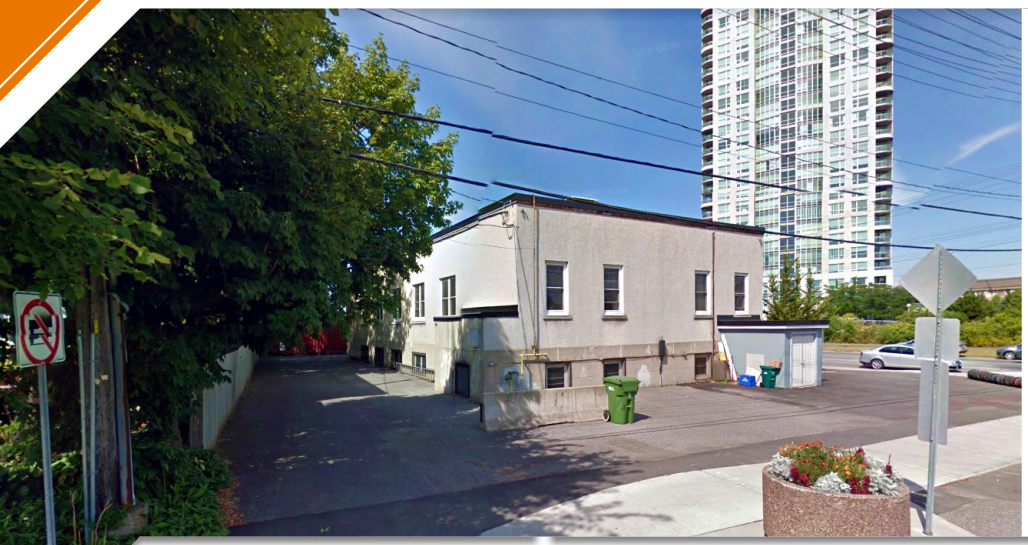
EBC

1950 Scott Street

TIA Strategy Report



July 2018

PARSONS

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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

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TIA Strategy Report

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TIA Strategy Report

1. SCREENING FORM

The Screening Form is provided as Appendix A. The trip generation trigger was met based on the development size, the location trigger was met based on the development being in a Design Priority Area (DPA), and the safety trigger was met based on the proposed site driveway's proximity to the Scott/Lanark signalized intersection. As triggers have been met, the TIA process continued with the Scoping and Forecasting reports, provided herein.

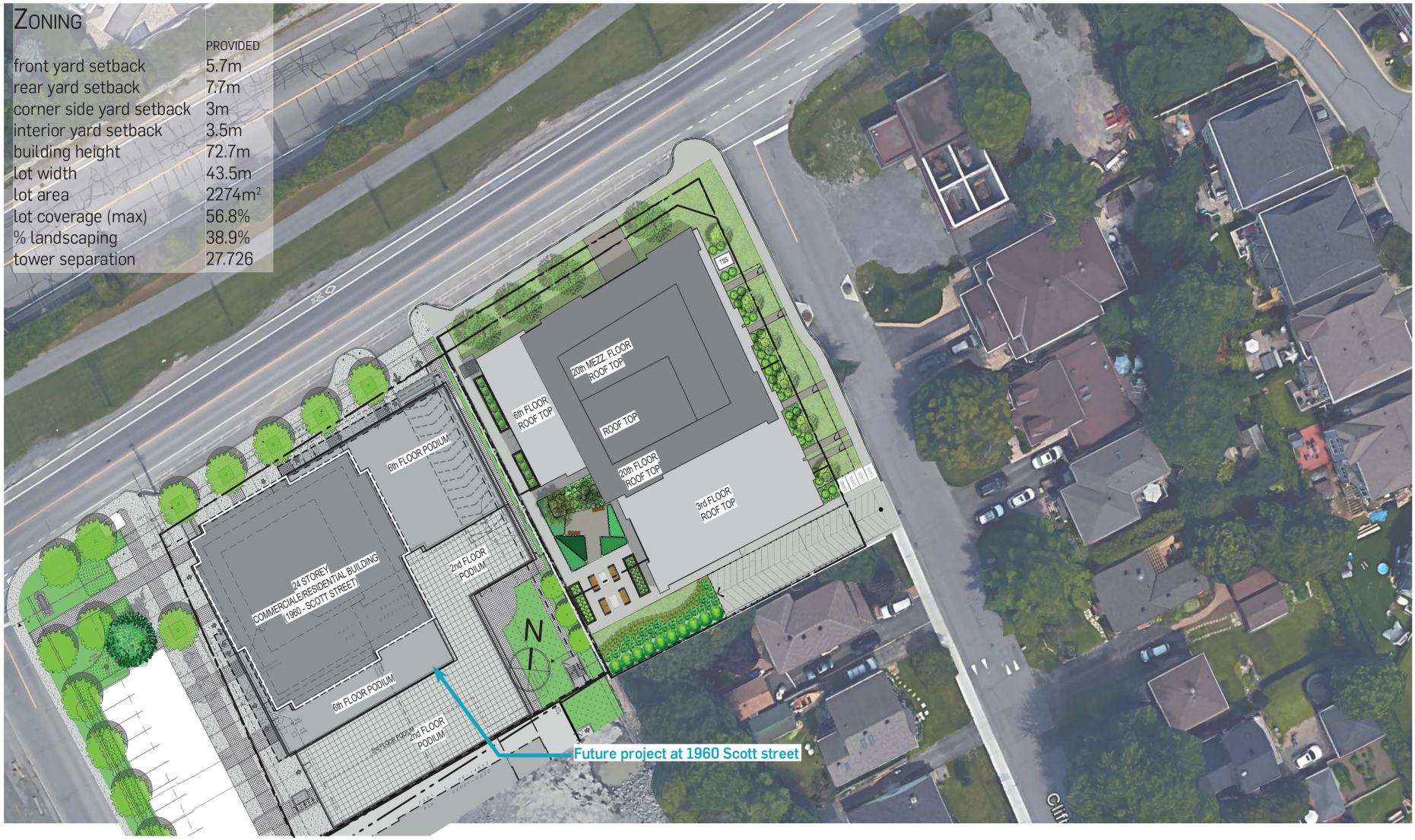
2. SCOPING REPORT

2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

Based on the proposed Site Plan, it is our understanding that the proponent is proposing a single-phase residential development located at 1950 Scott Street with an expected occupancy date in 2020. The proposed residential development will consist of approximately 141 condominium/apartment units with 162 proposed residential parking spaces and 10 visitor parking spaces. A single full-movement vehicle access is proposed to Clifton Road at the southern boundary of the site. The site is located on three property parcels, which are currently occupied by a single occupant one-story building and single-family homes and are zoned as Residential Fifth Density and Residential Third Density. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context



SITE PLAN

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NEUF ARCHITECT(E)S

11646- 1950 SCOTT STREET, Ottawa, ON 2018-06-12 40

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Figure 2: Proposed Site Plan

2.1.2. EXISTING CONDITIONS

Area Road Network

Scott Street is an east-west arterial, which extends from Churchill Avenue in the west to Bayview Road in the east, where it continues as Albert Street. Within the study area, Scott Street has a two-lane cross-section and auxiliary turn lanes are provided at major intersections. On-street parking bays are provided and the posted speed limit within the study area is 50 km/h.

As part of the Stage 2 LRT project, bus detours from the Transitway will be routed down Scott Street until the completion of Stage 2 LRT, expected to be in 2023.

Lanark Avenue/West Village Private is a collector roadway north of Scott Street that continues as a private roadway south of Scott Street (West Village Private). Lanark Avenue has a two-lane undivided cross-section and an unposted speed limit of 50 km/h. West Village Private has a posted speed limit of 25 km/h.

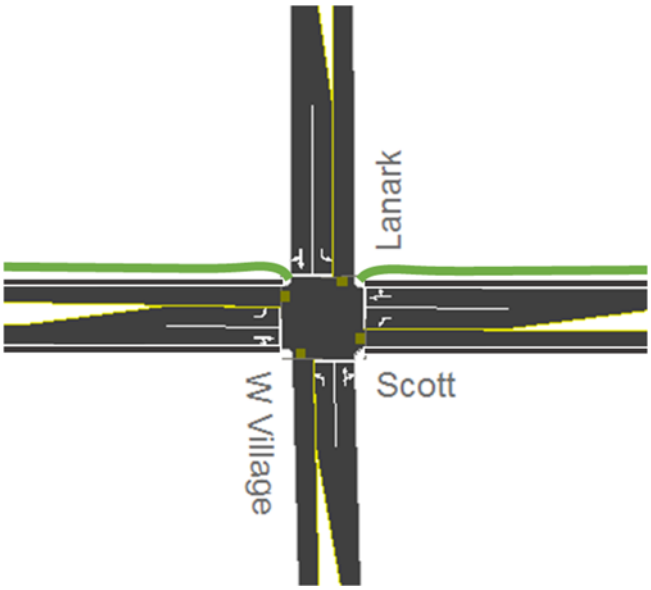
Clifton Road is a north-south local roadway that extends from Scott Street to Richmond Road. The roadway has a two-lane undivided cross-section with on-street parking provided along the east side of the roadway. The unposted speed limit is understood to be 50 km/h.

Through previous consultation with residents in the neighbourhood, we understand that there is an existing cut-through traffic issue along Clifton Road. Vehicles travel via Clifton Road, Wilber Avenue and Kirkwood Avenue to access Richmond Road and Scott Street. It is our understanding that the City is aware of this existing cut-through traffic issue and efforts have been made to minimize the amount of traffic on these local roadways. The following mitigative measures are currently installed along Clifton Road:

- Peak hour turn restrictions;
- Multiple curb bulb-outs; and
- Speed humps.

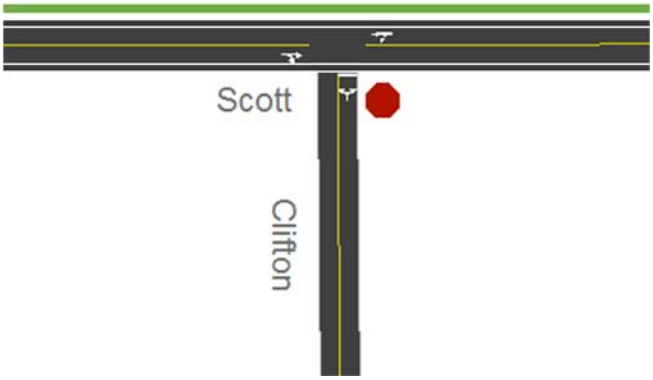
Existing Study Area Intersections

Scott/Lanark
The Scott/Lanark intersection is a 4-legged signalized intersection. All four approaches consist of a single left-turn lane and a shared through/right-turn lane. East and westbound curb bike lanes are provided along with an east-west MUP located to the north of Scott Street. All movements are permitted at this location.



Scott/Clifton

The Scott/Clifton intersection is an unsignalized T intersection with STOP control on the minor approach only (Clifton Road). All three approaches consist of a single full-movement lane. East and westbound curb bike lanes are provided along with an east-west MUP located to the north of Scott Street. There is an existing westbound left-turn restriction during the weekday morning peak period from Scott Street to Clifton Road. It is understood that this turn movement restriction is in place to help minimize cut-through traffic along Clifton Road.



Pedestrian/Cycling Network

According to the City's 2013 Official Cycling Plan (OCP), Scott Street is classified as Spine Route and a Cross-Town Bikeway, and Clifton Road between Scott Street and Wilber Avenue is classified as a "Local Route". Within the study area, a multi-use pathway exists along the north side of Scott Street in addition to on-street bicycle lanes.

Connecting pedestrians to transit service and other adjacent development, sidewalks are currently provided along both sides of Lanark Avenue, along the west side of Clifton Road, and along the south side of Scott Street, with an off-road multi-use pathway provided along the north side of Scott Street.

Transit Network

Transit service within the vicinity of the site is currently provided by OC Transpo Regular Route #50, which provides frequent all-day service. Bus stops for this route are located along Scott Street approximately 40 m from the site.

Rapid transit service (in the form of BRT) is also provided via the Westboro Station, located approximately 250 metres northwest of the proposed development, which provides convenient access to multiple routes along the Transitway. The following Figure 3 summarizes OC Transpo's Transit network system within the vicinity.

