	33	97
Less Pass-by 0% AM (44% PM)		0	0	0	-4	-4	-8
Total 'New' Restaurant Auto Trips		1	1	2	10	1	11

Table 11: General Office Peak Hour Trips Generated by Mode

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	35%	15	3	18	1	8	9
Pre-Internal Reduction		18	4	22	2	10	12
Vehicles Reduced		-3	-1	-4	-1	-2	-3
Auto Passenger	10%	5	1	6	0	3	3
Transit	50%	24	4	28	2	13	15
Cycling	2%	1	0	1	0	0	0
Walking	3%	1	0	1	0	1	1
Total Person Trips	100%	49	9	58	4	27	31
Less Pass-by 0% AM (0% PM)		0	0	0	0	0	0
Total 'New' Office Auto Trips		15	3	18	1	8	9

Table 12: Health/Fitness Club Peak Hour Trips Generated by Mode

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	60%	5	4	9	16	10	26
Pre-Internal Reduction		6	6	12	26	20	46
Vehicles Reduced		-1	-2	-3	-10	-10	-20
Auto Passenger	15%	2	2	4	6	5	11
Transit	15%	1	1	2	6	5	11
Cycling	3%	0	0	0	1	1	2
Walking	7%	0	1	1	3	2	5
Total Person Trips	100%	9	10	19	42	33	75
Less Pass-by 0% AM (0% PM)		0	0	0	0	0	0
Total 'New' Health Auto Trips		5	4	9	16	10	26

Table 13: Combined Commercial Peak Hour Trips Generated by Mode

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	25	10	35	43	32	75
Pre-Internal Reduction	31	15	46	68	60	128
Vehicles Reduced	-6	-5	-11	-25	-28	-53
Auto Passenger	9	5	14	14	14	28
Transit	29	8	37	37	38	75
Cycling	1	0	2	6	5	10
Walking	3	3	5	19	14	34
Total Person Trips	73	31	104	144	131	275
Less Pass-by	0	0	0	-8	-8	-16
Total 'New' Commercial Auto Trips	25	10	35	35	24	59

Additionally, an internal reduction to residential trips is applicable, as shown in **Table 14**.

Table 14: Residential Peak Hour Trips using TRANS 2020 Mode Shares with Internal Reduction

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	61	135	196	121	87	208
Pre-Internal Reduction	62	137	199	133	96	229
Vehicles Reduced	-1	-2	-3	-12	-9	-21
Auto Passenger, Transit, Cycling, Walking, Total Person Trips all remain the same (refer to Table 7)						
Total 'New' Residential Auto Trips	61	135	196	121	87	208

Using the total commercial trips generated from **Table 13** and the internally reduced residential trips generated from **Table 14**, the combined trips generated at full buildout using TRANS mode shares for residential and custom mode shares for commercial can be found on **Table 15**.

Table 15: Combined Residential and Commercial Trips Generated - TRANS

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	86	145	231	164	119	283
Pre-Internal Reduction	93	152	245	201	156	357
Vehicles Reduced	-7	-7	-14	-37	-37	-74
Auto Passenger	17	23	40	42	34	76
Transit	66	91	158	86	74	160
Cycling	1	0	2	6	5	10
Walking	17	34	50	34	25	60
Total Person Trips	194	300	494	369	294	663
Less Pass-by	0	0	0	-8	-8	-16
Total 'New' Full Buildout Auto Trips	86	145	231	156	111	267

As shown in **Table 15**, based on the 2020 TRANS Trip Generation Manual, the proposed site is projected to generate approximately 230 to 265 new auto-trips per hour during the weekday commuter peak hours if the proposed four towers at 956 units total, plus commercial and office uses was built. The increase in two-way transit trips is estimated to be approximately 160 persons per hour, and the increase in walk trips is approximately 50 to 70 persons per hour during the peak hours.

It is important to note that the TRANS Mode share for Orléans includes a large portion of homes located far from rapid transit and thus, the mode shares for residential uses reflected in **Table 15** show a large percentage of drivers and low percentage of transit/active users, making an adjusted mode share valid.

3.1.2. TOD MODE SHARES FOR RESIDENTIAL

Given the location of the site, within close proximity to the Trim BRT Transit Station (future LRT station expected to be operational by 2024), a higher transit modal share for residential uses is appropriate. **Table 16** illustrates the TRANS 2020 suggested residential modal shares, the City's Transit Oriented Development (TOD) mode shares and future projected residential modal shares. The projected modal shares were based on a hybrid of the ideal TOD mode shares and the TRANS 2020 mode shares. Given the site's local context, it is anticipated that non-motorized residential trips will be predominantly for pleasure and not for daily commuter trips; therefore, the peak hour residential non-motorized mode shares were assumed to be negligible. Transit trips will still remain high, but auto driver and passenger trips have been increased to reflect the lack in non-motorized trips for residents. Transit trips will be modelled as pedestrian trips to and from the future Trim LRT station.

Table 16: Future Mode Share Targets for Residential Trips

Travel Mode	TRANS Residential Mode Shares		City's TOD Mode Shares	Future Target Mode Share (AM & PM)	Residential Modal Share Target Rationale
	AM	PM			
Auto Driver	54%	61%	15%	30%	A reduction in driver mode share from TRANS is justifiable given the close proximity to future LRT station. The increase from TOD reflects a capture of non-motorized trips forecasted.
Auto Passenger	7%	12%	5%	10%	
Transit	29%	21%	65%	60%	Development is located within 600m of a future LRT station and is within 600m of existing BRT Transitway Corridor, making it a Transit-Oriented Development (TOD) which have transit targets of 65%.
Cycling	0%	0%	5%	0%	Given the site's location on the outskirts of Orléans, not many active residential travel trips are anticipated.
Walking	10%	6%	10%	0%	

Using the future target mode shares from **Table 16**, plus the commercial uses from **Table 13** the new trips generated by mode shares can be derived, as summarized in **Table 17**. Note that the slight reduction in residential vehicle trips between TRANS and target mode shares did not impact the commercial internal trip reductions.

Table 17: Future Combined Projected Site Generated Traffic Based on Target Mode Shares

Travel Mode	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
	In	Out	Total	In	Out	Total
Auto Driver	60	89	149	99	72	170
<i>Pre-Internal Reduction</i>	66	94	160	124	100	223
<i>Vehicles Reduced</i>	-7	-7	-14	-37	-37	-74
Auto Passenger	21	32	53	37	30	67
Transit	102	170	271	172	136	308
Cycling	1	0	2	6	5	10
Walking	3	3	5	19	14	34
Total Person Trips	194	300	494	369	294	663
Less Pass-by	0	0	0	-8	-8	-16
Total 'New' Full Buildout Auto Trips	60	89	149	91	64	154

Based on **Table 17**, for proposed 956 unit build within four towers, commercial and office uses, it is anticipated that the proposed development will generate approximately 150 to 155 'new' vehicles trips, 270 to 310 'new' transit trips and 5 to 45 'new' bike/walk trips (excluding recreational trips and trips to transit station), two-way per peak hour. Note that transit trips are anticipated to contribute to active modes to/from Trim Station, which will be accounted for in the future analysis.

3.1.3. TRIP DISTRIBUTION

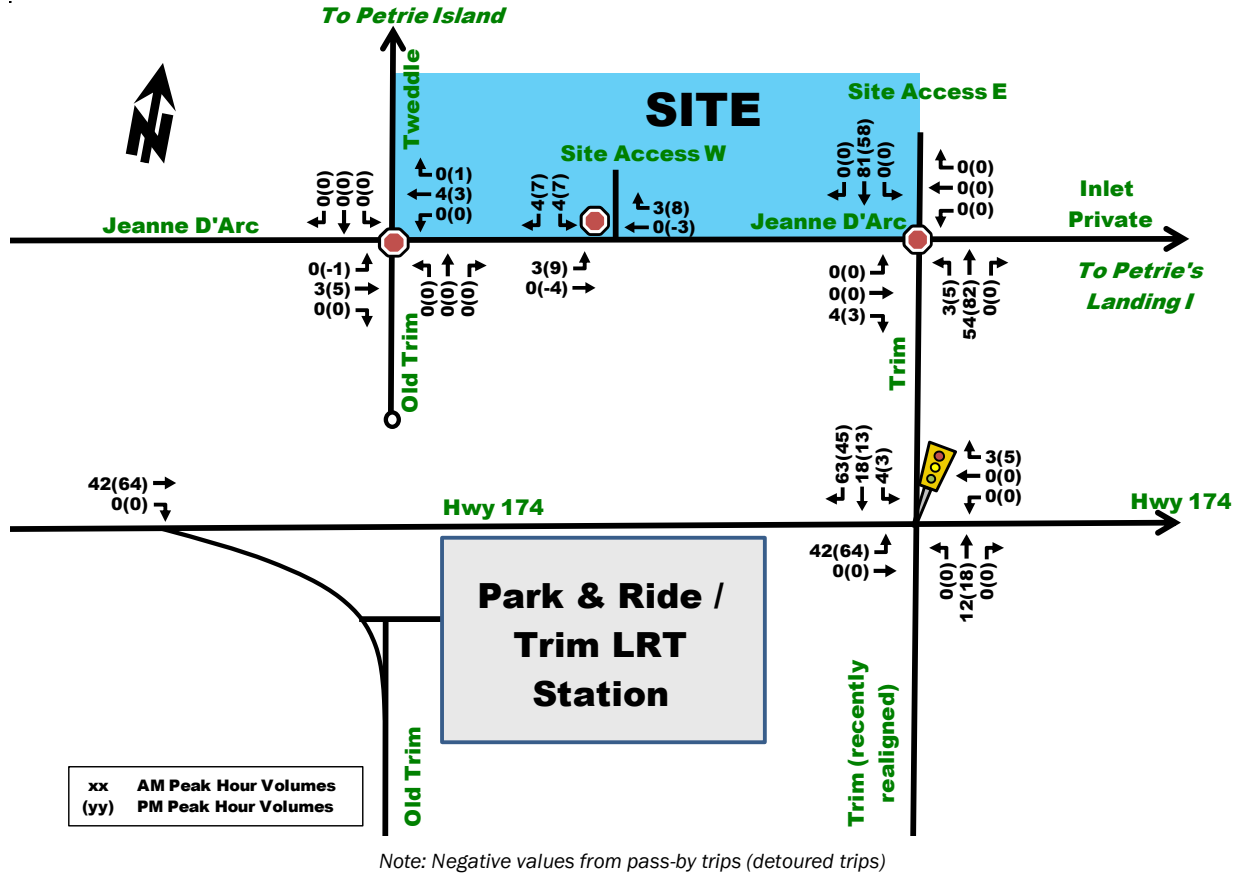
Based on the OD Mode Share Survey, existing traffic volume counts and the location of adjacent arterial roadways and neighborhoods, the distribution of site-generated traffic volumes is as follows:

- (From/To) the East: 5%;
- (From/To) the South: 20%; and,
- (From/To) the West: 75%.

