

**STARBUCKS COFFEE SHOP  
1910 BANK STREET  
OTTAWA, ONTARIO**

**TRANSPORTATION IMPACT ASSESSMENT**

Prepared for:

RioCan Holdings Inc.  
RioCan Yonge Eglinton Centre  
2300 Yonge Street, Suite 500  
Toronto, ON M4P 1E4

December 17, 2018

118-686  
686 TIA Report\_1.doc

**D. J. Halpenny & Associates Ltd.**

CONSULTING TRANSPORTATION ENGINEERS

P.O. Box 774, MANOTICK, ON K4M 1A7 - TEL (613) 692-8662 - FAX (613) 692-1945

---

## TABLE OF CONTENTS

	PAGE
STEP 1 - SCREENING .....	1
STEP 2 - SCOPING .....	1
MODULE 2.1 – Existing and Planned Conditions .....	1
MODULE 2.2 – Study Area and Time Periods .....	6
MODULE 2.3 – Exemptions Review .....	7
STEP 3 - FORECASTING .....	8
MODULE 3.1 – Development- Generated Travel Demand .....	8
MODULE 3.2 – Background Network Travel Demand .....	12
MODULE 3.3 – Demand Rationalization .....	15
STEP 4 - ANALYSIS .....	15
MODULE 4.1 – Development Design .....	15
MODULE 4.2 – Parking .....	18
MODULE 4.3 – Boundary Street Design .....	19
MODULE 4.4 – Access Intersection Design .....	19
MODULE 4.5 – Transportation Demand Management .....	28
MODULE 4.6 – Neighbourhood Traffic Management .....	28
MODULE 4.7 – Transit .....	28
MODULE 4.8 – Review of Network Concept .....	29
MODULE 4.9 – Intersection Design .....	29
SUMMARY .....	29
APPENDIX .....	32

## LIST OF FIGURES

2.1	SITE LOCATION PLAN .....	2
2.2	CONCEPTUAL SITE PLAN .....	4
2.3	2018 PEAK AM AND PM HOUR TRAFFIC COUNTS .....	5
3.1	PEAK AM AND PM HOUR SITE GENERATED PRIMARY TRIPS .....	13
3.2	PEAK AM AND PM HOUR SITE GENERATED PASS-BY TRIPS .....	14
3.3	2019 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC .....	16
3.4	2024 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC .....	17
4.1	AERIAL PHOTO OF THE SITE ACCESS .....	20
4.2	2019 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC .....	22
4.3	2024 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC .....	23

## LIST OF TABLES

2.1	COLLISION SUMMARY .....	6
3.1	INVENTORY .....	8
3.2	VEHICLE TRIP GENERATION RATES AND DIRECTIONAL SPLITS .....	8
3.3	MODE SHARE SUMMARY (Person-Trips) .....	9
3.4	TOTAL PEAK HOUR SITE GENERATED TRIPS .....	9
3.5	PRIMARY AND PASS-BY PERSON TRIPS .....	10
3.6	FUTURE DEVELOPMENT GENERATED PERSON-TRIPS .....	10
3.7	PRIMARY AND PASS-BY PERSON-TRIPS .....	11
3.8	PRIMARY AND PASS-BY TRIP DISTRIBUTION .....	12
4.1	VEHICLE LEVEL OF SERVICE (LoS) – LoS & DELAY .....	24
4.2	PEDESTRIAN LEVEL OF SERVICE (PLOS) – Street Segment & Intersections .....	26
4.3	BICYCLE LEVEL OF SERVICE (BLOS) – Street Segment & Intersections .....	27
4.4	TRANSIT LEVEL OF SERVICE (TLOS) – Street Segment & Intersections .....	27
4.5	TRUCK LEVEL OF SERVICE (TkLOS) – Street Segment & Intersections .....	28
4.6	MULTI-MODAL (MMLOS) SUMMARY TABLE .....	30

**STARBUCKS COFFEE SHOP  
1910 BANK STREET  
OTTAWA, ONTARIO**

**TRANSPORTATION IMPACT ASSESSMENT**

**STEP 1 - SCREENING**

A Screening Form has been prepared by the Planning Consultant for the proposed Starbucks coffee shop. The Screening Form, which is included as Exhibit 1 in the Appendix, determined that the Trip Generation, Location, and Safety Triggers have all been triggered. It is recommended that the assessment study proceed to the Scoping Document. The following will address the requirements of the Scoping Document.

**STEP 2 - SCOPING**

**MODULE 2.1 – Existing and Planned Conditions**

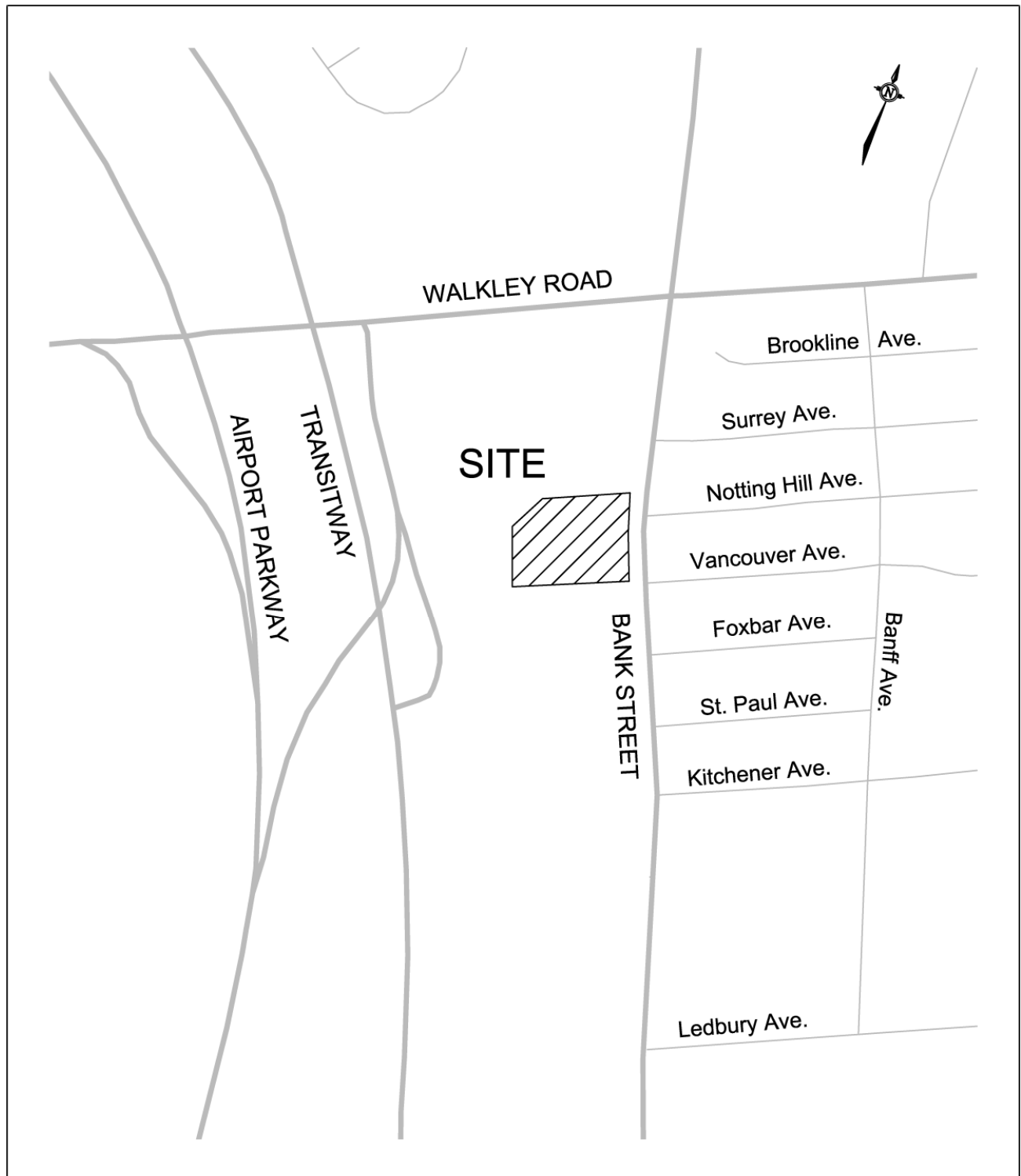
**Element 2.1.1 – Proposed Development**

The proposed Starbucks coffee shop is located at 1910 Bank Street within the same site as the existing Swiss Chalet restaurant. The site is situated along the west side of Bank Street approximately 250 m south of the intersection of Bank Street and Walkley Road. Figure 2.1 shows the location of the site.

The total size of the property is 8,000.85 m<sup>2</sup> and currently has a Swiss Chalet restaurant located on the north portion of the property, with the proposed Starbucks to be located on the south portion of the property. The Swiss Chalet restaurant is a sit-down restaurant with a building size of 576.55 m<sup>2</sup>, and is open seven days a week between the hours of 11:00 AM to 10:00 PM. The proposed Starbucks will provide indoor and outdoor seating along with a drive-through window in a 213.58 m<sup>2</sup> (2,300 ft<sup>2</sup>) free standing building. The land is currently zoned AM1[1913] “Arterial Mainstreet Zoning” which would support the development. Existing development along Bank Street in the vicinity of the site comprises mainly of commercial and retail uses.

The site currently has one site access onto Bank Street for the Swiss Chalet restaurant. The Site Plan does not propose any additional access points, and will use the existing access for the Starbucks coffee shop. The site will provide 114 parking spaces which include 4 barrier free spaces which will be shared between Starbucks and Swiss Chalet.

**FIGURE 2.1**  
**SITE LOCATION PLAN**



NOT TO SCALE

The Starbucks coffee shop is expected to be completed by 2019. Figure 2.2 provides a conceptual site plan of the development.

### **Element 2.1.2 – Existing Conditions**

The Starbucks will be located along the west side of Bank Street south of Walkley Road. Bank Street is designated in the City of Ottawa *Transportation Master Plan* (TMP) as an arterial road. Bank Street is a four lane undivided road with exclusive left turn lanes south of Walkley Road. The site has a northbound Bank Street left turn lane into the site. Bank Street in the vicinity of the site has a posted speed limit of 50 km./h.

The TMP identifies Bank Street as a Spine Route in the primary cycling network. There are no cycling facilities along Bank Street in the vicinity of the site. There are pedestrian sidewalks along both sides of Bank Street.

The intersection of Bank Street and Vancouver Avenue is located approximately 20 m south of the existing site access (centreline to centreline). The intersection is a “T” intersection which is controlled by a stop sign at the westbound Vancouver Avenue approach. Vancouver Avenue is a local residential street. The intersection has the following lane configuration:

Northbound Bank -	1 through lane 1 shared through/right lane
Southbound Bank -	1 exclusive left turn lane 2 through lanes
Westbound Vancouver -	1 shared left/right turn lane (Stop Controlled)

The site is serviced by OC Transpo Regular Route 6 which provides access to the Billings Bridge Transitway Station, Greenboro O-Train Station, or will travel north to downtown Ottawa. Bus stops are located within 70 m of the site.

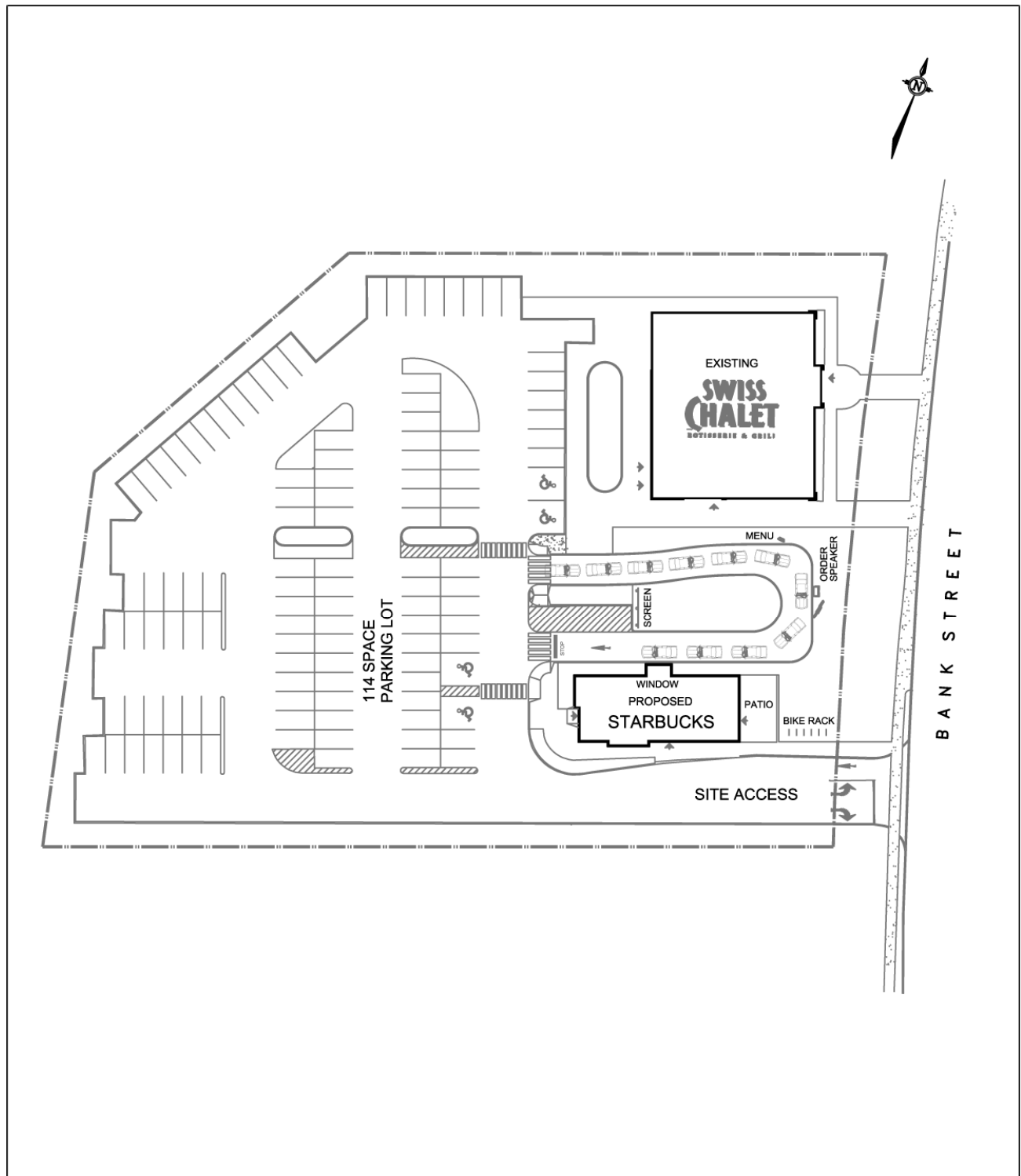
The existing traffic along Bank Street was determined from counts taken by the City of Ottawa at the south approach to the Walkley/Bank intersection on February 22, 2018. Traffic entering/exiting the site and Vancouver Avenue were from counts taken by the consultant on November 21, 2018. Figure 2.3 shows the existing traffic counts.