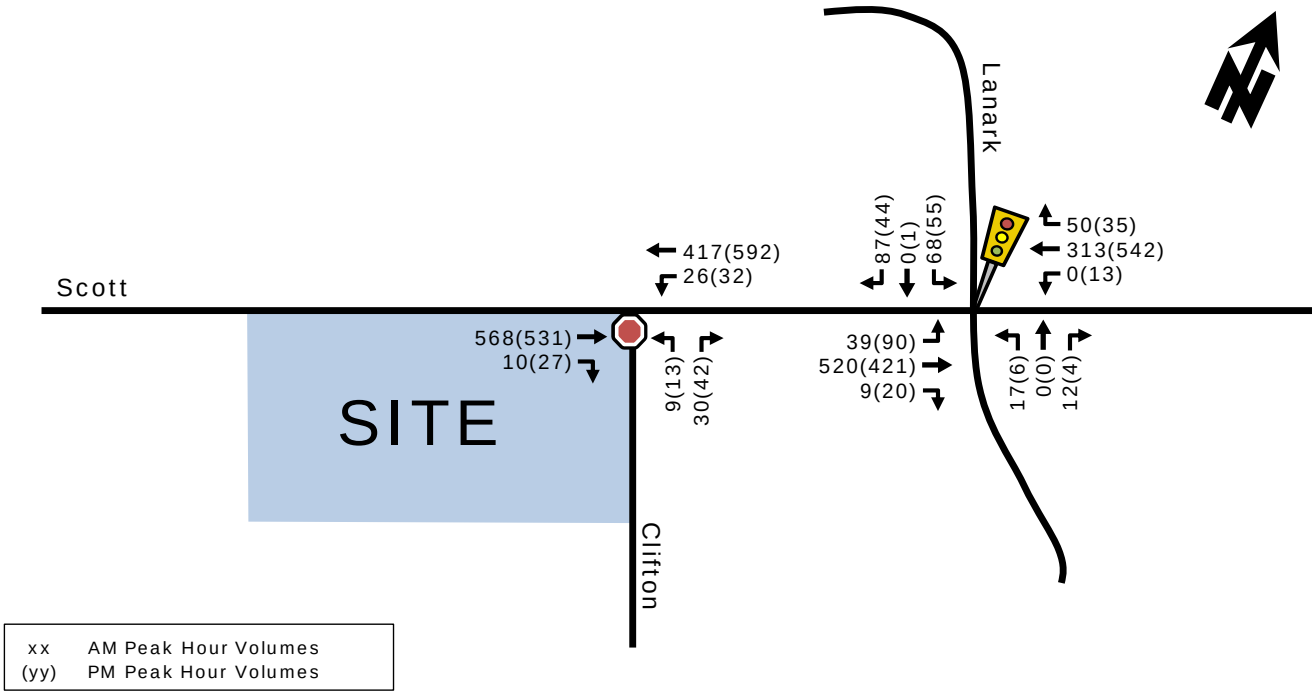
Figure 3: Area Transit Network

Phase 2 of the LRT project will divert transit onto Scott Street and the Westboro Transit Station will become the Westboro LRT Station once Phase 2 is complete by approximately 2023.

Peak Hour Travel Demands

Illustrated as Figure 4, are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa at the Scott/Lanark intersection and collected by Parsons (May 2018) at the Scott/Clifton intersection. These peak hour traffic volumes are included as Appendix B.

Figure 4: Existing Traffic Volumes



With regards to pedestrian volumes within the study area, the traffic count data indicates that there are approximately 25 to 60 pedestrians per hour along Scott Street and 10 to 30 pedestrians per hour crossing Scott Street along Lanark Road. With regard to cycling volumes, there were 2 to 17 cyclists per hour along Scott Street and 1 to 3 cyclists per hour along Lanark Road. The traffic count data was collected at the end of March 2017.

As mentioned previously, there is a westbound left-turn restriction at the Scott/Clifton intersection during the morning peak period. As shown in Figure 4, there were 26 violators of this left-turn restriction observed during one hour. In addition, there had previously been a northbound right-turn restriction at this location during the afternoon peak hour. It was observed that one of the signs (located along the north side of Scott Street) has been removed and the other sign (located along the east side of Clifton Road) is bent and requires repair as shown below. If the northbound right-turn restriction is in place, it is violated during the afternoon peak hour, as there were 42 veh/h turning northbound right onto Scott Street during the afternoon peak hour.

Figure 5: Northbound Signage along Clifton Road

Approaching Scott Street

Right-turn restriction not visible to NB vehicles

Existing Road Safety Conditions

Collision history for study area roads (2011 to 2015, inclusive) was obtained from the City of Ottawa, and most collisions (82%) involved only property damage, indicating low impact speeds, and 18% involved personal injuries. The primary causes of collisions cited by police include rear end (27%), sideswipe (27%), and angle (18%) type collisions.

A standard unit of measure for assessing collisions at an intersection is based on the number collisions per million entering vehicles (MEV). At the signalized Scott/Lanark & West Village intersection reported collisions have historically taken place at a rate of 0.27/MEV.

It is noteworthy that within the vicinity of the site, there was one collision involving two pedestrians at the Scott/Lanark intersection (in 2014) and one collision involving a cyclist at the Scott/Clifton intersection (in 2013). Both resulted in non-fatal injuries. The source collision data as provided by the City of Ottawa and related analysis is included as Appendix C.

2.1.3. PLANNED CONDITIONS

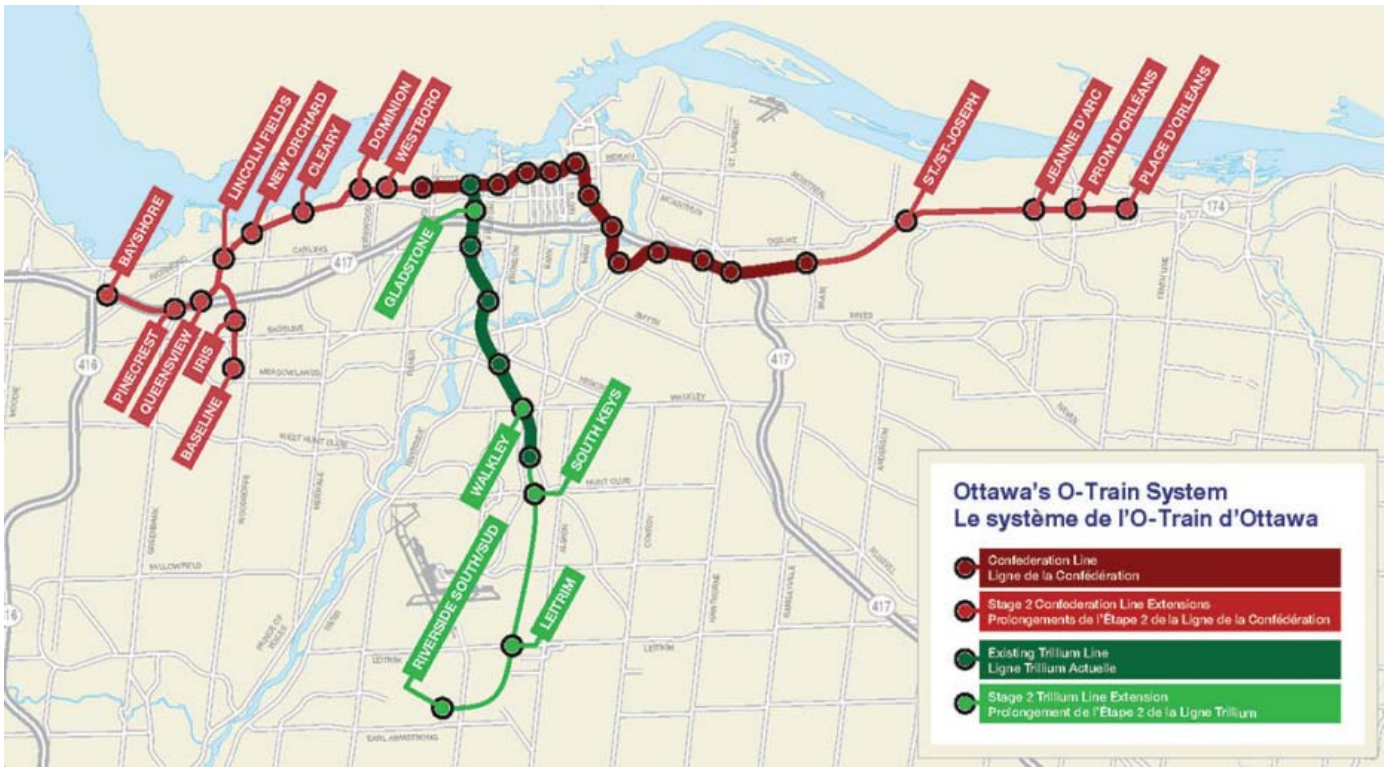
Planned Study Area Transportation Network Changes

Transit Projects

A notable transportation network change within the study area is the Phase I construction of the east-west LRT, which is the conversion of the City's existing BRT corridor to LRT between the current Blair transit station and the Tunney's Pasture station which includes a tunnel through the City's Downtown. Currently, this phase of construction is underway and is expected to be completed by the end of 2018.

Phase 2 of the LRT construction, which will extend the City's LRT further east, west and south (further improving transit within the vicinity of the site), is expected to begin by 2018 and be completed by 2023. The following Figure 6 illustrates the planned Phases 1 and 2 of the future Confederation/Trillium Lines. As mentioned previously, the subject development is located approximately 250 m from the Westboro station, which is part of Phase 2.

Figure 6: Planned LRT Phase 2



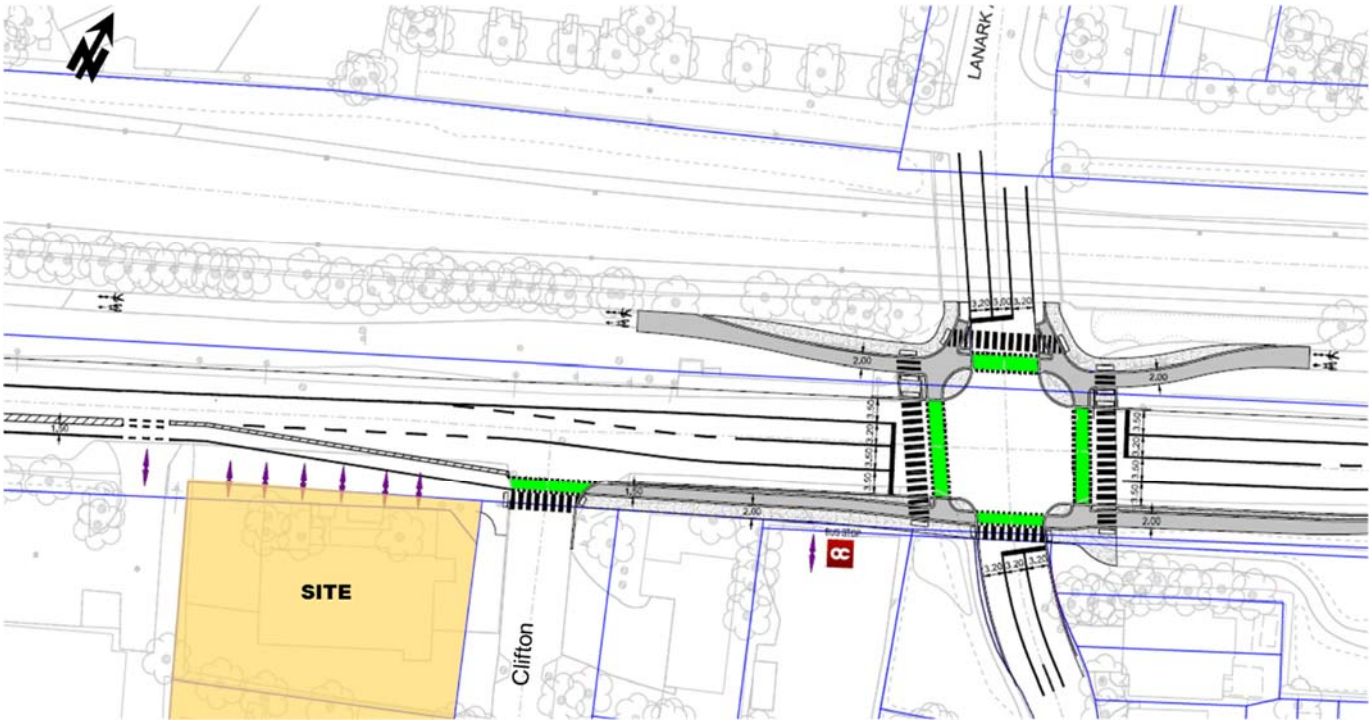
During the LRT Phase II construction, buses will be routed off the existing Transitway onto Scott Street. Approximately 210 additional busses in the morning peak and 225 additional busses in the afternoon peak are expected to be added to the existing vehicle traffic. The detour is expected to be in operation from late 2021 (October/November) to 2023.

Road Projects

As part of Stage 2 LRT, the City of Ottawa has prepared a "complete street" concept for Scott Street which is attached as Appendix D and the section directly adjacent to the site is shown as Figure 7. The proposed design will provide cycle tracks and sidewalks along both sides of Scott Street and provide fully-protected intersections at signalized intersections, including at the site's adjacent intersection (Scott/Lanark & West Village).

The planned modifications along Scott Street are expected to be constructed from May 2021 to October 2021 (some construction might begin in fall 2020). This plan will be in place for the detour of BRT buses along Scott Street during the Phase 2 LRT construction. The interim cross-section of Scott Street will include two vehicle travel lanes (curb lane is transit only) in the eastbound direction between Island Park Drive and Clifton Road. Post LRT construction (2024), it is understood that the cross-section of Scott Street will be revised to be a single vehicle travel lane in each direction.