3.1.4. TRIP ASSIGNMENT

The latest site plan proposes two full movement driveways on to Jeanne D'Arc Boulevard. The first will be an addition to the realigned Trim/Jeanne D'Arc intersection, forming the fourth leg (north leg) to the all-way-stop-controlled intersection. The second driveway is proposed approximately 75 meters east of the Tweddle/Jeanne D'Arc intersection. The exact location of the driveways will be confirmed once a Site Plan Application is filed. The 'new' site-generated vehicle trips outlined in **Table 17** for the residential and commercial uses were assigned to the study area network and are illustrated as **Figure 14**.

Figure 14: 'New' Site-Generated Traffic - All Uses (4 Towers)



3.2. Background Network Travel Demands

3.2.1. TRANSPORTATION NETWORK PLANS

Refer to **Section 2.1.3** Planned Conditions – Planned Study Area Transportation Network Changes.

3.2.2. BACKGROUND GROWTH

The background traffic growth through the immediate study area (summarized in **Table 18**) was calculated based on historical traffic count data (2007, 2008, 2010, 2012, and 2017) provided by the City of Ottawa at the Trim/Hwy 174 intersection. Detailed analysis of the background growth is included in **Appendix F**.

Table 18: Trim/Hwy 174 Historical Background Growth (2007 – 2017)

Time Period	Percent Annual Change				
	North Leg	South Leg	East Leg	West Leg	Overall
8 hrs	2.64%	1.03%	-0.66%	-0.05%	0.13%
AM Peak	4.40%	2.49%	0.26%	0.84%	1.13%
PM Peak	-3.09%	0.12%	-0.16%	-0.37%	-0.24%

As shown in **Table 18**, in past years Hwy 174 and Trim Road have experienced varied annual growth, ranging from -0.37% to 0.84% and -3.09% to 4.40%, respectively. Overall, growth was observed north of Hwy 174, which coincides with recent development (Petrie Landing I – III), whereas Hwy 174 traffic growth remained fairly stagnant. For the subsequent analysis of future conditions, a conservative 1% annual growth rate along Hwy 174 and Trim Road, in addition to other area developments-generated traffic will be layered on to future analysis.

3.2.3. OTHER AREA DEVELOPMENTS

Other area developments were identified and described in **Section 2.1.3**. Peak hour trips generated by these developments, based on the supporting TIA studies, have been summarized in **Table 19**. It is noteworthy that these studies were performed using the 2011 TRANS Trip Generation manual which is now outdated and projects a higher trip generation rate compared to the new industry standard, TRANS 2020 Trip Generation manual.

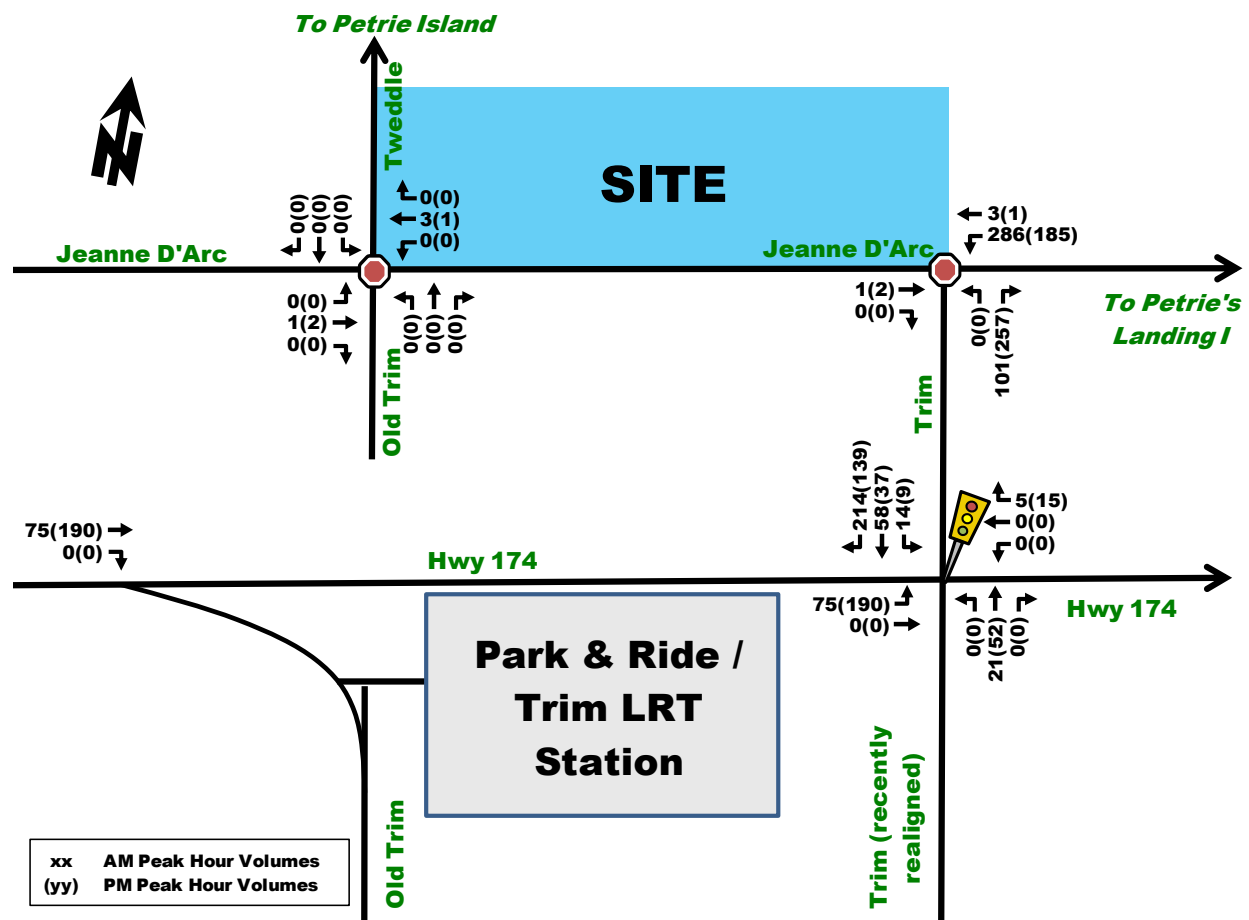
Table 19: Other Area Developments Vehicle Trip Generation

	AM Peak (persons/h)			PM Peak (persons/h)		
	In	Out	Total	In	Out	Total
Petrie's Landing I ₁	77	223	300	157	112	269
Petrie's Landing II ₂	20	64	84	80	50	130
Petrie's Landing III	422	237	659	254	430	684
Cardinal Creek ₃	412	940	1,352	1,246	980	2,226
Phoenix Homes	93	161	254	156	138	294
Total	1,024	1,625	2,649	1,893	1,710	3,603
1) Includes all towers not captured by the existing traffic count (Towers 2 – 6) 2) Includes all blocks not captured by the existing traffic count, including proposed Block 8 3) Vehicle Trips generated by Cardinal Creek are not anticipated to use Jeanne D'Arc, external only						

Petrie's Landing I - Towers 2 to 5

Petrie's Landing I - Towers 2 to 5 are expected to be fully occupied by 2023. The projected traffic volumes were obtained, Figure 13 within the Petrie's Landing I Report, and additional layering of Tower 2 volumes (Figure 14) are illustrated in **Figure 15**.

