

**OTY RESIDENTIAL DEVELOPMENT  
200, 230 & 260 STEAMLINE STREET  
OTTAWA, ONTARIO**

**TRANSPORTATION IMPACT ASSESSMENT**

Prepared for:

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**TRANSPORTATION IMPACT ASSESSMENT**

**MODULE 1 - SCREENING**

A Screening Form has been prepared which is included as Exhibit 1 in the Appendix. The Trip Generation Trigger has been satisfied in the Screening Form, with the City of Ottawa staff review recommending that the assessment study proceed to the Scoping Form. The following will address the requirements of the Scoping Form.

**MODULE 2 - SCOPING**

**MODULE 2.1 – Existing and Planned Conditions**

A Site Plan has been prepared for the development of land along Steamline Street which is part of the Ottawa Train Yards land. The proposed development is located along the south side of Steamline Street, between Sandford Fleming Avenue and Terminal Avenue. The location of the development is shown in Figure 2.1.

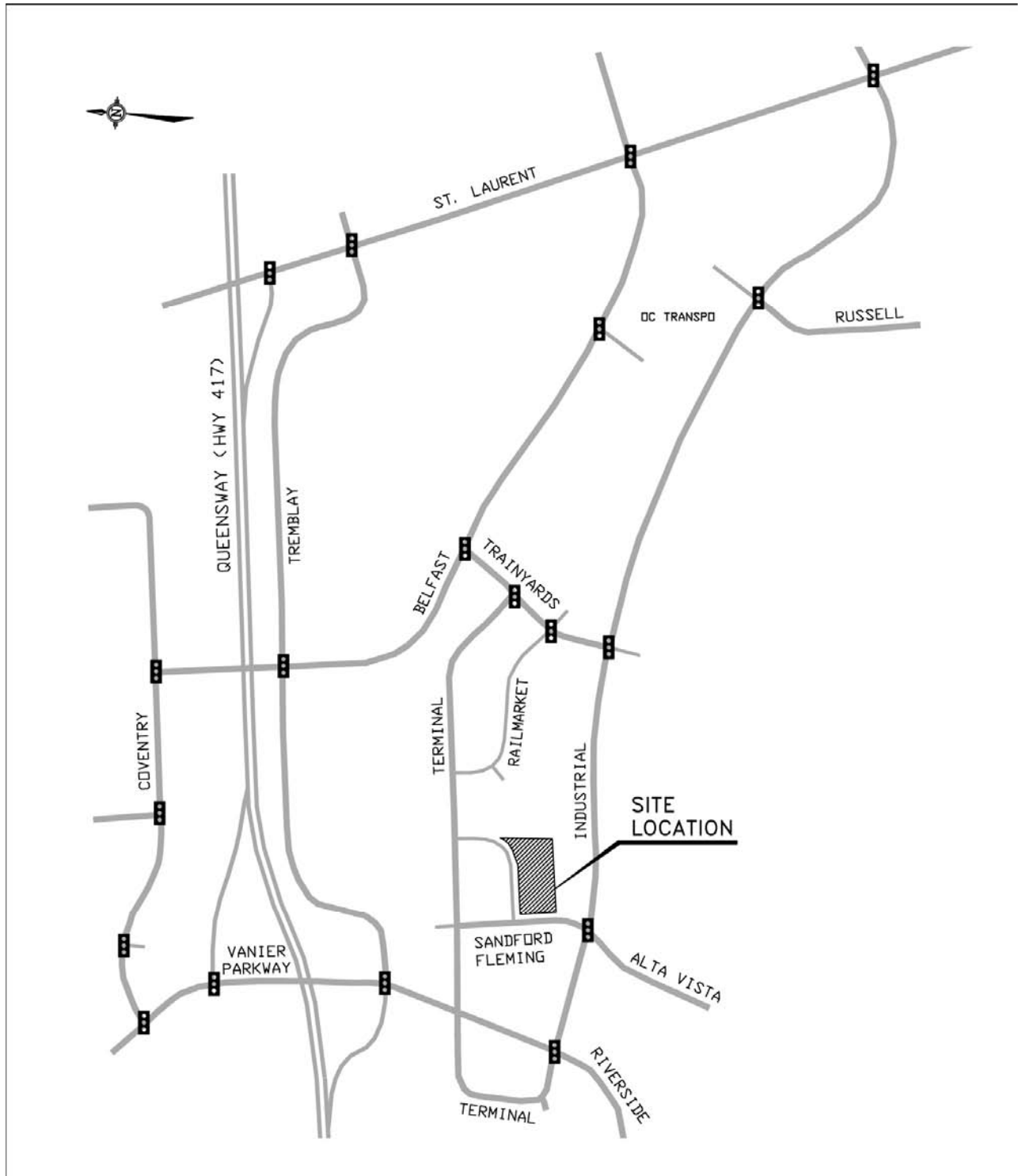
**Element 2.1.1 – Proposed Development**

The Site Plan proposes the development to consist of the construction of seven apartment buildings on a 3.529 ha parcel of land. The development will be constructed in three phases with the following showing the building number, number of units, and anticipated completion date.

<b>PHASE 1</b>		
Buildings 100 & 200	375 units	2019 completion
<b>PHASE 2</b>		
Buildings 300, 400 & 500	865 units	2025 completion
<b>PHASE 3</b>		
Buildings 600 & 700	605 units	2029 completion
Total Apartment Units	1,845 units	



**FIGURE 2.1  
SITE LOCATION PLAN**



NOT TO SCALE

The land currently has one commercial/industrial use building. The surrounding land uses consist of the Canada Post office complex to the west, retail shopping to the east, office development to the north, and commercial/industrial to the south. Steamline Street currently exists with a connection to Sandford Fleming Avenue. The street provides access to the commercial/industrial properties on both the north and south sides of Steamline Street.

The land is currently zoned “Transit Oriented Development Zone” TD2[1979] which will support the proposed development. Amendments to the zoning may be required for the development.

The proposed development will have two access points onto Steamline Street. Steamline Street currently connects to Sandford Fleming Avenue approximately 125 m south of Terminal Avenue, and will be extended during Phase 3 of the development to Terminal Avenue approximately 320 m east of Sandford Fleming Avenue. A drop off is proposed on Sandford Fleming Avenue for passengers and deliveries. The drop off will have two access points onto Sandford Fleming Avenue which will have a separation of 28 m (centreline to centreline).

The Site Plan provides 1,843 parking spaces in an underground parking garage and 189 surface parking spaces for tenants and visitors for a total of 2,032 parking spaces. The parking spaces provide approximately one space per unit and do not exceed the maximum allowed within a TOD zone. Access to both the surface and underground parking will be from the two proposed accesses onto Steamline Street. Figure 2.2 shows a plan of the proposed development.

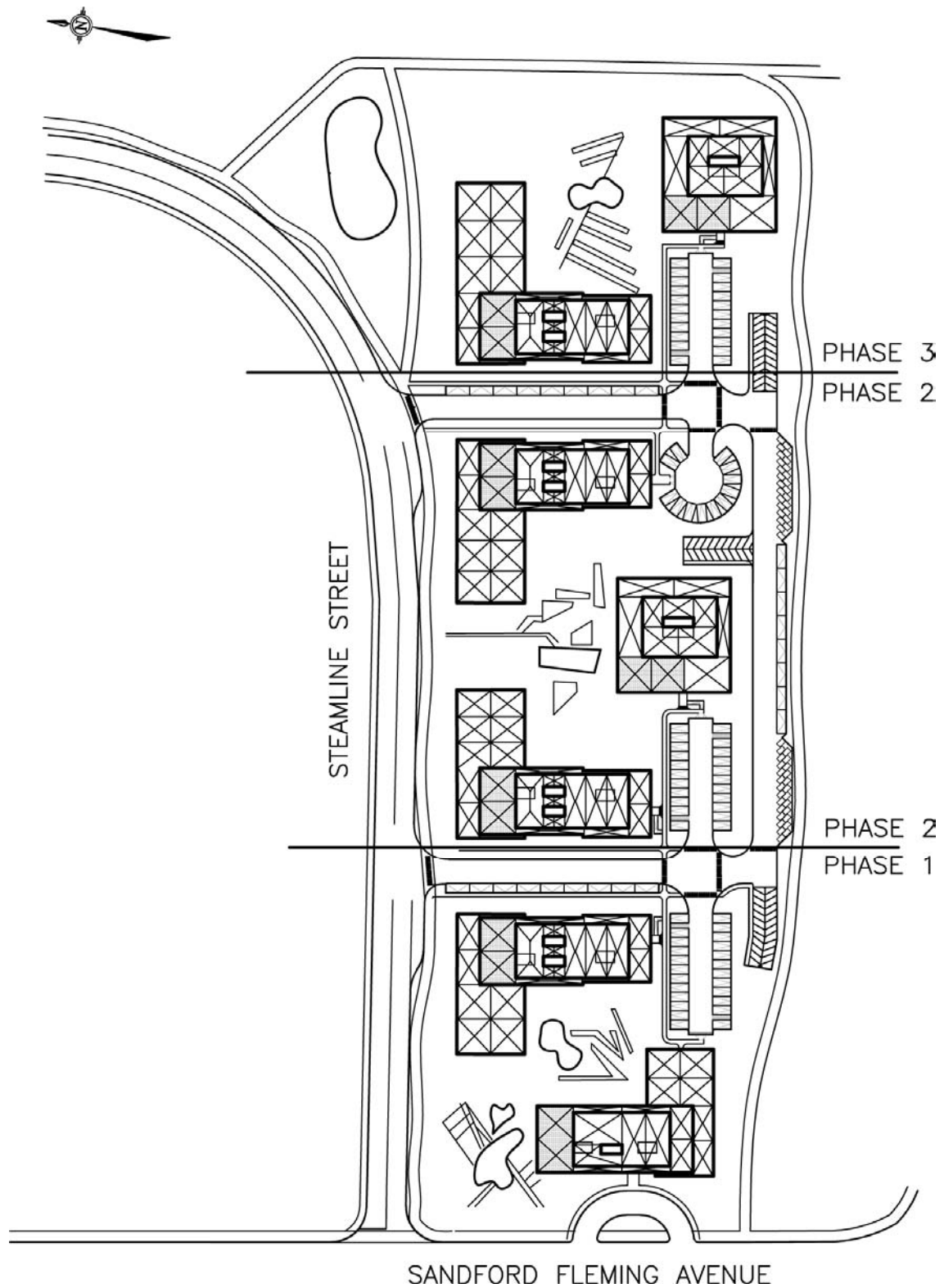
### **Element 2.1.2 – Existing Conditions**

The apartment development will be located along Steamline Street which will connect to both Sandford Fleming Avenue and Terminal Avenue. Sandford Fleming Avenue is a two lane urban collector road with an unposted speed limit of 50 km./h. The pavement width is approximately 14 metres, with sidewalks along both sides of the roadway. Paid parking is permitted along the east side of the road with parking prohibited along the west side. There are no designated cycling lanes along the road.

The City of Ottawa *Transportation Master Plan* (TMP) has identified a “Major Pathway” in the Cycling Network - Primary Urban plan which would connect Industrial Avenue to Terminal Avenue. The pathway would then travel north along a route which has yet to be established. The Site Plan has provided a pathway through the east portion of the site from the south property limit to Terminal Avenue. The land between the site’s south property limit and Industrial Avenue is not owned by Ottawa Train Yards Inc.

Terminal Avenue is designated in the TMP as a collector road. The road is a two lane urban roadway with a posted speed limit of 50 km./h. The pavement is approximately 11 metres in width with parking restricted along the south side of the road. There is a sidewalk along the south side of the roadway which extends across the frontage of Walmart from Steamline Street to Railmarket Private. A sidewalk exists along the north side of Terminal Avenue from Sandford Fleming Avenue to the point where the south sidewalk terminates at the west limit of Walmart. There are no cycling lanes along this portion of the road. In the fall of 2013 Terminal Avenue was open to two-way traffic between Sandford Fleming Avenue and Riverside Drive. In 2015

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



the traffic was changed back to bus only traffic westbound from Sandford Fleming to Riverside Drive as part of the construction of the Transitway/LRT.