Figure 7: Planned Scott Street Interim "Complete Street" Design



Other Area Development

With respect to other area development, the following development applications have been submitted to the City of Ottawa in the vicinity of the proposed site:

1960 Scott Street
Colonnade Bridgeport is proposing the construction of a mixed-use development consisting of approximately 120 residential dwelling units, 74,153 ft^2 of office and 14,440 ft^2 of retail located at the above address. The Transportation Brief (prepared by Parsons) projected 123 veh/h and 132 veh/h in the morning and afternoon peak hours, respectively.

1946 Scott Street
Surface Developments is proposing the construction of a 9-storey residential building consisting of 60 units and 9 parking spaces. The Transportation Impact Assessment (prepared by Parsons) projected minimal vehicle impact on the transportation network. This development is currently being appealed.

320 McRae Avenue, 1976 Scott Street, and 315 Tweedsmuir Avenue
A mixed-use development consisting of approximately 242 residential dwelling units, 11,200 ft^2 of office space, and 23,000 ft^2 of retail land uses is proposed at the abovementioned address. The Transportation Study (prepared by Parsons) projected 104 and 142 veh/h in the morning and afternoon peak hours, respectively.

Tunney's Pasture
Tunney's Pasture is located approximately 1 km east of the subject site and currently consists of approximately 10,000 office/lab employees. A Master Plan for Tunney's Pasture proposes the site to be redeveloped to consist of approximately 24,000 office, lab, and retail employees and approximately 3,700 high density residential dwelling units. The Multi-Modal Transportation Study (prepared by Parsons) projected net increase in vehicle traffic of 1,135 and 1,400 veh/h during the morning and afternoon peak hours, respectively. Intersection modifications are recommended at locations that are

projected to experience capacity issues and new signalized intersections are proposed for access/egress to/from the development.

The emphasis in the City's recent Official Plan and Transportation Master Plan is to place priority on transit, encourage intensification around transit stations, encourage mixed-use developments and provide "complete streets" that better accommodate the active transportation needs of its residents and reduce the use of the private auto. The Tunney's Pasture Master Plan is reflective of these realities and is an excellent example of a sustainable plan from a transportation perspective.

2.2. STUDY AREA AND TIME PERIODS

2.2.1. STUDY AREA

The proposed study area is outlined below and highlighted in Figure 8.

- Scott/Lanark intersection;
- Scott/Clifton intersection;
- Clifton Road – adjacent to the site; and
- Scott Street – adjacent to the site;

Figure 8: Study Area

2.2.2. TIME PERIODS

As the proposed land use is residential, the time periods to be assessed are the weekday morning and afternoon commuter peak hours.

2.2.3. HORIZON YEARS

The expected build out date for the proposed development is assumed to be 2020. Depending on the growth rate of the study area, the horizon year 2025 will be assessed for 5-years beyond site build out.

2.3. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following sections of the TIA process will be exempt, unless otherwise directed.

Module	Element	Exemption Consideration
4.1 Development Design	4.1.3 New Street Networks	Not required for applications involving site plans.
4.2 Parking	4.2.2 Spillover Parking	The site's residential rate meets the City's By-Law requirements and visitor parking rate is deficient by only 3 spaces. Given the site's location close to transit and active mode facilities, and the option to pay for parking at adjacent sites, ie 320 McRae, the amount of visitor parking is likely sufficient.
4.8 Review of Network Concept	All elements	This development is not expected to generate 200 person trips more than the permitted zoning for the site.

3. FORECASTING REPORT

3.1. DEVELOPMENT-GENERATED TRAVEL DEMAND

3.1.1. TRIP GENERATION AND MODE SHARES

Appropriate trip generation rates for the proposed development consisting of approximately 141 high-rise condominiums were obtained from the City's 2009 TRANS Trip Generation – Residential Trip Rates Report. The developer is considering either rental or condominium units. Given condominium unit trip-generation rates are higher than apartment trip-generation rates, for the purposes of this report, we have used the condominium rates, as this represents a more conservative approach. These rates are summarized in Table 1.

Table 1: 2009 TRANS Residential Trip Generation Rates

Land Use	ITE Land Use Code	Trip Rates	
		AM Peak	PM Peak
High-Rise Condominiums	ITE 232	T = 0.38(du)	T = 0.34(du)
Notes: T = Average Vehicle Trip Ends *du = Dwelling units*			

Using the TRANS Trip Generation rates, the total amount of vehicle trips generated by the proposed 141 residential units was calculated. The results are summarized in Table 2.

Table 2: Projected Site Vehicle Trip Generation – TRANS Model

Land Use	Area	AM Peak (Veh/h)			PM Peak (Veh/h)		
		In	Out	Total	In	Out	Total
High-Rise Condominiums	141 units	15	39	54	27	21	48

As shown in Table 2, a total of 54 and 48 veh/h are projected to travel to/from the proposed development during the weekday morning and afternoon commuter peak hours. Using the TRANS Auto Trips projected in Table 2 and the mode share percentages in the TRANS Trip Generation Report (Table 3.13), the total projected number of person trips by mode for the residential development are summarized in Table 3.

Table 3: Projected Site Person Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/h)			Mode Share	PM Peak (Person Trips/h)		
		In	Out	Total		In	Out	Total
Auto Driver	37%	15	39	54	40%	27	21	48
Auto Passenger	8%	3	8	11	9%	6	5	11
Transit	41%	16	44	60	37%	26	18	44
Non-motorized	14%	5	16	21	14%	10	7	17
Total Person Trips	**100%**	**39**	**107**	**146**	**100%**	**69**	**51**	**120**

As shown in Table 3, based on the TRANS Trip Generation method, the proposed site is projected to generate approximately 120 to 146 person-trips per hour during the weekday commuter peak hours. The increase in two-way transit trips is estimated to be approximately 45 to 60 persons per hour, and the increase in bike/walk trips is approximately 15 to 20 persons per hour.

Existing Permitted Zoning

The proposed site is located within three different property parcels. The 1950 Scott parcel, adjacent to Scott Street, is zoned Residential Fifth Density (maximum height 18 m) and the 312 Clifton Road and 314 Clifton Road parcels, that form the southern part of the site, are zoned Residential Third Density. Based on the existing zoning, the estimated number of people trips was calculated assuming approximately 50 residential units and similar trip generation rates as outlined above. The resulting number of people trips is estimated to be 45 to 50 persons/h during the peak hour with approximately 15 to 20 of those trips being vehicle trips.

As shown, based on the proposed Site Plan, there are projected to be approximately 75 to 95 more person trips per hour during peak hours than the currently zoned land uses. However, as the City invests in improving transit and active mode transportation there is a desire to increase density in areas that are located close to these planned facilities. As the site is located within 250 m from the future Westboro LRT Station, it is expected there will be a high transit mode split for the proposed development as outlined below. The increased number of people trips from these lands is expected to be able to be accommodated given completion of Stage 2 LRT and the active mode improvements along Scott Street.

Mode Shares

The existing mode shares outlined in Table 3 were obtained from the TRANS Trip Generation Report. In comparison, the 2011 OD Survey mode shares for the Ottawa Inner Area are summarized below.

Table 4: OD Survey Trips by Primary Travel Mode – Ottawa Inner Area

Time Period	24 Hours			AM Peak Hour			PM Peak Hour			Average
Mode	From District	To District	Within District	From District	To District	Within District	From District	To District	Within District	
Driver	44%	44%	22%	40%	41%	20%	45%	43%	21%	36%
Passenger	12%	12%	8%	7%	9%	9%	11%	11%	8%	10%
Transit	28%	28%	10%	25%	41%	13%	33%	22%	10%	23%
Bike/Walk	13%	14%	58%	25%	7%	52%	10%	22%	60%	29%
Other	2%	3%	2%	4%	2%	6%	2%	2%	2%	3%

These existing OD Survey modal shares are similar to the ones used in Table 3 to calculate the projected person trip generation for the build-out year of the proposed development. It is noteworthy that the OD Survey records a higher number of bike/walk trips in the subject area by approximately 15% and a lower number of transit trips. However, given the location of the site, within close proximity to the Westboro Transit Station (future LRT stations), a higher transit modal share is appropriate.

For the Horizon Year 2025, which represents five-years beyond full-build out, the following future mode share are forecasted. These mode shares reflect the construction of Phase 2 LRT and site's location within close proximity to the future Westboro LRT Station.

Table 5: Future Mode Share Targets for the Development

Travel Mode	Mode Share Target	Rationale
Transit	65%	Development is located within 600 m of a future LRT station, making it a Transit-Oriented Development (TOD) which have transit targets of 65%.
Walking	10%	This is consistent with the City's TMP, TOD areas and the existing TRANS trip-generation report.
Biking	5%	This is consistent with the City's TMP, TOD areas and the existing TRANS trip-generation report.
Auto Passenger	5%	This is consistent with TOD targets.
Auto Driver	15%	This is consistent with TOD targets.

Based on the future mode share targets for this development, the project site-generated person trips are outlined in Table 6.

Table 6: Future Projected 2025 Site-Generated Person Trips

Travel Mode	Mode Share	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	15%	6	16	22	10	8	18
Auto Passenger	5%	2	5	7	3	3	6
Transit	65%	26	69	95	45	33	78
Non-motorized	15%	6	16	22	10	8	18
Total Person Trips	**100%**	**40**	**106**	**146**	**68**	**52**	**120**

Given the low forecasted number of vehicle trips for the Horizon Year 2025 of approximately 20 new veh/h during the peak hours, no further vehicle analysis is included for this Horizon Year 2025 with respect to the site-generated traffic volumes.

3.1.2. TRIP DISTRIBUTION

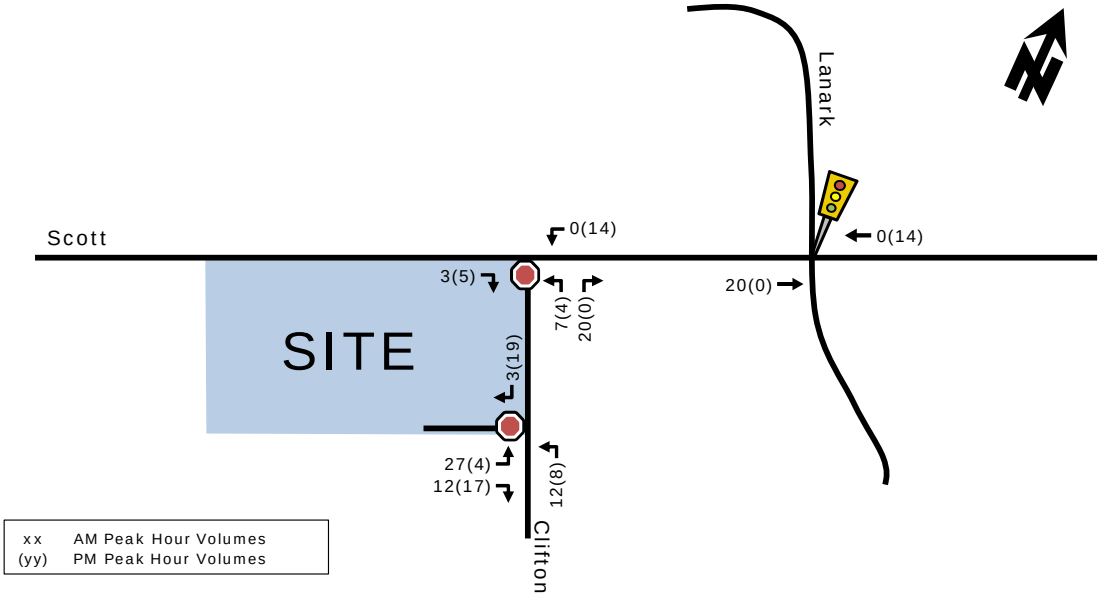
Based on the existing traffic volume counts and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes is as follows:

- 50% to/from the east;
- 30% to/from the south; and
- 20% to/from the west.

3.1.3. TRIP ASSIGNMENT

A full movement driveway connection to Clifton Road is proposed to serve the subject development. This driveway is proposed at the southern boundary of the site, approximately 50 m south of Scott Street. During the morning peak hour there is a westbound left-turn restriction at the Scott/Clifton intersection and during the afternoon peak hour, there is a northbound right-turn restriction. Given the proposed driveway and existing turn restrictions, 'new' site-generated vehicle trips are assigned to the study area network and illustrated as Figure 9.

Figure 9: 'New' Site-Generated Traffic



It is noteworthy that the existing turn restrictions are understood to be in place to help prevent cut-through traffic through the neighbourhood. Based on the existing count data at the Clifton/Scott intersection, there are a number of drivers that do not comply with these existing turn restrictions. Some site-generated traffic originating/destined from/to the east will be required to travel along the southern portion on Clifton Road during the peak hours to comply with the existing turn restrictions. This is represented in Figure 9.