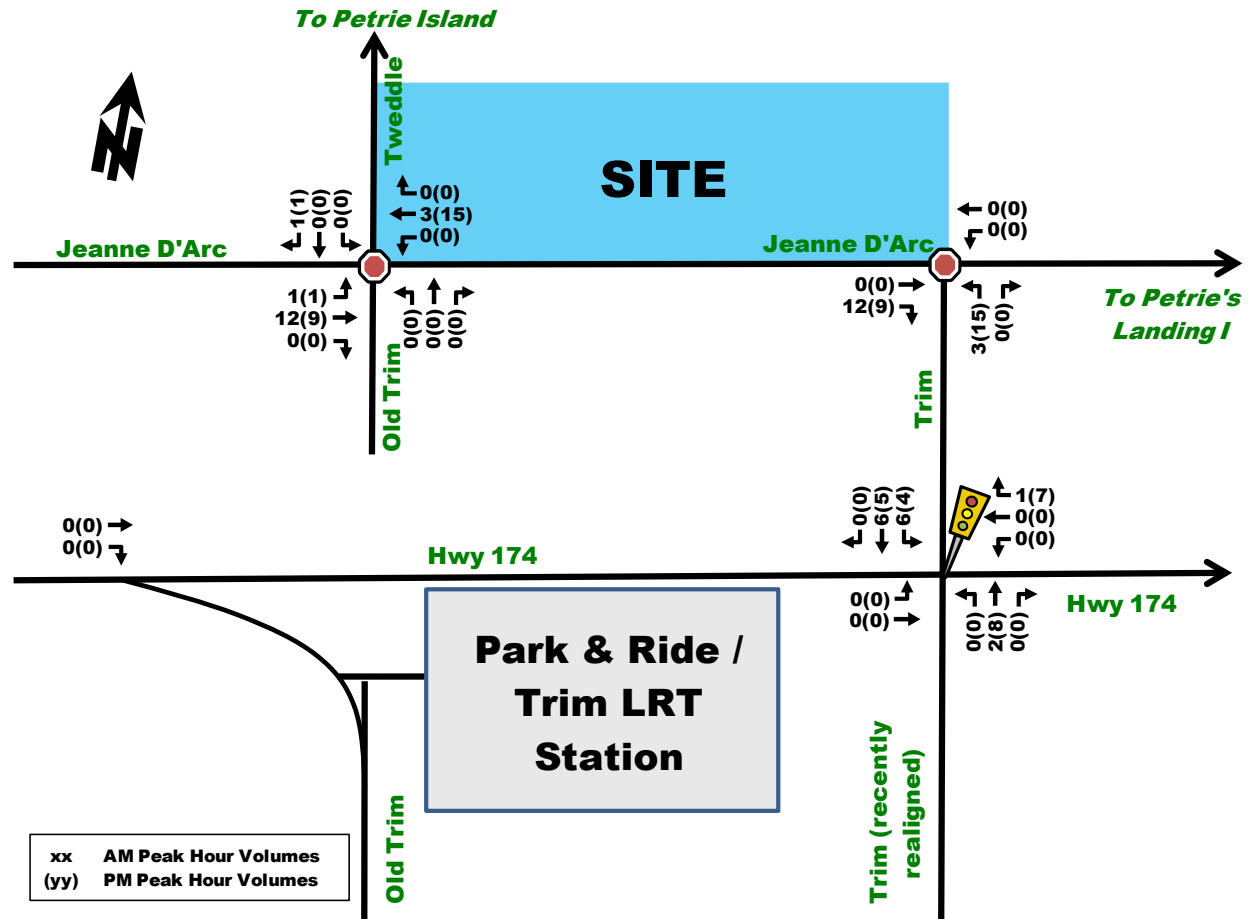
Figure 15: Petrie's Landing I Towers 2 to 5 Projected Traffic Volumes



Petrie's Landing II

Figure 16 illustrates the projected traffic volumes for Petrie's Landing II at full build-out, obtained from the 2013 Petrie's Landing I TIS (Figure 15) and Block 8 TIS Report layered together. Assumed to be fully occupied by 2024.

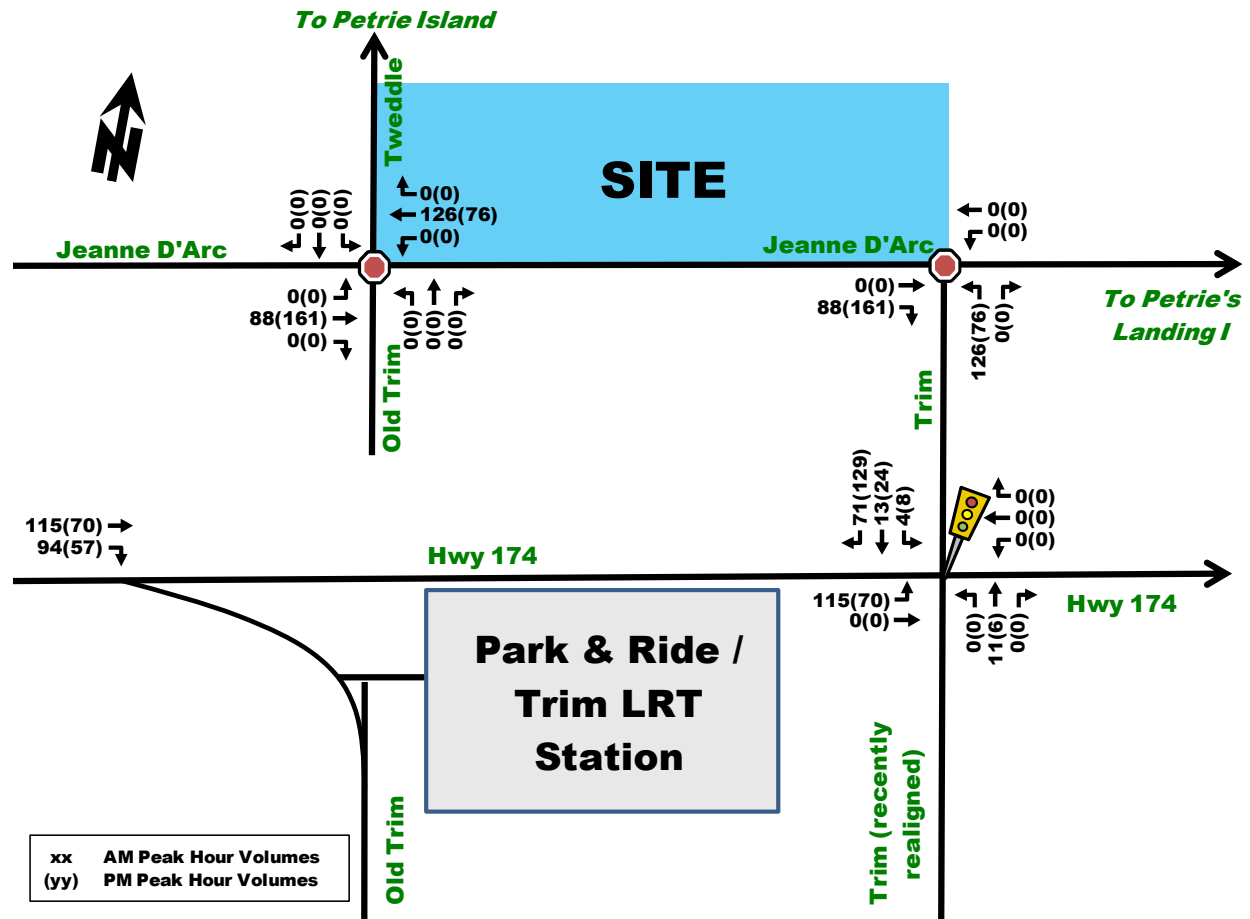
Figure 16: Petrie's Landing II Projected Traffic Volumes – Full Build Out



Petrie's Landing III

Figure 17 illustrates the projected traffic volumes for Petrie's Landing III at full build-out, obtained from the 2013 Petrie's Landing I TIS (Figure 16). Considering assumed time horizons, 50% of build-out volumes will be applied in year 2024 and 100% in year 2029.

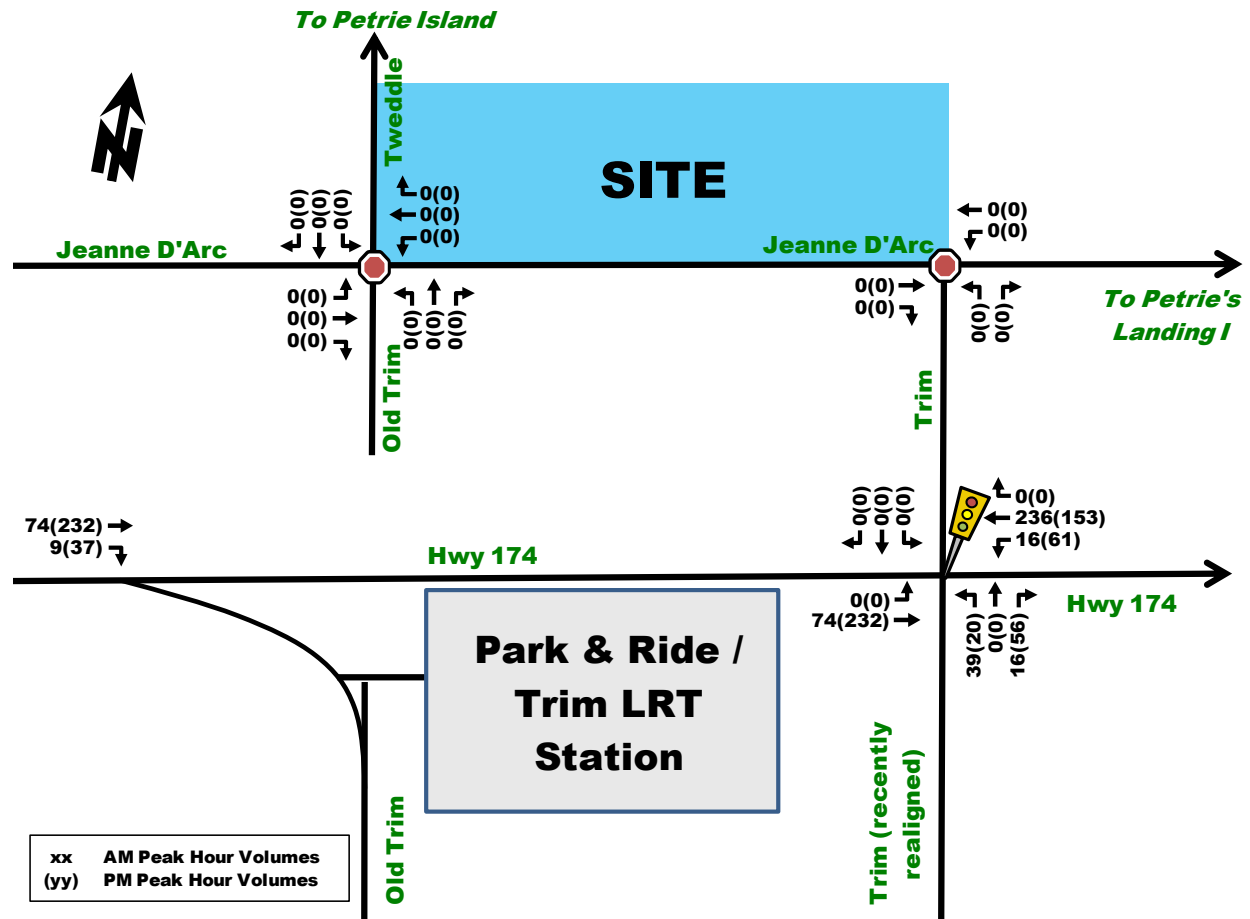
Figure 17: Petrie's Landing III Projected Traffic Volumes – Full Build-Out



Cardinal Creek Village

Figure 18 illustrates the projected traffic volumes for Cardinal Creek Village at horizon year 2029 at study area intersections (obtained from the 2013 Cardinal Creek Village CTS, Exhibit 12). Considering assumed time horizons, 60% of full build-out volumes will be applied in year 2024 and 90% in year 2029.