Belfast Road is designated as a collector road with an unposted speed of 50 km./h. The road has a two lane cross-section east and west of the Belfast/Trainyards intersection, and a four lane urban cross-section at the approaches to Trainyards Drive. There is a sidewalk along the north side of the road. There are no cycling lanes along the road, but Belfast Road between Trainyards Drive and Coventry Road is identified as a “Major Pathway” in the Cycling Network - Primary Urban in the City of Ottawa *Transportation Master Plan* (TMP).

Trainyards Drive is a two lane urban roadway linking Belfast Road to Industrial Avenue. The road has an unposted speed limit of 50 km./h., with a sidewalk along the west side of the roadway and a multi-use pathway along the east side. Trainyards Drive is designated as a “Major Pathway” in the TMP.

Railmarket Private is a two lane private urban road which passes through the retail site linking Terminal Avenue to Trainyards Drive.

Industrial Avenue is designated in the *Transportation Master Plan* as a four lane undivided arterial roadway. The posted speed limit along Industrial Avenue is 60 km./h. There is a pedestrian sidewalk along the north side of the road. There are no designated cycling lanes along the road. Industrial Avenue is identified as a “Spine Route” in the TMP.

Riverside Drive is a four lane divided arterial road with a posted speed limit of 60 km./h. The road has pedestrian sidewalks along both sides of the road. Riverside Drive is identified as a “Spine Route” in the TMP, with no designated cycling lanes.

The intersection of Terminal Avenue and Sandford Fleming Avenue is controlled by all-way stop signs. The Terminal/Sandford Fleming intersection is a “T” intersection, with Terminal Avenue forming the eastbound and westbound approaches to the intersection, and Sandford Fleming Avenue the northbound approach. The southbound approach to the intersection is a private approach to the Canada Post parking lot. The following is the lane configuration:

NB Sandford Fleming Approach -	One shared left/through/right lane
Southbound Canada Post Driveway -	One shared left/through/right lane
Eastbound Terminal Approach -	One shared left/through lane
	One right turn lane
Westbound Terminal Approach -	One shared left/through/right lane

Note: Currently all westbound movements on Terminal Avenue west of Sandford Fleming Avenue is restricted to Buses Only. The NB approach functions as an exclusive right turn lane and a shared left/through lane due to the pavement width of the road

The Terminal/Railmarket intersection is a “T” intersection controlled by a stop sign at the northbound Railmarket Private approach. The eastbound and westbound Terminal Avenue approaches are single lanes with no exclusive turn lanes, and the northbound Railmarket Private approach consists of an exclusive left turn and right turn lane.

The Terminal/Trainyards intersection is essentially a “T” intersection with Trainyards Drive forming the northbound and southbound approaches, and Terminal Avenue the eastbound approach. A private driveway forms the westbound approach. The intersection is controlled by traffic signals with the following lane configuration:

Northbound Trainyards Approach -	One left turn lane One through lane One right turn lane
Southbound Trainyards Approach -	One shared left/through lane One right turn lane
Eastbound Trainyards Approach -	Two left turn lanes One shared through/right lane
Westbound Private Driveway -	One shared left/through/right lane

The Trainyards/Belfast intersection is a “T” intersection with Belfast Road forming the eastbound and westbound approaches, and Trainyards Drive the northbound approach. The intersection is controlled by traffic signals with the following lane configuration:

Northbound Trainyards Approach -	Two left turn lanes One right turn lane
Eastbound Belfast Approach -	One through lane One right turn lane
Westbound Belfast Approach -	One left turn lane Two through lanes

The Trainyards/Railmarket intersection is controlled by traffic signals. The lane configuration of the intersection is as follows:

Northbound Trainyards Approach -	One left turn lane One shared through/right lane
Southbound Trainyards Approach -	One left turn lane One through lane One right turn lane
Eastbound Railmarket Approach -	One left turn lane One shared through/right lane
Westbound New Retail Entrance -	One left turn lane One shared through/right lane

The Industrial/Trainyards intersection is a signalized intersection with Industrial Avenue forming the eastbound and westbound approaches, Trainyards Drive the southbound approach, and a private driveway to a commercial site forms the northbound approach. The lane configuration of the intersection is as follows:

Northbound Private Driveway -	One shared left/through/right lane
Southbound Trainyards Approach -	One left turn lane One shared through/right lane

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Eastbound Industrial Approach -	One left turn lane One through lane One shared through/right lane
Westbound Industrial Approach -	One left turn lane One through lane One shared through/right lane

The Industrial/Sandford Fleming (Alta Vista) intersection is controlled by traffic signals, with Industrial Avenue forming the eastbound and westbound approaches, Sandford Fleming Avenue the southbound approach, and Alta Vista Drive the northbound approach. The intersection has a continuous eastbound right turn lane from Riverside Drive to Sandford Fleming Avenue (Alta Vista Drive). The lane configuration of the intersection is as follows:

Northbound Alta Vista Approach -	Two left turn lanes One shared through/right lane
SB Sandford Fleming Approach -	One left turn lane One through lane One right turn lane (channelized)
Eastbound Industrial Approach -	One left turn lane Two through lanes One right turn lane (channelized)
Westbound Industrial Approach -	One left turn lane One through lane One shared through/right lane

The Industrial (Terminal)/Riverside intersection is controlled by traffic signals, with Riverside Drive forming the northbound and southbound approaches, Terminal Avenue the eastbound approach, and Industrial Avenue the westbound approach. The lane configuration of the intersection is as follows:

Northbound Riverside Approach -	One left turn lane Three through lanes One right turn lane (channelized)
Southbound Riverside Approach -	Two left turn lanes Two through lane One right turn lane
Eastbound Terminal Approach -	One left turn lane One through lane One right turn lane
Westbound Industrial Approach -	Two left turn lanes One through lane Two right turn lanes (channelized) One right turn bus lane (channelized)

Driveways in close proximity to the site is the Canada Post main entrance which is located 95 m south of the Sandford Fleming/Steamline intersection, with loading docks located along the east side of the Canada Post building across from Steamline Street. Along Terminal Avenue the



access to 405 Terminal Avenue is located 90 m west of the Terminal/Steamline intersection, and the access to Walmart is located 70 m east of the proposed intersection.

Transit service in the vicinity of Steamline Street comprises of routes along both Sandford Fleming Avenue and Terminal Avenue. These routes provide service to the downtown area and to Hurdman Transit Station. Bus stops are located at the Terminal/Sandford Fleming and Sandford Fleming/Steamline intersections. Hurdman Transit Station is located at a walk of approximately 900 m.

Traffic counts obtained from the City of Ottawa at intersections in the vicinity of the site has determined the weekday peak AM hour to occur between 7:30 and 9:30, and peak PM between 3:15 and 5:15. The time period for the peak volume of traffic was applicable to vehicular, cycling and pedestrian traffic. Figure 2.3 presents the existing peak hour traffic counts.

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

The City of Ottawa *Transportation Master Plan 2013* was reviewed to identify transit and roadway projects in the vicinity of the development. The document identified the Confederation LRT Line between Tunney's Pasture and Blair stations in the "2031 Affordable RTTP Network Projects", and the widening of Tremblay Road from two to four lanes between Pickering Place and St. Laurent Boulevard in the "2031 Affordable Road Network". Both projects would have a positive impact on the volume of site related trips.

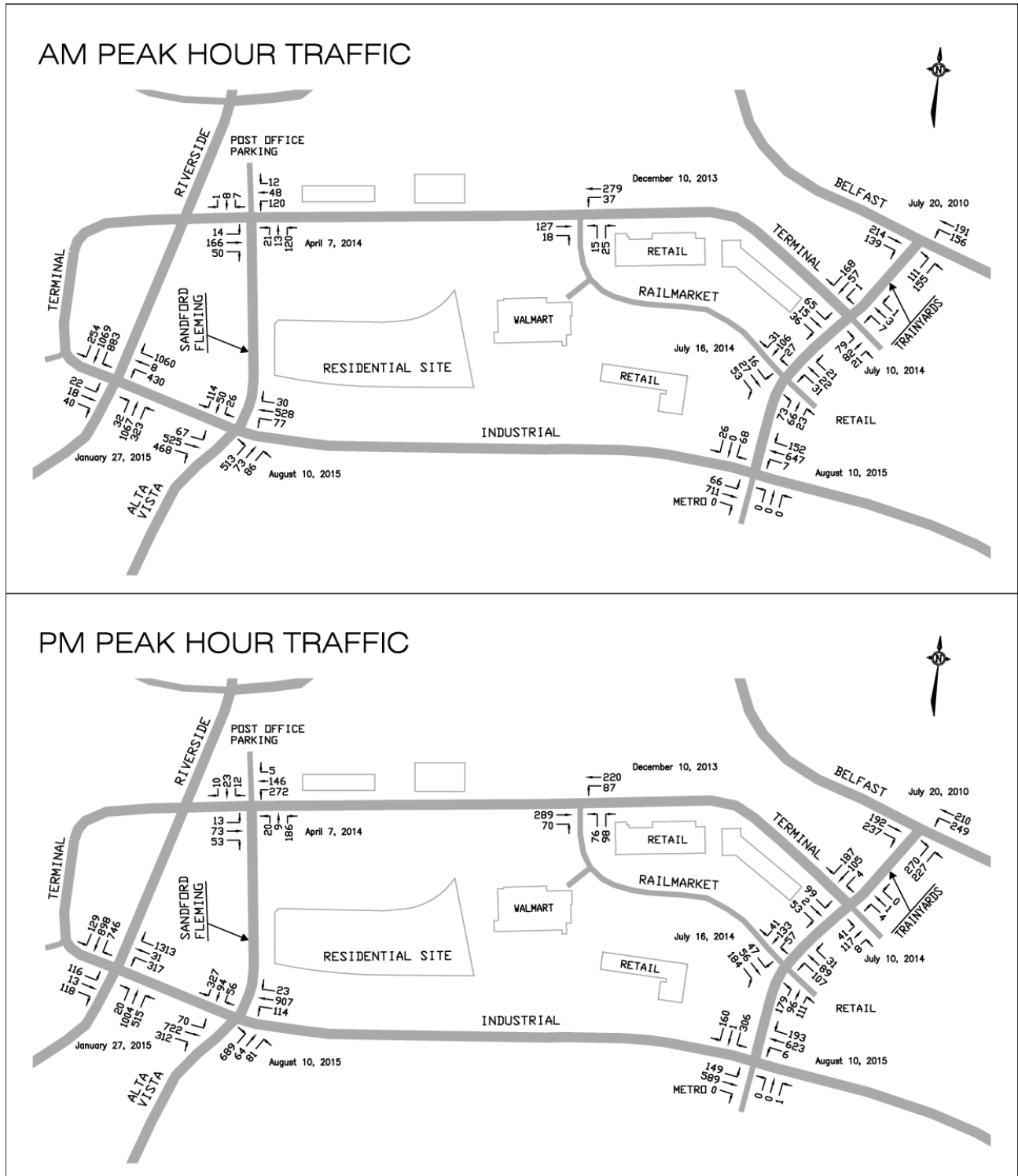
## **MODULE 2.2 – Study Area and Time Periods**

### **Element 2.2.1 – Study Area**

The study area was determined during a pre-consultation meeting with City staff which discussed the scope of the study and the impact of site trips from the proposed apartment development on the surrounding roads. It was determined that the traffic analysis should address the operation of the following intersections:

1. Sandford Fleming/Steamline intersection (proposed)
2. Terminal/Steamline intersection (proposed)
3. Terminal/Sandford Fleming intersection
4. Terminal/Railmarket intersection
5. Terminal/Trainyards intersection
6. Trainyards/Belfast intersection
7. Trainyards/Railmarket intersection
8. Industrial/Trainyards intersection
9. Industrial/Sandford Fleming (Alta Vista) intersection
10. Industrial (Terminal)/Riverside intersection

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





### **Element 2.2.2 – Time Periods**

The proposed apartment development would typically produce peak hour trips during the weekday AM hours as tenants leave for work and during the PM hours as tenants arrive home from work.