3.2. BACKGROUND NETWORK TRAVEL DEMANDS

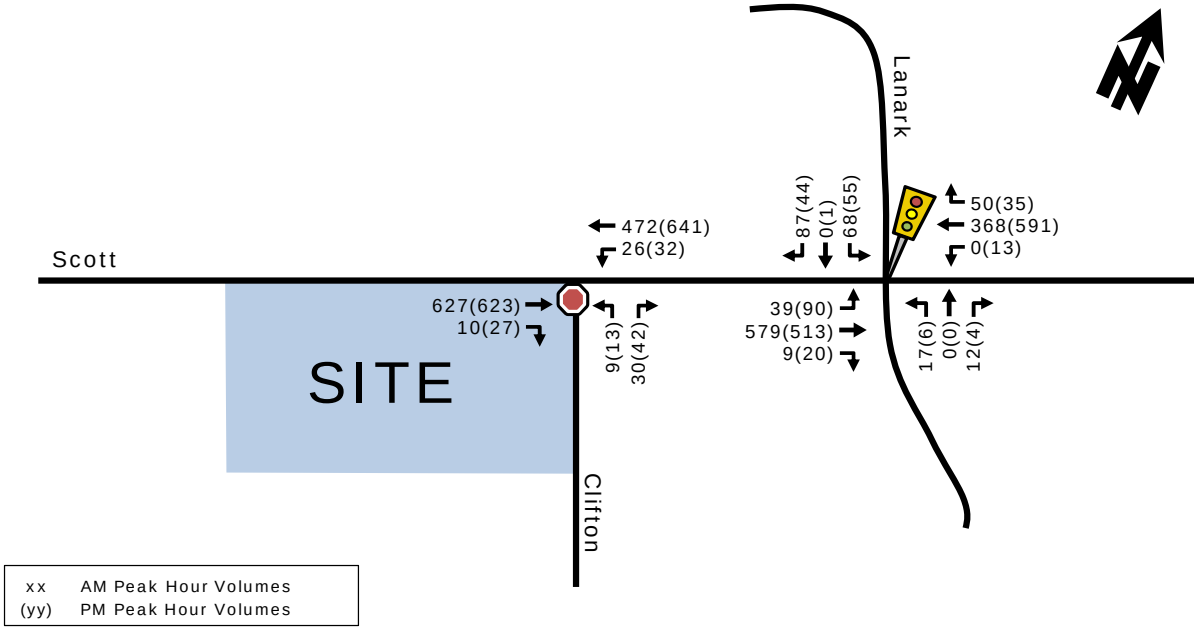
3.2.1. TRANSPORTATION NETWORK PLANS

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

3.2.2. BACKGROUND GROWTH

Background traffic growth for the area is expected to grow based on significant planned area developments. However, given Stage 2 LRT construction, the City is expecting to see negative vehicle growth along Scott Street in the future (see map attached as Appendix E). As such, for background traffic projections, the projected vehicle volumes from the planned area developments (1960 Scott Street and 320 McRae) were layered onto the existing traffic volumes for the build out year 2020. As the City expects to see a significant increase in transit modes once Stage 2 LRT is constructed in this area (2023) and a decline in traffic volumes, and as there is likely to be continued development growth in the area, the vehicle traffic volumes for horizon year 2025 is assumed to be the same as year 2020.

Figure 10: Background Traffic Volumes



3.2.3. OTHER DEVELOPMENTS

Refer to section 2.1.3 Planned Conditions – Other Area Developments.

3.3. DEMAND RATIONALIZATION

Given the site's location within close proximity of Phase 2 LRT and the City's initiatives to increase density within close proximity to the LRT stations, the future travel within the study area is expected to shift modes as transit and active mode infrastructure is constructed. The future traffic volumes along Scott Street are projected to continue to increase as density in the neighbourhood increases, however higher transit modes area also expected and in the fullness of t. Given the proposed site is expected to generate less than one new vehicle per minute (less than 60 veh/h) at build-out and approximately 20 veh/h (1 new vehicle every 3 minutes) by 2025, the vehicle impact generated by the site is considered minimal.

4. STRATEGY REPORT

4.1. DEVELOPMENT DESIGN

4.1.1. DESIGN FOR SUSTAINABLE MODES

Vehicle and Bicycle Parking

Vehicle parking is proposed in an underground parking garage for residential and visitor use. A total of 159 parking spaces are proposed for residents and 10 visitor parking spaces are proposed. With regard to bicycle parking, it is located within the underground parking structure and a total of 79 bicycle parking spaces are proposed. In addition, there are 141 storage units planned within the underground structure.

Transit and Pedestrians
Transit service within the vicinity of the site is currently provided by OC Transpo Regular Route #50, which provides frequent all-day service. Bus stops for this route are located along Scott Street approximately 40 m from the site. Rapid transit service (in the form of BRT) is also provided via the Westboro Station, located approximately 250 metres northwest of the proposed development, which provides convenient access to multiple routes along the Transitway. Phase 2 of the LRT project will divert transit onto Scott Street and the Westboro Transit Station will become the Westboro LRT Station once Stage 2 is complete by approximately 2023.

Sidewalk facilities within the vicinity of the site are provided along both sides of Lanark Avenue, along the west side of Clifton Road (adjacent to the site), and along the south side of Scott Street, with an off-road MUP provided along the north side of Scott Street. Pedestrian pathways are provided connecting the building entrances/exits to the public sidewalks along Scott Street and Clifton Road.

4.1.2. CIRCULATION AND ACCESS

The full-movement driveway to Clifton Road is proposed to the underground parking garage. The width of the driveway is noted to be 6 m, and the drive aisles within the parking garage are also noted to be 6 m wide. These widths meet the City's By-Law requirements and are sufficient for the circulation of two-way traffic.

It is noteworthy that there are 6 tandem parking spaces located in the underground parking garage. We are advised by the developer that these tandem parking spaces are planned to be sold to residents of the same unit so drivers can arrange to access their vehicles.

Garbage is located adjacent to the proposed vehicle driveway along Clifton Road and it is understood that loading is planned to take place on Clifton Road.

4.2. PARKING

4.2.1. PARKING SUPPLY

Vehicle Parking
A total of 159 underground parking spaces are proposed to serve the residents of the proposed development and 10 visitor parking spaces are proposed underground. This amount of residential parking meets the City's minimum By-Law requirements for 141 units within Area Y, identified on the City's Schedule 1A. The number of visitor parking spaces required by By-Law is calculated to be 13 spaces. As such, the total of 10 visitor spaces is deficient by 3 spaces. Given the site's location close to active mode facilities and the future LRT (existing BRT) Westboro Transit Station, it is expected that the proposed number of visitor parking spaces will be sufficient. In addition, there are paid parking spaces available at adjacent sites (i.e. 315 McRae) available to any potential visitor of the site. The total amount of residential and visitor parking does not exceed the City's maximum number of parking spaces for a development of this size within close proximity to rapid transit.

The majority of parking spaces (162 spaces) are noted to be 5.2 m in length and 2.6 m in width. There are seven (7) small parking spaces which are noted to be 4.6 m in length and 2.4 m in width. These parking space dimensions meet the City's By-Law requirements. In addition, there are six (6) tandem parking spaces, which are planned to be sold to tenants of the same unit that have more than one vehicle.

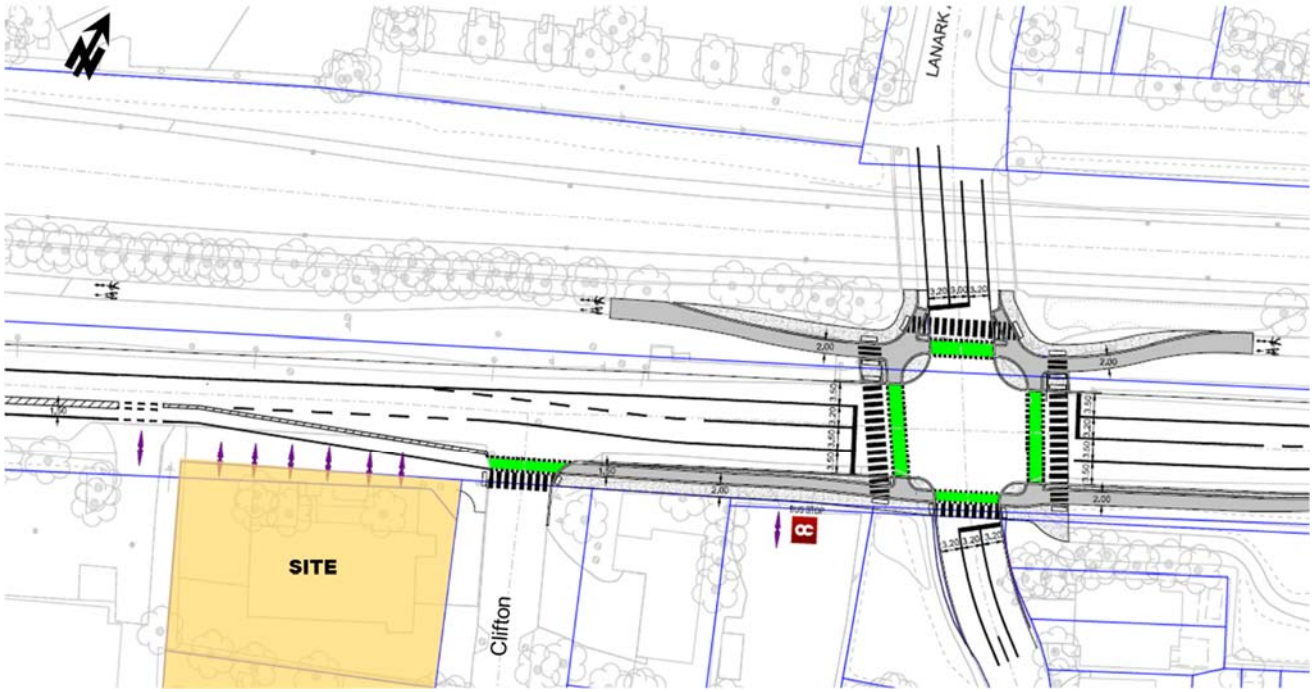
Bicycle Parking
A total of 79 bicycle parking spaces are proposed in the underground parking lot to serve the subject residential development. This amount of bicycle parking meets the City's minimum requirement with respect to the By-Law

requirements. In addition, there are 141 storage lockers planned in the underground parking lot, which may also serve as bicycle parking for owners/tenants.

4.3. BOUNDARY STREET DESIGN

The boundary streets of the proposed development are Scott Street and Clifton Road. The City of Ottawa has prepared a "complete street" concept for Scott Street which is attached as Appendix D and the section directly adjacent to the site is shown as Figure 11. The subject development is not expected to have any significant impact on the future design as no driveway is proposed to Scott Street.

Figure 11: Planned Scott Street Interim "Complete Street" Design



The proposed design will provide cycle tracks and sidewalks along both sides of Scott Street and provide fully-protected intersections at signalized intersections, including at the site's adjacent intersection (Scott/Lanark & West Village). Transit access is provided by bus stops located adjacent to the Scott/Lanark intersection.

The planned modifications along Scott Street are expected to be constructed from May 2021 to October 2021 (some construction might begin in fall 2020). This plan will be in place for the detour of BRT busses along Scott Street during the Stage 2 LRT construction. The resulting cross-section of Scott Street will include two vehicle travel lanes (curb lane is transit only) in the eastbound direction between Island Park Drive and Clifton Road. Post construction (2024), it is understood that the cross-section of Scott Street will be revised to be a single vehicle travel lane in each direction.

4.4. ACCESS INTERSECTION DESIGN

4.4.1. LOCATION AND DESIGN OF ACCESS

The proposed access is located approximately 50 m south of Scott Street along Clifton Road. The driveway is off-set as far as possible from Scott Street, and is approximately 0.3 m from the southern property line of the site. The driveway is replacing three existing driveways and is proposed to be full-movement with a width of 6 m. The location and width of the driveway meet the City's Private Approach By-Law.

South of the proposed access there are single family home driveways, the closest being approximately 8 m south of the subject driveway. Similarly, along the east side of Clifton Road, there are multiple single-family home driveways. Given the land use type and size of the adjacent driveways, vehicle conflicts between driveways are expected to be minimal.

With respect to the ramp providing access to the underground parking garage, the ramp grade is noted to be 2% from the edge of the sidewalk to 9 m down the ramp, where it increases to 10% then further to 16%. This 2% ramp grade follows the City's guidelines to provide sufficient space for a vehicle to be at grade as the vehicle approaches the sidewalk, to ensure proper sight lines for drivers to see pedestrians and cyclists on the public sidewalks and roads. At the bottom of the ramp, appropriate transition grades should be provided to continue into the parking garage, where a 3-4% grade is provided throughout the parking garage.

4.4.2. INTERSECTION CONTROL

Based on the projected number of vehicles traveling to/from the site's driveway, STOP control on the minor approach (site driveway) only is recommended. No further traffic control or turn lanes are warranted at this site driveway.