Figure 18: Cardinal Creek Projected Traffic Volumes at Study Area Intersections

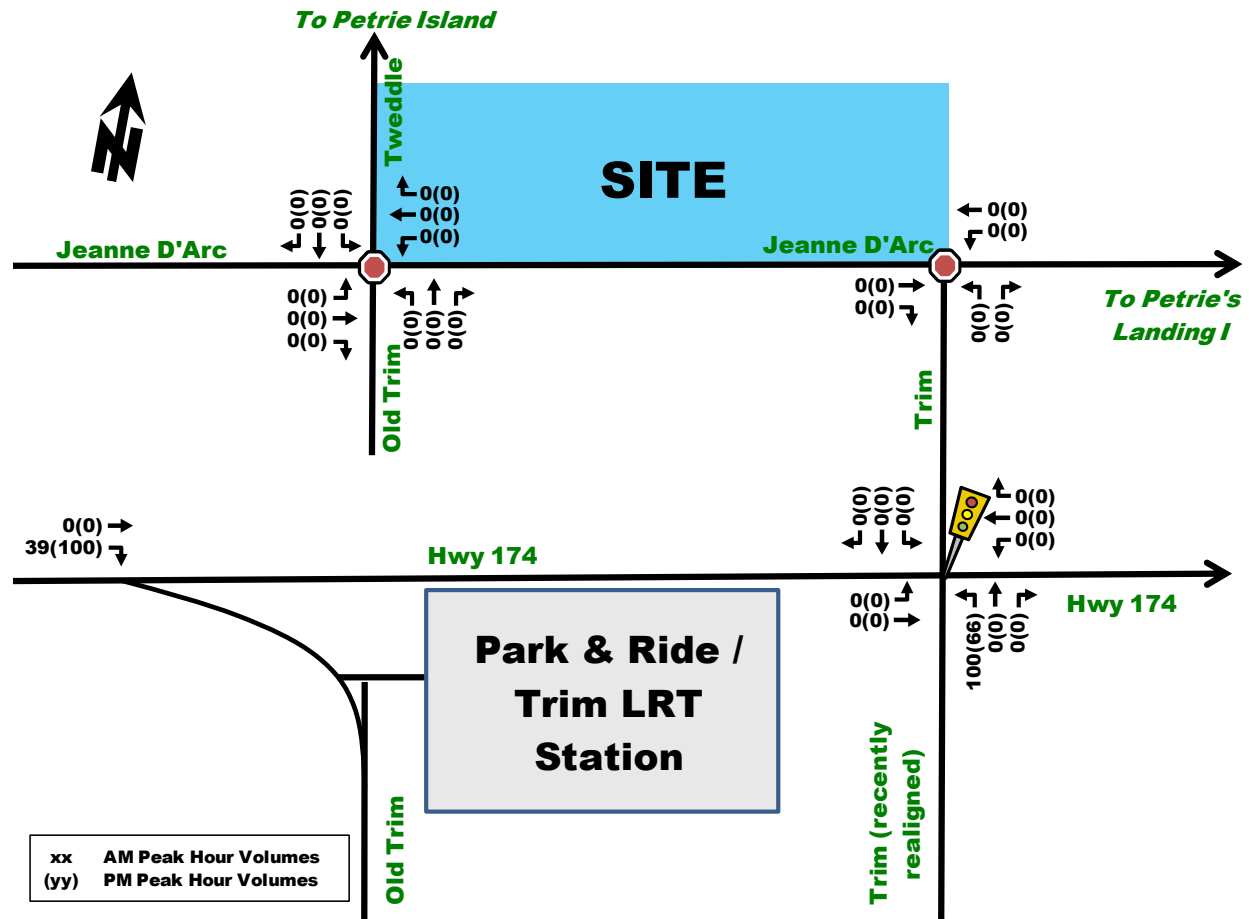


Based on Cardinal Creek Village Transportation Impact Study (October, 2013), Exhibit 12.

Phoenix Homes

Figure 19 illustrates the projected traffic volumes for Phoenix Homes at full build-out, obtained from the 2018 Phoenix Homes TIS by WSP (Figure 1). Considering assumed time horizons, 100% of build-out volumes will be applied in year 2024 and onwards.

Figure 19: Phoenix Homes Projected Traffic Volumes – Full Build-Out



3.3. Demand Rationalization

According to the City of Ottawa, Inlet Private is classified as a local road, Jeanne D'Arc Boulevard a major collector and Trim Road an arterial road.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads outlines “typical” daily traffic volume (DTV) capacities of urban collector road. The recommended urban residential collector road capacity threshold is 8,000 vehicles per day, and 12,000 for urban industrial/commercial collector road. An urban minor arterial road such as Trim Road north of Hwy 174 can accommodate up to 20,000 vehicles a day, while a major arterial such as Trim Road south of Hwy 174 can accommodate up to 30,000 vehicles per day.

The 2029 total projected daily traffic volumes, which includes background growth, known future developments and site-generated traffic, were estimated by factoring the peak hour traffic volumes. The conversion factor was calculated as the sum of AM and PM peak hour two-way traffic volumes on the roadway and multiplied 5, which is a standard industry approach to estimating DTV. The estimated DTVs along Jeanne D'Arc Boulevard at the development frontage was approximately 3,500 vehicles per day, and along Trim Road, north of Hwy 174 was

approximately 9,000 vehicles per day. Therefore, both roadways are expected to accommodate anticipated growth through year 2029. The future intersection capacity along these road sections will be explored in more detail in the ensuing Strategy Report.

4. Strategy Report

4.1. Development Design

4.1.1. DESIGN FOR SUSTAINABLE MODES

Although a detailed design for the ultimate Trim Road realignment including the intersection at Hwy 174 hasn't been finalized, some information has been provided by the Stage 2 LRT Office, including general features such as:

- A multiuse pathway (MUP) on the east side of Trim Road and south side of Jeanne D'Arc Boulevard
- Bi-directional cross-rides at the north and east legs of Tweddle/Jeanne D'Arc, the south leg of Trim/Jeanne D'Arc and the east leg of the Trim/Hwy 174 intersections
- Two-lane cross section on Jeanne D'Arc Boulevard and Trim Road north of Hwy 174, and a three-lane cross section on Trim Road south of Hwy 174
- The ultimate Trim/Hwy 174 intersection will include the following notable lane arrangements:
 - Channelized right-turn lanes on all approaches except for the eastbound approach
 - Single left-turn lanes on all approaches except for the northbound approach
 - Triple northbound left-turn lanes with three westbound receiving lanes

The segment of Jeanne D'arc fronting the site must now accommodate increased vehicular traffic and OC Transpo Route #38 with the realignment of Trim Road, making this segment between the Tweddle/Jeanne D'Arc and Trim/Jeanne D'Arc, intersections a candidate to be retrofitted to collector road standards.

Location of Transit Facilities

The subject site is located approximately 600m walking distance to the future Trim LRT Station via the realigned Trim/Hwy 174 intersection. If a pedestrian bridge from Trim LRT Station to the north connecting to the former Trim Road was built, the site would be approximately 300m from the Trim LRT Station and would highly incentivize the use of public transit. A pedestrian bridge connection to the Trim LRT Station would also improve safety by providing a grade separated cross over Hwy 174.

Since the realignment of Trim Road, OC-Transpo Route #38 has been using the newly constructed Trim Road which is now east of the development. The new Route #38 now provides service passing adjacent to the site on Jeanne D'Arc Boulevard with connection from Trim Station (currently BRT, future LRT) to local communities on the north side of Hwy 174, Place D'Orléans Shopping Center and Blair Station. Google Maps displays a transit stop icon on both sides of Jeanne D'Arc Boulevard adjacent to the site.

Pedestrian/Cycling Routes and Facilities

All proposed buildings will have direct pedestrian and cycling access to Jeanne D'Arc Boulevard. Currently there is a sidewalk on the south side of Jeanne D'Arc Boulevard only. It is expected that new active travel facilities will be introduced onto Jeanne D'arc Boulevard on the north side, east of the realigned Trim Road, to facilitate connectivity to Hwy 174 and the broader network. However, the current functional plans of the Trim Road realignment, as seen in Error! Reference source not found., do not provide any details on active transportation facilities or treatments on the north side of Jeanne D'Arc Boulevard. The expectation is that the ultimate planned Trim Road realignment by the City of Ottawa will incorporate appropriate pedestrian and cycling facilities along the Jeanne D'arc Boulevard and Trim Road as part of Stage 2 LRT implementation. A MUP with bi-directional

cross rides at intersections is proposed to connect the existing MUP on the north side of Jeanne D'Arc Boulevard (east of Tweddle/Jeanne D'Arc) to the MUP on Trim Road.