The adjacent land uses to the development comprise mainly of office/industrial with Canada Post west of the site, light industrial south of the site, and two office buildings located at 395 and 405 Terminal Avenue north of the site. These land uses generate peak hour trips during the weekday AM and PM hours with a very low number of trips on a Saturday.

The Ottawa Train Yards shopping centre is located east of the site with the peak hour trips occurring on a Saturday which are distributed mainly along Trainyards Drive to Industrial Avenue.

With the adjacent office/industrial uses on Sandford Fleming Avenue and Terminal Avenue generating peak hour trips on a weekday, the peak time periods for the analysis would be the weekday peak AM and PM hours which would be determined from traffic counts obtained from the City of Ottawa.

### **Element 2.2.3 – Horizon Years**

The apartment development would be constructed in the following three phases:

- Phase 1 – 2019
- Phase 2 – 2025
- Phase 3 – 2029

The TIA will examine the operation of the roads and intersections using the existing traffic counts, and at build out of each phase in 2019, 2025 and 2029. With the final phase planned for completion in 2029 which is beyond the immediate future and close to the horizon year of the *Transportation Master Plan* and *Official Plan*, the scope of work would not consider the “build out plus five years” time horizon as discussed in Element 2.2.3 of the TIA Guidelines.

## **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:

## POSSIBLE EXEMPTIONS

MODULE	ELEMENT	EXEMPTION CONSIDERATIONS
<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 - No spillover expected. Parking will be above that required by zoning.
<b>Network Impact Component</b>		
4.5 Transportation Demand Management	All Elements	No - TDM measures will be addressed.
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	No - Will examine the traffic along the adjacent local and collector streets and determine the function and role of the streets.
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.

## MODULE 3 - FORECASTING

### MODULE 3.1 – Development-generated Travel Demand

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

The proposed development consists of an apartment use which is located adjacent to a regional shopping centre and within walking distance to OC Transpo bus stops. The apartment development will be constructed in three phases with the following table showing the number of apartment units and expected completion date for each phase.

**TABLE 3.1  
PHASING OF THE DEVELOPMENT**

PHASE 1		
Buildings 100 & 200	375 units	2019 completion
Total Units – Phase 1	375 units	
PHASE 2		
Buildings 300, 400 & 500	865 units	2025 completion
Total Units – Phase 1 & 2	1,240 units	
PHASE 3		
Buildings 600 & 700	605 units	2029 completion
Total Apartment Units	1,845 units	

The number of expected site generated trips utilized the trip statistical data documented in the 2009 *TRANS Trip Generation Study* report. The analysis used the vehicle trip generation rates with transit bonus from Table 6.3 of the TRANS document for ITE Land Use Code 222 “High-rise apartments”, and the blended directional distribution shown in Table 6.2 of the document. The trips rates are shown in Table 3.2 below.

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

<b>Peak Hr.</b> <b>Trip Rate</b>	<b>Peak AM Hour</b>		<b>Peak PM Hour</b>	
<b>Trip Rate</b>	0.24 T/Unit		0.27 T/Unit	
	<b>Inbound</b>	<b>Outbound</b>	<b>Inbound</b>	<b>Outbound</b>
<b>Directional Distribution</b>	24%	77%	62%	39%

The development falls within the Transit Oriented Development area which would place a high priority on transit use. Table 3.3 presents the mode share of person trips as discussed with staff of the City of Ottawa.

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

Future Mode Share Targets for the Development		
Travel Mode	Mode Share Target	Rationale
Transit	65%	The development is within the Transit Oriented Development area
Walking	13%	Due to the close proximity to the Train Yards shopping centre
Cycling	2%	Consistent with the City's <i>Official Plan</i>
Auto Passenger	5%	Consistent with modal share targets and proximity to employment and retail areas
Auto Driver	15%	

The site generated trips were determined by the product of the number of units for each phase during the peak hour (Table 3.1), and the trip rates shown in Table 3.2. The total number of auto trips for each phase is shown in Table 3.4.

The person trips were determined by the number of auto trips divided by the mode share for the number of vehicle trips. The mode share used was from Table 3.13 of the 2009 TRANS Trip Generation report for an apartment use in an urban area inside the green belt. The mode share is 0.37 vehicle trips for the peak AM hour and 0.40 vehicle trips for the peak PM hour. Table 3.4 shows the future peak hour person trips.

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

Trips Phase	AUTO TRIP GENERATION		FUTURE PERSON TRIPS	
	PEAK AM HR.	PEAK PM HR.	PEAK AM HR.	PEAK PM HR.
PHASE 1 375 Units	90 veh.	101 veh.	243 per.	253 per.
PHASE 2 1,240 Units	298 veh.	335 veh.	805 per.	838 per.
PHASE 3 1,845 Units	443 veh.	498 veh.	1,197 per.	1,245 per.

The peak hour person trips were determined by the product of the peak hour future person trips from Table 3.4 and the future mode share from Table 3.3. The results are shown in Table 3.5.

**TABLE 3.5**  
**PEAK HOUR FUTURE DEVELOPMENT GENERATED PERSON-TRIPS**

TRAVEL MODE	DEVELOPMENT GENERATED PERSON-TRIPS	
	PEAK AM HOUR	PEAK PM HOUR
<b>PHASE 1</b>		
Transit	158 per./trips	164 per./trips
Walking	32 per./trips	33 per./trips
Cycling	5 per./trips	5 per./trips
Auto Passenger	12 per./trips	13 per./trips
Auto Driver	36 per./trips	38 per./trips
<b>PHASE 2</b>		
Transit	523 per./trips	544 per./trips
Walking	105 per./trips	109 per./trips
Cycling	16 per./trips	17 per./trips
Auto Passenger	40 per./trips	42 per./trips
Auto Driver	121 per./trips	126 per./trips
<b>PHASE 3</b>		
Transit	777 per./trips	809 per./trips
Walking	156 per./trips	162 per./trips
Cycling	24 per./trips	25 per./trips
Auto Passenger	60 per./trips	62 per./trips
Auto Driver	180 per./trips	187 per./trips

The number of expected site generated trips would have two Trip Reduction Factors applied. The two factors are the following:

- The existing site is currently occupied by a light industrial land use which will be replaced by the proposed apartment development. The building is currently unoccupied and is ready for demolition. The building comprises of a three storey office/commercial building and an attached single storey industrial building. The building use and zoning would be for an ITE Land Use 110 “General Light Industrial” with a gross floor area of approximately 5,400 m<sup>2</sup> (58,125 ft<sup>2</sup>). The number of existing site trips which will be replaced by the proposed apartment development will be accounted for as a trip reduction in the vehicular trip generation table in the Analysis module. It was determined that during the peak AM hour there would be 47 vehicles entering the site and 6 exiting, and during the peak PM hour 7 vehicles would be entering and 49 vehicles exiting the site.

- The proposed apartment development is adjacent to Walmart and the Ottawa Train Yards shopping centre. The Ottawa Train Yards would be a destination for shopping, restaurants, amenities, as well as an employment centre. Discussions with staff of the Ottawa Train Yards has determined that the shopping centre may employ approximately 4,000 employees, and the office buildings at 395 and 405 Terminal Avenue may have approximately 5,000 office workers. With approximately 9,000 potential jobs within walking distance along with shopping, restaurants and a health club, the study has conservatively assumed a 15 percent trip reduction for the shared trips between the rental apartments and the adjacent shopping centre.

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

The distribution of site generated trips for the proposed apartment development was determined from the projected population and employment growth at the year 2021, and examination of the existing traffic pattern in the area. The trip distribution which will be utilized in the study for both the weekday peak AM hour and PM hour was as follows:

To/From the north	along Riverside Drive & Vanier Parkway	30%
	along Belfast Road	5%
To/From the south	along Riverside Drive	20%
	along Alta Vista Drive	10%
	along Industrial Ave. and St. Laurent Blvd.	10%
To/From the east	along Belfast Rd. and St. Laurent Blvd.	10%
	along Industrial Ave. and Innes Road	15%

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

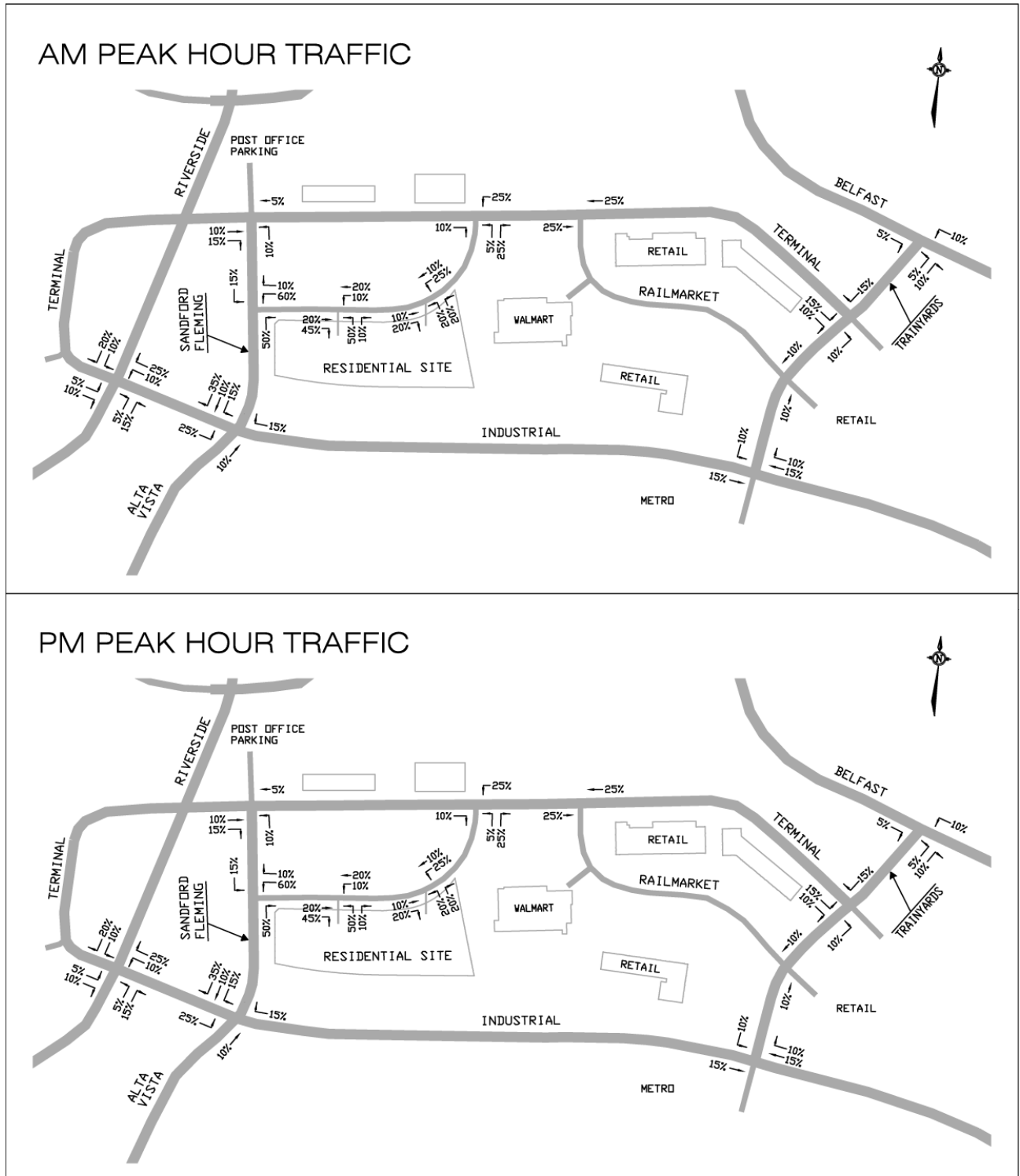
The trip assignment has examined the site generated trips with respect to the shortest and most convenient routes to/from the development. The study has assumed that the westbound Terminal Avenue traffic to Riverside Drive will be open to automobile traffic following the completion of the LRT and modifications to the Hurdman Transit Station. Figure 3.1 shows the trip assignment for the apartment development.