4.5. TRANSPORTATION DEMAND MANAGEMENT

The proposed residential development is located within walking distance to transit stops located along Scott Street and the Westboro Rapid Transit Station, located within 250 m walking distance. As such, the development is expected to attract significant transit ridership, particularly post Stage 2 LRT construction (approximately 2023). Sidewalks are currently provided along adjacent City roadways and a pedestrian crossing signal is provided along Scott Street, adjacent to the Westboro Transit Station. Cycle lanes and cross-rides are proposed along Scott Street as part of the City's future works related to Stage 2 LRT construction. As such, the location of the site is ideal in promoting non-auto travel during the weekday peak hours and outside peak hours. The Transportation Demand Management (TDM) checklist is provided as Appendix F and highlighted below:

- Provide pedestrian connections to existing City sidewalks;
- Provide secure underground bicycle parking;
- Number of bicycle parking spaces exceed City's minimum requirements according to the By-Law; and
- Number of vehicle parking spaces does not exceed the City's By-Law maximum.

Given the type of development and its location adjacent to rapid transit, within the urban inner area, and given the existing and future cycling and pedestrian facilities within the area, the development is well positioned to promote travel via transit and active modes.

4.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

Through previous consultation with residents in the neighbourhood, we understand that there is an existing cut-through traffic issue along Clifton Road. It is understood that vehicles travel via Clifton Road, Wilber Avenue and Kirkwood Avenue to access Richmond Road and Scott Street. It is our understanding that the City is aware of this existing cut-through traffic issue and efforts have been made to minimize the amount of traffic on these local roadways. The following mitigative measures are currently installed along Clifton Road:

- Peak-hour turn restrictions;
- Multiple curb bulb-outs; and
- Speed humps.

Given the site's location adjacent to Scott Street, the traffic distribution shows the majority of site-generated traffic is projected to travel to/from Scott Street. A portion of the site-generated traffic is projected to travel to/from the south via Clifton Road. The increase of vehicle traffic along Clifton Road, south of the site driveway is projected to be approximately

25 veh/h during the weekday morning and afternoon peak hours. This amount of traffic equates to one new vehicle every 2 minutes. The traffic travelling to/from the proposed development along Clifton Road is considered local residential traffic and not cut-through traffic.

The City has implemented significant traffic management measures along Clifton Road to prevent cut-through traffic of vehicles travelling between Scott Street and Richmond Road. As the increase in local residential traffic along Clifton Road is projected to be low (one new vehicle every 2 minutes), no further mitigative measures are recommended. However, it is recommended that the City repair the signage along Clifton Road and additional signage along the north side of Scott Street be installed to reinforce the westbound left-turn restriction, as there are a significant number of violations of these turning movements, as noted in Section 2.1.2.

4.7. TRANSIT

The Westboro Rapid Transit Station is located within 250 m walking distance from the proposed site. Stage 2 LRT is planned to be completed by 2023 with the existing BRT station being converted into an LRT station. As shown in Section 3.1, the two-way transit people trips generated by of the proposed development at build-out year is approximately 45 to 60 persons/h during the weekday morning and afternoon peak hours. At five years beyond full-build out, this number of site-generated persons trips is expected to increase to 80 – 95 persons per hour during the peak hours. This additional amount of transit trips is expected to be able to be accommodated by the future LRT line.

4.8. REVIEW OF NETWORK CONCEPT

Exempt – See Section 2.3.

4.9. INTERSECTION DESIGN

4.9.1. EXISTING CONDITIONS

The following Table 7 provides a summary of the existing traffic operations at the study area intersections based on the SYNCHRO (V9) traffic analysis software and the existing traffic volumes (Figure 4). The subject signalized intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The subject signalized intersection 'as a whole' was assessed based on weighted v/c ratio. The SYNCHRO model output of existing conditions is provided within Appendix G.

Table 7: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Scott/Lanark	A(A)	0.39(0.41)	SBL(WBT)	6.4(6.0)	A(A)	0.37(0.37)
Scott/Clifton (unsignalized)	C(C)	15.3(17.8)	NB(NB)	0.9(1.2)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

As shown in Table 7, the study area intersections 'as a whole' are currently operate at an excellent LoS 'A' during the morning and afternoon peak hours. With regard to 'critical movements' at study area intersections, they are operating at an acceptable LoS 'C' or better during peak hours with regard to City of Ottawa operating standards.

As shown in Figure 4, existing traffic volumes, the westbound left-turn and northbound right-turn restrictions are often violated. To prevent the continuation of the westbound left-turn at the Scott/Clifton intersection, it is recommended that additional signage be installed to ensure that the violation is visible to motorists. It was observed during the June 2018

site visit by Parsons' staff that the turn restriction sign on the north side of Scott Street (visible on Google Street View) has been removed. This leaves one turn restriction sign on the south side of the road which is not as visible to drivers approaching the unsignalized intersection. The northbound right-turn sign is bent (as outlined in Section 2.1.2) and should be repaired to be visible to drivers.

Multi-Modal Level of Service – Existing Conditions

The MMLoS analysis for the Scott/Lanark signalized study area intersection is summarized in Table 8. The existing detailed MMLoS analysis is provided as Appendix H.

Table 8: MMLoS – Signalized Scott/Lanark Intersection, Existing Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
Scott/Lanark	E	A	C	A	B	No target	E	No target	A	E

Given the development's location within close proximity to existing and future rapid transit and its location adjacent to a cross-town bikeway, the target levels of service for pedestrians and cyclists are high ('A'). As the BRT and future LRT are located adjacent to Scott Street and there are no transit priority measures along Scott Street (given the BRT/LRT are adjacent), there is no target for transit level of service. Scott Street is designated a truck route, however, Lanark and West Village are not part of the truck route, as such trucks are not required to turn at this intersection as part of the City's truck route, therefore there is no target level of service for trucks at this intersection. The vehicle level of service is met given the existing v/c ratio and delays.

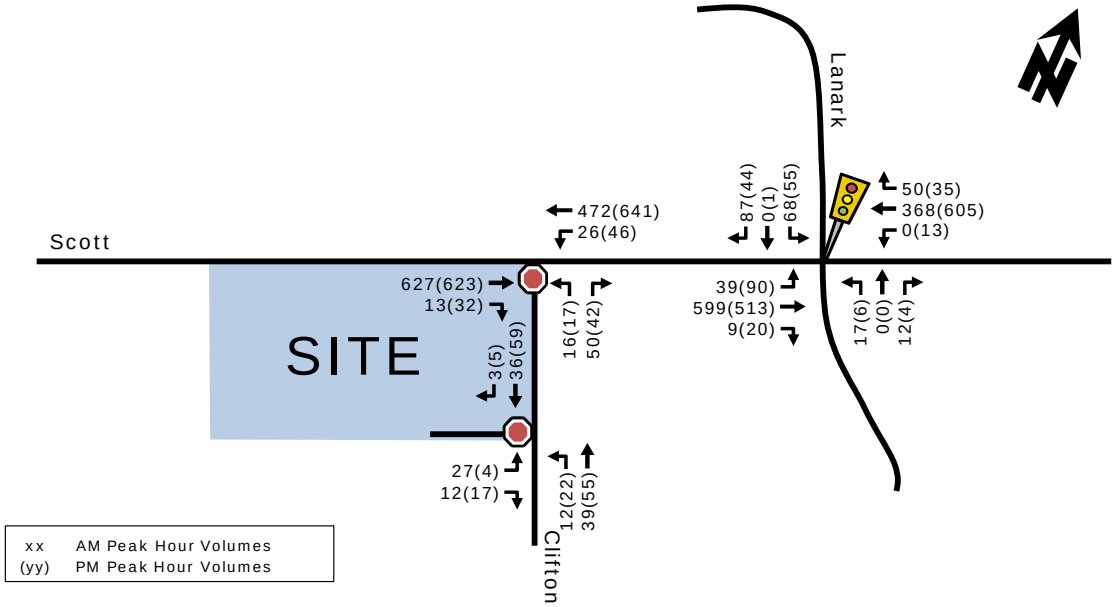
With regard to pedestrians, the PETSI (Pedestrian Exposure to Traffic at Signalized Intersection) scores are PLoS 'C' for all four legs. The delay score is PLoS 'A' for pedestrians crossing the north and south legs, however, pedestrians experience an average of 40 seconds of delay crossing the east and west legs, which results in a PLoS 'E'. Minimal changes to the signalized intersection are proposed to improve the PLoS score for the interim design (2021). Providing a zebra-stripe crosswalk type (proposed for the interim), an advanced pedestrian walk phase and increasing the effective walk time for pedestrians would improve the level of service. This crosswalk treatment has been included in the interim Scott Street design detailed in Section 4.3. Changing the existing signal timing can be done by the City Traffic Signals group if the City desires to improve the PLoS at this intersection, however, it is noteworthy that PLoS 'A' is not achievable given the MMLoS guidelines and the effective walk time calculation.

With regard to cyclists, there are currently no dedicated cycling facilities along Clifton Road and no protected left-turn for cyclists along Scott Street, resulting in a BLoS 'C'. Providing 2-stage left-turn crossing along all four legs of the intersection will improve the level of service to BLoS 'A', meeting the target for this intersection.

4.9.2. TOTAL PROJECTED 2020 CONDITIONS – FULL BUILD-OUT

The total projected 2020 traffic volumes were derived by superimposing the site-generated traffic volumes (Figure 9) onto background traffic volumes (Figure 10). The resulting total projected 2020 traffic volumes are illustrated in Figure 12.

Figure 12: Total Projected 2020 Traffic Volumes



The following Table 9 provides a summary of the total projected operations at the study area intersection based on the SYNCHRO (V10) traffic analysis software. The SYNCHRO model output of 2020 projected conditions is provided within Appendix G.

Table 9: Total Projected 2020 Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Scott/Lanark	A(A)	0.45(0.47)	EBT(WBT)	7.6(6.6)	A(A)	0.44(0.42)
Scott/Clifton (unsignalized)	C(C)	18.5(23.7)	NBL(NBL)	1.4(1.7)	A(A)	-
Clifton/Site Access (unsignalized)	A(A)	9.1(8.8)	EBL(EBL)	3.5(1.5)	A(A)	-
Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.						

The Scott/Lanark and Scott/Clifton intersections are projected to operate similar to the existing conditions, with slight increases in v/c and delays due to background traffic.

The Clifton/Site Access intersection is projected to operate 'as a whole' with an excellent LoS 'A'. Critical movements at this intersection are also projected to operate at LoS 'A'.

Multi-Modal Level of Service –Projected Build-Out Conditions

For the purpose of this report, the proposed interim changes for Scott Street mentioned in Section 4.3 will be assessed for the build-out year. The following Table 10 outlines the projected multi-model level of service for the Scott/Lanark intersection and the MMLoS analysis is provided as Appendix H.

Table 10: MMLOS – Signalized Scott/Lanark Intersection, Projected 2021 Conditions

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
Scott/Lanark	E	A	A	A	B	No target	E	No target	A	E

As shown in Table 10, the bicycle level of service meets the target BLoS 'A' with the proposed cross rides in the interim design. Similar to existing conditions, the vehicle level of service target is also achieved and there are no targets for trucks or transit at this intersection.

With regard to pedestrians, the target is not met due to the low effective walk time for pedestrians crossing the north and south legs. Signal timing can be revised at the time of the reconstruction to improve walking conditions for pedestrians, if desired, however this will reduce the amount of green time for east-west vehicle traffic. It is noteworthy that there is an existing pedestrian crossing signal location west of the Scott/Lanark intersection. Pedestrians walking from the proposed site to the Westboro Transit Station are likely to use the pedestrian signal to cross Scott Street given the shorter walking distance.

4.9.3. TOTAL PROJECTED 2025 CONDITIONS – FULL BUILD-OUT + 5 YEARS

The total projected 2025 traffic volumes are expected to be less than the 2020 total projected volumes as the vehicle site trip generation is lower than the projected site trip-generated for build out year 2020 and the background traffic is expected to experience negative growth as outlined in Section 3.2.2. As such, the vehicle level of service is expected to be similar or better at horizon year 2025 than the projected 2020 results.

Multi-Modal Level of Service – 2025 Projected Conditions

For the 2025 horizon year, it is assumed that the cross-section will be revised to two travel lanes with auxiliary turn lanes and the cross-rides and zebra stripe crosswalks implemented for the interim design will be maintained. The following Table 11 outlines the multi-model level of service for the Scott/Lanark intersection. The projected 2025 MMLoS analysis is provided as Appendix H.

Table 11: MMLOS – Signalized Scott/Lanark Intersection

Intersection	Level of Service									
	Pedestrian (PLoS)		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)		Vehicle (LoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target	LoS	Target
Scott/Lanark	E	A	A	A	B	No Target	F	No Target	A	E

As shown in Table 11, the final Scott Street design provides the same level of service for each mode compared to the levels of service achieved as the interim design for Scott Street.

5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis herein, the following conclusions are provided:

Proposed Site

- The development will include 141 condominium/apartment units with 159 proposed underground residential parking spaces and 10 visitor parking spaces;
- Bicycle parking is proposed within the underground parking structure and a total of 79 bicycle parking spaces are proposed. In addition, there are 141 proposed lockers proposed in the underground parking garage as well;
- The proposed development will consist of one phase, with the build-out year assumed to be 2020;
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 48 and 54 during the weekday morning and afternoon peak hours at build-out year;
- The development is located approximately 250 m from the Westboro Transit Station, which is planned to be a LRT Station with the completion of Stage 2 LRT (approximately 2023). As such, site-generated vehicle volumes are expected to decrease as transit ridership increases with the implementation of Stage 2 LRT; and
- Vehicle access to the development is proposed via a new full-movement driveway to Clifton Road.