A cross ride on the north and east approaches of Tweddle/Jeanne D'Arc is proposed to connect the existing MUP on the north side of Jeanne D'Arc Boulevard and east of Tweddle Road to the MUP on the south side of Jeanne D'Arc Boulevard. This MUP will then continue on the south side of Jeanne D'Arc Boulevard to Trim/Jeanne D'Arc where it will have cross rides on the south approach of the intersection, connecting to the MUP on the east side of the realigned Trim Road. The MUP on the east side of Trim Road will then cross Trim/Hwy 174 on the east leg of the intersection and will continue on the east side of Trim Road. Further south of Frontage Street, a MUP will be present on both sides of Trim Road.

For the purpose of this study, based on comments received by the City of Ottawa and available information, it will be assumed that transit users will take active transportation to and from the Trim LRT Station via the north sidewalk of Jeanne D'Arc Boulevard, some will cross the north and east legs of Trim/Jeanne D'Arc intersection while other may cross the west and south legs of the intersection, then continue on the MUP proposed on the east side of Trim Road, cross the east leg of Trim/Hwy 174 and continue to the LRT station via the pathway on the north side of parking lot, crossing Trim Road at S Frontage Road or the south leg of Trim/Hwy 174 if pedestrian facilities are provided.

Bicycle Parking

Bicycle parking is anticipated to meet the minimum City By-Law requirements. Bicycle parking will be encouraged to be indoors in a secure, well-lit area located at a level which would provide convenient access to and from the building to cycling facilities. More details will be available once a Site Plan Application is filed.

4.1.2. CIRCULATION AND ACCESS

Exempt. See **Table 2**.

4.1.3. NEW STREETS NETWORK

Exempt. See **Table 2**.

4.2. Parking

4.2.1. PARKING SUPPLY

Though parking is normally exempt for Zoning or OP Applications, as discussed in **Table 2**, a preliminary estimate has been provided and compared to parking requirements as per City of Ottawa Zoning By-Law. The site is located in Area C according to Schedule 1 and Area C in Schedule 1A, however, it is within 600m walk to Trim Rapid Transit Station within Schedule 2B, wherein the Area X provisions apply. **Table 20** summarizes the vehicle parking minimum and maximums allowed within the current parking by-law as an Area X development. Similarly, **Table 21** summarizes the bicycle parking requirements as per City of Ottawa Zoning By-Law-Part 4, Sections 100-114.

The proposed ancillary commercial uses onsite were not included in the vehicle parking space calculation due to their size, the proximity to the Trim LRT station, and local context (serving primarily local community residents within walking/cycling distance north of Highway 174). It is important to note that there have been discussions between the applicant and City staff to consider this development within Area Z in the ongoing Orleans Corridor Secondary Plan Study, which precludes minimum parking requirements for commercial uses.

Table 20: Vehicle Parking Space Supply

Land Use		Rate per Unit		Required Vehicle Spaces				Proposed Spaces
		Base	Visitor	Base	Visitors	Min Req.	Max Allowed	
Residential 4 Towers	956 units	0.5 per unit ₁	0.1 per unit ₂	454	94	549	1,673 ₃	575
1) no off-street motor vehicle parking is required for the first 12 dwelling units per building 2) no off-street motor vehicle parking is required for the first 12 dwelling units on the lot, with a max of 30 visitor spaces per building 3) maximum parking allowed is at a rate of 1.75 parking stalls per unit (combined base and visitor)								

The applicant intends to provide the full 94 visitor parking spaces required for residential uses, which is ample within a TOD area, expected to provide adequate parking supply for both residential and commercial uses. Furthermore, residential and commercial visitor arrival times tend to vary and are unlikely to have significant overlap, which supports the shared visitor parking provision. At the moment, the development is proposing at least 120 more parking than the minimum base residential parking allots, providing additional flexibility on how many visitor parking spaces can be provided. The vehicular parking allotments will be confirmed during the Site Plan Control process for future phases.

Table 21: Bicycle Parking Requirements

Land Use		Rate	Required Bicycle Spaces	Proposed Spaces
			Required	
Residential 4 Towers	956 units	0.5 per unit	478	To be confirmed
Retail	1,368 m ²	1 per 250 m ²	5	
Restaurant/Cafe	906 m ²	1 per 250 m ²	4	
General Office	1,844 m ²	1 per 250 m ²	7	
Spa/Health Club	1,062 m ²	1 per 1,000 m ²	1	
Totals			495	

The majority onsite bicycle parking is expected to be enclosed within a parking structure beneath the towers. Details will be confirmed during the Site Plan Control Application, but the parking rates are expected to be compliant with the Zoning By-Law.

4.2.2. SPILLOVER PARKING

Exempt. See table Table 2.

4.3. Boundary Street Design

4.3.1. EXISTING CONDITIONS

The boundary street for the development is Jeanne D'Arc Boulevard. Since Trim Road is a critical link for pedestrians accessing the Trim LRT Station, it will be considered as well for future conditions in **Section 4.3.2**. The existing roadway geometries consist of the following features:

- *Jeanne D'Arc Boulevard:*
 - 1 vehicle travel lane in each direction;
 - 2m sidewalk on south side, no sidewalk on north side of roadway;
 - More than 3,000 vehicles per day;
 - Assumed unposted speed 50km/h (used 60km/h);
 - Classified as major collector roadway (assumed since realignment of Trim Road);
 - Identified as a spine route and major pathway for cycling; and,
 - Not identified as a Truck Route.

The proposed site is located within 600m of a rapid bus station/future LRT station at Trim. Multi-modal Level of Service analysis for the subject road segments adjacent to the site is summarized in **Table 22** with detail analysis provided in **Appendix G**.

Table 22: MMLoS – Boundary Street Segment Existing

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TkLOS)	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Jeanne D’Arc north side between Tweddle and Trim Road	F	A	E	B	D	D	-	N/A
Jeanne D’Arc south side between Tweddle and Trim Road	E	A	E	B	D	D	-	N/A

Pedestrian

- **Existing Jeanne D’Arc** does not meet pedestrian PLOS due to lack of sidewalk on the north side and lack of boulevard separation on the sidewalk in the south side of roadway.

Bicycle

- **Existing Jeanne D’Arc** does not meet cyclist BLOS due to the assumed posted speed +10km/h due to lack of speed survey. If a speed survey shows driver compliance to a reduced posted speed limit of 40km/h, the bike BLOS target would be met.

Transit

- **Existing Jeanne D’Arc** meets transit TLOS targets.

Truck

- **Existing Jeanne D’Arc** is not a truck route.

4.3.2. FUTURE CONDITIONS

The future boundary streets for the development will be Jeanne D’Arc Boulevard and Trim Road, both critical links for pedestrians accessing the Trim LRT Station. Currently, it is understood that a multi-use pathway (MUP) with boulevard separation will replace the southern sidewalk of Jeanne D’Arc Boulevard and a new MUP will be located on the east side of Trim Road. While roadway geometries are temporary and not finalized at this time, the expectation is the following features would be included as part of the ultimate Trim Road realignment in support of Stage 2 LRT by the City:

- **Jeanne D’Arc Boulevard:**
 - 1 vehicle travel lane in each direction;
 - Sidewalk on the north side of roadway with MUP on south side;
 - More than 3,000 vehicles per day;
 - Speed limit 50km/h (used 60km/h);
 - Classified as major collector roadway;
 - Identified as a spine route and major pathway for cycling; and,
 - Not a Truck Route.
- **Trim Road (realigned):**
 - 1 vehicle travel lane in each direction;
 - MUP on east side only;
 - More than 3,000 vehicles per day;
 - Speed limit 50km/h (used 60km/h);
 - Classified as major collector roadway;
 - Identified as a spine route and major pathway for cycling; and,

- Not a Truck Route.

The proposed site is located within 600m of a rapid bus station/future LRT station. Multi-modal Level of Service analysis for the subject road segments adjacent to the site is summarized in **Table 23** with detail analysis provided in **Appendix G**.

Table 23: MMLoS – Future Boundary Street Segment

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck (TLOS)	
	PLOS	Target	BLOS	Target	PLOS	Target	BLOS	Target
Jeanne D'Arc - north side between Tweddle and Trim Road	C	A	E	B	D	D	-	N/A
Jeanne D'Arc - south side between Tweddle and Trim Road	C	A	A	B	D	D	-	N/A
Trim Road east side between Jeanne D'Arc and Hwy 174	D	A	A	B	D	D	-	N/A
Trim Road west side between Jeanne D'Arc and Hwy 174	F	A	E	B	D	D	-	N/A

Pedestrian

- **Jeanne D'Arc Blvd & New Trim Road** do not meet pedestrian PLOS due high vehicular traffic of more than 3000 veh/day and lack of boulevard separation. A posted speed limit of 30 km/h on Jeanne D'Arc would meet the PLOS target.

Bicycle

- **Jeanne D'Arc Blvd & New Trim Road** does not meet cyclist BLOS for Jeanne D'Arc north side due to the assumed posted speed +10km/h due to lack of speed survey. If a speed survey shows driver compliance to a posted speed limit of 40km/h, the bike BLOS target would be met.

Transit

- **Jeanne D'Arc Blvd & New Trim Road** meet transit TLOS targets.

Truck

- **Jeanne D'Arc Blvd & New Trim Road** are not truck routes.

4.4. Access Intersection Design

4.4.1. LOCATION AND DESIGN OF ACCESS

The proposed access to the site is currently envisioned as two new full movement access driveways to Jeanne D'Arc Boulevard. The new driveways are located approximately 75m east of Tweddle/Jeanne D'Arc intersection and the second is proposed as the north leg addition of the realigned Trim/Jeanne D'Arc intersection.