Collision reports were obtained from the City of Ottawa through Open Data Ottawa for the four year time period between the years January 1, 2014 and December 31, 2017. The collision reports were for the intersection of Bank Street and the Site Access, and for the intersection of Bank Street and Vancouver Avenue. Over the four year period there were only 2 collisions at the Site Access/Bank intersection and 3 collisions at the Vancouver/Bank intersection. Table 2.1 summarizes the collisions by year and type.

### **Element 2.1.3 – Planned Conditions**

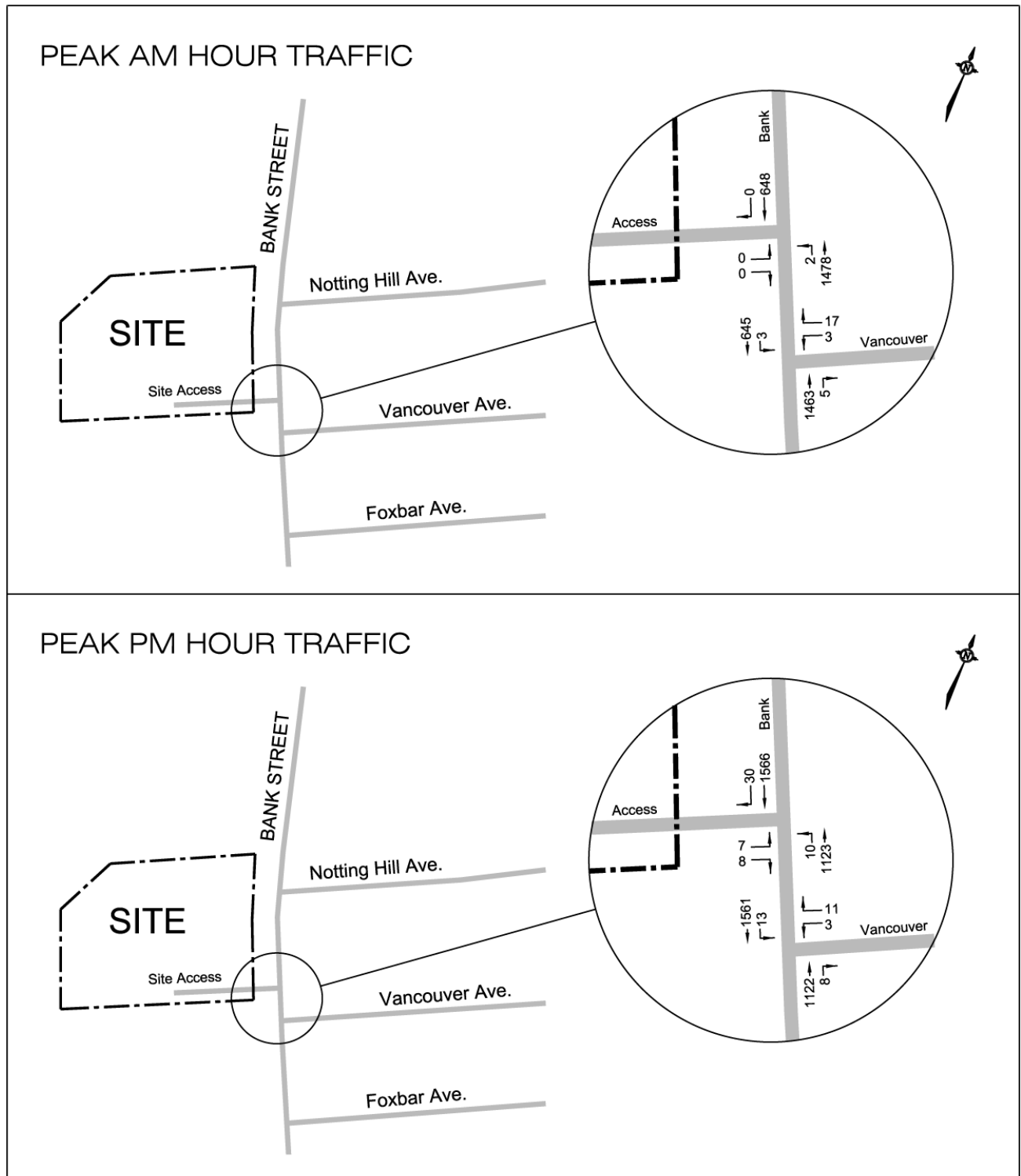
The *Transportation Master Plan 2013* does not identify any roadway modifications planned along Bank Street in the vicinity of the site.

**FIGURE 2.2**  
**CONCEPTUAL SITE PLAN**



NOT TO SCALE

**FIGURE 2.3**  
**2018 PEAK AM AND PM HOUR TRAFFIC COUNTS**



NOT TO SCALE



**TABLE 2.1  
COLLISION SUMMARY**

YEAR	COLLISION TYPE				OTHER (SMV)	TOTAL
	REAR END	ANGULAR	TURNING	SIDESWIPE		
Bank Street at Site Access						
2014	1					1
2015						0
2016						0
2017					<u>1</u>	<u>1</u>
TOTAL	1	0	0	0	1	2
Bank Street at Vancouver Avenue						
2014						0
2015				1		1
2016						0
2017	<u>1</u>				<u>1</u>	<u>2</u>
TOTAL	1	0	0	1	1	3

## MODULE 2.2 – Study Area and Time Periods

### Element 2.2.1 – Study Area

The site trips generated by the Starbucks coffee shop would be a combination of primary and pass-by trips which mainly comprise of customers travelling to/from work. All of the site trips would be entering and exiting the site at the existing access to the Swiss Chalet restaurant.

The study area for the Transportation Impact Assessment (TIA) report would be confined to the examination of the site access onto Bank Street, and the intersection of Bank Street and Vancouver Avenue.

### Element 2.2.2 – Time Periods

The peak AM time period of traffic would occur during the peak hour of the adjacent street traffic where trips to and from the Starbucks coffee shop would comprise of patrons getting a coffee on their way to work. The peak PM time period of traffic would occur during the peak hour of traffic on the adjacent streets as workers stop for coffee or a snack while travelling home. The peak PM hour site trips would be a combination of customers of Starbucks and Swiss Chalet.

### **Element 2.2.3 – Horizon Years**

The Starbucks coffee shop is expected to be completed and operational by the summer of 2019.

### **MODULE 2.3 – Exemptions Review**

The exemptions, which provide possible reductions to the scope of work of the TIA Study, were examined using Table 4: Possible Exemptions which is provided in the City's *Transportation Impact Assessment Guidelines (2017)*. Utilizing the table, the following lists the possible exemptions proposed for the TIA Study report:

<b>MODULE</b>	<b>ELEMENT</b>	<b>EXEMPTION CONSIDERATIONS</b>
<b>Design Review Component</b>		
4.1 Development Design	4.1.2 Circulation and Access	No - Access to the development and site circulation will be examined.
	4.1.3 New Street Networks	Yes - Only required for subdivisions.
4.2 Parking	4.2.1 Parking Supply	No - the supply of parking will be discussed.
	4.2.2 Spillover Parking	Yes - Parking will meet the City of Ottawa By-laws. Spillover parking is not expected to be a problem.
<b>Network Impact Component</b>		
4.5 Transportation Demand Management	All Elements	Yes – The coffee shop use has few employees and would not benefit from TDM.
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Yes – The site will have direct access onto an arterial road.
4.8 Network Concept		Yes - The site would not generate more than 200 person-trips per peak hour in excess of the volume permitted by established zoning.

## STEP 3 - FORECASTING

### MODULE 3.1 - Development-Generated Traffic Demand

#### Element 3.1.1 – Trip Generation and Mode Shares

The proposed development will consist of a Starbucks coffee shop with a drive-through window. The drive-through aisle provides sufficient space for 11 queued vehicles at the service window. The Starbucks will share the site with Swiss Chalet along with the existing entrance to the site. There are no plans to modify the existing site access onto Bank Street. Table 3.1 provides an inventory of the gross floor area of Starbucks.

**TABLE 3.1  
INVENTORY**

BUILDING	GROSS FLOOR AREA	
Starbucks Coffee Shop	213.58 m <sup>2</sup>	2,300 ft <sup>2</sup>

The number of expected site generated trips utilized the trip statistical data in the Institute of Transportation Engineers (ITE) document, *Trip Generation Manual 10<sup>th</sup> Edition*. The study will utilize the Average Trip Rate for a “Coffee/Donut Shop with Drive-Through Window” ITE 937 Land Use. The trip rate was determined for the number of trips during the peak hour of the adjacent street traffic. The trip rates are shown in Table 3.2 with the ITE data sheets provided as Exhibit 2.

**TABLE 3.2  
VEHICLE TRIP GENERATION RATES AND DIRECTIONAL SPLITS**

Peak Hr.	Peak AM Hour		Peak PM Hour	
Average Trip Rate	88.99 T/1000 ft <sup>2</sup>		43.38 T/1000 ft <sup>2</sup>	
Directional Distribution	51% Entering	49% Exiting	50% Entering	50% Exiting

The total number of site generated trips is a combination of primary trips and pass-by trips. Primary trips are trips where the primary destination is to/from Starbucks, and pass-by trips can be defined as traffic already on the adjacent street, which “stops off” at Starbucks while passing by “on-route” to its primary destination. With the number of coffee shops and fast-food restaurants in the area, the non-primary trips are assumed to be pass-by trips along Bank Street past the site with no diverted trips from other arterial roads in the area.

The site is within the Transit Oriented Development (TOD) Area. The Starbucks site is surrounded by commercial and retail development, with the South Keys shopping centre and Home Depot store within walking and cycling distance. The nature of a coffee shop with a drive-through window would not produce high transit usage as expected in a TOD area. With employment and retail areas in close proximity the site, the Starbucks would expect a high number of walk-in trips. Walk-in pass-by trips would be trips on the way to their primary destination or to bus stops. Following discussions with City staff, Table 3.3 presents the modal share summary which will be used in the TIA Submission. For the pass-by share, it is expected that few trips would be from patrons passing by the site by transit, departing from the bus for Starbucks, and then boarding the bus to continue to their primary destination.

**TABLE 3.3**  
**MODE SHARE SUMMARY (Person-Trips)**

Travel Mode	Future Mode Share Targets for the Development		
	Mode Share Target		Rationale
	Primary	Pass-by Trips	
Transit	25%	5%	Discussed above
Walking	20%	20%	Discussed above
Cycling	10%	10%	Consistent with TOD areas
Auto Passenger	10%	15%	Consistent with modal share observations in the TMP
Auto Driver	35%	50%	

The number of person-trips was determined by the number of auto-trips calculated from the ITE trip rates, multiplied by 1.28 (from the TIA Guidelines) to convert auto-trips to person-trips. Table 3.4 shows the future peak hour person-trips.

**TABLE 3.4**  
**TOTAL PEAK HOUR SITE GENERATED TRIPS**

Trips	AUTO-TRIP GENERATION		FUTURE PERSON-TRIPS	
	PEAK AM HR.	PEAK PM HR.	PEAK AM HR.	PEAK PM HR.
Starbucks	205 veh.	100 veh.	262 per.	128 per.

The percentage of primary and pass-by trips was determined by examination of the statistical data provided in the ITE Trip Generation Handbook, 3<sup>rd</sup> Edition. The

document shows a pass-by vehicle percentage of 83 percent for a Coffee/Donut Shop with a Drive-Through Window and No Indoor Seating (ITE 938). The study has therefore assumed a pass-by percentage of 75 percent for a coffee shop providing indoor seating. Table 3.5 shows the number of primary and pass-by trips during the peak AM and PM hour.

**TABLE 3.5**  
**PRIMARY AND PASS-BY PERSON-TRIPS**

UNIT TYPE	PEAK AM HR.	PEAK PM HR.
	TOTAL	TOTAL
Primary Trips (25%)	66	32
Pass-By Trips (75%)	<u>196</u>	<u>96</u>
<b>Total Trips</b>	<b>262</b>	<b>128</b>

The peak hour person-trips per mode were determined by the product of the peak hour future person-trips from Table 3.5 and the future mode share from Table 3.3. The mode share of Table 3.3 was applied to both the expected peak AM and PM hour trips. The results are shown in Table 3.6.