Background Conditions

- There are several area developments planned within close proximity of the site. The vehicle volumes associated with these other area developments was layered onto the existing traffic volumes to provide background traffic volumes;
- Overall, the signalized Scott/Lanark and unsignalized Scott/Clifton intersections are projected to operate adequately during the projected background horizons;
- The levels of service achieved by mode for existing conditions are: PLoS 'E', BLoS 'C', TLoS 'B' and TkLoS 'E'; and,
- As part of Stage 2 LRT, the interim cross-section of Scott Street will include two vehicle travel lanes (curb lane is transit only) in the eastbound direction between Island Park Drive and Clifton Road;

Projected Conditions

- The signalized Scott/Lanark intersection and unsignalized Scott/Clifton intersection at horizon year 2020, are projected to operate similar to existing conditions in terms of vehicle operation;
- The new site access on Clifton Road is projected to operate 'as a whole' with a LoS 'A' throughout the horizon years;
- The bicycle level of service achieved at the Scott/Lanark intersection for the interim and post LRT Stage 2 construction of Scott Street meets the target BLoS 'A';
- The pedestrian level of service 'A' is not achieved due to low effective walk time for pedestrians crossing north-south at the signalized Scott/Clifton intersection; and,
- The approximate 45 to 60 projected transit trips for the 2020 horizon year is expected to increase to 80 to 95 trips for the 2025 horizon year. This additional amount of transit trips is expected to be able to be accommodated by the future LRT line.

Site Plan

- Cycling facilities are provided on Scott Street in the form of on-street cycle lanes and a MUP on the north side of the street;
- Pedestrian facilities include pathways connecting the building entrances/exits to the public sidewalks along Scott Street and Clifton Road;
- The proposed residential development is in a desirable location to promote active and transit modes given the type of development, its location adjacent to rapid transit, and the existing and future cycling and pedestrian facilities within the area;

- The number of vehicle and bicycle parking spaces meets the City's minimum By-Law requirement for residents, however, the visitor vehicle parking is deficient by 3 spaces. Given the site's location adjacent to transit and active mode facilities, the amount of visitor parking is likely sufficient; and,
- Vehicle access is proposed to Clifton Road and is off set as much as possible (50 m) from Scott Street.

Based on the foregoing, the proposed development fits well into the context of the surrounding area, and its location and design serves to promote use of walking, cycling, and transit modes, thus supporting City of Ottawa policies, goals and objectives with respect to redevelopment, intensification and modal share.

Therefore, approval from a transportation perspective of the proposed 1950 Scott Street development is recommended.

Prepared By:

André Jane Sponder, P.Eng.
Transportation Engineer

Reviewed by:

Ronald Jack, P.Eng.
Senior Transportation Engineer

Appendix A

Screening Form

PARSONS

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City of Ottawa 2017 TIA Guidelines

TIA Screening Form

Date	May-18
Project	1950 Scott Street
Project Number	476658-01000

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	1950 Scott Street
Description of location	Southwest quadrant of the Scott/Clifton intersection
Land Use	Residential
Development Size	141 Units
Number of Accesses and Locations	One full-movement vehicle access on Clifton Road
Development Phasing	None
Buildout Year	Assumed 2020
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger		
Land Use Type	Townhomes or Apartments	
Development Size	141	Units
Trip Generation Trigger Met?	Yes	

Module 1.3 - Location Triggers	
Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3)	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	No	
Safety Trigger Met?	Yes	

Appendix B

Turning Movement Counts

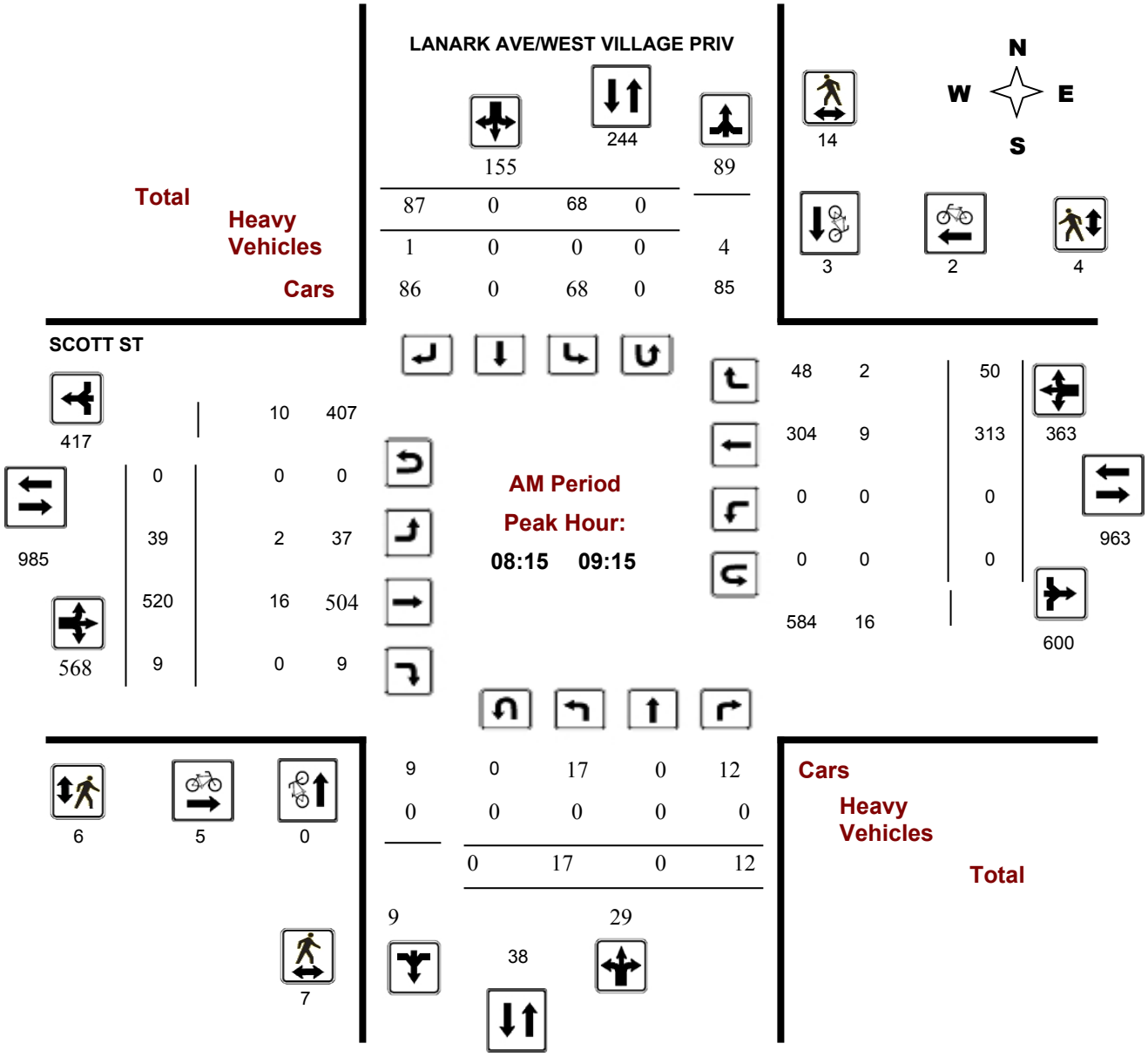
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LANARK AVE/WEST VILLAGE PRIV @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36807

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



Comments

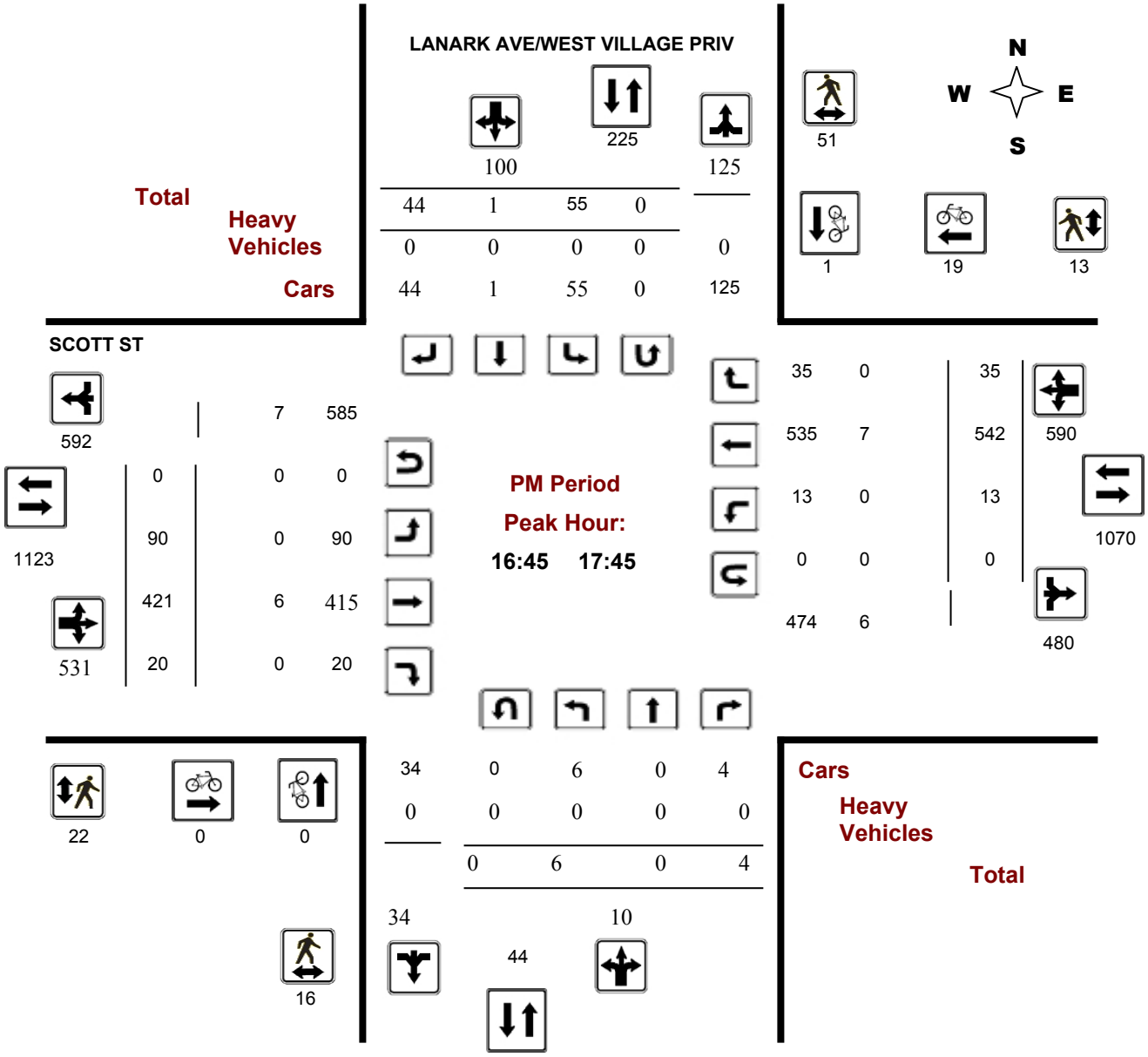
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LANARK AVE/WEST VILLAGE PRIV @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36807