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

The City of Ottawa *Transportation Master Plan 2013* was reviewed to identify transit and roadway projects in the vicinity of the development. The document identified the Confederation LRT Line between Tunney's Pasture and Blair stations in the "2031 Affordable RTTP Network Projects", and the widening of Tremblay Road from two to four lanes between Pickering Place and St. Laurent Boulevard in the "2031 Affordable Road Network". Both projects would have a positive impact on the volume of both pedestrian and vehicular site related trips.

On a smaller scale, development in close proximity to the apartment development would consist of the office building at 405 Terminal Avenue. The construction of the building is substantially complete, but the building has not been occupied to date.

**FIGURE 3.1**  
**TRIP ASSIGNMENT**



NOT TO SCALE

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

To determine the growth in background traffic, the study has compared historical traffic counts obtained from the City of Ottawa at major intersections in the vicinity of the development. The counts taken in 2009/2010 at the Industrial/Sandford Fleming, Industrial/Riverside, Industrial/Trainyards and Terminal/Trainyards were compared to the traffic from the 2015 counts. The counts showed that over the 5 or 6 year time period, the volume of traffic was relatively the same with traffic at some approach movements decreasing over time while others increased. Increases in traffic were attributed to the 395 Terminal Avenue office building and more retail which was constructed at the Ottawa Train Yards (OTY) shopping centre. From historical traffic counts, previous studies have determined the growth in background traffic from outside the study area to be at an annual rate of 0.7 percent. The study has therefore increased all municipal road traffic volumes by an annual compounded rate of 1.0 percent to account for development outside the proposed apartment development and Ottawa Train Yards shopping centre.

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

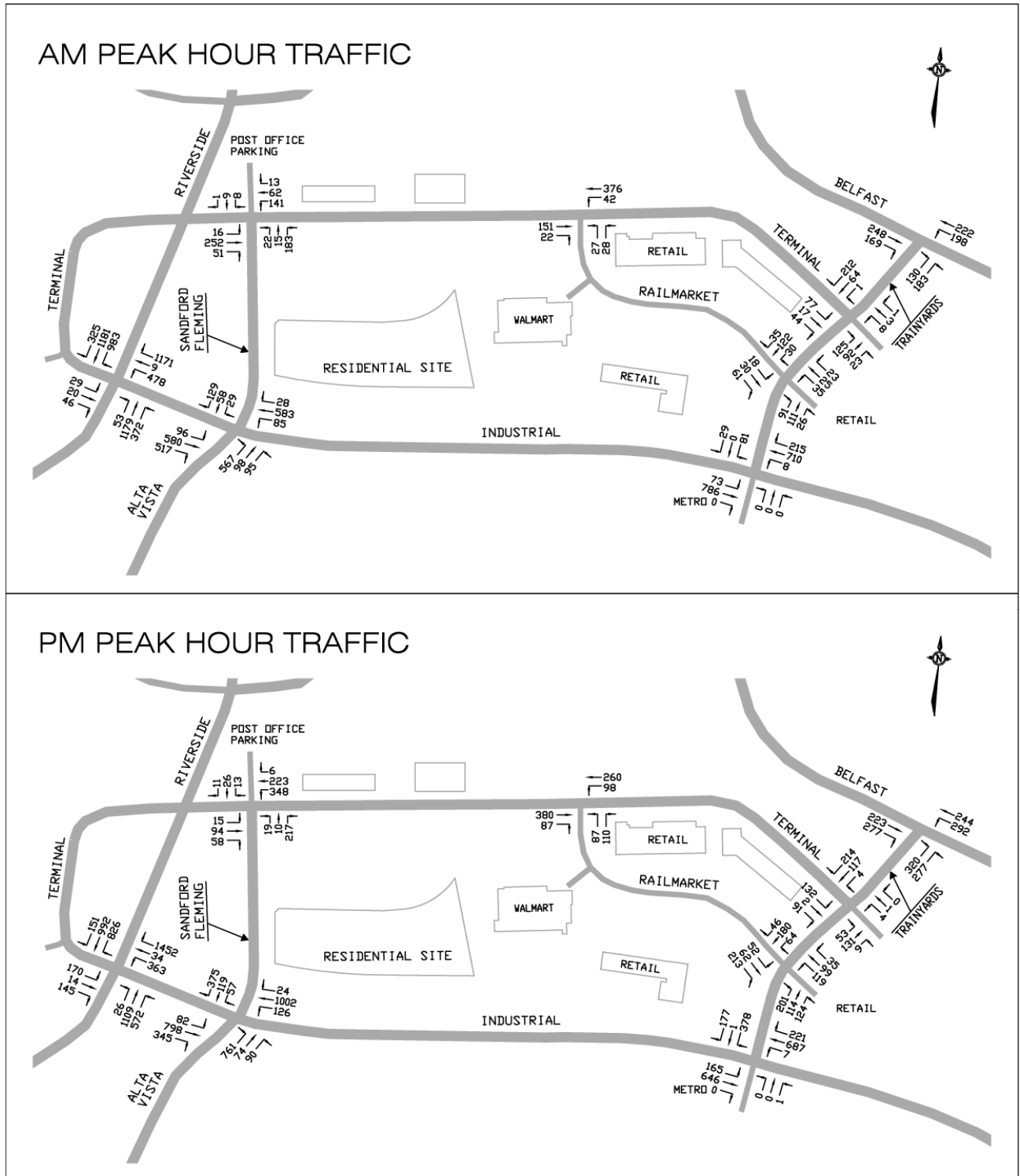
The background traffic at the Trainyards/Belfast intersection was adjusted to account for the construction of additional retail at OTY east of Trainyards Drive, and the new OC Transpo access onto Belfast Road which also provides access to the OTY lands. Recent traffic counts by the City of Ottawa at the Trainyards/Belfast intersection were not reliable due to road construction as part of the LRT Line.

Local developments which will be accounted for in the background traffic are the expected trips from the 405 Terminal Avenue office building. The building is substantially complete but currently is unoccupied. The expected trips would be estimated from the TIS report prepared for the building development.

The commercial/industrial building at 400 Terminal Avenue located between Steamline Street and Terminal Avenue will be demolished in the summer of 2018. The background traffic has accounted for the reduction in trips from the site. The trips were determined from a gross floor area of the building of 3,505 m<sup>2</sup> (37,720 ft<sup>2</sup>) and the ITE Land Use 110 “General Light Industrial”. Figure 3.2 presents the 2025 background traffic at the completion of Phase 2, and Figure 3.3 the 2029 background traffic at the completion of Phase 3.

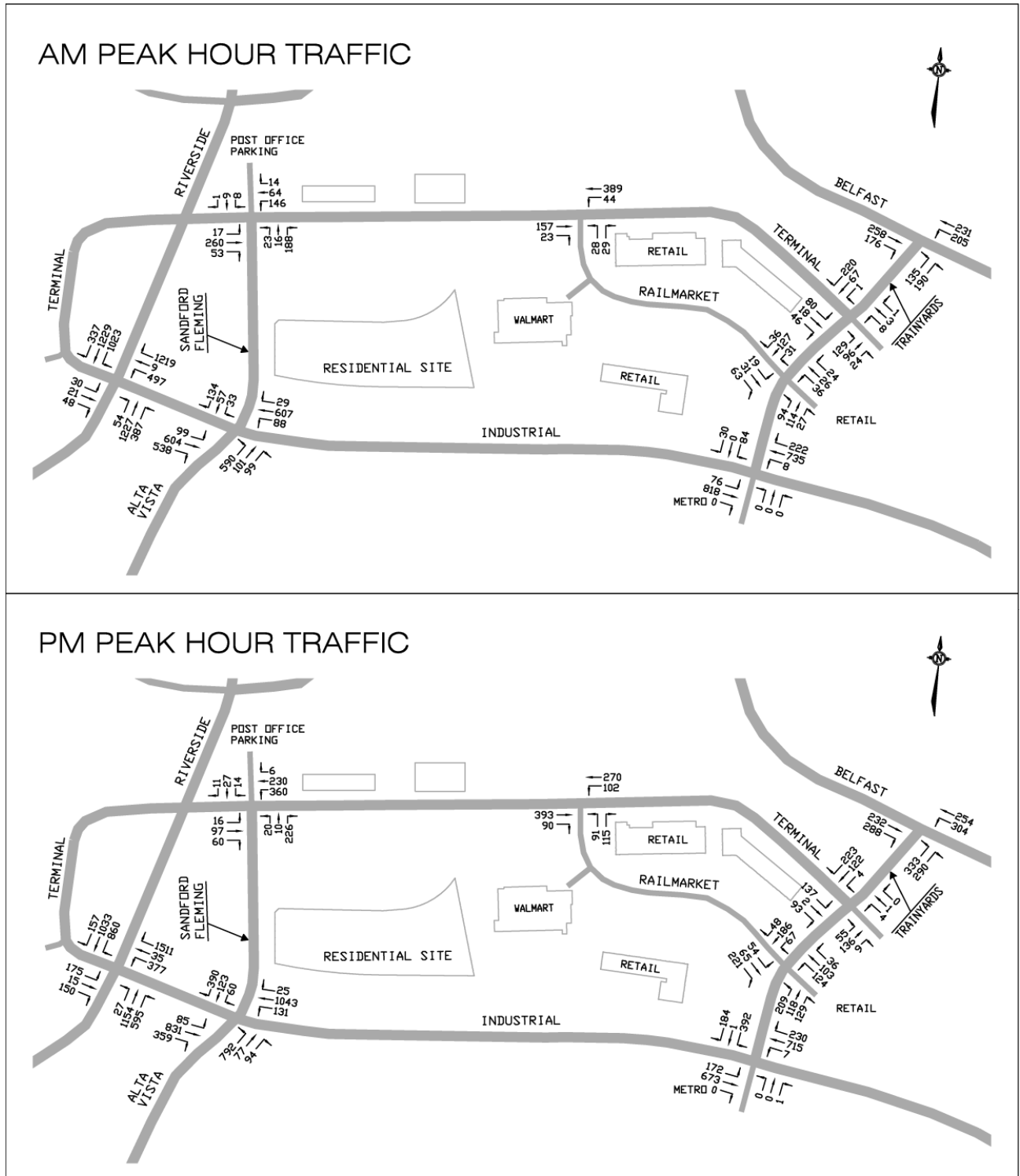


**FIGURE 3.2**  
**2025 PEAK AM AND PM HOUR BACKGROUND TRAFFIC (Phase 2)**



NOT TO SCALE

**FIGURE 3.3**  
**2029 PEAK AM AND PM HOUR BACKGROUND TRAFFIC (Phase 3)**



NOT TO SCALE

## **MODULE 4 – ANALYSIS**

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

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

The site plan is consistent with the City of Ottawa Planning and Design Guidelines by placing the parking lots within the site with the majority of parking placed in an underground parking garage. Surface parking is placed close to the apartment building accesses but within the site at a distance from the municipal street which would provide a visual separation. The site contains two access points onto Steamline Street for vehicular traffic.

The site plan provides a 3.0 m multi-use pathway along the south side of Steamline Street adjacent to the site, and a 1.85 m sidewalk along the north side. The site has an internal sidewalk/pathway network connecting the buildings to the sidewalks along Steamline Street, with direct access from the 200 Steamline Street apartment building to Sanford Fleming Avenue.

Bicycle storage racks for tenants are provided in the parking garage and would access the city streets from the garage to Steamline Street. Visitor bike racks are placed close to the building entrances.

OC Transpo bus stops are currently located along Sandford Fleming Avenue and at the Terminal/Sandford Fleming intersection. The site is located at an approximate walking distance of 900 m from the Hurdman Transit Station, and in close proximity to the LRT station at the Tremblay Road VIA rail station.

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

The apartment development provides two site access points onto Steamline Street. The access meets the requirements for a fire route and would allow single unit garbage trucks to access the garbage containers which are located on the garbage pad at the south limit of the site. All moving trucks will enter/exit the site from Steamline Street and load/unload within the site.