**TABLE 3.6**  
**FUTURE DEVELOPMENT GENERATED PERSON-TRIPS**

TRAVEL MODE	DEVELOPMENT GENERATED PERSON-TRIPS			
	PRIMARY TRIPS		PASS-BY TRIPS	
	PEAK AM HR.	PEAK PM HR.	PEAK AM HR.	PEAK PM HR.
Transit	16 per./trips	8 per./trips	10 per./trips	5 per./trips
Walking	13 per./trips	7 per./trips	39 per./trips	19 per./trips
Cycling	7 per./trips	3 per./trips	20 per./trips	10 per./trips
Auto Passenger	7 per./trips	3 per./trips	29 per./trips	14 per./trips
Auto Driver	<u>23 per./trips</u>	<u>11 per./trips</u>	<u>98 per./trips</u>	<u>48 per./trips</u>
<b>Total Trips</b>	<b>66 per./trips</b>	<b>32 per./trips</b>	<b>196 per./trips</b>	<b>96 per./trips</b>

The TIA Guidelines allow for three Trip Reduction Factors that may be applied to the expected development trips. Below discusses the three factors, with the second factor providing a trip reduction for the development:

1. Deduction of Existing Development Trips - The proposed site also contains a Swiss Chalet restaurant. The restaurant will remain and all existing trips into the site would be accounted for as background traffic. The reduction for existing development trips would not apply.
2. Pass-by Vehicular Trips - The total number of site generated trips is a combination of primary trips and pass-by trips. The analysis has utilized a 75 percent pass-by trip percentage of the total trips as previously discussed in Element 3.1.1.

The analysis has assumed that one auto driver trip would equal one vehicle-trip. The site would generate 121 auto driver or vehicular trips during the peak AM hour and 59 vehicle trips during the peak PM hour as shown in Table 3.7. The trips have been proportioned to expected primary and pass-by vehicular trips. The pass-by trips would provide a trips reduction to the background traffic.

**TABLE 3.7**  
**PRIMARY AND PASS-BY PERSON-TRIPS**

UNIT TYPE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
Primary Trips (25%)	23	12	11	11	6	5
Pass-By Trips (75%)	<u>98</u>	<u>50</u>	<u>48</u>	<u>48</u>	<u>24</u>	<u>24</u>
<b>Total Trips</b>	<b>121</b>	<b>62</b>	<b>59</b>	<b>59</b>	<b>30</b>	<b>29</b>

3. Synergy of Internalization – There would be no shared trips expected between the Starbucks coffee shop and Swiss Chalet restaurant. The Swiss Chalet does not open until 11:00 AM after the peak AM hour of traffic along the adjacent roads, and would not share the same patrons during a single trip with Starbucks. The reduction for shared trips would not apply.

### **Element 3.1.2 – Trip Distribution**

The distribution of site generated primary trips was determined from both the examination of residential areas and employment areas, and the traffic entering and exiting Vancouver Avenue which would show the traffic pattern of trips in the area which would form the primary trips to the site. The distribution of pass-by trips was determined from the proportion of traffic travelling along Bank Street past the site.

### **Element 3.1.3 – Trip Assignment**

The trip patterns discussed in Element 3.1.2 were applied to the peak AM and PM hour primary and pass-by trips at the site access onto Bank Street. Table 3.8 shows the percentage distribution of primary and pass-by trips during the peak AM and PM hour. The trips from Table 3.7 used the trip distribution in Table 3.8 to determine the primary site generated trips shown in Figure 3.1 and the pass-by trips shown in Figure 3.2.

**TABLE 3.8  
PRIMARY AND PASS-BY TRIP DISTRIBUTION**

TRIP DISTRIBUTION				
	PEAK AM HOUR		PEAK PM HOUR	
PRIMARY TRIPS	TO NORTH	TO SOUTH	TO NORTH	TO SOUTH
	70%	30%	70%	30%
	FROM NORTH	FROM SOUTH	FROM NORTH	FROM SOUTH
	70%	30%	70%	30%
PASS-BY TRIPS	TO NORTH	TO SOUTH	TO NORTH	TO SOUTH
	70%	30%	40%	60%
	FROM NORTH	FROM SOUTH	FROM NORTH	FROM SOUTH
	30%	70%	60%	40%

## **MODULE 3.2 - Background Network Traffic Demand**

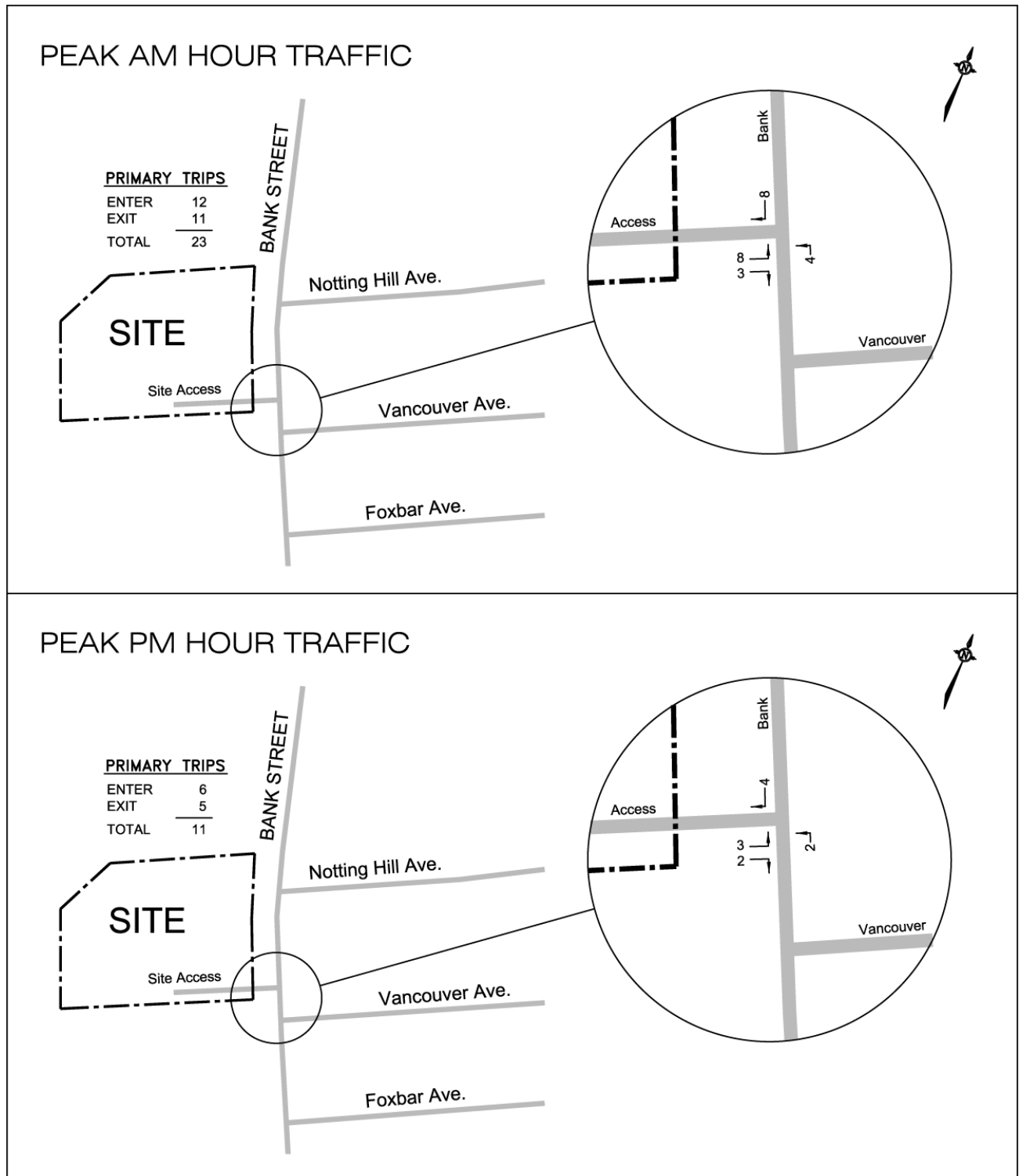
### **Element 3.2.1 – Transportation Network Plans**

The City of Ottawa *Transportation Master Plan 2013* (TMP) was reviewed to identify transit and roadway projects in the vicinity of the development. The TMP did not identify any rapid transit, transit priority or road projects within the “2031 Affordable RTTP Network Projects” or “2031 Affordable Road Network”.

### **Element 3.2.2 – Background Growth**

The growth in background traffic was determined by examination of historical traffic counts. The traffic growth using the 2000 and 2018 traffic counts taken by the City of Ottawa at the south approach of the Walkley/Bank intersection determined that the peak AM hour volume of traffic increased at an annual compounded rate of 1.0 percent, and decrease at an annual compounded rate of -0.6 percent during the peak PM hour. The study analysis has therefore assumed the background traffic along Bank Street past the

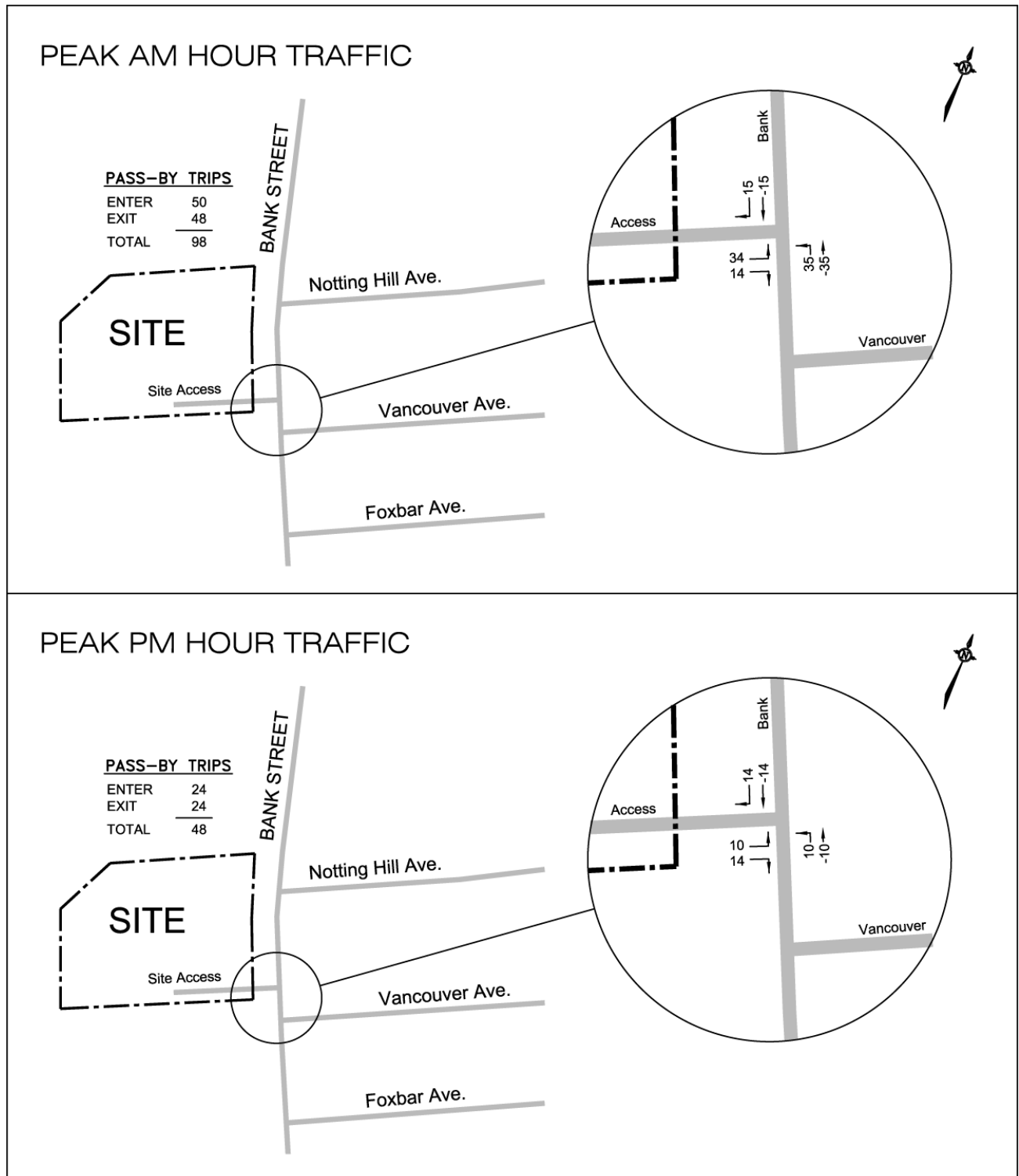
**FIGURE 3.1**  
**PEAK AM AND PM HOUR SITE GENERATED PRIMARY TRIPS**



NOT TO SCALE



**FIGURE 3.2**  
**PEAK AM AND PM HOUR SITE GENERATED PASS-BY TRIPS**



NOT TO SCALE

site to increase at an annual compounded rate of 1.0 percent to account for development outside the study area which would not include the Starbucks coffee shop.

### **Element 3.2.3 – Other Developments**

A Development Application Search was conducted which determined that the only significant development in the area would be a development at 655-755 Anand Private. The development would consist of two 16 storey residential towers totalling 250 condominium units. Access to/from the site would be from an existing signalized intersection at Walkley Road and Greenhaven Private located approximately 150 m west of the Walkley/Bank intersection. The Transportation Brief report which is dated February 20, 2014 and Addendum #1 dated May 20, 2016, determined that the development would place 4 additional trips on Bank Street past the site during the peak AM and PM hours. These trips will be added to the calculated 2024 background traffic.