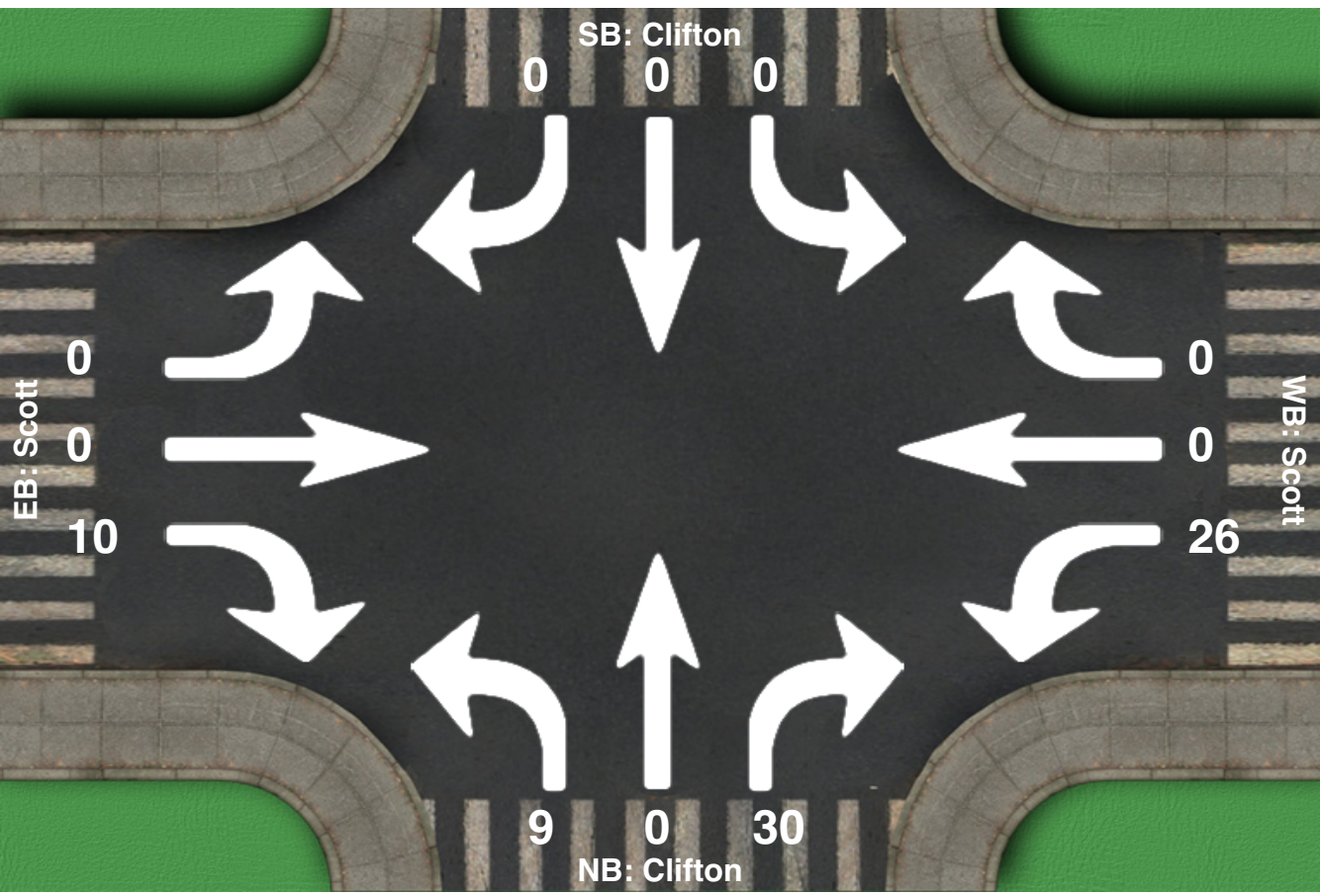
Start Time: 07:00 **Device:** Miovision



Comments

Intersection Peak Hour

Location: Clifton at Scott, Ottawa
GPS Coordinates:
Date: 2018-05-24
Day of week: Thursday
Weather: Sunny
Analyst: Rani Nahas



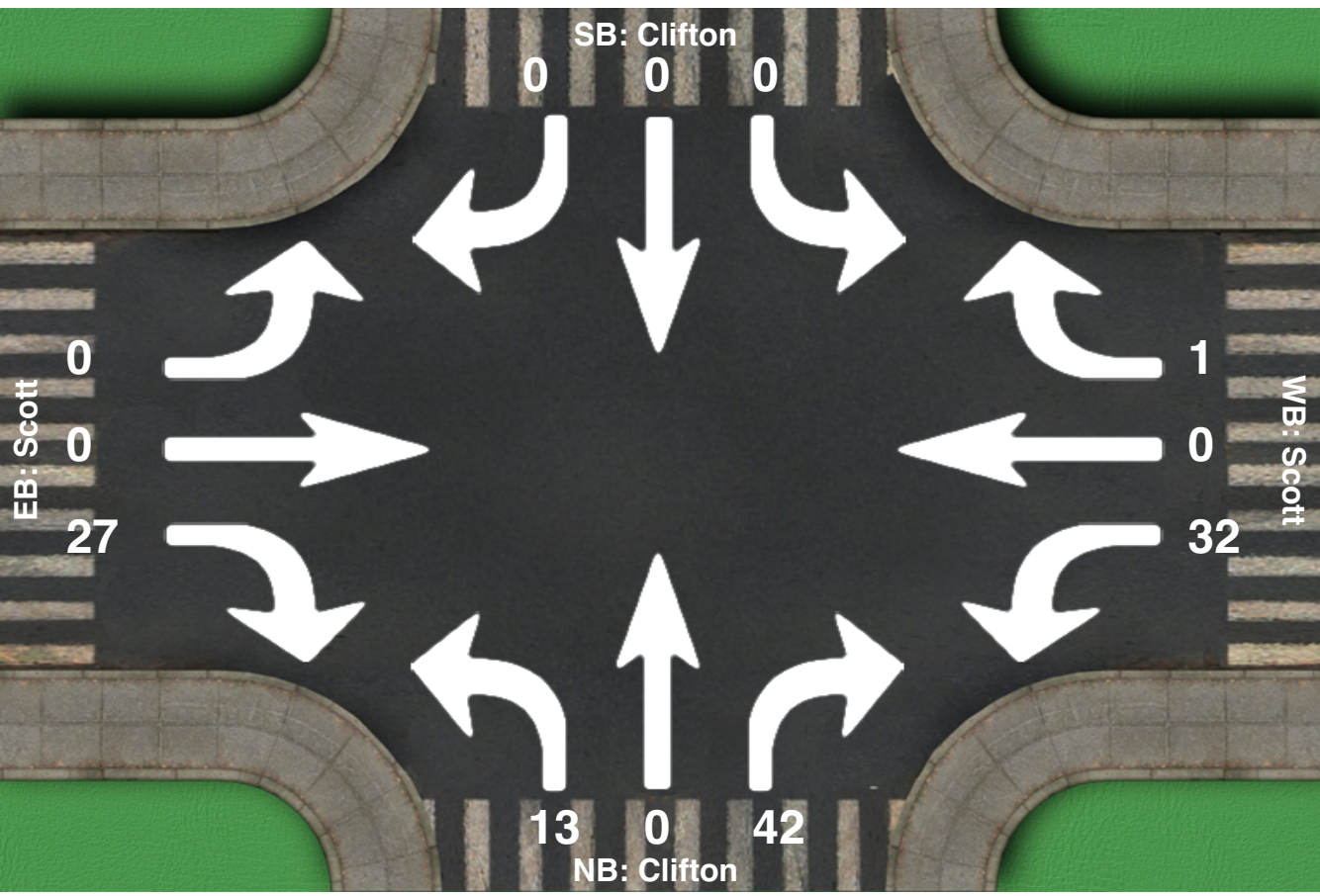
Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	26	0	0	9	0	30	0	0	10	75
Factor	0.00	0.00	0.00	0.72	0.00	0.00	0.56	0.00	0.54	0.00	0.00	0.50	0.78
Approach Factor	0.00			0.72			0.54			0.50			

Intersection Peak Hour

Location: Clifton at Scott, Ottawa
GPS Coordinates:
Date: 2018-05-24
Day of week: Thursday
Weather: Sunny
Analyst: Rani Nahas



Intersection Peak Hour

16:30 - 17:30

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	0	0	32	0	1	13	0	42	0	0	27	115
Factor	0.00	0.00	0.00	0.80	0.00	0.25	0.46	0.00	0.81	0.00	0.00	0.75	0.74
Approach Factor	0.00			0.82			0.69			0.75			

Appendix C

Collision Data and Analysis

Total Area

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	3	1	1	1	1	2	0	0	9	82%
Non-fatal injury	0	0	0	1	0	1	0	0	2	18%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**1**	**1**	**2**	**1**	**3**	**0**	**0**	**11**	100%
	#1 or 27%	#4 or 9%	#4 or 9%	#3 or 18%	#4 or 9%	#1 or 27%	#7 or 0%	#7 or 0%		

LANARK AVE / SCOTT ST

Years	*Total # Collisions*	*24 Hr AADT Veh Volume*	*Days*	*Collisions/MEV*
2011-2015	7	14,039	1825	**0.27**

Classification of Accident	*Rear End*	*Turning Movement*	*Sideswipe*	*Angle*	*Approaching*	*Single Vehicle (other)*	*Single vehicle (Unattended vehicle)*	*Other*	*Total*	
P.D. only	3	0	1	0	1	1	0	0	6	86%
Non-fatal injury	0	0	0	0	0	1	0	0	1	14%
Non reportable	0	0	0	0	0	0	0	0	0	0%
Total	**3**	**0**	**1**	**0**	**1**	**2**	**0**	**0**	**7**	100%
	43%	0%	14%	0%	14%	29%	0%	0%		

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** January 1, 2016

Location: CLIFTON RD @ SCOTT ST

Traffic Control: Stop sign **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Nov-24, Mon,15:00	Clear	Angle	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: LANARK AVE/WEST VILLAGE PRIV @ SCOTT ST

Traffic Control: Traffic signal **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Nov-06, Thu,15:03	Rain	Rear end	P.D. only	Wet	West	Going ahead	Delivery van	Other motor vehicle	
					West	Turning left	Pick-up truck	Other motor vehicle	
2014-Oct-17, Fri,09:46	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Pick-up truck	Pedestrian	2
2015-Feb-08, Sun,18:55	Clear	SMV other	P.D. only	Packed snow	East	Slowing or stopping	Pick-up truck	Ran off road	

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2011-01-01 TO: 2014-01-01

CLIFTON RD & SCOTT ST

Former Municipality: **Ottawa** Traffic Control: **Stop sign** Number of Collisions: **3**

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2011-12-12	Mo	09:00	Clear	Daylight	Turning	P.D. only	V1 W	Dry	Turning left	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Going ahead	Automobile, station	Other motor vehicle	
2	2012-06-08	Fri	19:15	Clear	Daylight	Single vehicle	P.D. only	V1 N	Dry	Turning left	Pick-up truck	Fire hydrant	0
3	2013-06-20	Thu	19:01	Clear	Daylight	Angle	Non-fatal	V1 N	Dry	Turning right	Automobile, station	Cyclist	0
								V2 E	Dry	Going ahead	Bicycle	Other motor vehicle	

LANARK AVE & SCOTT ST

Former Municipality: **Ottawa** Traffic Control: **Traffic signal** Number of Collisions: **4**

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
4	2011-08-05	Fri	15:45	Clear	Daylight	Rear end	P.D. only	V1 E	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Stopped	Pick-up truck	Other motor vehicle	
5	2012-11-26	Mo	16:57	Clear	Dusk	Approaching	P.D. only	V1 E	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 W	Dry	Stopped	Automobile, station	Other motor vehicle	
6	2013-01-07	Mo	13:39	Clear	Daylight	Rear end	P.D. only	V1 E	Slush	Slowing or	Automobile, station	Other motor vehicle	0
								V2 E	Slush	Slowing or	Pick-up truck	Other motor vehicle	
7	2013-06-13	Thu	17:45	Clear	Daylight	Sideswipe	P.D. only	V1 E	Dry	Overtaking	Unknown	Other motor vehicle	0
								V2 E	Dry	Stopped	Municipal transit bus	Other motor vehicle	

(Note: Time of Day = "00:00" represents unknown collision time

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2013-01-01 TO: 2014-01-01

CLIFTON RD & SCOTT ST

Former Municipality: **Ottawa** Traffic Control: **Stop sign** Number of Collisions: **1**

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2013-06-20	Thu	19:01	Clear	Daylight	Angle	Non-fatal	V1 N	Dry	Turning right	Automobile, station	Cyclist	0
								V2 E	Dry	Going ahead	Bicycle	Other motor vehicle	

LANARK AVE & SCOTT ST

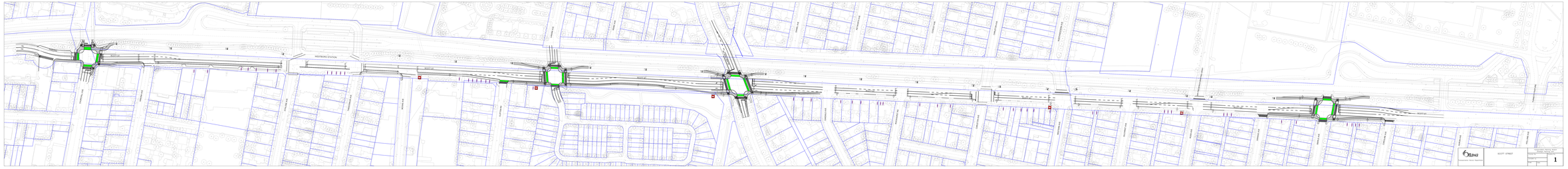
Former Municipality: **Ottawa** Traffic Control: **Traffic signal** Number of Collisions: **2**

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2	2013-01-07	Mo	13:39	Clear	Daylight	Rear end	P.D. only	V1 E	Slush	Slowing or	Automobile, station	Other motor vehicle	0
								V2 E	Slush	Slowing or	Pick-up truck	Other motor vehicle	
3	2013-06-13	Thu	17:45	Clear	Daylight	Sideswipe	P.D. only	V1 E	Dry	Overtaking	Unknown	Other motor vehicle	0
								V2 E	Dry	Stopped	Municipal transit bus	Other motor vehicle	