### **MODULE 4.2 – Parking**

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

The Site Plan shows parking at full development of the site (Phases 1 to 3) to have 1,843 underground garage spaces and 189 surface spaces for a total of 2,032 parking spaces. The number of parking spaces meets the “Transit Oriented Development Zone” for the lands. The demand for parking would be for the storage of a minimum of 1 vehicle per apartment unit, which the site would provide a parking ratio of 1.10 spaces per unit including visitor parking.

Bicycle parking will be accommodated in the underground garage. Storage racks will provide space for 944 bicycles for the total Phase 1 to 3 of the development.

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

The Site Plan provides sufficient parking for both residents and for visitors. Steamline Street will not provide any on-street parking. Spillover parking is not expected to be an issue.

### **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 the existing streets of Sandford Fleming Avenue and Terminal Avenue.

Sandford Fleming Avenue is a collector road linking Industrial Avenue to Terminal Avenue. The road has an urban cross-section with a pavement width of approximately 14 m. OC Transpo provides bus service along the road which connects to the Hurdman Transit Station. Sidewalks are provided along both sides of the road which allows pedestrian access to the Hurdman Transit Station and the Ottawa Train Yards shopping centre. Although not identified in the TMP as a cycling route, Sandford Fleming is of sufficient width to accommodate cycling.

Terminal Avenue is an urban collector road with a pavement width of 11 m. OC Transpo provides service along Terminal Avenue to the Hurdman Transit Station, and to the downtown core to the north and Billings Bridge Plaza to the south. Sidewalks currently exist along the north side of the road, east of Sandford Fleming Avenue to the approximate location of the extension of Steamline Street to Terminal Avenue. A multi-use pathway is proposed across the frontage of the site (south side of Steamline Street) which will connect to the portion of sidewalk adjacent to Walmart which will allow the safe movement of pedestrians along sidewalks to the retail at the Ottawa Train Yards shopping centre. The road is not designated as a cycling route in the TMP, but would provide a route to a major pathway along Trainyards Drive and the recreational pathway along the Rideau River.

Table 4.1 shows the collision history over a three year period between 2014 and 2016 for the boundary roads of Sandford Fleming Avenue, Terminal Avenue and Industrial Avenue.

The collision data of Table 4.1 determined a pattern of rear end collisions being the most prominent form of collision which would be mainly attributed to a high volume of traffic. Industrial Avenue between Riverside Drive and Trainyards Drive experienced the most collisions, with Sandford Fleming Avenue and Terminal Avenue experiencing a relatively low number of collisions for each pattern type.

The boundary streets provide the elements which would maximize the objectives of the Multi-Modal Level of Service (MMLOS).

**TABLE 4.1**  
**BOUNDARY ROAD COLLISION SUMMARY (2014 to 2016)**

YEAR	COLLISION TYPE					TOTAL
	REAR END	ANGULAR	TURNING	SIDESWIPE	OTHER	
Sandford Fleming Street (Industrial Avenue to Terminal Avenue)						
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	0	1	0	0	0	1
Terminal Avenue (Sandford Fleming Avenue to Trainyards Drive)						
2014	2	1	0	0	2	5
2015	0	0	1	1	3	5
2016	3	2	0	0	1	6
Industrial Avenue (Riverside Drive to Trainyards Drive)						
2014	3	0	2	1	0	6
2015	6	1	0	3	0	10
2016	5	4	0	4	0	13

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

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

The apartment development site would be located on the south side of Steamline Street. Steamline Street would be classified as a local street with a 20 m right-of-way and a pavement width of 11 m. The Site Plan proposes two access points onto Steamline Street. The first access is located approximately 112 m east of Sandford Fleming Avenue (centreline to centreline) and would have a clear throat length of 60 m. The second access is located approximately 130 m east of the first access (centreline to centreline) and would provide a clear throat length of 65 m.

Steamline Street is an existing street with access to Sandford Fleming Avenue which is located 125 m south of Terminal Avenue. At Phase 3 of the development, Steamline Street will be extended to Terminal Avenue at an intersection 320 m east of Sandford Fleming Avenue.

The commercial/industrial on the north side of Steamline Street is scheduled to be demolished in the summer of 2018. Any accesses to future development for the site will align with the accesses to the apartment development. Along Sandford Fleming Avenue there is an access to the Canada Post facility which is located 100 m south of Steamline Street. Along Terminal Avenue there is an access to the office building at 405 Terminal Avenue which is located approximately 80 m west of the proposed Terminal/Steamline intersection.

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

The intersection traffic controls for the Sandford Fleming/Steamline and Terminal/Steamline intersections were analyzed utilizing the traffic signal warrant analysis as documented in the Ministry of Transportation publication, *Geometric Design Standards for Ontario Highways*. The analysis determined that the Sandford Fleming/Steamline intersection met 36 percent of the warrants and the Terminal/Steamline intersection 10 percent of the warrants for the installation of traffic control signals. Exhibit 2 in the Appendix presents the warrant analysis for the Sandford Fleming/Steamline intersection and Exhibit 3 the Terminal/Steamline intersection. Both intersections should be designed as two-way stop controlled intersections.

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

The intersection analysis will use the *Highway Capacity Software, Version 7.4*, which utilizes the intersection capacity analysis procedure as documented in the *Highway Capacity Manual 2010 and 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 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.

For a signalized intersection, the operation or level of service of an intersection is determined from the volume to capacity ratio (v/c) for each lane movement as documented by the City of Ottawa in the *Transportation Impact Assessment Guidelines (2017)*. The following relates the level of service with the volume to capacity ratio at each lane movement.

LEVEL OF SERVICE	VOLUME TO CAPACITY RATIO
Level of Service A	0 to 0.60
Level of Service B	0.61 to 0.70
Level of Service C	0.71 to 0.80
Level of Service D	0.81 to 0.90
Level of Service E	0.91 to 1.00
Level of Service F	> 1.00

The number of new site generated trips was determined utilizing the Peak Hour Future Development Generated Person-Trips (Table 3.5). The one person-trip for an auto driver from the table would represent one vehicular trip. The number of new site generated trips was determined for each of the three phases of development.

### PEAK HOUR SITE GENERATED TRIPS

Phase 1 would comprise of 375 apartment units. The auto driver trips from Table 3.5 were proportioned to trips entering and exiting the site at the percentages shown in Table 3.2. The number of new site generated trips is presented in Table 4.2 which incorporates the 15 percent synergy reduction due to the close proximity of employment areas (shopping centre and office buildings), and the trip reduction from the light industrial use on the site which will be replaced by the proposed apartment development.

**TABLE 4.2**  
**PHASE 1 - PEAK HOUR SITE TRIPS GENERATED**

PHASE 1 - UNIT TYPE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
375 Apartments (ITE 222)	36	8 (24%)	28 (77%)	38	23 (62%)	15 (39%)
15% Synergy Reduction	<u>-5</u>	<u>-1</u>	<u>-4</u>	<u>-5</u>	<u>-3</u>	<u>-2</u>
<b>Total Site Trips</b>	31	7	24	33	20	13
Existing Trip Reduction	<u>-53</u>	<u>-47</u>	<u>-6</u>	<u>-56</u>	<u>-7</u>	<u>-49</u>
<b>Total New Trips</b>	-22	-40	18	-23	13	-36

The number of new trips generated by the site was proportioned onto the surrounding roads using the trip assignment distribution presented in Figure 3.1. For the purpose of evaluating the operation of the Sandford Fleming/Steamline intersection, the number of trips at that intersection does not include the reduction of the trips from the light industrial use previously occupying the site. The distribution of new site generated trips is shown in Figure 4.1.

The number of new site generated trips shown in Table 4.2 determined that during Phase 1 of the development, the apartment complex would generate fewer new trips than the original use on the site. A traffic analysis therefore was not completed for Phase 1 as the development would not have a negative impact on the operation of the adjacent roads.

Phase 2 of the apartment development would comprise of 1,250 apartment units which would have access to Sandford Fleming Avenue from Steamline Street. Table 3.3 shows the expected new trips generated by the site. The distribution of site trips is presented in Figure 4.2.

**TABLE 4.3**  
**PHASE 2 - PEAK HOUR SITE TRIPS GENERATED**

PHASE 2 - UNIT TYPE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
1,240 Apartments (ITE 222)	121	29 (24%)	92 (77%)	126	77 (62%)	49 (39%)
15% Synergy Reduction	<u>-18</u>	<u>-4</u>	<u>-14</u>	<u>-19</u>	<u>-12</u>	<u>-7</u>
<b>Total Site Trips</b>	103	<b>25</b>	<b>78</b>	107	<b>65</b>	<b>42</b>
Existing Trip Reduction	<u>-53</u>	<u>-47</u>	<u>-6</u>	<u>-56</u>	<u>-7</u>	<u>-49</u>
<b>Total New Trips</b>	50	<b>-22</b>	<b>72</b>	51	<b>58</b>	<b>-7</b>

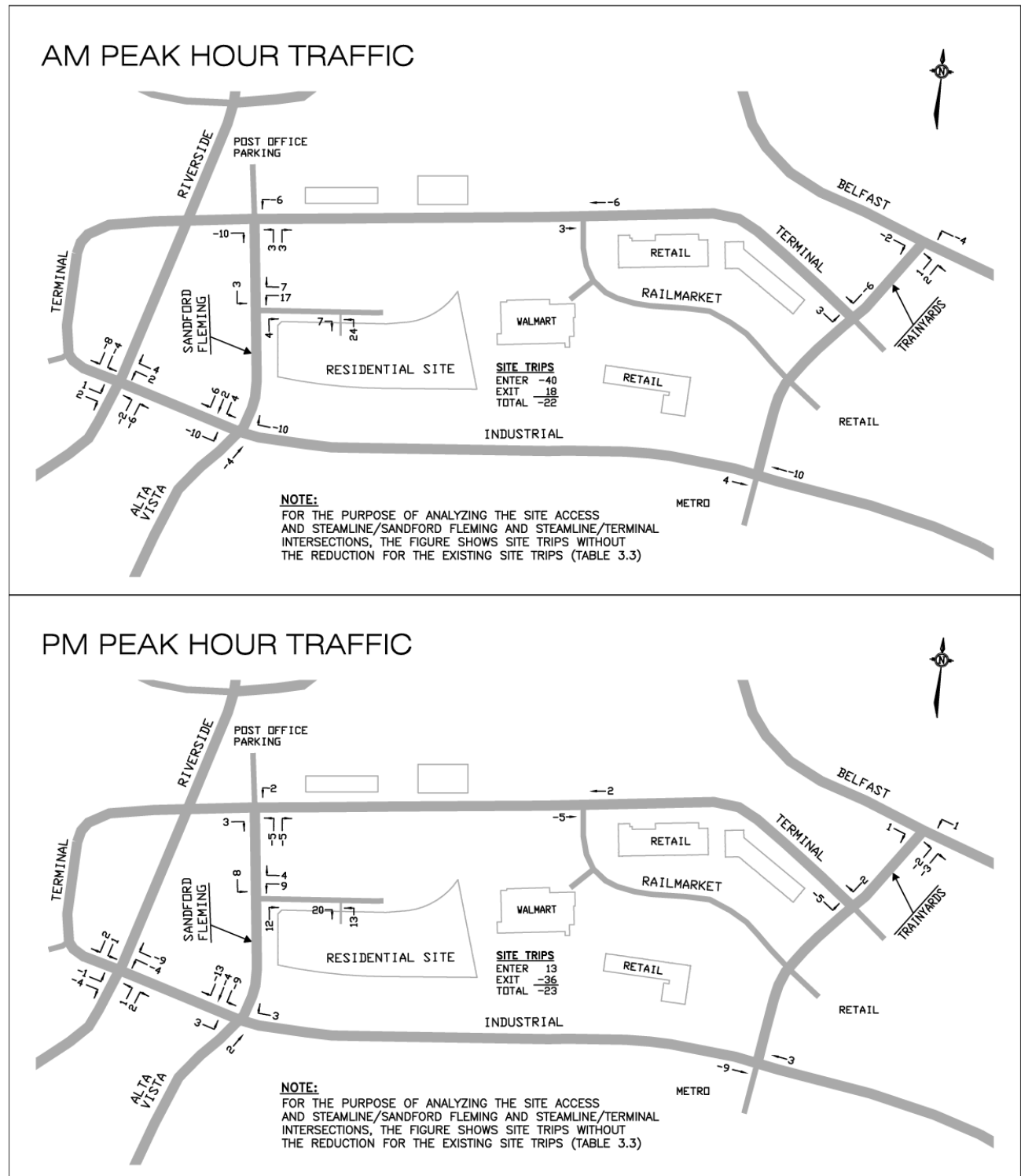
Phase 3 would be the completion of the development which would provide 1,845 apartment units. Table 4.4 presents the expected site generated trips which are shown in Figure 4.3.