For the increase in traffic from development outside the immediate area, the study has calculated the expected background traffic by increasing the through movements along Bank Street using the February 22, 2018 traffic counts (Figure 2.3). The northbound and southbound traffic would be increased by an annual compounded rate of 1.0 percent as discussed in Element 3.2.2. The traffic entering and exiting Vancouver Avenue was not increased as there is no further development expected along Vancouver Avenue within the timeline of the Starbucks development. The trips generated by the 655-755 Anand Private development discussed above were added to the 2024 background traffic. Figure 3.3 shows the 2019 peak AM and PM hour background traffic (does not include trips from Starbucks), and Figure 3.4 the expected 2024 peak hour background traffic which represents five years beyond the completion of the Starbucks.

## **MODULE 3.3 - Demand Rationalization**

The proposed Starbucks coffee shop would generate a small number of new trips with the majority (75%) of the trips being pass-by trips already traveling along the adjacent road. Bank Street is a four lane undivided arterial road with left turn lanes. Bank Street would have the capacity to accommodate the number of new site generated trips produced by the proposed Starbucks. There would be no requirement to apply measures to reduce travel demand to either background or site related trips.

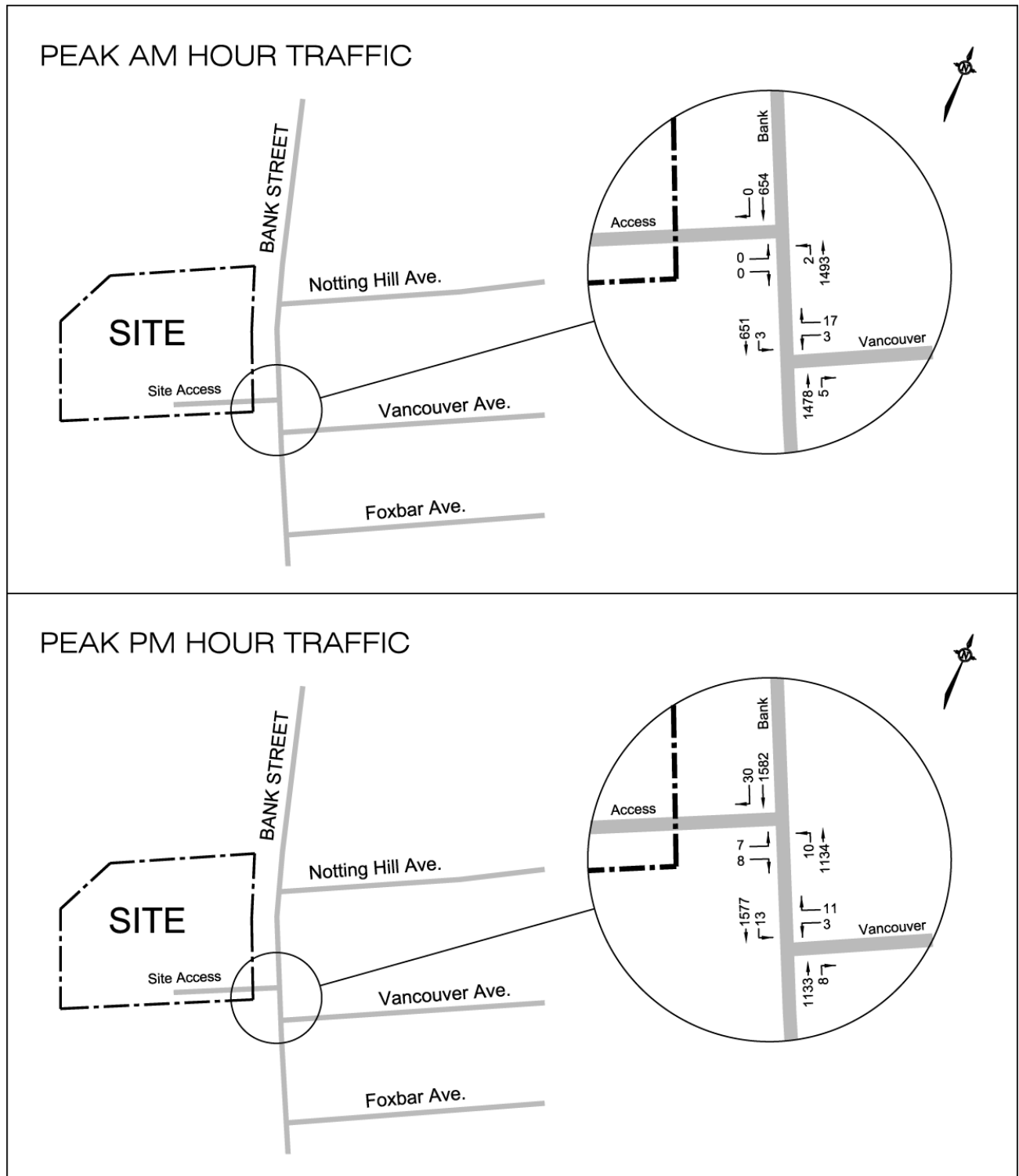
## **STEP 4 – ANALYSIS**

### **MODULE 4.1 – Development Design**

#### **Element 4.1.1 – Design for Sustainable Modes**

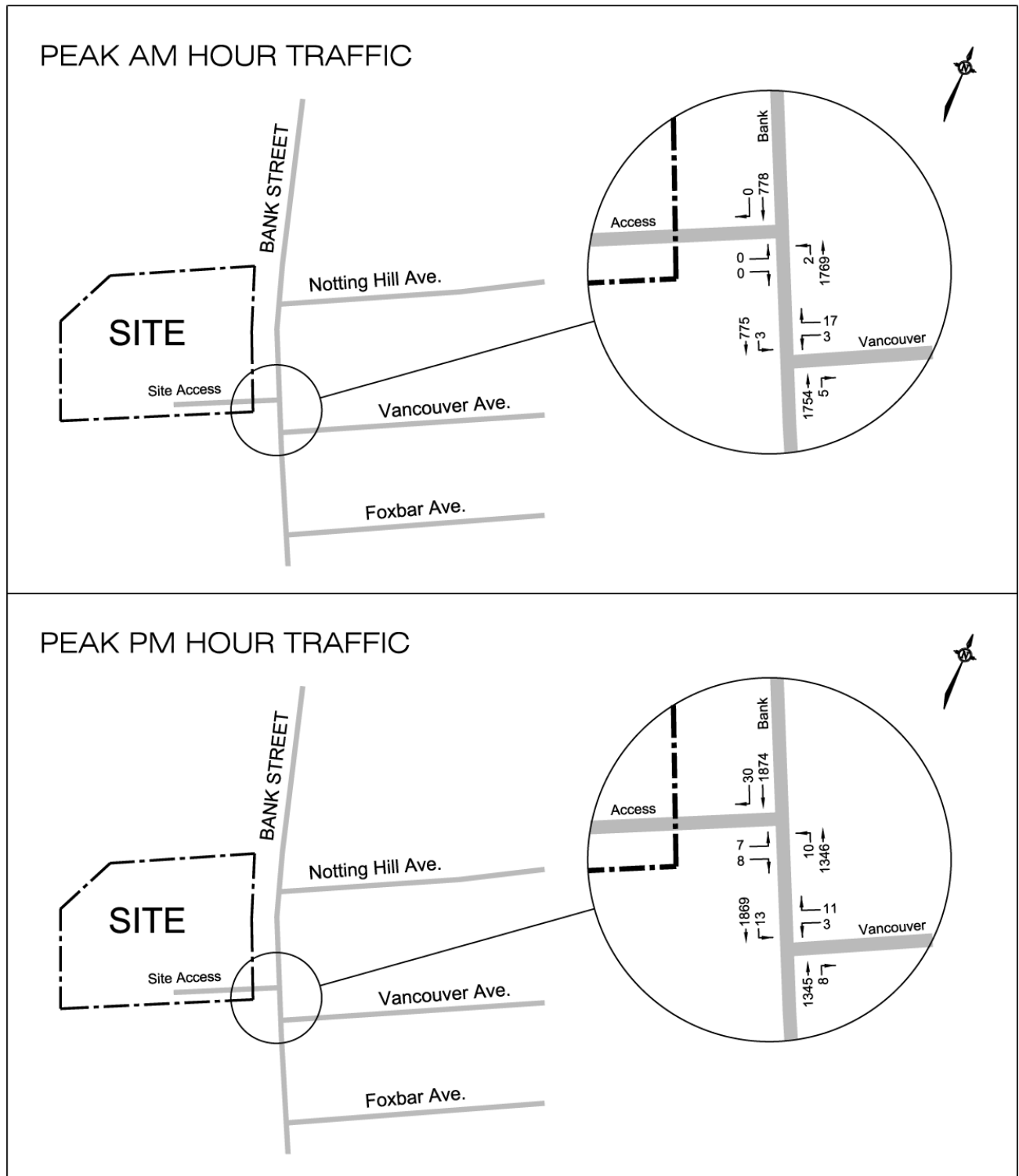
The site will be designed to provide adequate on-site parking for both vehicles and bicycles. The Site Plan provides a total of 114 vehicular parking spaces and sufficient bicycle spaces to satisfy the City of Ottawa By-laws.

**FIGURE 3.3**  
**2019 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC**



NOT TO SCALE

**FIGURE 3.4**  
**2024 WEEKDAY PEAK AM AND PM HOUR BACKGROUND TRAFFIC**



NOT TO SCALE

The Site Plan will provide racks for the storage of bicycles in a protected area close to the building entrances.

The Starbucks will have a pedestrian connection from the municipal sidewalk along Bank Street. Bank Street has pedestrian sidewalks along both sides of the road.

OC Transpo Regular Route 6 travels northbound and southbound along Bank Street past the site. The route provides service to the Greenboro O-Train Station to the south and the Billing Bridge Transitway Station to the north as well as traveling to downtown Ottawa and Vanier. Bus stops are located approximately 70 m from the site. The Starbucks site has a walking distance of approximately 550 m from the Walkley Road Transitway Station.

#### **Element 4.1.2 – Circulation and Access**

The Starbucks coffee shop will share the existing one access to the site with the Swiss Chalet restaurant. The site access from Bank Street currently accommodates delivery trucks to the Swiss Chalet as well as providing an approved fire route for emergency vehicles.

The Starbucks coffee shop will have a drive-through window which would provide storage for 11 queued vehicles along the drive-through aisle which meets the City of Ottawa Zoning By-law for a restaurant with an order board. The drive-through aisle is of sufficient distance from the site access that the operation of the drive-through aisle would not have an impact on the operation of the site access onto Bank Street.

All service vehicles, delivery trucks and garbage trucks would enter/exit from the existing site access. All loading areas are close to the buildings with the service vehicles not having an impact on the operation of the site access onto Bank Street.

#### **Element 4.1.3 – New Street Networks**

Exempt as determined in the Scoping Document.

### **MODULE 4.2 – Parking**

#### **Element 4.2.1 – Parking Supply**

The site will provide parking for 114 vehicles which include 4 barrier free spaces. The on-site parking will be shared between the Swiss Chalet and Starbucks. The parking will be adequate when examining the peak hour trips generated by both land uses during the peak PM hour, and during the peak AM hour of Starbucks since the Swiss Chalet restaurant is not open during the peak AM hour.

#### **Element 4.2.2 – Spillover Parking**

Exempt as determined in the Scoping Document.

## **MODULE 4.3 – Boundary Street Design**

The City of Ottawa Complete Streets concept allows for the safe movement of everyone whether they choose to walk, bike, drive, or take public transit. The boundary roads to the site would consist of Bank Street bordering the east limit of the site.

Bank Street is a four lane undivided arterial road with a pavement width of approximately 21.5 m. The road is designated as a Spine Route in the TMP, but there are no cycling facilities along the road. Sidewalks exist on both the east and west sides of the road. The road has a posted speed limit of 50 km/h.

The intersection of Bank Street and Vancouver Avenue is located 20 m south of the site access (centreline to centreline). The intersection is a “T” intersection with Vancouver Avenue forming the westbound approach, and Bank Street the northbound and southbound approaches. The southbound Bank Street approach has an exclusive left turn lane which provides 30 m of vehicular storage. The left turn lane extends past the existing access to the Starbucks/Swiss Chalet site.

A northbound Bank Street left turn lane is provided into the site. The left turn lane has approximately 9 m of vehicular storage. Figure 4.1 shows an aerial photo of the site access and the Vancouver/Bank intersection.

Table 2.1 in Element 2.1.2 of Step 2 in the Scoping section of the TIA report shows the collision history over a four year period between January 1, 2014 and December 31, 2017 for the Site Access/Bank intersection and Vancouver/Bank intersection. The collision data determined that there was no pattern of collisions, with the Site Access/Bank intersection experiencing 2 collisions and Vancouver/Bank 3 collisions over the four year time period.

## **MODULE 4.4 – Access Intersection Design**

### **Element 4.4.1 – Location and Design of Access**

The site has one existing access onto Bank Street. The access is located 20 m north of the Vancouver/Bank intersection (centreline to centreline), and 48 m south of the Notting Hill/Bank intersection (centreline to centreline). There are no private driveways across from the site.

The closest intersections which are controlled by traffic signals are the Walkley/Bank intersection located 250 m north of the site, and the Kitchener/Bank intersection located 250 m south of the site.

The Transportation Association of Canada (TAC) document, *Geometric Design for Canadian Roads*, suggests in Table 3.2.9.3 that the clear throat distance for the access onto an arterial road for a drive-in restaurant with a gross floor area >200 m<sup>2</sup> should be a minimum of 30 m. The Site Plan shows the existing driveway to have a clear throat distance of 47 m.



**FIGURE 4.1**  
**AERIAL PHOTO OF THE SITE ACCESS**



### **Element 4.4.2 – Intersection Control**

The Starbucks coffee shop will use the existing site access onto Bank Street. The lane configuration of the access intersection is that Bank Street will form the northbound and southbound approaches with an exclusive northbound Bank Street left turn lane, and the eastbound site exit approach would provide an exclusive left turn and exclusive right turn lane. The “T” intersection will be controlled by a stop at the eastbound site exit approach.