With most site generated traffic expected to be drawn to Hwy 174, it was assumed that the majority of these vehicles will enter/exit via the Trim/Jeanne D'Arc site access, ultimately destined for the parking structure. Vehicles will also have a secondary route in/out, which provides redundancy and helps mitigate potential queue spillback during heavier hours of traffic. These assumptions will be further analyzed during the SPA.

4.4.2. INTERSECTION CONTROL

A traffic signal warrant was completed at realigned Trim/Jeanne D'Arc and it was not warranted. However, the all-way stop control warrant was triggered, confirming that the intersection should be maintained as an AWSC on opening day. All warrant analysis has been provided in **Appendix H**.

According to the City of Ottawa Private Approach By-Law Section 25, if a site has more than 300 parking spaces, a minimum distance between the private approach and signalized intersection is 75 meters. In the event that the New Trim/Jeanne D'Arc intersection were to require traffic control signals, the nearest site proposed access would need to be located at a minimum 75 meters west of the signalized intersection to meet the minimum corner clearance requirement on a major collector road.

4.4.3. INTERSECTION DESIGN

See **Section 4.9.2**.

4.5. Transportation Demand Management

4.5.1. CONTEXT FOR TDM

Based on the type of development, it is assumed that most trips generated by the proposed site will be residents leaving the site in the AM peak to go to work and returning from work to the proposed site in the PM peak. Sections 3.1.1 and 3.1.2 describe how many trips are anticipated per travel mode and anticipates the likely locations that they will travel to and from based on the OD-Survey 2011 for Ottawa. The site is located in a Transit-Oriented Development (TOD) zone according to the Official Plan.

4.5.2. NEED AND OPPORTUNITY

Developments located in a Transit-Oriented Development (TOD) zone such as the proposed site are expected to utilize measures to provide sustainable active mode shares. Such measures are described in more detail in Section 4.5.3 below, but can include reduced parking (to be discussed in SPA), more aggressive Multi-Modal Levels of Service (MMLOS) as described in Section 4.3 and 4.9 and safe and efficient connectivity to public transit as described in Section 4.7, to name a few.

4.5.3. TDM PROGRAM

Given that this is a ZBLA only, the exact details of the proposed development are unknown. A draft TDM infrastructure checklist is attached as **Appendix I** with some of the proposed attributes that are known. Note that the measures checklist is not yet applicable to this ZBLA as details of the buildings are not concrete yet.

4.6. Neighborhood Traffic Management

4.6.1. ADJACENT NEIGHBORHOODS

The road segment adjacent to the site has significantly increased in traffic volumes since Trim Road was relocated further east and all traffic headed to and from west of the former intersection now passes in front of the site. It is understood that this segment of road has since been upgraded from a local roadway to a major collector between the former and new Trim/Jeanne D'Arc intersection segment as part of the Trim Road realignment in support of Stage 2 LRT by the City.

The future projected 2029 volumes along this stretch are anticipated to be approximately 3,350 vehicles per day or 335 peak hour volumes which is consistent with a major collector road, capable of handling volumes between 2,500 to 5,000 daily or 300 to 600 peak hour volumes, based on City of Ottawa suggested guidelines. This segment of roadway should be retrofitted to major collector roadway standards, including sidewalks on both sides of the road. The geometric features will be confirmed during the Site Plan Application.

4.7. Transit

4.7.1. ROUTE CAPACITY

It is projected that 270 to 310 'new' two-way transit passenger trips per hour will be generated for the AM and PM peak hours. Considering the envisioned LRT East extension line is projected to begin operation in 2024 and assuming a similar capacity to that of the Confederation Line (OC Transpo site suggests 600 passengers per train and 12 trains per hour during peak), it is anticipated that the future transit network will have sufficient capacity to accommodate the subject development transit demand. 310 two-way transit trips equate to approximately 4% of the total capacity of the Confederation Line at that given station assuming that all trips were headed the same direction. An ultimate Confederation Line capacity of 24,000 passengers per hour per direction is envisioned. Additionally, added capacity is available on local bus routes on Jeanne D'Arc Boulevard and Trim Station.

4.7.2. TRANSIT PRIORITY

Since the Confederation LRT Line is grade separated, the development's driveways will not impact travel times. On average, the LRT stations are approximately 90m long, providing enough station distance to efficiently load and off-load the passengers without creating delays.

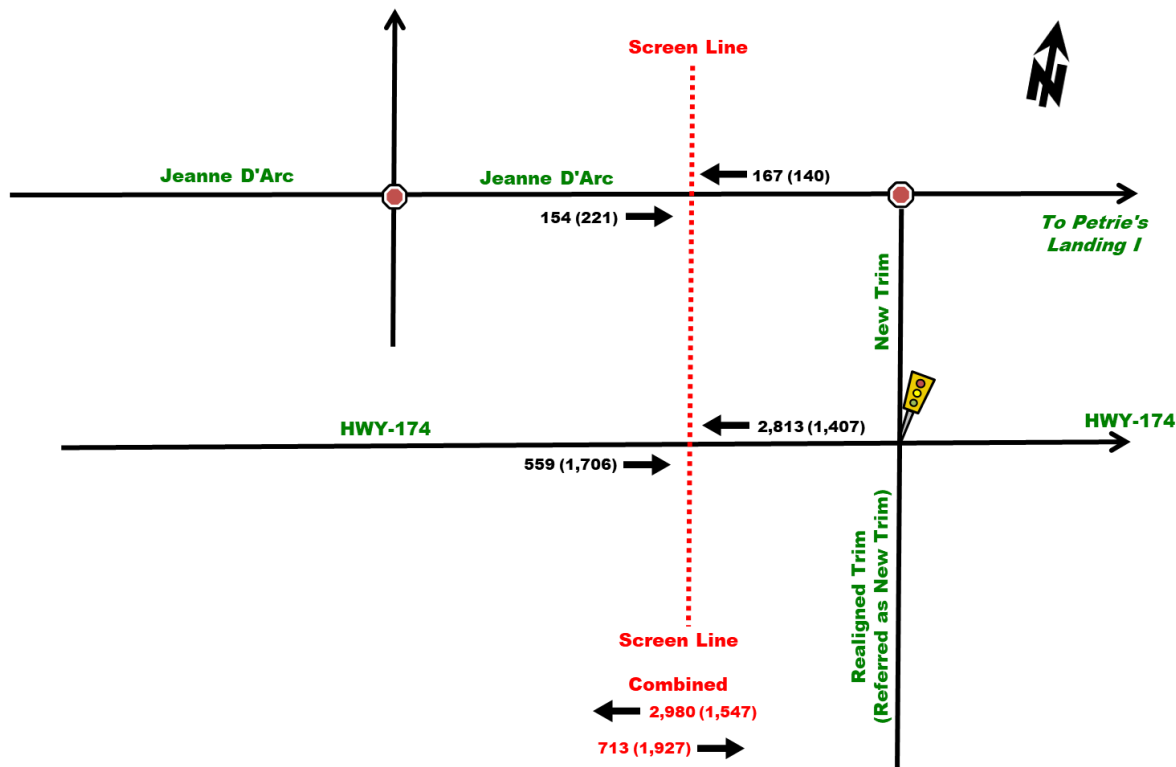
4.8. Review of Network Concept

The proposed site is currently located within DR zoning (developmental reserve). Given that the maximum height allowed for DR is 11m high (approximately 4-storeys), the majority of the development will be above that height and it is anticipated that more than 200 peak hour person trips more than the equivalent volume permits by the established zoning will be achieved.

Approximately 390 person trips are anticipated to be generated by the proposed development, as shown **Section 3.1.2**, with a large portion of these people trips surpassing the current zoning allowance. However, changes to the existing network infrastructure are not expected to be needed, based on the close proximity to rapid transit such as Trim Station, access to pedestrian and cycling facilities, and anticipated capacity on the adjacent road network to accommodate the proposed development traffic.

Due to the isolated nature of the development given geographical constraints and it being pinched by Hwy 174, a micro screen line was completed to assess the impacts on the greater network. As seen in **Figure 20**, a north-south cross-section west of New Trim Road on Jeanne D'Arc Boulevard and Hwy 174 was created and analyzed.

Figure 20: Micro-Screen Line Analysis



Jeanne D'Arc Boulevard will be a major collector road once upgraded and Hwy 174 is a freeway. Their respective capacities are based on City Guidelines and the Ottawa Road 174/Prescott Russell Road 17 (Trim Road to Canaan Road) Environmental Assessment Study. According to City Guidelines, Jeanne D'Arc Boulevard will have a capacity of approximately 600 vehicles per hour per direction and according to the Environmental Assessment Study for Hwy 174, it has a capacity of 4,600 vehicles per hour for two lanes per direction, for a combined total of approximately 5,200 vehicles per hour per direction.

As seen in **Figure 20**, the critical directional and time period is in the AM headed westbound, with approximately 3,000 vehicles per hour crossing the screen line. The other directional peak hours vary between 700 to 1,900 vehicles per hour per direction. Given that all directional peak hour periods are less than the maximum capacity of 5,200 vehicles per hour, there is sufficient capacity in the network to accommodate the future development.

4.9. Intersection Design

4.9.1. INTERSECTION CONTROL

See **Section 4.4.2**.

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 new realigned Trim/Hwy 174 intersections is the only signalized intersections within the study area. The realigned Trim/Hwy 174 reflects future ultimate conditions once Trim LRT Station is complete. The MMLOS analysis is summarized in **Table 24**, with detailed analyses provided in **Appendix J**.