**TABLE 4.4**  
**PHASE 3 - PEAK HOUR SITE TRIPS GENERATED**

PHASE 3 - UNIT TYPE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
1,845 Apartments (ITE 222)	180	42 (24%)	138 (77%)	187	115 (62%)	72 (39%)
15% Synergy Reduction	<u>-27</u>	<u>-6</u>	<u>-21</u>	<u>-28</u>	<u>-17</u>	<u>-11</u>
<b>Total Site Trips</b>	153	<b>36</b>	<b>117</b>	159	<b>98</b>	<b>61</b>
Existing Trip Reduction	<u>-53</u>	<u>-47</u>	<u>-6</u>	<u>-56</u>	<u>-7</u>	<u>-49</u>
<b>Total New Trips</b>	100	<b>-11</b>	<b>111</b>	103	<b>91</b>	<b>12</b>

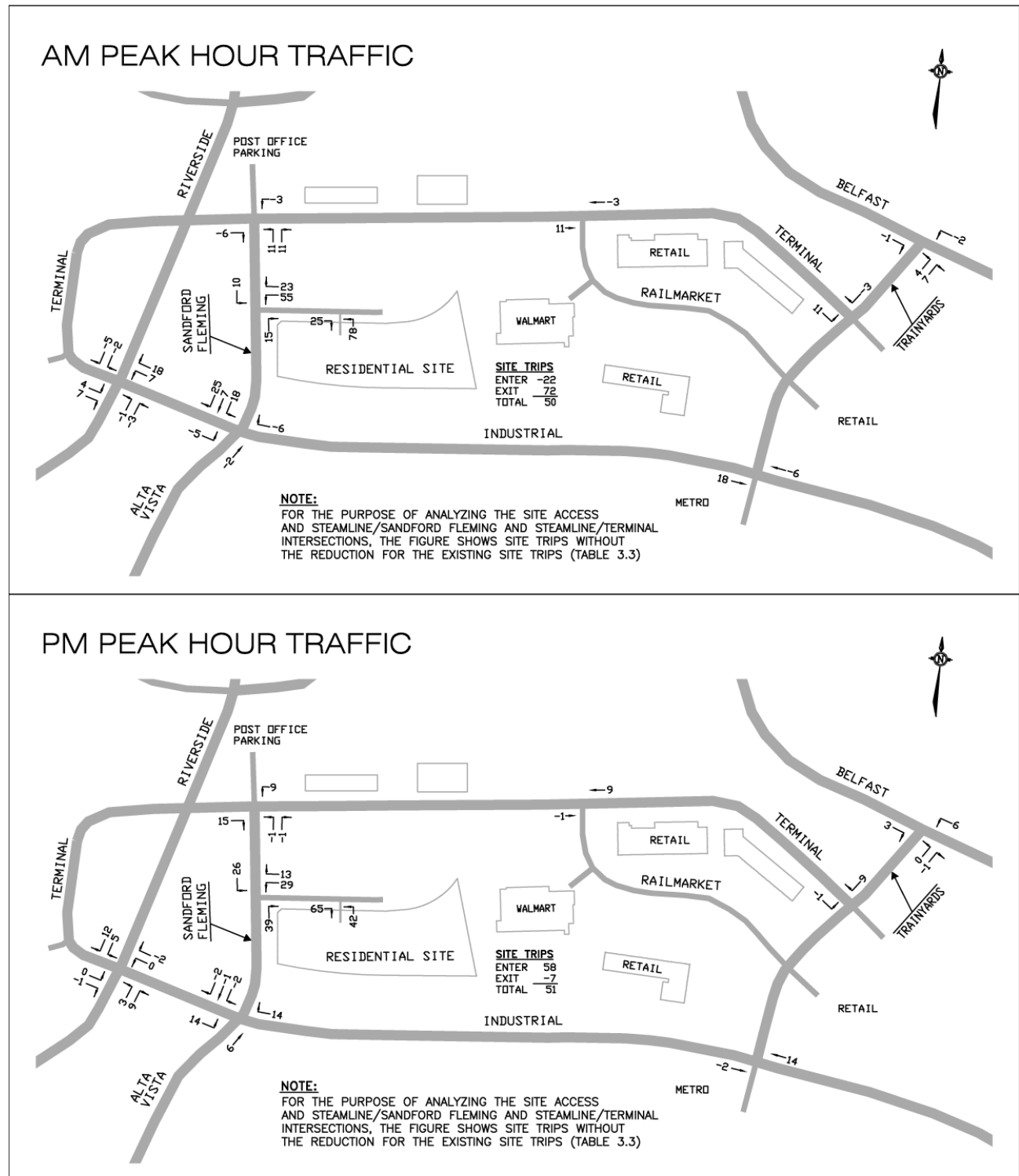


**FIGURE 4.1**  
**PHASE 1 – PEAK AM AND PM HOUR SITE GENERATED TRIPS**



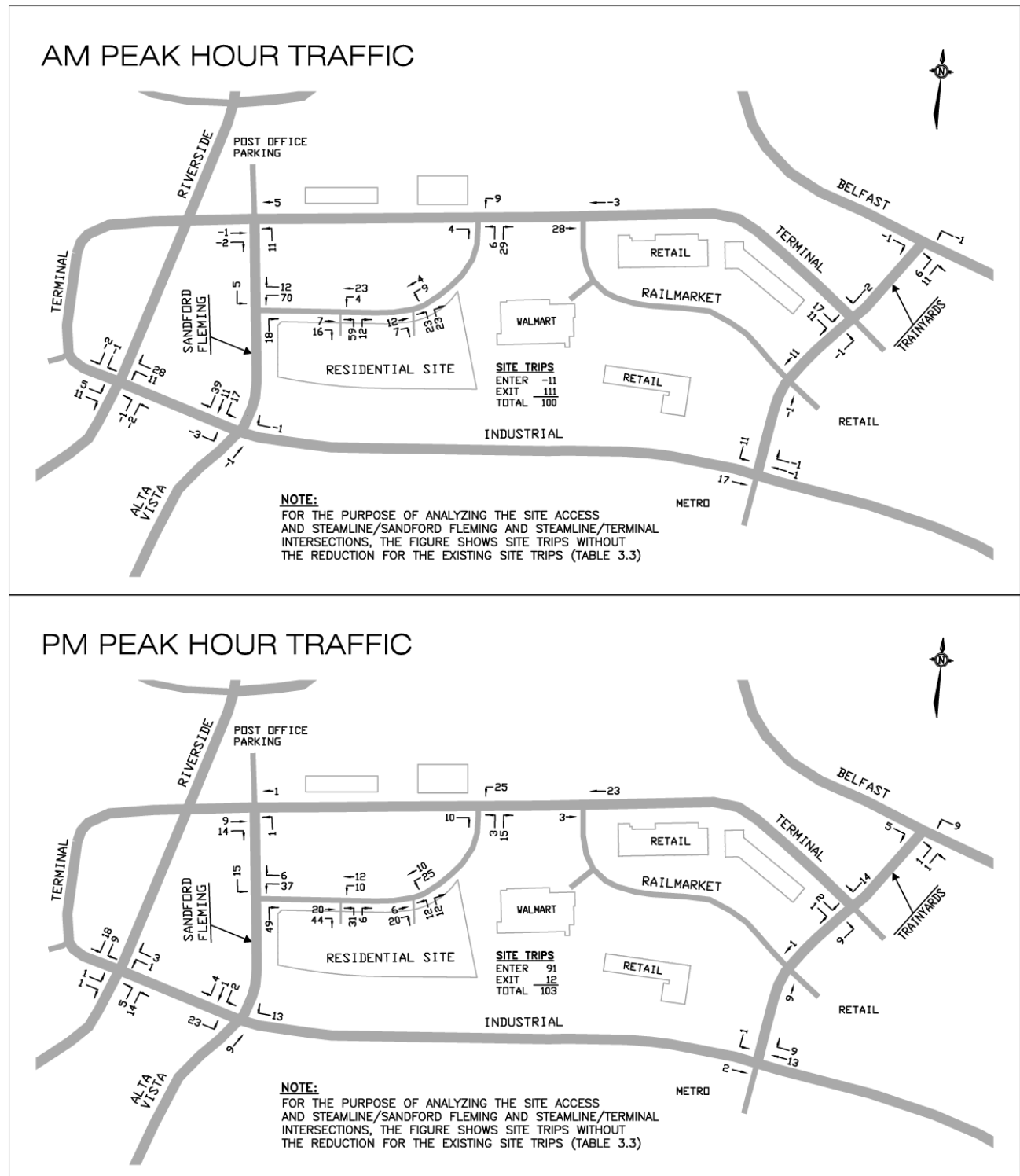
NOT TO SCALE

**FIGURE 4.2**  
**PHASE 2 – PEAK AM AND PM HOUR SITE GENERATED TRIPS**



NOT TO SCALE

**FIGURE 4.3**  
**PHASE 3 – PEAK AM AND PM HOUR SITE GENERATED TRIPS**



NOT TO SCALE

## TOTAL PEAK AM AND PM HOUR TRAFFIC

The total traffic generated by the site was determined for Phase 2 (2025) and for Phase 3 (2029). Phase 1 was not examined as the expected trips from the site would be less than the original land use for the site.

The total traffic is the sum of the peak hour background traffic, Figure 3.2 for the 2025 and Figure 3.3 for the 2029 traffic, and the site generated trips provided as Figure 4.2 for Phase 2 and Figure 4.3 for Phase 3. Figure 4.4 presents the total peak AM and PM hour traffic at the year 2025 (Phase 2) and Figure 4.5 the peak hour traffic at the year 2029 (Phase 3).

## VEHICULAR LEVEL OF SERVICE (LOS) - Intersection Capacity Analysis

### Sandford Fleming Avenue and Steamline Street Intersection

The Sandford Fleming/Steamline intersection is an existing intersection which provides access to the previous development on site and to 400 Terminal Avenue. A traffic signal warrant analysis (Exhibit 2) determined that the intersection would not meet the warrants for the installation of traffic signals using the expected 2029 traffic. The intersection was examined as a two-way stop controlled intersection with a stop sign at the westbound Steamline Street approach. For the 2025 traffic, the lane configuration of Sandford Fleming Avenue would be one southbound shared left/through lane and for Steamline Street one westbound shared left/right lane. Following the completion of Phase 3 at the year 2029, the southbound approach would comprise of one exclusive left turn lane and one through lane, and the westbound approach an exclusive left turn lane and right turn lane. With a pavement width of approximately 14 m on Sandford Fleming Avenue and 11 m on Steamline Street, the exclusive turn lanes following the completion of Phase 3 at 2029 can be accommodated by the use of pavement markings.