### **Element 4.4.3 – Intersection Design**

The analysis of the Site Access/Bank and Vancouver/Bank intersections along with the Bank Street roadway segment adjacent to the site was completed for all modes using the *Multi-Modal Level of Service (MMLOS) Guidelines*. Each mode will be addressed in the following sections:

#### **Vehicle Level of Service (LoS) – Intersection Capacity Analysis**

The analysis of the Site Access/Bank and Vancouver/Bank intersections will use the *Highway Capacity Software, Version 7.7*, which uses the capacity analysis procedure as documented in the *Highway Capacity Manual (HCM) 2010 and HCM 6<sup>th</sup> Edition*.

For unsignalized intersections the level of service of each lane movement and approach is determined as a function of the delay of vehicles at the approach. The following relates the level of service of each lane movement with the expected control delay at the approach.

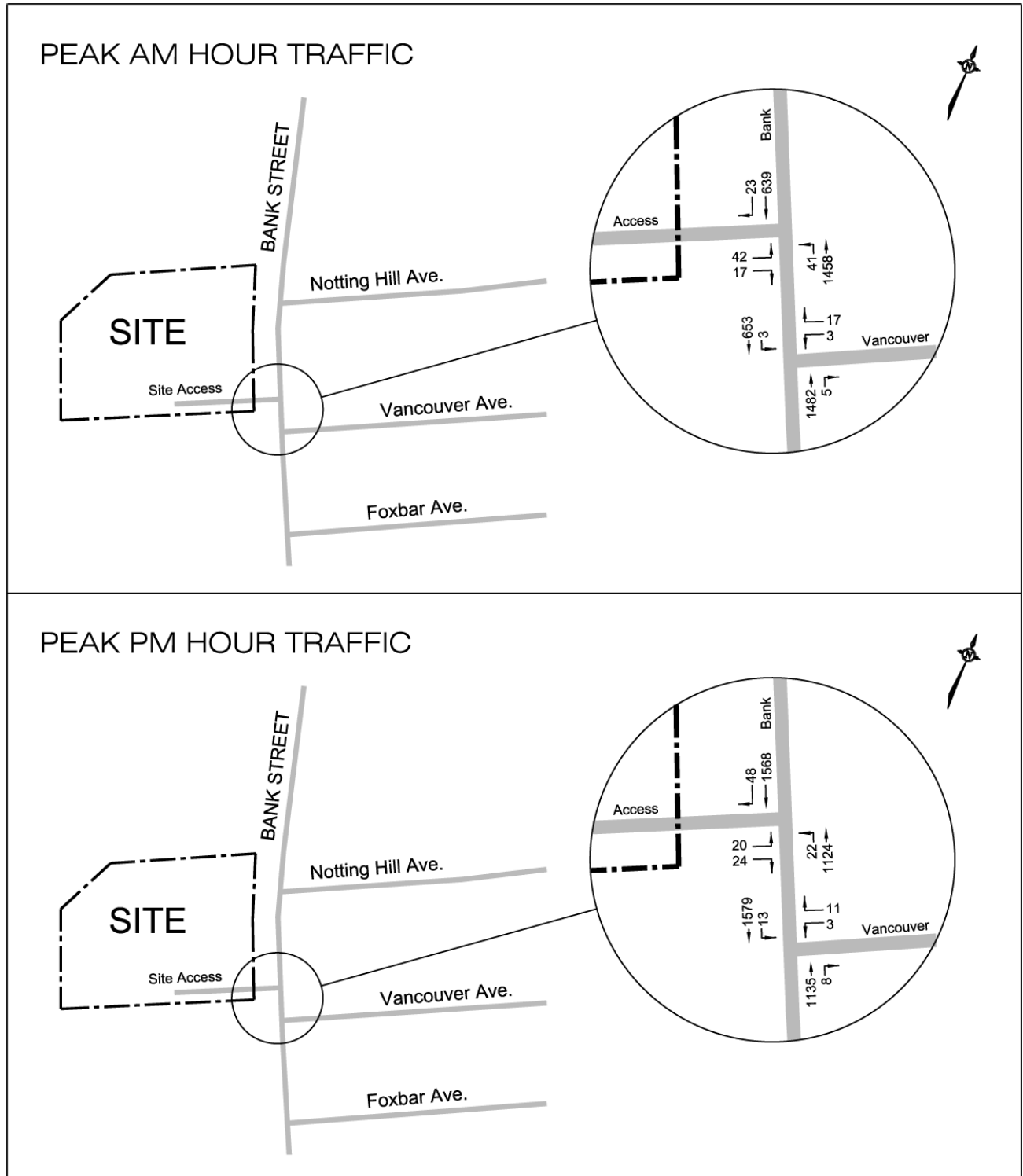
LEVEL OF SERVICE	DELAY	
Level of Service A	0-10 sec./vehicle	Little or No Delay
Level of Service B	>10-15 sec./vehicle	Short Traffic Delays
Level of Service C	>15-25 sec./vehicle	Average Traffic Delays
Level of Service D	>25-35 sec./vehicle	Long Traffic Delays
Level of Service E	>35-50 sec./vehicle	Very Long Traffic Delays
Level of Service F	>50 sec./vehicle	Extreme Delays – Demand Exceeds Capacity

The expected length of queue at the critical lane movements for an unsignalized intersection was determined by the calculation of the 95<sup>th</sup> percentile queue at the lane approach. The 95<sup>th</sup> percentile queue length is the calculated 95<sup>th</sup> greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95<sup>th</sup> percentile queue length is a function of the capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of the queue by representing the queue length as fractions of vehicles.

The total traffic is the sum of the peak hour site generated primary trips (Figure 3.1) and pass-by trips (Figure 3.2), and the peak hour background traffic (Figure 3.3 for the year 2019 and Figure 3.4 for the year 2024). Figure 4.2 presents the total 2019 peak hour vehicular traffic and Figure 4.3 the total 2024 peak hour vehicular traffic.

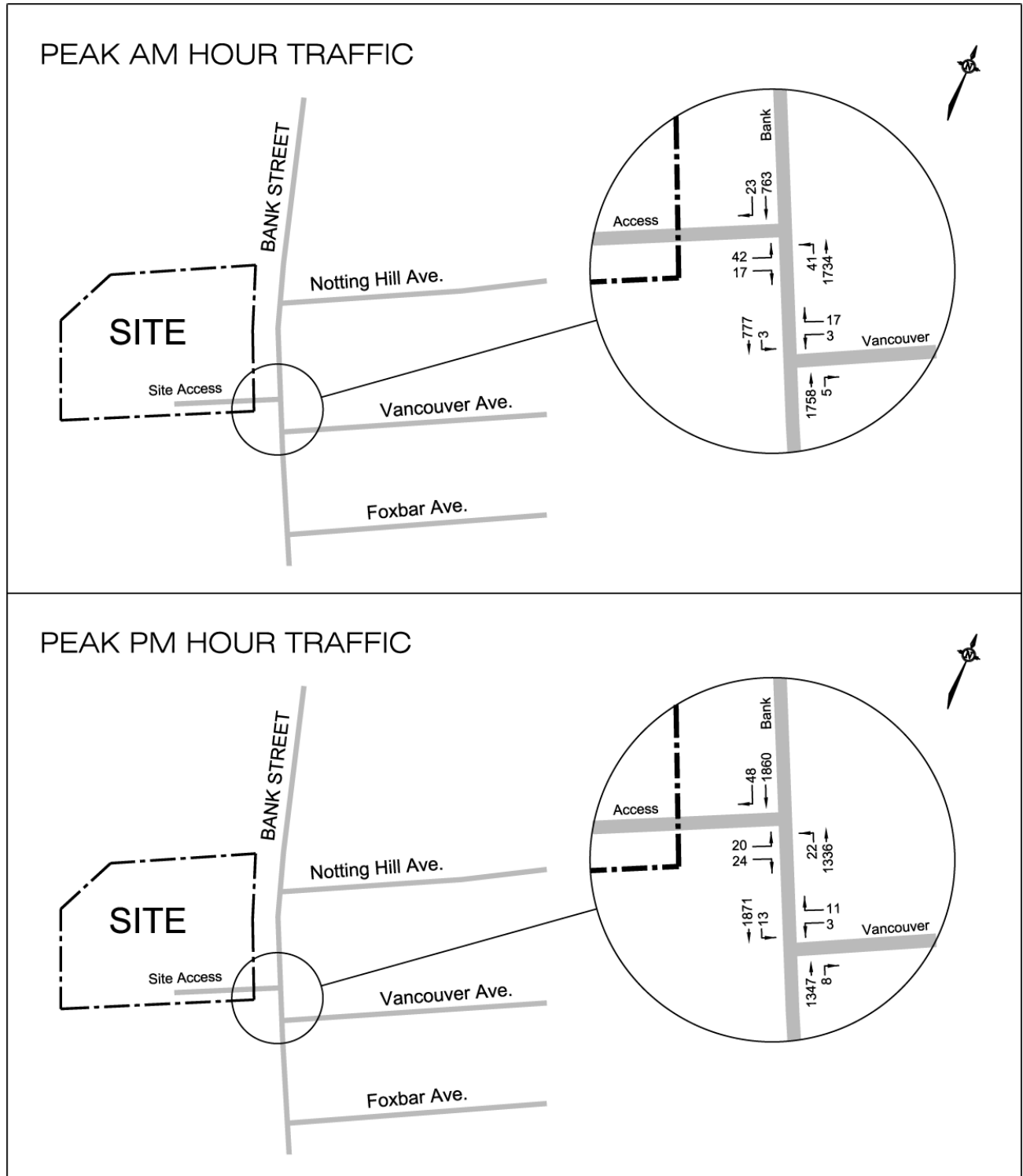


**FIGURE 4.2**  
**2019 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC**



NOT TO SCALE

**FIGURE 4.3**  
**2024 WEEKDAY PEAK AM AND PM HOUR TOTAL TRAFFIC**



NOT TO SCALE

### Site Access and Bank Street Intersection

The Site Access/Bank intersection is an existing “T” intersection where Bank Street forms the northbound and southbound approaches and the Swiss Chalet the eastbound stop controlled approach. The Starbucks coffee shop will share the existing site access which will have a pavement width of approximately 8.7 m with a lane configuration of one lane entering and an exclusive left turn and exclusive right turn lane exiting. Bank Street will have a northbound exclusive left turn lane into the site which will provide approximately 9 m of vehicular storage.

The operational analysis utilizing the 2018 traffic counts determined that during the peak AM hour, the northbound Bank Street left turn movement would function at a Level of Service (LoS) “A”, and the eastbound exit right turn movement at a LoS “B” and left turn movement at a LoS “E” (Swiss Chalet is not open or generating trips). During the peak PM hour (4:30 to 5:30) when the Swiss Chalet is open, the northbound Bank Street left turn movement would function at a LoS “C” with an observed maximum queue of 1 vehicle, and the eastbound right turn movement at a LoS “C” and left turn movement at a LoS “F”. Table 4.1 summarizes the peak hour operation of the intersection with the analysis sheets provided in the Appendix as Exhibit 3 and 4.

**TABLE 4.1**  
**VEHICLE LEVEL OF SERVICE (LoS) – LoS & DELAY**

Intersection Approach	PEAK AM HOUR YEAR 2018 2019 (2024)		PEAK PM HOUR YEAR 2018 2019 (2024)	
	LoS	Delay (sec.)	LoS	Delay (sec.)
<b>Site Access/Bank</b>				
EB Left – Site Access	<i>E</i> F (F)	37.0 73.3 (157.9)	<i>F</i> F (F)	165.7 325.4 (906.4)
EB Right – Site Access	<i>B</i> B (B)	10.6 10.8 (11.5)	<i>C</i> C (C)	17.5 18.5 (22.7)
NB Left – Bank St.	<i>A</i> A (A)	9.0 9.3 (9.8)	<i>C</i> C (C)	15.1 15.7 (19.5)
<b>Vancouver/Bank</b>				
WB Left/Right – Vancouver	<i>C</i> C (C)	15.1 15.5 (24.7)	<i>C</i> C (E)	23.9 24.6 (44.1)
SB Left – Bank St.	<i>B</i> B (C)	13.7 13.9 (16.6)	<i>B</i> B (B)	11.4 11.5 (13.0)

Following the opening of the Starbucks coffee shop in 2019, the traffic for the peak AM hour would result in the northbound left turn movement to function at a LoS “A”, and the eastbound right turn exit movement at a LoS “B” and left turn movement at a LoS “F”. During the peak PM hour the northbound Bank Street left turn movement would function at a LoS “C”, and the eastbound exit right turn movement at a LoS C” and left turn at a

LoS “F”. Table 4.1 summarizes the peak hour operation of the intersection with the analysis sheets provided as Exhibit 5 for the peak AM hour and Exhibit 6 for the peak PM hour.

At the year 2024, which represents five years beyond completion of the Starbucks coffee shop, the lane movements would continue to function at the same level of service as the 2019 traffic. During the peak AM hour the northbound left turn movement would function at a LoS “A”, and eastbound right turn at a LoS “B” and left turn at a LoS “F”. During the peak PM hour the northbound Bank Street left turn movement would function at a LoS “C”, and eastbound exit right turn movement at a LoS “C” and left turn movement at a LoS “F”. Table 4.1 summarizes the peak hour operation of the intersection with the analysis sheets provided as Exhibit 7 and Exhibit 8. During the peak PM hour the 95<sup>th</sup> percentile queue at the northbound Bank Street left turn lane would be 0.3 vehicles with 9 m of storage provided which is sufficient for 1 vehicle. For the eastbound left turn movement at the site exit the 95<sup>th</sup> percentile queue was 3.4 vehicles, with 47 m provided which is sufficient for 7 vehicles. The operational analysis determined that the approach delay was 906.4 seconds or approximately 15 minutes for the eastbound left turn movement during the peak PM hour. The approach delay is based on a sufficient gap at the same time in both the northbound and southbound Bank Street traffic in order for the eastbound left turning vehicle to complete the maneuver. Observations during the 2018 traffic counts showed that eastbound left turning vehicles proceeded to turn left when there was a gap in the southbound Bank Street traffic, and it would wait in the northbound left turn lane until there was a gap in the northbound traffic before merging. Figure 4.1 shows the lane configuration in which the two step turning process would dramatically reduce the approach delay at the eastbound exit.