Table 24: MMLOS – Existing and Future Trim/Hwy 174

Intersection	Level of Service							
	Pedestrian		Bicycle (BLoS)		Transit (TLoS)		Truck (TLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Trim/Hwy 174 (realigned) ¹	F	A	D	B	F	D	A	D
1) Trim/Hwy 174 is based on the latest ultimate design plans available, however, it is subject to change								

Pedestrian

- Pedestrians have to cross up to eight lanes of traffic at Trim/Hwy 174 and in some cases, equivalent to 10+ given the separation distance from curb to curb. There are no options that can help improve the PLoS significantly enough to come anywhere near the target PLoS. A grade separated pathway, such as the addition of a north bridge from the Trim LRT Station would provide a safer pedestrian crossing.

Bicycle

- A bi-directional cross ride is proposed along the east leg of the realigned Trim/Hwy 174 intersection. Trim Road will be a spine cycle route. It is understood that at this moment, no active transportation will be allowed to use the west leg of the intersection due to the proposed triple left turn – this will be confirmed once a final detailed design for Trim/Hwy 174 is confirmed. The failure in BLoS at the intersection can be attributed to operating speed of vehicles. As such, there are no options that can help improve the BLoS significantly enough to meet the target BLoS.

Transit

- Transit TLoS targets were not met as it relies on average signal delay. To reach the target goal, buses must wait no longer than 30 seconds at the intersection. Since the existing cycles are in the magnitude of 120-130 seconds, buses are anticipated to wait longer than 30 seconds.

Truck

- Truck target level of service was met.

Direct north access to the Trim LRT Station would reduce walking and cycling distances to site and would provide increased pedestrian/cyclist safety by eliminating the at-grade crossing point at Trim/Hwy 174 intersection.

Existing Intersection Performance

The following **Table 25** provides a summary of the existing traffic operations at the study area intersection based on the Synchro (V10) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The Synchro model outputs of existing conditions are provided within **Appendix K** and the volumes used were obtained from **Figure 5**.

Table 25: Existing 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
Trim/Hwy 174 (S)	D(C)	0.83(0.78)	NBL(NBL)	44.0(38.1)	B(C)	0.66(0.75)
Trim/Jeanne D’Arc (A)	A(A)	8(8)	NB(NB)	8(7)	A(A)	-
Tweddle/Jeanne D’Arc (A)	A(A)	8(8)	EB(EB)	7(8)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane. (S) = Signalized; (A) = All-way-stop-controlled						

As seen in **Table 25**, all intersections operate overall at good LoS ‘C’ or better with critical movements operating at LoS ‘D’ or better during the existing conditions.

Background Conditions 2029

The future 2029 background volumes were projected by increasing existing volumes by 1% annually and superimposing other area development trip generations as illustrated in **Figure 21** with projected operation outputs in **Table 26**. The detailed Synchro results can be found in **Appendix L**.

Figure 21: 2029 Background Projected Volumes

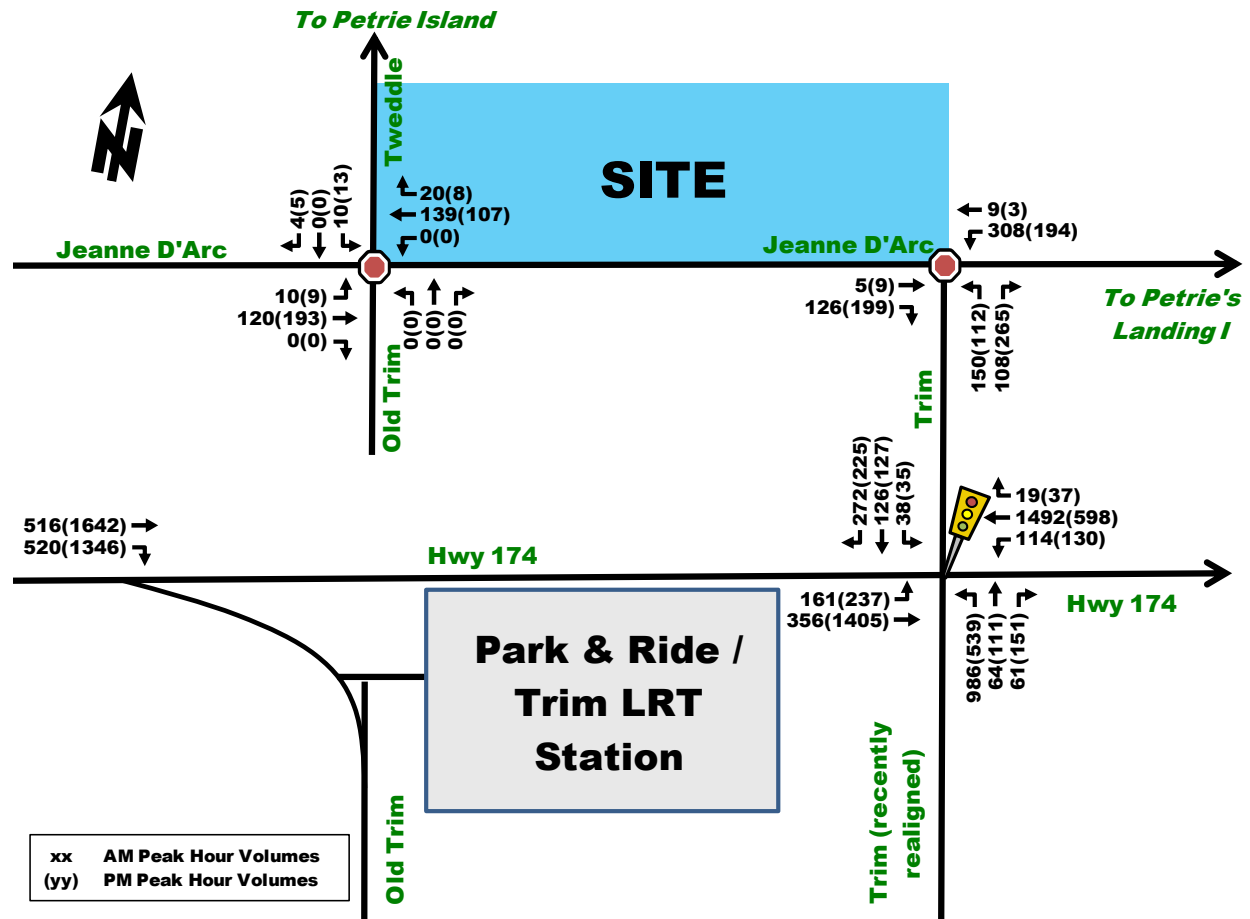


Table 26: 2029 Background Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Trim/Hwy 174 (S)	E(E)	0.93(0.97)	NBL(EBT)	53.2(51.5)	D(E)	0.89(0.93)
Trim/Jeanne D'Arc (A)	B(B)	12(12)	WB(NB)	11(11)	B(B)	-
Tweddle/Jeanne D'Arc (A)	A(A)	8(8)	WB(EB)	8(8)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) = Signalized; (A) = All-way-stop-controlled

As seen in **Table 26**, all intersections operate overall at acceptable LoS 'E' or better with critical movements operating at LoS 'E' or better during the 2029 background volumes. Operations have deteriorated, predominantly on Trim/Hwy 174 compared to existing intersection performance. The worsening of performance is

predominantly caused by a 1% annual growth assumed plus the additional layering of other large developments such as the completion of Petrie's Landing I and III, or developments south of Hwy 174.

Future Conditions 2029

The future full build-out 2029 volumes were derived by superimposing background 2029 volumes which include other area developments and background growth, with future site-generated volumes. The future projected 2029 volumes are illustrated in **Figure 22** with projected operation outputs in **Table 27**. The detailed Synchro results can be found in **Appendix M**.