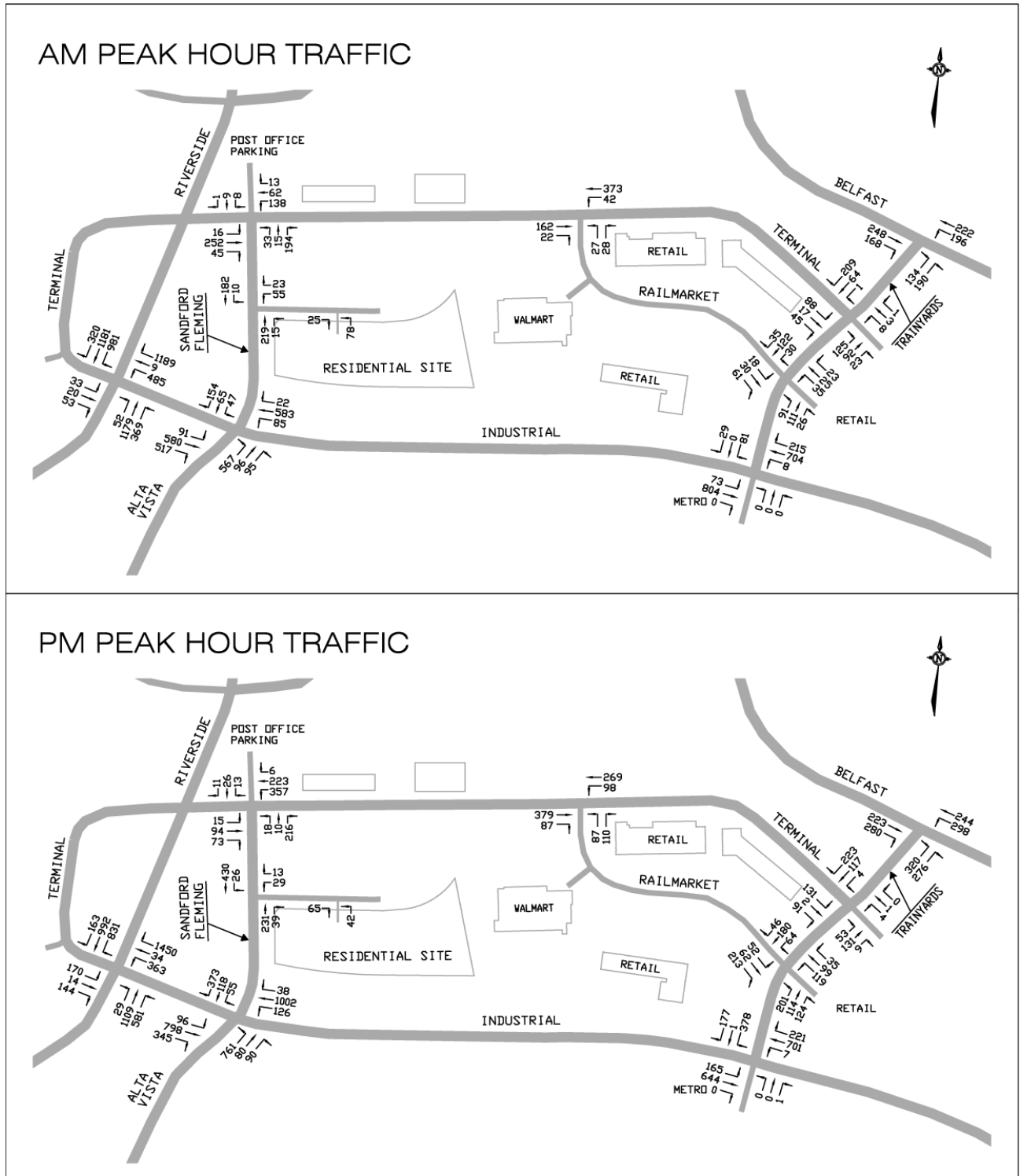
Table 4.5 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 4 and 5 for the 2025 peak AM and PM hours, and Exhibit 6 and 7 for the 2029 peak AM and PM hour traffic.

**TABLE 4.5**  
**SANDFORD FLEMING/STEAMLINE INTERSECTION – LoS & Control Delay**

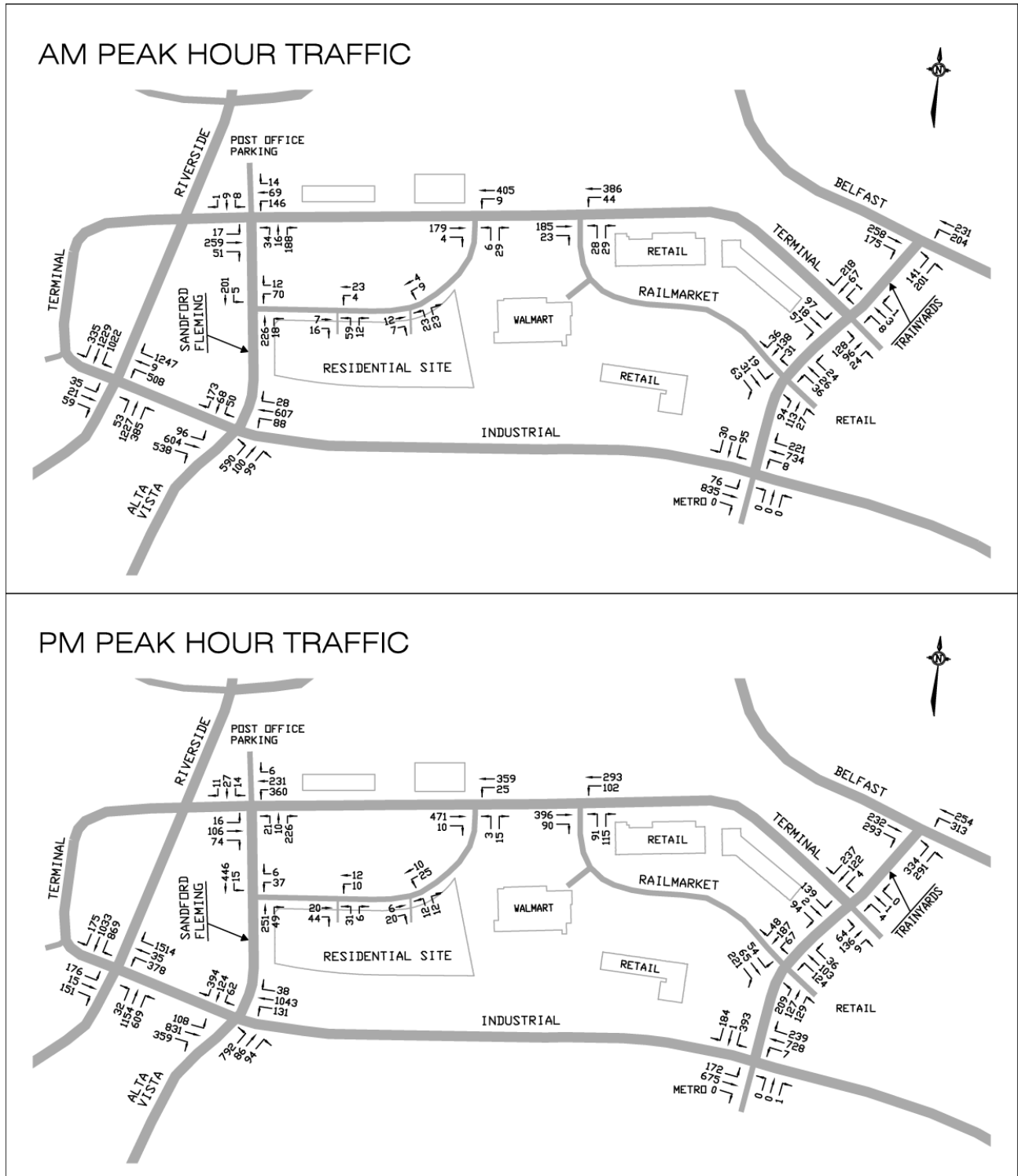
Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2025 (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
WB Left/Through/Right – Steamline *	B (B)	11.5 (9.5)	B (A)	13.7 (9.7)
WB Left – Steamline (2029)	(B)	(12.2)	(C)	(15.7)
SB Left/Through – Sandford Fleming	A (A)	7.7 (7.7)	A (A)	7.8 (7.9)

\* For the 2029 traffic scenario, the westbound approach would comprise of exclusive left and right turn lanes.

**FIGURE 4.4**  
**2025 PEAK AM AND PM HOUR TOTAL TRAFFIC (Phase 2)**



**FIGURE 4.5**  
**2029 PEAK AM AND PM HOUR TOTAL TRAFFIC (Phase 3)**



NOT TO SCALE

### Terminal Avenue and Steamline Street Intersection

Steamline Street will be extended to Terminal Avenue at Phase 3 of the development in 2029. The westbound Terminal Avenue approach will comprise of an exclusive left turn and exclusive through lane, and the northbound Steamline Street approach will comprise of an exclusive left turn and right turn lane. The intersection will be controlled by a stop sign at the northbound Steamline Street approach.

Table 4.6 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 8 and 9 for the 2029 peak AM and PM hour traffic.

**TABLE 4.6**  
**TERMINAL/STEAMLIN INTERSECTION – LoS & Control Delay**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR (2029)		WEEKDAY PEAK PM HOUR YEAR (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
WB Left – Terminal	(A)	(7.6)	(A)	(8.4)
NB Left – Steamline	(B)	(12.9)	(C)	(16.7)
NB Right – Steamline	(A)	(9.3)	(B)	(11.3)

### Terminal Avenue and Sandford Fleming Avenue Intersection

The intersection of Terminal Avenue and Sandford Fleming Avenue is an all-way stop controlled intersection. The intersection was examined using the 2014 traffic counts which were taken during the two year period when Terminal Avenue permitted two-way vehicle travel between Sandford Fleming Avenue and Riverside Drive. Traffic along Terminal Avenue is restricted to buses only between Riverside Drive and Sandford Fleming Avenue until 2018 when construction of the LRT is completed.

The analysis has used the existing lane configuration for the 2014 analysis (the northbound Sandford Fleming Avenue approach was assumed to be a shared left/through lane and exclusive right turn lane as that is the way the intersection functioned). The westbound Terminal Avenue approach comprised of a shared left/through/right lane movement.

As the background traffic increases, the westbound Terminal Avenue approach should be modified to provide an exclusive left turn lane and shared through/right lane. This can be accomplished through pavement markings. The 2025 and 2029 analysis has assumed the exclusive westbound left turn lane. This would be triggered by the increasing background traffic and not by the proposed apartment development.

Table 4.7 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 10 and 11 for the existing 2014 traffic counts, Exhibit 12 and 13 for the 2025 peak AM and PM hour traffic, and Exhibit 14 and 15 for the 2029 peak hour traffic.

**TABLE 4.7**  
**TERMINAL/SANDFORD FLEMING INTERSECTION – LoS & Control Delay**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2014 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2014 2025 (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
EB Left/Through – Terminal	<i>B B (B)</i>	<i>10.1 11.9 (12.2)</i>	<i>A B (B)</i>	<i>10.0 10.4 (10.8)</i>
EB Right – Terminal	<i>A A (A)</i>	<i>7.7 7.9 (7.9)</i>	<i>A A (A)</i>	<i>8.6 9.0 (9.1)</i>
WB Left/Through/Right – Terminal	<i>B B (B)</i>	<i>10.8 10.6 (10.8)</i>	<i>C C (C)</i>	<i>23.9 18.2 (18.9)</i>
WB Left – Terminal *	<i>- A (A)</i>	<i>- 8.9 (9.0)</i>	<i>- B (B)</i>	<i>- 11.5 (11.9)</i>
NB Left/Through – Sandford Fleming	<i>A A (A)</i>	<i>9.2 9.6 (9.7)</i>	<i>A B (B)</i>	<i>9.9 10.0 (10.2)</i>
NB Right – Sandford Fleming	<i>A A (A)</i>	<i>8.8 9.8 (9.9)</i>	<i>B B (B)</i>	<i>11.1 11.6 (12.0)</i>
SB Left/Through/Right – Parking Lot	<i>A A (A)</i>	<i>9.2 9.4 (9.5)</i>	<i>B B (B)</i>	<i>10.4 10.3 (10.5)</i>

\* For the 2025 & 2029 traffic scenario, the westbound approach would comprise of an exclusive left turn and shared through/right lane.