No modifications are recommended to the Site Access/Bank intersection due to the construction of the Starbucks coffee shop.

The collision data shown in Table 2.1 determined that there was no pattern of collision type over the four year time period with the intersection experiencing two collisions during that time. There would be no requirement for roadway modifications to improve the safety of the intersection.

#### Vancouver Avenue and Bank Street Intersection

The Vancouver/Bank intersection is a “T” intersection with Bank Street forming the northbound and southbound approaches and Vancouver Avenue the stop controlled westbound approach. The intersection is located approximately 20 m south of the site access (centreline to centreline), and has a southbound Bank Street exclusive left turn lane which provides 30 m of vehicular storage. The westbound Vancouver Avenue approach consists of one shared left/right turn lane.

The operational analysis for the existing 2018 traffic counts and expected 2019 traffic determined that the southbound Bank Street left turn movement functioned at a LoS “B” and westbound Vancouver Avenue left/right turn movement at a LoS “C” during both the

peak AM and Peak PM hours. Table 4.1 summarizes the peak hour operation of the intersection with the analysis sheets provided as Exhibit 9 to Exhibit 12. The 2018 traffic counts observed that the maximum queue at the southbound left turn movement was 1 vehicle.

As the background traffic along Bank Street increases, the 2024 traffic analysis determined that during the peak AM hour both the southbound left turn movement and westbound left/right turn movement functioned at a LoS “C”. During the peak PM hour the southbound left turn functioned at a LoS “B” and westbound left/right at a LoS “E”. The analysis determined that during the peak PM hour, the 95<sup>th</sup> percentile queue at the southbound left was 0.1 vehicles and 0.5 vehicles at the westbound left/right movement. Table 4.1 summarizes the peak hour operation of the intersection with the analysis sheets provided as Exhibit 13 and Exhibit 14. The expected queue at the southbound Bank Street left turn lane movement would not extend past the Starbucks site access or interfere with the operation of the site access.

The collision data shown in Table 2.1 determined that there was no pattern of collision type over the four year time period with the intersection experiencing three collisions during that time.

## PEDESTRIAN LEVEL OF SERVICE (PLOS)

The pedestrian level of service was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. There are sidewalks along both sides of Bank Street and Walkley Road to the Transitway station. The MMLOS analysis for the intersections was not completed as the Site Access/Bank and Vancouver/Bank intersections are both stop controlled intersections. Table 4.2 presents the level of service for street segment adjacent to the site, with the analysis provided in the Appendix.

**TABLE 4.2**  
**PEDESTRIAN LEVEL OF SERVICE (PLOS) – Street Segments & Intersections**

Street	Segment	Level of Service	Analysis
Bank Street	Notting Hill to Vancouver	C	Exhibit 15
Intersection		Level of Service	Analysis
No signalized intersections within the study area		-	-

## BICYCLE LEVEL OF SERVICE (BLOS)

The bicycle level of service (BLOS) was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. TMP identifies Bank

Street as a Spine Route in the primary cycling network. There are no cycling facilities along Bank Street in the vicinity of the site. The MMLOS analysis for the intersections was not completed as the Site Access/Bank and Vancouver/Bank intersections are both stop controlled intersections. Table 4.3 presents the level of service for the road segment with the analysis sheets provided in the Appendix.

**TABLE 4.3**  
**BICYCLE LEVEL OF SERVICE (BLOS) – Street Segments & Intersections**

Street	Segment	Level of Service	Analysis
Bank Street	Notting Hill to Vancouver	E	Exhibit 16
Intersection		Level of Service	Analysis
No signalized intersections within the study area		-	-

#### **TRANSIT LEVEL OF SERVICE (TLOS)**

The Starbucks coffee shop site is located within the Transit Oriented Development area. The site is serviced by Route 6 Rockcliffe/Greenboro line which provides service to the Greenboro O-Train Station, Billing Bridge Transitway Station, and downtown Ottawa. The site is also a 550 m walk from the Walkley Transitway Station. There is no parking along Bank Street and no dedicated transit lanes in the vicinity of the site.

Table 4.4 presents the level of service along the Bank Street segment which was determined from the evaluation table provided in the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. The Site Access/Bank and Vancouver/Bank intersections are both stop controlled intersections. The MMLOS analysis for the intersections will not be completed as per the MMLOS Guidelines.

**TABLE 4.4**  
**TRANSIT LEVEL OF SERVICE (TLOS) – Street Segments & Intersections**

Street	Segment	Level of Service	Analysis
Bank Street	Notting Hill to Vancouver	D	Exhibit 17
Intersection		Level of Service	Analysis
No signalized intersections within the study area		-	-

## **TRUCK LEVEL OF SERVICE (TkLOS) - Street Segments & Intersections**

The truck level of service (TkLOS) was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. The truck LoS was determined for the Bank Street road segment adjacent to the site. The MMLOS analysis for the intersections was not completed as the Site Access/Bank and Vancouver/Bank intersections are both stop controlled intersections. Table 4.5 presents the truck level of service for the Bank Street road segment, with the analysis provided as Exhibit 18.

**TABLE 4.5**  
**TRUCK LEVEL OF SERVICE (TkLOS) – Street Segments & Intersections**

<b>Street</b>	<b>Segment</b>	<b>Level of Service</b>	<b>Analysis</b>
Bank Street	Notting Hill to Vancouver	A	Exhibit 18
<b>Intersection</b>		<b>Level of Service</b>	<b>Analysis</b>
No signalized intersections within the study area		-	-

### **MODULE 4.5 – Transportation Demand Management**

Exempt as determined in the Scoping Document.

### **MODULE 4.6 – Neighbourhood Traffic Management**

#### **Element 4.6.1 – Adjacent Neighbourhoods**

Exempt as determined in the Scoping Document.

### **MODULE 4.7 - Transit**

#### **Element 4.7.1 – Route Capacity**

OC Transpo Route 6 should have the capacity to handle the additional transit trips from the site. The Walkley Transitway Station is within walking distance from the site and would provide additional transit options for the patrons.

#### **Element 4.7.1 – Transit Priority**

Transit priority measures would not be applicable since the Site Access/Bank intersection currently exists and transit demand would be low for the land use.

## **MODULE 4.8 – Review of Network Concept**

Exempt as determined in the Scoping Document.

## **MODULE 4.9 – Intersection Design**

### **Element 4.9.1 – Intersection Control**

The Site Access/Bank intersection is a two-way stop controlled intersection with a stop at the eastbound site exit. The site access is in close proximity to the Vancouver/Bank intersection which would prohibit the installation of traffic control signals. There would be no further intersection control modifications required.

### **Element 4.9.2 – Intersection Design**

The operation of the Site Access/Bank and Vancouver/Bank intersections were analyzed to determine the operation and possible intersection modifications which would be triggered by the proposed Starbucks coffee shop. The analysis determined that the Site Access/Bank intersection operated at an acceptable level of service with the exception of the eastbound exclusive left turn lane which would experience long delays due to the high volume of background traffic along Bank Street. Intersection modifications would not improve the operation of the existing site access and no modifications to the intersection are recommended.

The Vancouver/Bank intersection would operate at an acceptable level of service with the proposed Starbucks with few new trips added to the through traffic movements along Bank Street. The Starbucks would have a minor impact on the operation of the intersection with no modifications to the Vancouver/Bank intersection recommended.

## **SUMMARY**

The Starbucks coffee shop is proposed on vacant land at 1910 Bank Street approximately 250 m south of the intersection of Bank Street and Walkley Road. The coffee shop will share the site with the existing Swiss Chalet restaurant, and share the existing access onto Bank Street. The Starbucks will be located in a 213.58 m<sup>2</sup> free standing building which would provide sit-down seating and a drive-through window. The transportation analysis has determined the following:

1. The Starbucks is expected to generate 62 trips entering and 59 trips exiting during the peak AM hour, and 30 trips entering and 29 trips exiting during the peak PM hour. Of the total trips generated, 25 percent of the trips would be new trips and 75 percent would be pass-by trips that are already on the road.
2. The Starbucks drive-through aisle provides sufficient space for the queuing of 11 vehicles from the pickup window which conforms to City of Ottawa By-laws.



3. The shared site access onto Bank Street is approximately 8.7 m in width and has an exclusive eastbound left turn lane and exclusive right turn lane. The clear throat length of the exit would meet the TAC Guidelines for site accesses.
4. The 2024 operational analysis of the Site Access/Bank intersection determined that the northbound Bank Street left turn movement functioned at an acceptable level of service with the expected queue to not interfere with the operation of the Vancouver/Bank intersection. The eastbound access right turn movement would operate at an acceptable level of service. The eastbound left turn movement would experience a low level of service during both the peak AM and PM hours due to the high volume of background traffic along Bank Street. Left turning vehicles were observed during the 2018 counts to reduce the wait time by exiting during a gap in the southbound traffic, and storing in the refuge of the Bank Street left turn lane before merging into the northbound traffic. Left turning vehicles do have the option of exiting to the south and making a legal U-turn to travel north. There are no recommended modifications to the intersection to improve the operation of the eastbound left turn movement.
5. The Vancouver/Bank intersection would operate at an acceptable level of service for the expected 2024 traffic. The queue at the southbound Bank Street left turn movement is not expected to extend past the Starbucks/Swiss Chalet access and would not interfere with the operation of the access. There are no recommended modifications to the intersection.

A summary of the level of service for the various modes of transportation are summarized in Table 4.6 with the results detailed in the analysis sheets provided as Exhibits in the Appendix.

**TABLE 4.6**  
**MULTI-MODAL (MMLOS) SUMMARY TABLE**

SEGMENTS	Level of Service (LoS) – 2024				
	Pedestrian	Cyclist	Transit	Auto	Truck
Bank Street	C	E	D	-	A
INTERSECTIONS	Level of Service (LoS) – 2024				
	Pedestrian	Cyclist	Transit	Auto	Truck
Site Access/Bank	-	-	-	C <sup>1</sup>	-
Vancouver/Bank	-	-	-	C <sup>2</sup>	-

<sup>1</sup> Year 2024 peak PM hour northbound Bank Street left turn movement

<sup>2</sup> Year 2024 peak AM hour southbound Bank Street left turn movement

The Bank Street segment did not meet the MMLOS targets for pedestrians, bicycles or transit. The targets are shown in the *Multi-Modal Level of Service (MMLOS) Guidelines* (Exhibit 22). The targets could be met with wider sidewalks, a reduction in vehicular speed and traffic volume, and the provision of bus lanes. Roadway modifications to meet MMLOS targets would not be possible with the existing right-of-way and development along Bank Street. The target was met for trucks.

The lane movements at the Site Access/Bank and Vancouver/Bank intersections met the MMLOS target for the auto mode. No roadway improvements are recommended for the existing Site Access/Bank and Vancouver/Bank intersections.

The trips generated by the Starbucks coffee shop would result in a minor impact on the intersections along Bank Street.

Prepared by:

*David J. Halpenny*

David J. Halpenny, M. Eng., P. Eng.



## **APPENDIX**

### **SCREENING FORM**

#### **ITE TRIP GENERATION DATA SHEETS**

#### **TRAFFIC AND MMLOS ANALYSIS SHEETS**

## EXHIBIT 1 SCREENING FORM



Transportation Impact Assessment Guidelines

### City of Ottawa 2017 TIA Guidelines Screening Form

#### 1. Description of Proposed Development

Municipal Address	1910 BANK STREET.
Description of Location	WEST-SIDE OF BANK / SOUTH OF WALKLEY
Land Use Classification	
Development Size (units)	
Development Size (m <sup>2</sup> )	204 m <sup>2</sup> - PROPOSED STARBUCKS
Number of Accesses and Locations	ONE (1)
Phase of Development	
Buildout Year	2018 (SWISS CHALET BUILT IN 2011)

If available, please attach a sketch of the development or site plan to this form.

#### 2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m <sup>2</sup>
Industrial	5,000 m <sup>2</sup>
Fast-food restaurant or coffee shop	100 m <sup>2</sup>
Destination retail	1,000 m <sup>2</sup>
Gas station or convenience market	75 m <sup>2</sup>

\* If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.