(Note: Time of Day = "00:00" represents unknown collision time

Appendix D

Scott Street Design


MEETBANG STATION
SCOTT ST
SCOTT ST
SCOTT ST

Appendix E

TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

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

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

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

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☑
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐ N/A
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐ N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N/A

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐ N/A
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

Appendix F

Synchro Analysis Output

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	39	520	313	17	0	68	0
Future Volume (vph)	39	520	313	17	0	68	0
Lane Group Flow (vph)	41	556	382	18	13	72	92
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	21.5	21.5	21.5	21.5
Total Split (s)	73.0	73.0	73.0	22.0	22.0	22.0	22.0
Total Split (%)	76.8%	76.8%	76.8%	23.2%	23.2%	23.2%	23.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	77.9	77.9	77.9	13.0	13.0	13.0	13.0
Actuated g/C Ratio	0.82	0.82	0.82	0.14	0.14	0.14	0.14
v/c Ratio	0.05	0.38	0.27	0.11	0.02	0.39	0.13
Control Delay	3.0	4.1	3.3	36.4	0.1	43.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.0	4.1	3.3	36.4	0.1	43.4	0.3
LOS	A	A	A	D	A	D	A
Approach Delay		4.1	3.3		21.2		19.3
Approach LOS		A	A		C		B
Queue Length 50th (m)	1.3	23.6	13.3	3.0	0.0	12.4	0.0
Queue Length 95th (m)	4.1	46.7	27.6	8.8	0.0	24.3	0.0
Internal Link Dist (m)		52.4	109.5		44.2		56.0
Turn Bay Length (m)	20.0			15.0		30.0	
Base Capacity (vph)	770	1460	1435	224	622	253	782
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.38	0.27	0.08	0.02	0.28	0.12

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 83 (87%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: W Village/Lanark & Scott

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	568	10	26	417	9	30
Future Volume (Veh/h)	568	10	26	417	9	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	598	11	27	439	9	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				77		
pX, platoon unblocked					0.96	
vC, conflicting volume			609		1096	604
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			609		1079	604
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	94
cM capacity (veh/h)			970		225	499

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	609	466	41
Volume Left	0	27	9
Volume Right	11	0	32
cSH	1700	970	394
Volume to Capacity	0.36	0.03	0.10
Queue Length 95th (m)	0.0	0.7	2.6
Control Delay (s)	0.0	0.8	15.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	15.2
Approach LOS			C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	90	421	13	542	6	0	55	1
Future Volume (vph)	90	421	13	542	6	0	55	1
Lane Group Flow (vph)	95	464	14	608	6	4	58	47
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	21.5	21.5	21.5	21.5
Total Split (s)	78.0	78.0	78.0	78.0	22.0	22.0	22.0	22.0
Total Split (%)	78.0%	78.0%	78.0%	78.0%	22.0%	22.0%	22.0%	22.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	83.3	83.3	83.3	83.3	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.83	0.83	0.83	0.83	0.13	0.13	0.13	0.13
v/c Ratio	0.16	0.31	0.02	0.41	0.04	0.01	0.35	0.20
Control Delay	3.3	3.3	2.5	4.0	37.8	0.0	45.5	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.3	3.3	2.5	4.0	37.8	0.0	45.5	14.1
LOS	A	A	A	A	D	A	D	B
Approach Delay		3.3		3.9		22.7		31.4
Approach LOS		A		A		C		C
Queue Length 50th (m)	3.1	17.6	0.4	25.9	1.1	0.0	10.6	0.2
Queue Length 95th (m)	8.3	33.7	1.8	49.0	4.6	0.0	21.9	10.0
Internal Link Dist (m)		52.4		109.5		44.2		56.0
Turn Bay Length (m)	20.0		25.0		15.0		30.0	
Base Capacity (vph)	602	1477	715	1474	233	687	242	311
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	0.16	0.31	0.02	0.41	0.03	0.01	0.24	0.15

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 40 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 6.0	Intersection LOS: A
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: W Village/Lanark & Scott

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	531	27	32	592	13	42
Future Volume (Veh/h)	531	27	32	592	13	42
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	559	28	34	623	14	44
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				77		
pX, platoon unblocked					0.90	
vC, conflicting volume			587		1264	573
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			587		1239	573
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		92	92
cM capacity (veh/h)			988		169	519

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	587	657	58
Volume Left	0	34	14
Volume Right	28	0	44
cSH	1700	988	346
Volume to Capacity	0.35	0.03	0.17
Queue Length 95th (m)	0.0	0.8	4.5
Control Delay (s)	0.0	0.9	17.5
Lane LOS		A	C
Approach Delay (s)	0.0	0.9	17.5
Approach LOS			C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	39	599	368	17	0	68	0
Future Volume (vph)	39	599	368	17	0	68	0
Lane Group Flow (vph)	41	640	440	18	13	72	92
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA
Protected Phases		2	6		8		4
Permitted Phases	2			8		4	
Detector Phase	2	2	6	8	8	4	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	21.5	21.5	21.5	21.5
Total Split (s)	73.0	73.0	73.0	22.0	22.0	22.0	22.0
Total Split (%)	76.8%	76.8%	76.8%	23.2%	23.2%	23.2%	23.2%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	5.5	5.5	5.5	5.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	75.2	75.2	75.2	12.5	12.5	12.5	12.5
Actuated g/C Ratio	0.79	0.79	0.79	0.13	0.13	0.13	0.13
v/c Ratio	0.06	0.45	0.32	0.12	0.03	0.43	0.15
Control Delay	4.1	6.0	4.6	36.4	0.1	45.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	6.0	4.6	36.4	0.1	45.5	0.5
LOS	A	A	A	D	A	D	A
Approach Delay		5.9	4.6		21.2		20.3
Approach LOS		A	A		C		C
Queue Length 50th (m)	1.5	34.3	19.2	3.0	0.0	12.6	0.0
Queue Length 95th (m)	4.9	67.2	38.9	8.9	0.0	24.7	0.0
Internal Link Dist (m)		52.4	109.5		44.2		56.0
Turn Bay Length (m)	20.0			15.0		30.0	
Base Capacity (vph)	689	1408	1379	204	504	218	656
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.45	0.32	0.09	0.03	0.33	0.14

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 81 (85%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: W Village/Lanark & Scott

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	627	13	26	476	16	50
Future Volume (Veh/h)	627	13	26	476	16	50
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	660	14	27	501	17	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				77		
pX, platoon unblocked					0.93	
vC, conflicting volume			674		1222	667
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			674		1201	667
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		91	88
cM capacity (veh/h)			917		184	459

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	674	528	70
Volume Left	0	27	17
Volume Right	14	0	53
cSH	1700	917	337
Volume to Capacity	0.40	0.03	0.21
Queue Length 95th (m)	0.0	0.7	5.8
Control Delay (s)	0.0	0.8	18.5
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	18.5
Approach LOS			C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Projected 2020 AM
3: Clifton & Site

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	12	12	39	36	3
Future Volume (Veh/h)	27	12	12	39	36	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	28	13	13	41	38	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	106	40	41			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106	40	41			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	99			
cM capacity (veh/h)	884	1032	1568			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	54	41
Volume Left	28	13	0
Volume Right	13	0	3
cSH	926	1568	1700
Volume to Capacity	0.04	0.01	0.02
Queue Length 95th (m)	1.1	0.2	0.0
Control Delay (s)	9.1	1.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	1.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	90	513	13	605	6	0	55	1
Future Volume (vph)	90	513	13	605	6	0	55	1
Lane Group Flow (vph)	95	561	14	674	6	4	58	47
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.1	26.1	26.1	26.1	21.5	21.5	21.5	21.5
Total Split (s)	78.0	78.0	78.0	78.0	22.0	22.0	22.0	22.0
Total Split (%)	78.0%	78.0%	78.0%	78.0%	22.0%	22.0%	22.0%	22.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.8	2.8	2.8	2.8	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-1.5	-1.5	-1.5	-1.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	82.0	82.0	82.0	82.0	13.9	13.9	13.9	13.9
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.14	0.14	0.14	0.14
v/c Ratio	0.18	0.39	0.02	0.47	0.04	0.01	0.33	0.20
Control Delay	4.1	4.4	3.2	5.1	35.7	0.0	43.2	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	4.4	3.2	5.1	35.7	0.0	43.2	13.4
LOS	A	A	A	A	D	A	D	B
Approach Delay		4.3		5.0		21.4		29.8
Approach LOS		A		A		C		C
Queue Length 50th (m)	3.2	23.1	0.4	30.6	1.1	0.0	10.6	0.2
Queue Length 95th (m)	9.6	49.2	2.0	64.9	4.5	0.0	21.4	9.8
Internal Link Dist (m)		52.4		109.5		44.2		56.0
Turn Bay Length (m)	20.0		25.0		15.0		30.0	
Base Capacity (vph)	530	1451	610	1447	219	572	227	287
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	0.18	0.39	0.02	0.47	0.03	0.01	0.26	0.16

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 65.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: W Village/Lanark & Scott

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	623	32	46	641	17	42
Future Volume (Veh/h)	623	32	46	641	17	42
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	656	34	48	675	18	44
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				77		
pX, platoon unblocked					0.87	
vC, conflicting volume			690		1444	673
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			690		1436	673
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		85	90
cM capacity (veh/h)			905		122	455

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	690	723	62
Volume Left	0	48	18
Volume Right	34	0	44
cSH	1700	905	254
Volume to Capacity	0.41	0.05	0.24
Queue Length 95th (m)	0.0	1.3	7.1
Control Delay (s)	0.0	1.4	23.7
Lane LOS		A	C
Approach Delay (s)	0.0	1.4	23.7
Approach LOS			C

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	17	8	55	59	19
Future Volume (Veh/h)	4	17	8	55	59	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	18	8	58	62	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	146	72	82			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	146	72	82			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	99			
cM capacity (veh/h)	842	990	1515			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	66	82
Volume Left	4	8	0
Volume Right	18	0	20
cSH	959	1515	1700
Volume to Capacity	0.02	0.01	0.05
Queue Length 95th (m)	0.5	0.1	0.0
Control Delay (s)	8.8	0.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	0.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

MMLoS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	PARSONS	**Project**	476658 - 1000
Scenario	1950 Scott Street TIA	**Date**	6/29/2018
Comments			

INTERSECTIONS		Scott/Lanark - Existing				Scott/Lanark - Interim Cross-Section				Scott/Lanark - Future 2025			
	Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Pedestrian	Lanes	3	3	3	3	3	3	4	4	3	3	3	3
	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	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	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	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	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	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	No Channel	No Channel	No Channel	No Channel
	Corner Radius	10-15m	5-10m	5-10m	5-10m	5-10m	3-5m	5-10m	3-5m	5-10m	3-5m	5-10m	3-5m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse 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	Zebra stripe hi-vis markings
	PETSI Score	**70**	**71**	**71**	**71**	**74**	**75**	**57**	**58**	**74**	**75**	**74**	**75**
	Ped. Exposure to Traffic LoS	**C**	**C**	**C**	**C**	**C**	**B**	**D**	**D**	**C**	**B**	**C**	**B**
	Cycle Length	95	95	95	95	95	95	95	95	95	95	95	95
	Effective Walk Time	54	54	8	8	54	54	8	8	54	54	8	8
	Average Pedestrian Delay	**9**	**9**	**40**	**40**	**9**	**9**	**40**	**40**	**9**	**9**	**40**	**40**
	Pedestrian Delay LoS	**A**	**A**	**E**	**E**	**A**	**A**	**E**	**E**	**A**	**A**	**E**	**E**
	Level of Service	**C**	**C**	**E**	**E**	**C**	**B**	**E**	**E**	**C**	**B**	**E**	**E**
		E				**E**				**E**			
	Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST
Bicycle	Bicycle Lane Arrangement on Approach			Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP
	Right Turn Lane Configuration												
	Right Turning Speed												
	Cyclist relative to RT motorists	**-**	**-**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**	**Not Applicable**
	Separated or Mixed Traffic	**-**	**-**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**
	Left Turn Approach	No lane crossed	No lane crossed	1 lane crossed	1 lane crossed	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box	2-stage, LT box
	Operating Speed	> 40 to ≤ 50 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≤ 40 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h
	Left Turning Cyclist	**B**	**B**	**C**	**C**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
	Level of Service	**-**	**-**	**C**	**C**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
		C				**A**				**A**			
Transit	Average Signal Delay			≤ 10 sec	≤ 10 sec			≤ 10 sec	≤ 10 sec			≤ 10 sec	≤ 10 sec
	Level of Service	**-**	**-**	**B**	**B**	**-**	**-**	**B**	**B**	**-**	**-**	**B**	**B**
		B				**B**				**B**			
Truck	Effective Corner Radius	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m	10 - 15 m			< 10 m	< 10 m
	Number of Receiving Lanes on Departure from Intersection	1	1	1	1	1	1	1	≥ 2			1	1
	Level of Service	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**B**	**-**	**-**	**F**	**F**
		E				**E**				**F**			
Auto	Volume to Capacity Ratio	0.0 - 0.60				0.0 - 0.60				0.0 - 0.60			
	Level of Service	**A**				**A**				**A**			