Figure 22: 2029 Total Projected Volumes

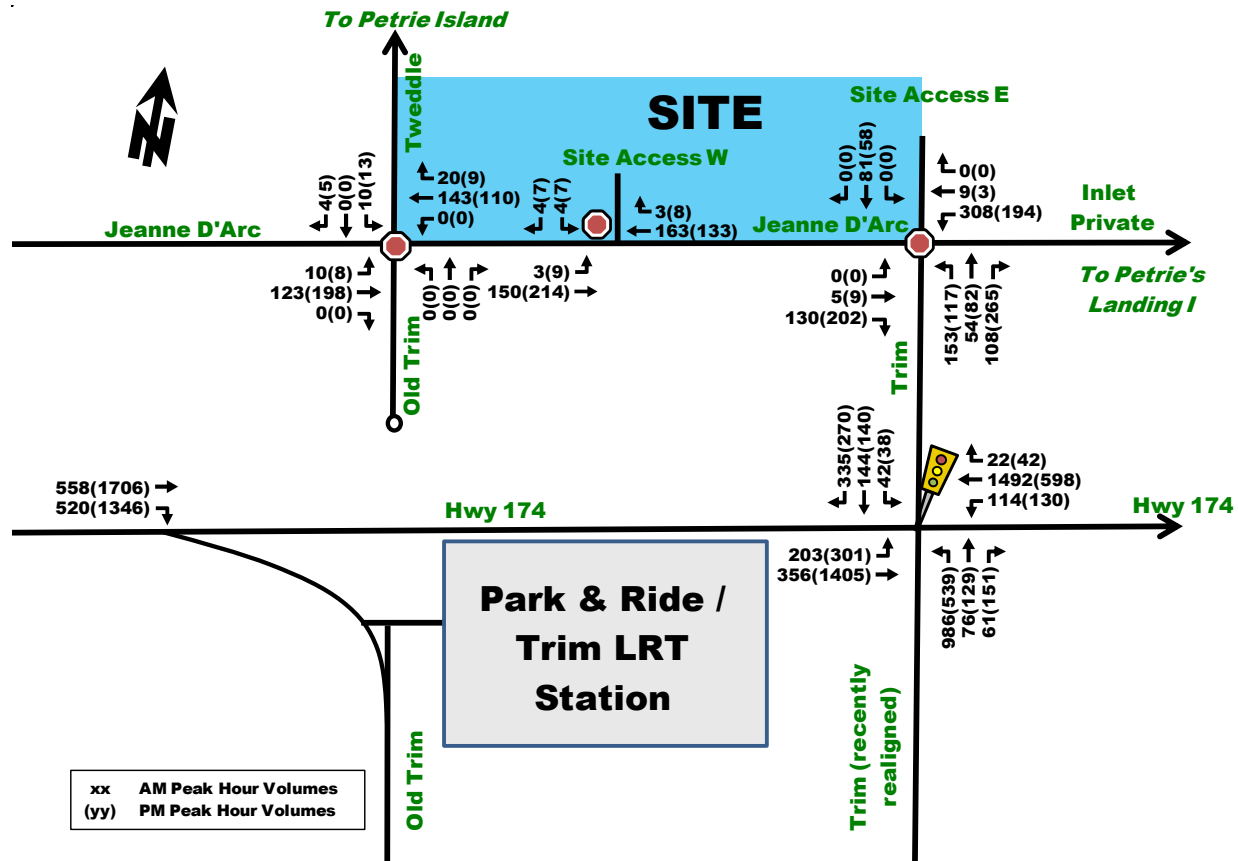


Table 27: 2029 Full Build-out Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Trim/Hwy 174 (S)	E(E)	0.95(0.97)	NBL(EBT)	56.4(51.9)	E(E)	0.93(0.93)
Trim-Site/Jeanne D'Arc (A)	B(C)	13(16)	WB(NB)	12(13)	B(B)	-
Tweddle/Jeanne D'Arc (A)	A(A)	8(8)	WB(EB)	8(8)	A(A)	-
Site/Jeanne D'Arc (U)	B(B)	12(13)	SB(SB)	1(1)	A(A)	-

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) = Signalized; (A) = All-way-stop-controlled; (U) = Stop-controlled on minor

As seen in **Table 27**, all study area intersections are expected to operate similarly to background 2029 conditions with acceptable delays. New Trim/Hwy 174, overall, is nearing theoretical capacity, similar to 2029 background volumes, but still operates within accepted City standards.

A sensitivity analysis was completed using SimTraffic to determine if queue lengths would spill back to upstream intersections, particularly the northbound queues on Trim Road leading to Jeanne D'arc. The intersection spacing between Jeanne D'arc and Hwy 174 on Trim Road was estimated to be approximately 190m. The analysis showed the estimated northbound 95th percentile queue was approximately 75m and 310m in the AM and PM peak hours respectively, exceeding the available spacing capacity. Different storage lane configurations were explored for the critical PM peak hour and are summarized in **Table 28** below.

Table 28: 95th Percentile Queue Northbound Approach New Trim/Jeanne D'Arc PM Peak for AWSC

Intersection Modification	95 th Percentile Queue PM Peak (m)	
	NBL or NBTL Queue	NBR or NBTR Queue
No storage lanes (shared through/left/right lane)	310 ₁	310 ₁
2 NB full lanes	49	75
NBTR full lane with 50m NBL storage	67	174
NBTL full lane with 50m NBR storage	78	58
1.) NBL and NBR share a single lane, making the queues the same		

To reduce the potential northbound queue length and spill back onto Hwy 174, an auxiliary turn lane should be implemented on the northbound approach, with the preferred configuration of a 50m right-turn storage and a full lane NBTL which reduces the northbound 95th percentile queue to a maximum of approximately 80m in the PM peak hour. These storage lane lengths and requirements will be re-evaluated once an official SPA is filed. The SimTraffic results have been included in **Appendix N**.

Future Conditions if Target Mode Share not Met

The trips generated based on TRANS 2020 mode share for Oréans are shown in **Figure 23** in the event that the target mode shares are not met. The projected intersection performance for the critical scenario 2029 with Orléans mode shares from TRANS 2020 are shown in **Table 29** with detailed output in **Appendix O**.



As seen in **Table 29**, most study area intersections are expected to operate very similarly to projected 2029 conditions with custom mode shares.

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

- As of August 2021, Trim Road was realigned approximately 250 meters east of its former intersection with Hwy 174. The realignment was performed to repurpose the former intersection location to the future Trim LRT Station. As a result, the intersection of Trim/Jeanne D'Arc was also shifted east,

extending the major collector road classification of Jeanne D'Arc Boulevard to the new Trim Road (adjacent to site).

- Trim/Hwy 174 intersection has currently been built to interim conditions, featuring a double northbound left-turn. The full buildout intersection, expected to be built prior to the opening day of this development is proposed to have triple northbound left-turn lanes.
- Overall, there are no existing safety concerns along the proposed development frontage and the planned Trim Road realignment is expected to significantly alter the roadway landscape within the broader study area. Therefore, no mitigation measures were considered.
- Existing intersections operate at good overall LoS 'C' or better with critical movements of 'D' or better during the weekday peak hours.

Proposed Development

- The proposed development will comprise of approximately 960 apartment units in four 24 to 32-storey buildings. Additional land uses proposed within the ground floor and second floors include approximately 14,750 ft² of ancillary retail, two restaurants with a combined floor area of less than 10,000 ft², approximately 20,000 ft² of office, and 11,500 ft² of spa/health club uses.
- The proposed development is projected to generate approximately 150 to 155 'new' vehicles per hour (two-way) during the weekday morning and afternoon peak hours.
- The proposed development is projected to generate approximately 270 to 310 'new' transit trips during the morning and afternoon peak hour periods, which can be accommodated by the nearby high-capacity Confederation East LRT Line. Additional capacity is also available on local bus routes departing Trim Station.
- TDM measures should be reviewed during the Site Plan Application to identify ways to leverage the site's proximity to rapid transit.
- The applicant is proposing 575 vehicle parking spaces, which exceeds the minimum vehicle parking requirements for the residential uses. The ancillary commercial uses were not included in the vehicle parking calculation based on the size, local context, and proximity to Trim LRT Station. The applicant and City of Ottawa are currently in discussions to consider this development within the Area Z designation in the Parking By-law, which precludes any commercial vehicle parking requirements. The quantity and location of vehicle parking spaces will be confirmed during the Site Plan Control Application for future phases.
- The applicant intends to provide at least the minimum bicycle parking space required by the Zoning By-law, to be confirmed during the Site Plan Control Application for future phases.
- The site proposes two new full movement driveways to Jeanne D'Arc Boulevard, one located approximately 75m east of Tweddle/Jeanne D'Arc intersection, and the second located at the newly relocated Trim/Jeanne D'Arc as the fourth leg to the intersection (north approach).

Future Conditions

- Other nearby developments and a 1% growth rate were applied to existing volumes to estimate 2029 background conditions. Note that the traffic volumes from 'other nearby developments' were based on TRANS 2011 Trip Generation manual which is now outdated. The new industry standard, TRANS 2020 Trip Generation results in lower trip generation forecasts compared to the 2011 methodology. Even with this conservative approach, the 2029 background intersection performance of all study area intersections was LoS 'E' or better and with critical movement of 'E' or better.

- In future conditions, site generated vehicle, pedestrian, and transit trips (note: transit trips were modelled as pedestrians heading to/from Trim Station) were layered onto the future road network. The study area intersections performed similarly to background 2029 conditions, with overall intersections operating at LoS 'E' or better and critical movements of 'E' or better.
- To mitigate potential queue spill-back between the realigned Trim/Jeanne D'Arc intersection to Hwy 174, it is recommended that the northbound movement be modified with a northbound through-left lane and a 50m auxiliary right-turn lane. This recommendation shall be revisited during the Site Plan Control Application for future phases.
- The MMLOS road segment analysis shows that future conditions on boundary streets do not meet MMLOS area targets for pedestrians (PLOS) due to high vehicular volumes in the future, even with a sidewalk on the north side of Jeanne D'arc Boulevard. The only means to achieve the PLOS target is to reduce the posted speed limit to 30 km/h on Jeanne D'arc Boulevard.
- The bike BLoS targets on Jeanne D'arc Boulevard are met for some segments, but could be met for all segments if the posted speed limit was reduced to 40 km/h and speed surveys show drivers are adhering to this speed. Transit targets are met for both present and future.
- The MMLOS intersection analysis shows that only truck target goals are met at the realigned Trim/Hwy 174 intersections. Given the fast-operating speeds and number of lanes crossed at Hwy 174, it is not possible to meet pedestrian and cyclist target goals without grade separating their crossing, such as a pedestrian/cyclist bridge over Hwy 174 between Trim Station and Tweddle Road (former Trim Road).
- A grade separated connection to the future Trim LRT Station, such as an extension of the proposed bridge from the park and ride in the south to the station, would significantly improve safety conditions for active transportation modes while also reducing the walking distance to the LRT station by more than 300 meters, to a development to station walking distance of approximately 300 meters.
- Active transportation facilities are currently being constructed along Jeanne D'Arc Boulevard east of Tweddle/Jeanne D'Arc and on the realigned Trim Road, including a new MUP on the south side of Jeanne D'Arc Boulevard, and a new MUP on the east side of realigned Trim Road. To connect these facilities to each other and existing facilities, crossrides are proposed on the north and east legs of Tweddle/Jeanne D'Arc, on the south leg of Trim/Jeanne D'Arc and on the east side of Trim/Hwy 174.
- The section of Jeanne D'Arc Boulevard between Tweddle Road and the realigned Trim Road should be modified to reflect a major collector road classification (similar to the existing Jeanne D'arc west of Tweddle) as part Stage 2 LRT implementation.
- The construction of the planned Trim Road realignment as part of Stage 2 LRT is ongoing. Therefore, any changes to the future road network as construction proceeds will be incorporated in future TIAs to support the Site Plan Control Application for future phases.

Based on the foregoing findings, the proposed development located at 1009 Trim is recommended from a transportation perspective.

Prepared By:

A handwritten signature in black ink, appearing to read 'Juan Lavin'.

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