Transportation Impact Assessment Guidelines

### 3. Location Triggers

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

\*DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		✓
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✓
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		✓
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✓
Does the development include a drive-thru facility?	✓	

250  
m  
From  
Intersection

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

### 5. Summary

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

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

## EXHIBIT 2

### ITE TRIP GENERATION MANUAL 10<sup>th</sup> Edition – Land Use 937 Trip Data

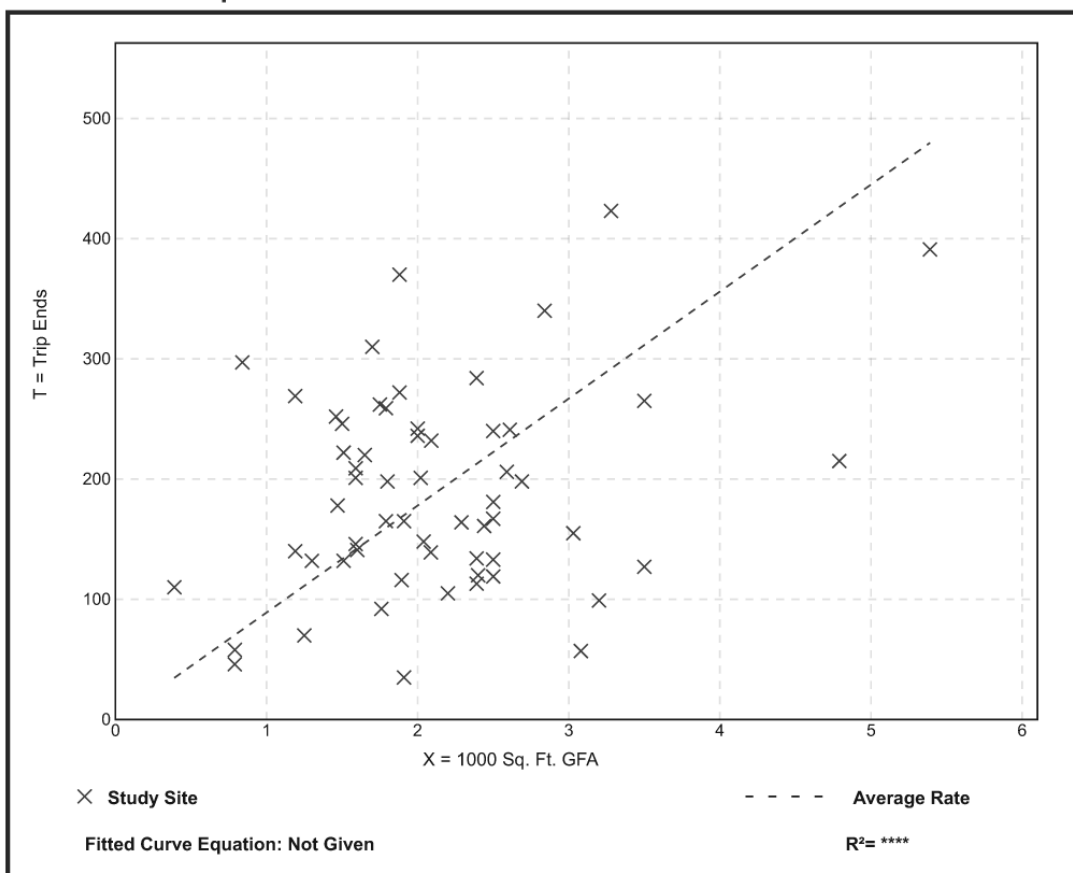
#### Coffee/Donut Shop with Drive-Through Window (937)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA  
On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 7 and 9 a.m.  
Setting/Location: General Urban/Suburban  
Number of Studies: 61  
1000 Sq. Ft. GFA: 2  
Directional Distribution: 51% entering, 49% exiting

#### Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
88.99	18.32 - 353.57	48.19

#### Data Plot and Equation



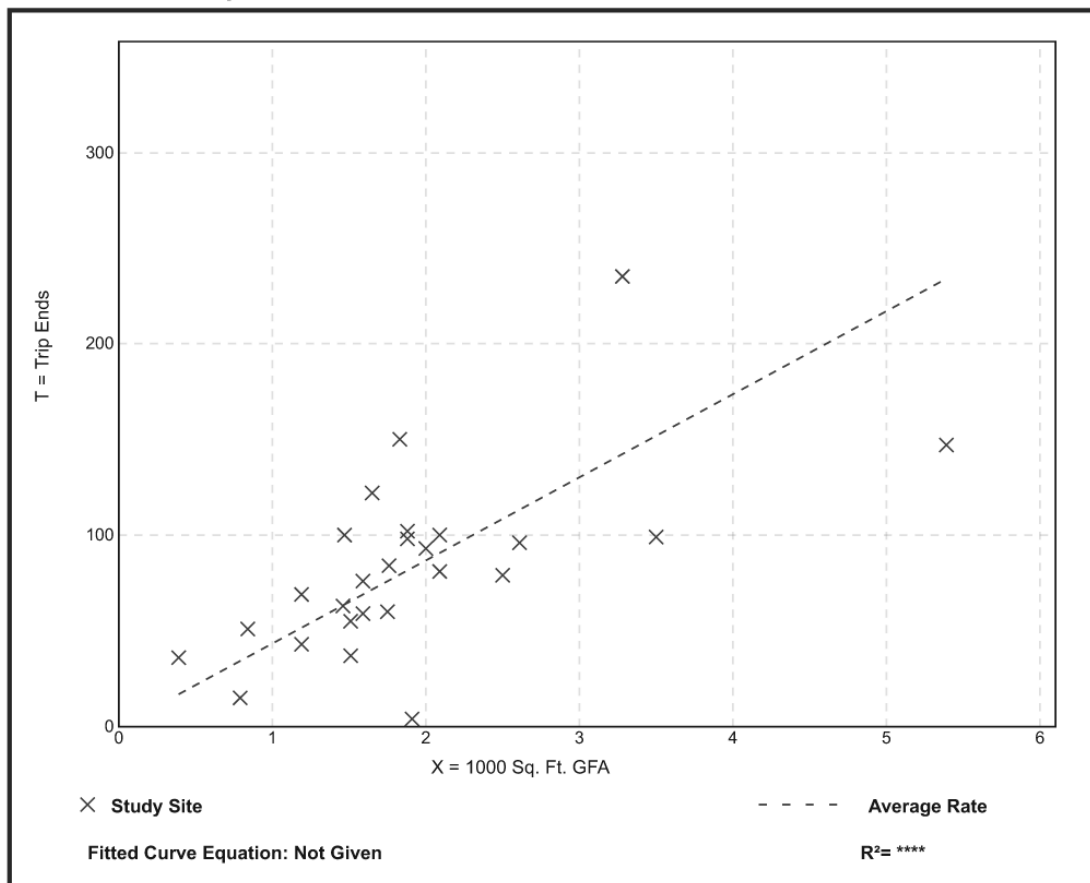
## Coffee/Donut Shop with Drive-Through Window (937)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA  
On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.  
Setting/Location: General Urban/Suburban  
Number of Studies: 26  
1000 Sq. Ft. GFA: 2  
Directional Distribution: 50% entering, 50% exiting

### Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
43.38	2.09 - 92.31	18.88

### Data Plot and Equation





## EXHIBIT 3

### 2018 PEAK AM HOUR EXISTING TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Site Access/Bank								
Agency/Co.								Jurisdiction	City of Ottawa								
Date Performed	11/27/2018							East/West Street	Site Access								
Analysis Year	2018							North/South Street	Bank Street								
Time Analyzed	Peak AM Hour							Peak Hour Factor	0.92								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Starbucks Coffee Shop																
<b>Lanes</b>																	
<p>Major Street: North-South</p>																	
<b>Vehicle Volumes and Adjustments</b>																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	0	1		0	0	0		0	1	2	0	0	0	2	0
Configuration		L		R						L	T				T	TR	
Volume (veh/h)		0		0						0	2	1478				648	0
Percent Heavy Vehicles (%)		0		0						0	0						
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No															
Median Type   Storage		Undivided															
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.80		6.90						4.10							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.30						2.20							
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)		0		0						2							
Capacity, c (veh/h)		113		644						903							
v/c Ratio		0.00		0.00						0.00							
95% Queue Length, Q <sub>95</sub> (veh)		0.0		0.0						0.0							
Control Delay (s/veh)		37.0		10.6						9.0							
Level of Service (LOS)		E		B						A							
Approach Delay (s/veh)										0.0							
Approach LOS																	



## EXHIBIT 4

### 2018 PEAK PM HOUR EXISTING TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Site Access/Bank								
Agency/Co.								Jurisdiction	City of Ottawa								
Date Performed	11/27/2018							East/West Street	Site Access								
Analysis Year	2018							North/South Street	Bank Street								
Time Analyzed	Peak PM Hour							Peak Hour Factor	0.92								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Starbucks Coffee Shop																
<b>Lanes</b>																	
<p>Major Street: North-South</p>																	
<b>Vehicle Volumes and Adjustments</b>																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	0	1		0	0	0		0	1	2	0	0	0	2	0
Configuration		L		R						L	T				T	TR	
Volume (veh/h)		7		8						0	10	1123				1566	30
Percent Heavy Vehicles (%)		0		0						0	0						
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No															
Median Type   Storage		Undivided															
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.80		6.90						4.10							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.30						2.20							
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)		8		9						11							
Capacity, c (veh/h)		29		297						368							
v/c Ratio		0.26		0.03						0.03							
95% Queue Length, Q <sub>95</sub> (veh)		0.8		0.1						0.1							
Control Delay (s/veh)		165.7		17.5						15.1							
Level of Service (LOS)		F		C						C							
Approach Delay (s/veh)		86.6								0.1							
Approach LOS		F															

## EXHIBIT 5

### 2019 PEAK AM HOUR TOTAL TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Site Access/Bank								
Agency/Co.								Jurisdiction	City of Ottawa								
Date Performed	11/27/2018							East/West Street	Site Access								
Analysis Year	2019							North/South Street	Bank Street								
Time Analyzed	Peak AM Hour							Peak Hour Factor	0.92								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Starbucks Coffee Shop																
<b>Lanes</b>																	
<p>Major Street: North-South</p>																	
<b>Vehicle Volumes and Adjustments</b>																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	0	1		0	0	0	0	1	2	0	0	0	2	0	
Configuration		L		R						L	T				T	TR	
Volume (veh/h)		42		17					0	41	1458				639	23	
Percent Heavy Vehicles (%)		0		0					0	0							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No															
Median Type   Storage		Undivided															
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.80		6.90						4.10							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.30						2.20							
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)		46		18						45							
Capacity, c (veh/h)		95		637						891							
v/c Ratio		0.48		0.03						0.05							
95% Queue Length, Q <sub>95</sub> (veh)		2.1		0.1						0.2							
Control Delay (s/veh)		73.3		10.8						9.3							
Level of Service (LOS)		F		B						A							
Approach Delay (s/veh)		55.3								0.3							
Approach LOS		F															

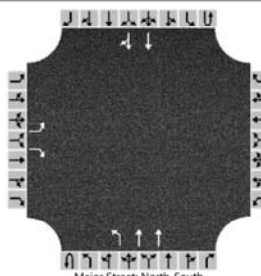
## EXHIBIT 6

### 2019 PEAK PM HOUR TOTAL TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst									Intersection	Site Access/Bank							
Agency/Co.									Jurisdiction	City of Ottawa							
Date Performed	11/27/2018								East/West Street	Site Access							
Analysis Year	2019								North/South Street	Bank Street							
Time Analyzed	Peak PM Hour								Peak Hour Factor	0.92							
Intersection Orientation	North-South								Analysis Time Period (hrs)	0.25							
Project Description	Starbucks Coffee Shop																
<b>Lanes</b>																	
<p>Major Street: North-South</p>																	
<b>Vehicle Volumes and Adjustments</b>																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	0	1		0	0	0	0	1	2	0	0	0	2	0	
Configuration		L		R						L	T				T	TR	
Volume (veh/h)		20		24					0	22	1124				1568	48	
Percent Heavy Vehicles (%)		0		0					0	0							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No															
Median Type   Storage		Undivided															
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.80		6.90						4.10							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.30						2.20							
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)		22		26						24							
Capacity, c (veh/h)		27		292						361							
v/c Ratio		0.82		0.09						0.07							
95% Queue Length, Q <sub>95</sub> (veh)		2.6		0.3						0.2							
Control Delay (s/veh)		325.4		18.5						15.7							
Level of Service (LOS)		F		C						C							
Approach Delay (s/veh)		158.0								0.3							
Approach LOS		F															

## EXHIBIT 7

### 2024 PEAK AM HOUR TOTAL TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Site Access/Bank				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Site Access				
Analysis Year	2024							North/South Street				Bank Street				
Time Analyzed	Peak AM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	2	0	0	0	2	0
Configuration		L		R						L	T				T	TR
Volume (veh/h)		42		17					0	41	1734				763	23
Percent Heavy Vehicles (%)		0		0					0	0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.80		6.90						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		46		18						45						
Capacity, c (veh/h)		61		576						794						
v/c Ratio		0.74		0.03						0.06						
95% Queue Length, Q <sub>95</sub> (veh)		3.3		0.1						0.2						
Control Delay (s/veh)		157.9		11.5						9.8						
Level of Service (LOS)		F		B						A						
Approach Delay (s/veh)	115.7								0.2							
Approach LOS	F															



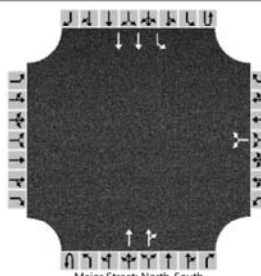
## EXHIBIT 8

### 2024 PEAK PM HOUR TOTAL TRAFFIC ANALYSIS – Site Access/Bank

HCS7 Two-Way Stop-Control Report																	
General Information									Site Information								
Analyst									Intersection	Site Access/Bank							
Agency/Co.									Jurisdiction	City of Ottawa							
Date Performed	11/27/2018								East/West Street	Site Access							
Analysis Year	2024								North/South Street	Bank Street							
Time Analyzed	Peak PM Hour								Peak Hour Factor	0.92							
Intersection Orientation	North-South								Analysis Time Period (hrs)	0.25							
Project Description	Starbucks Coffee Shop																
<b>Lanes</b>																	
<p>Major Street: North-South</p>																	
<b>Vehicle Volumes and Adjustments</b>																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		1	0	1		0	0	0		0	1	2	0	0	0	2	0
Configuration		L		R						L	T				T	TR	
Volume (veh/h)		20		24						0	22	1336				1860	48
Percent Heavy Vehicles (%)		0		0						0	0						
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized		No															
Median Type   Storage		Undivided															
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.80		6.90						4.10							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.50		3.30						2.20							
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)		22		26						24							
Capacity, c (veh/h)		13		230						272							
v/c Ratio		1.66		0.11						0.09							
95% Queue Length, Q <sub>95</sub> (veh)		3.4		0.4						0.3							
Control Delay (s/veh)		906.4		22.7						19.5							
Level of Service (LOS)		F		C						C							
Approach Delay (s/veh)		424.4								0.3							
Approach LOS		F															

## EXHIBIT 9

### 2018 PEAK AM HOUR EXISTING TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Bank/Vancouver				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Vancouver Avenue				
Analysis Year	2018							North/South Street				Bank Street				
Time Analyzed	Peak AM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
 <p>Major Street: North-South</p>																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		17			1463	5	0	3	645	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						22								3		
Capacity, c (veh/h)						378								416		
v/c Ratio						0.06								0.01		
95% Queue Length, Q <sub>95</sub> (veh)						0.2								0.0		
Control Delay (s/veh)						15.1								13.7		
Level of Service (LOS)						C								B		
Approach Delay (s/veh)					15.1								0.1			
Approach LOS					C											

## EXHIBIT 10

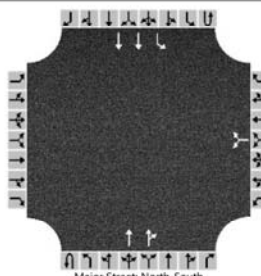
### 2018 PEAK PM HOUR EXISTING TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection	Bank/Vancouver							
Agency/Co.								Jurisdiction	City of Ottawa							
Date Performed	11/27/2018							East/West Street	Vancouver Avenue							
Analysis Year	2018							North/South Street	Bank Street							
Time Analyzed	Peak PM Hour							Peak Hour Factor	0.92							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Starbucks Coffee Shop															
<b>Lanes</b>																
<p>Major Street: North-South</p>																
<b>Vehicle Volumes and Adjustments</b>																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		11			1122	8	0	13	1561	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
<b>Critical and Follow-up Headways</b>																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
<b>Delay, Queue Length, and Level of Service</b>																
Flow Rate, v (veh/h)							15							14		
Capacity, c (veh/h)							206							574		
v/c Ratio							0.07							0.02		
95% Queue Length, Q <sub>95</sub> (veh)							0.2							0.1		
Control Delay (s/veh)							23.9							11.4		
Level of Service (LOS)							C							B		
Approach Delay (s/veh)					23.9								0.1			
Approach LOS					C											



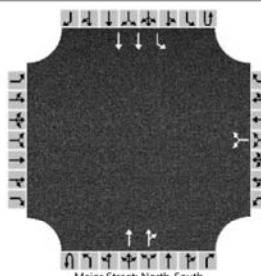
## EXHIBIT 11

### 2019 PEAK AM HOUR TOTAL TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Bank/Vancouver				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Vancouver Avenue				
Analysis Year	2019							North/South Street				Bank Street				
Time Analyzed	Peak AM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
 <p>Major Street: North-South</p>																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		17			1482	5	0	3	653	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						22								3		
Capacity, c (veh/h)						364								409		
v/c Ratio						0.06								0.01		
95% Queue Length, Q <sub>95</sub> (veh)						0.2								0.0		
Control Delay (s/veh)						15.5								13.9		
Level of Service (LOS)						C								B		
Approach Delay (s/veh)					15.5								0.1			
Approach LOS					C											

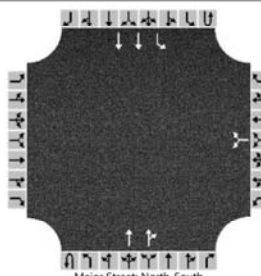
## EXHIBIT 12

### 2019 PEAK PM HOUR TOTAL TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Bank/Vancouver				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Vancouver Avenue				
Analysis Year	2019							North/South Street				Bank Street				
Time Analyzed	Peak PM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
 <p>Major Street: North-South</p>																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		11			1135	8	0	13	1579	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						15								14		
Capacity, c (veh/h)						198								567		
v/c Ratio						0.08								0.02		
95% Queue Length, Q <sub>95</sub> (veh)						0.2								0.1		
Control Delay (s/veh)						24.6								11.5		
Level of Service (LOS)						C								B		
Approach Delay (s/veh)					24.6								0.1			
Approach LOS					C											

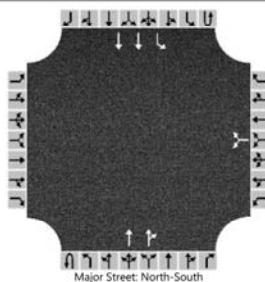
## EXHIBIT 13

### 2024 PEAK AM HOUR TOTAL TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Bank/Vancouver				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Vancouver Avenue				
Analysis Year	2024							North/South Street				Bank Street				
Time Analyzed	Peak AM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
<div></div> <p>Major Street: North-South</p>																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		17			1758	5	0	3	777	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							22							3		
Capacity, c (veh/h)							204							313		
v/c Ratio							0.11							0.01		
95% Queue Length, Q <sub>95</sub> (veh)							0.4							0.0		
Control Delay (s/veh)							24.7							16.6		
Level of Service (LOS)							C							C		
Approach Delay (s/veh)					24.7								0.1			
Approach LOS					C											

## EXHIBIT 14

### 2024 PEAK PM HOUR TOTAL TRAFFIC ANALYSIS – Vancouver/Bank

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection				Bank/Vancouver				
Agency/Co.								Jurisdiction				City of Ottawa				
Date Performed	11/27/2018							East/West Street				Vancouver Avenue				
Analysis Year	2024							North/South Street				Bank Street				
Time Analyzed	Peak PM Hour							Peak Hour Factor				0.92				
Intersection Orientation	North-South							Analysis Time Period (hrs)				0.25				
Project Description	Starbucks Coffee Shop															
Lanes																
																
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	1	2	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						3		11			1347	8	0	13	1871	
Percent Heavy Vehicles (%)						0		0					0	0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type   Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.80		6.90						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							15							14		
Capacity, c (veh/h)							107							464		
v/c Ratio							0.14							0.03		
95% Queue Length, Q <sub>95</sub> (veh)							0.5							0.1		
Control Delay (s/veh)							44.1							13.0		
Level of Service (LOS)							E							B		
Approach Delay (s/veh)					44.1								0.1			
Approach LOS					E											

## EXHIBIT 15

### BANK STREET – PLOS Segment Evaluation

STREET Bank Street  
FROM Notting Hill Avenue  
TO Vancouver Avenue  
YEAR 2024  
DIRECTION Northbound–Southbound  
MMLOS MODE PLOS

SEGMENT SCORE **C**

Sidewalk Width (m)	Boulevard Width (m)	Motor Vehicle Traffic Volume (AADT)	Presence of On- street Parking	Segment PLOS			
				Operating Speed (km/h)			
				≤30	>30 or 50	>50 or 60	>60 <sup>1</sup>
2.0 or more	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	B	N/A
			No	A	B	C	D
	0.5 to 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0	≤ 3000	NA	A	B	C	D
		> 3000	Yes	B	B	D	N/A
			No	B	C	E	F
1.8	> 2	≤ 3000	N/A	A	A	A	B
		> 3000	Yes	A	B	C	N/A
			No	A	C	D	E
	0.5 to 2	≤ 3000	N/A	A	B	B	D
		> 3000	Yes	A	C	C	N/A
			No	B	C	E	E
	0	≤ 3000	N/A	A	B	C	D
		> 3000	Yes	B	C	D	N/A
			No	C	D	F	F
1.5	> 2	≤ 3000	N/A	C	C	C	C
		> 3000	Yes	C	C	D	N/A
			No	C	D	E	E
	0.5 to 2	≤ 3000	N/A	C	C	C	D
		> 3000	Yes	C	C	D	N/A
			No	D	E	E	E
	0	N/A		D	E	F <sup>2</sup>	F <sup>2</sup>
<1.5	N/A		F <sup>3</sup>	F <sup>3</sup>	F <sup>3</sup>	F <sup>3</sup>	
No sidewalk	N/A		C <sup>4</sup>	F <sup>3</sup>	F <sup>3</sup>	F <sup>3</sup>	



## EXHIBIT 16

### BANK STREET – BLOS Segment Evaluation

STREET Bank Street  
FROM Notting Hill Avenue  
TO Vancouver Avenue  
YEAR 2024  
DIRECTION Northbound–Southbound  
MMLOS MODE BLOS

SEGMENT SCORE **E**

Type of Bikeway		LOS
<b>Physically Separated Bikeway</b> (cycle tracks, protected bike lanes and multi-use paths). Physical separation refers to, but is not limited to, curbs, raised medians, bollards and parking lanes (adjacent to the bike lane along the travelled way i.e. not curbside).		<b>A</b>
<b>Bike Lanes Not Adjacent Parking Lane - Select Worst Scoring Criteria</b>		
No. of Travel Lanes	1 travel lane in each direction	A
	2 travel lanes in each direction separated by a raised median	B
	2 travel lanes in each direction without a separating median	C
	More than 2 travel lanes in each direction	D
Bike Lane Width	> 1.8 m wide bike lane (includes marked buffer and paved gutter width)	A
	≥1.5 m to <1.8 m wide bike lane (includes marked buffer and paved gutter width)	B
	≥1.2 m to <1.5 m wide bike lane (includes marked buffer and paved gutter width)	C
Operating Speed	≤ 50 km/h operating speed	A
	60 km/h operating speed	C
	> 70 km/h operating speed	E
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
<b>Bike Lanes Adjacent to curbside Parking Lane - Select Worst Scoring Criteria</b>		
No. of Travel Lanes	1 travel lane in each direction	A
	2 or more travel lanes in each direction	C
Bike Lane and Parking Lane Width	4.5 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	A
	4.25 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	B
	NOT APPLICABLE	
	≤ 4.0 m wide bike lane plus parking lane (includes marked buffer and paved gutter width)	C
Operating Speed	< 40 km/h operating speed	A
	50 km/h operating speed	B
	60 km/h operating speed	D
	> 70 km/h operating speed	F
Bike lane blockage (commercial areas)	Rare	A
	Frequent	C
<b>Mixed Traffic</b>		
No. of Travel Lanes and Operating Speed	2 travel lanes; ≤ 40 km/h; no marked centerline or classified as residential	A
	2 to 3 travel lanes; ≤ 40 km/h	B
	2 travel lanes; 50 km/h; no marked centerline or classified as residential	B
	2 to 3 travel lanes; 50 km/h	D
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	<b>E</b>
	6 or more travel lanes; ≤ 40 km/h	E
	≥ 60 km/h	F
<b>Unsignalized Crossing along Route: no median refuge</b>		
No. of Travel Lanes on Side Street and Operating Speed	3 or less lanes being crossed; ≤ 40 km/h	A
	4 to 5 lanes being crossed; ≤ 40 km/h	B
	3 or less lanes being crossed; 50 km/h	<b>B</b>
	4 to 5 lanes being crossed; 50 km/h	C
	3 or less lanes being crossed; 60 km/h	C
	4 to 5 lanes being crossed; 60 km/h	D
	6 or more lanes being crossed; ≤ 40 km/h	E
	3 or less lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 50 km/h	F
	4 to 5 lanes being crossed; ≥ 65 km/h	F
<b>Unsignalized Crossing along Route: with median refuge (&gt; 1.8 m wide)</b>		
No. of Travel Lanes on Side Street and Operating Speed	5 or less lanes being crossed; ≤ 40 km/h	A
	3 or less lanes being crossed; 50 km/h	A
	6 or more lanes being crossed; ≤ 40 km/h	B
	4 to 5 lanes being crossed; 50 km/h	B
	3 or less lanes being crossed; 60 km/h	B
	6 or more lanes being crossed; 50 km/h	C
	4 to 5 lanes being crossed; 60 km/h	C
	3 or less lanes being crossed; ≥ 65 km/h	D
	6 or more lanes being crossed; 60 km/h	E
	4 to 5 lanes being crossed; ≥ 65 km/h	E
	6 or more lanes being crossed; ≥ 65 km/h	F

## EXHIBIT 17

### BANK STREET – TLOS Segment Evaluation

STREET Bank Street  
FROM Notting Hill Avenue  
TO Vancouver Avenue  
YEAR 2024  
DIRECTION Northbound–Southbound  
MMLOS MODE TLOS

SEGMENT SCORE **D**

Facility Type		Level/exposure to congestion delay, friction and incidents			Quantitative Measurement	LOS
		Congestion	Friction	Incident Potential		
Segregated ROW		No	No	No	N/A	A
Bus lane	No/limited parking/driveway friction	No	Low	Low	$C_f \leq 60$	B
	Frequent parking/driveway friction	No	Medium	Medium	$C_f > 60$	C
Mixed Traffic	Limited parking/driveway friction	Yes	Low	Medium	$V/V_p \geq 0.8$	D
	Moderate parking/driveway friction	Yes	Medium	Medium	$V/V_p \leq 0.6$	E
	Frequent parking/driveway friction	Yes	High	High	$V/V_p < 0.4$	F

Notes:

$C_f$ , Conflict Factor = (Number of driveways x crossing volume) / 1 km

$V/V_p$  is the ratio of average transit travel speed to posted speed limit



## EXHIBIT 18

### BANK STREET – TkLOS Segment Evaluation

STREET	Bank Street		
FROM	Notting Hill Avenue		
TO	Vancouver Avenue	SEGMENT SCORE	<b>A</b>
YEAR	2024		
DIRECTION	Northbound–Southbound		
MMLOS MODE	TkLOS		

Exhibit 20 – TkLOS Segment Evaluation Table

Curb Lane Width (m)	Only two travel lanes (one in each direction)	More than two travel lanes
>3.7	B	<b>A</b>
≤3.5	C	A
≤3.3	D	C
≤3.2	E	D
≤3	F	E