#### Industrial Avenue and Sandford Fleming Avenue Intersection

The intersection of Industrial Avenue and Sandford Fleming Avenue is controlled by traffic signals. Alta Vista Drive forms the northbound approach and Sandford Fleming Avenue the southbound approach.

Table 4.8 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 16 and 17 for the existing 2015 traffic counts, Exhibit 18 and 19 for the 2025 peak AM and PM hour traffic, and Exhibit 20 and 21 for the 2029 peak hour traffic.

#### Industrial Avenue and Riverside Drive Intersection

The intersection of Industrial Avenue and Riverside Drive is controlled by traffic signals. Riverside Drive forms the northbound and southbound approaches, Terminal Avenue the eastbound approach and Industrial Avenue the westbound approach.

Table 4.9 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 22 and 23 for the existing 2015 traffic counts, Exhibit 24 and 25 for the 2025 peak AM and PM hour traffic, and Exhibit 26 and 27 for the 2029 peak hour traffic.



**TABLE 4.8**  
**INDUSTRIAL/SANDFORD FLEMING INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2015 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2015 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Industrial	C D (D)	0.799 0.811 (0.815)	C D (D)	0.799 0.812 (0.822)
EB Through – Industrial	A A (A)	0.346 0.343 (0.364)	A A (A)	0.528 0.528 (0.570)
WB Left – Industrial	C C (C)	0.803 0.803 (0.805)	A A (A)	0.368 0.378 (0.419)
WB Through – Industrial	A A (A)	0.349 0.346 (0.372)	B B (C)	0.644 0.671 (0.731)
WB Right – Industrial.	A A (A)	0.387 0.384 (0.413)	C C (D)	0.722 0.755 (0.828)
NB Left – Alta Vista	D D (D)	0.886 0.886 (0.890)	D D (E)	0.909 0.909 (0.913)
NB Through/Right – Alta Vista	A A (A)	0.519 0.591 (0.605)	A A (A)	0.370 0.378 (0.391)
SB Left – Sandford Fleming	C D (D)	0.775 0.830 (0.827)	D D (D)	0.819 0.822 (0.819)
SB Through – Sandford Fleming	A A (A)	0.246 0.288 (0.301)	A A (A)	0.479 0.530 (0.543)

**TABLE 4.9**  
**INDUSTRIAL/RIVERSIDE INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2015 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2015 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Terminal	A A (A)	0.149 0.193 (0.200)	A C (C)	0.550 0.721 (0.764)
EB Through – Terminal	A A (A)	0.166 0.155 (0.157)	A A (A)	0.070 0.067 (0.074)
EB Right – Terminal	A A (A)	0.146 0.282 (0.341)	A B (B)	0.540 0.624 (0.684)
WB Left – Industrial	A A (A)	0.459 0.458 (0.470)	A A (A)	0.327 0.334 (0.348)
WB Through – Industrial	A A (A)	0.026 0.025 (0.025)	A A (A)	0.138 0.135 (0.139)
NB Left – Riverside	C C (C)	0.807 0.792 (0.792)	C D (D)	0.806 0.846 (0.837)
NB Through – Riverside	D D (D)	0.852 0.860 (0.902)	C C (D)	0.764 0.769 (0.825)
SB Left – Riverside	D D (E)	0.858 0.863 (0.915)	D D (D)	0.833 0.835 (0.849)
SB Through – Riverside	B B (B)	0.627 0.646 (0.683)	A A (A)	0.529 0.534 (0.558)
SB Right – Riverside	A A (A)	0.073 0.151 (0.173)	A A (A)	0.041 0.082 (0.098)

### Terminal Avenue and Railmarket Private Intersection

The intersection of Terminal Avenue and Railmarket Private is controlled by two-way stop control signs. The stop sign is installed at the northbound Railmarket Private approach.

Table 4.10 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 28 and 29 for the existing 2013 traffic counts, Exhibit 30 and 31 for the 2025 peak AM and PM hour traffic, and Exhibit 32 and 33 for the 2029 peak hour traffic.

**TABLE 4.10**  
**TERMINAL/RAILMARKET INTERSECTION – LoS & Control Delay**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2013 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2013 2025 (2029)	
	LoS	Delay (sec/veh)	LoS	Delay (sec/veh)
WB Left – Terminal	A A (A)	7.6 7.7 (7.7)	A A (A)	8.4 8.6 (8.7)
NB Left – Railmarket	B B (B)	12.6 13.9 (14.4)	C C (D)	19.8 22.9 (25.3)
NB Right – Railmarket	A A (A)	9.1 9.3 (9.4)	B B (B)	11.2 11.9 (12.1)

### Terminal Avenue and Trainyards Drive Intersection

The intersection of Terminal Avenue and Trainyards Drive is controlled by traffic signals. Terminal Avenue forms the eastbound approach and a private driveway the westbound approach.

Table 4.11 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 34 and 35 for the existing 2013 traffic counts, Exhibit 36 and 37 for the 2025 peak AM and PM hour traffic, and Exhibit 38 and 39 for the 2029 peak hour traffic.

### Trainyards Drive and Belfast Road Intersection

The intersection of Trainyards Drive and Belfast Road is controlled by traffic signals. Belfast Road in the vicinity of the intersection has been under construction for several years due to the construction of the OC Transpo Belfast Yard and LRT Line. The most recent and representative traffic counts provided by the City of Ottawa were taken in 2010. The operational analysis of the intersection for the existing traffic counts used the 2010 traffic counts and the current lane geometry.

Table 4.12 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 40 and 41 for the existing 2010 traffic counts, Exhibit 42 and 43 for the 2025 peak AM and PM hour traffic, and Exhibit 44 and 45 for the 2029 peak hour traffic.

**TABLE 4.11**  
**TERMINAL/TRAINYARDS INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2014 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2014 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Terminal	A A (A)	0.185 0.220 (0.239)	A A (A)	0.278 0.327 (0.346)
EB Through/Right – Terminal	A A (A)	0.271 0.296 (0.362)	A A (A)	0.279 0.437 (0.452)
WB Left/Through/Right – Driveway	A A (A)	0.218 0.217 (0.217)	A A (A)	0.304 0.292 (0.292)
NB Left – Trainyards	A A (A)	0.093 0.133 (0.137)	A A (A)	0.049 0.057 (0.069)
NB Through – Trainyards	A A (A)	0.090 0.091 (0.095)	A A (A)	0.123 0.124 (0.129)
NB Right – Trainyards	A A (A)	0.001 0.003 (0.005)	A A (A)	0.004 0.004 (0.004)
SB Left/Through – Trainyards	A A (A)	0.055 0.055 (0.058)	A A (A)	0.099 0.099 (0.103)
SB Right – Trainyards	A A (A)	0.021 0.061 (0.070)	A A (A)	0.045 0.080 (0.095)

**TABLE 4.12**  
**TRAINYARDS/BELFAST INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2010 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2010 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Through – Belfast	A A (A)	0.245 0.262 (0.277)	A A (A)	0.258 0.285 (0.309)
EB Right – Belfast	A A (A)	0.054 0.086 (0.096)	A A (A)	0.221 0.277 (0.308)
WB Left– Belfast	A A (A)	0.187 0.217 (0.231)	A A (A)	0.313 0.348 (0.374)
WB Through – Belfast	A A (A)	0.093 0.099 (0.104)	A A (A)	0.111 0.120 (0.127)
NB Left – Trainyards	A A (A)	0.258 0.259 (0.260)	A A (A)	0.450 0.445 (0.444)
NB Right – Trainyards	C D (D)	0.801 0.815 (0.823)	D D (D)	0.841 0.854 (0.861)

### Trainyards Drive and Railmarket Private Intersection

The intersection of Trainyards Drive and Railmarket Private is controlled by traffic signals.

Table 4.13 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 46 and 47 for the existing 2014 traffic counts, Exhibit 48 and 49 for the 2025 peak AM and PM hour traffic, and Exhibit 50 and 51 for the 2029 peak hour traffic.

**TABLE 4.13**  
**TRAINYARDS/RAILMARKET INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2014 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2014 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Railmarket	A A (A)	0.087 0.088 (0.093)	A A (A)	0.161 0.161 (0.169)
EB Through/Right – Railmarket	A A (A)	0.477 0.489 (0.502)	B B (C)	0.677 0.701 (0.730)
WB Left– Railmarket	A A (A)	0.203 0.208 (0.210)	B B (B)	0.602 0.628 (0.690)
WB Through/Right – Railmarket	A A (A)	0.249 0.249 (0.258)	A A (A)	0.303 0.305 (0.317)
NB Left – Trainyards	A A (A)	0.071 0.080 (0.084)	A A (A)	0.215 0.226 (0.236)
NB Through/Right – Trainyards	A A (A)	0.090 0.125 (0.128)	A A (A)	0.302 0.312 (0.335)
SB Left – Trainyards	A A (A)	0.025 0.031 (0.032)	A A (A)	0.091 0.093 (0.099)
SB Through – Trainyards	A A (A)	0.115 0.120 (0.136)	A A (A)	0.194 0.237 (0.247)
SB Right – Trainyards	A A (A)	0.001 0.006 (0.007)	A A (A)	0.018 0.024 (0.027)

### Industrial Avenue and Trainyards Drive Intersection

The intersection of Industrial Avenue and Trainyards Drive is controlled by traffic signals. Industrial Avenue forms the eastbound and westbound approaches, Trainyards Drive the southbound approach, and a private driveway the northbound approach.

Table 4.14 shows the operational analysis of the intersection with the analysis sheets provided as Exhibit 52 and 53 for the existing 2015 traffic counts, Exhibit 54 and 55 for the 2025 peak AM and PM hour traffic, and Exhibit 56 and 57 for the 2029 peak hour traffic.

**TABLE 4.14**  
**INDUSTRIAL/TRAINYARDS INTERSECTION – LoS & v/c Ratio**

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2015 2025 (2029)		WEEKDAY PEAK PM HOUR YEAR 2015 2025 (2029)	
	LoS	v/c Ratio	LoS	v/c Ratio
EB Left – Industrial	A A (A)	0.166 0.118 (0.126)	A A (A)	0.339 0.349 (0.381)
EB Through – Industrial	A A (A)	0.304 0.275 (0.287)	A A (A)	0.279 0.280 (0.298)
EB Right – Industrial	A A (A)	0.000 0.000 (0.000)	A A (A)	0.000 0.000 (0.000)
WB Left – Industrial	A A (A)	0.015 0.015 (0.016)	A A (A)	0.015 0.016 (0.017)
WB Through – Industrial	A A (A)	0.425 0.428 (0.446)	B B (B)	0.601 0.612 (0.662)
WB Right – Industrial	A A (A)	0.426 0.428 (0.446)	A B (B)	0.601 0.613 (0.662)
NB Left/Through/Right – Driveway	A A (A)	0.000 0.000 (0.000)	A A (A)	0.000 0.000 (0.000)
SB Left – Trainyards	A A (A)	0.296 0.315 (0.366)	C C (C)	0.761 0.783 (0.791)
SB Through/Right – Trainyards	A A (A)	0.182 0.181 (0.184)	A A (A)	0.458 0.415 (0.417)

## 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*. Table 4.15 presents the level of service for street segments within the study area, with the analysis for the 2029 traffic provided in the Appendix.

**TABLE 4.15**  
**PEDESTRIAN LEVEL OF SERVICE (PLOS) – STREET SEGMENT**

Street	Segment	Level of Service	Analysis
Sandford Fleming Ave.	Industrial Ave. to Terminal Ave.	C	Exhibit 58
Terminal Ave.	Sandford Fleming Ave. to Railmarket Private	D	Exhibit 59
Industrial Ave.	Riverside Dr. to Trainyards Dr.	E	Exhibit 60
Trainyards Drive	Belfast Ave. to Industrial Ave.	D	Exhibit 61

The Pedestrian Level of Service (PLOS) was determined from the intersection capacity analysis for the 2029 traffic which was conducted using the *Highway Capacity Software*, which utilizes the intersection capacity analysis procedure as documented in the *Highway Capacity Manual 2010 and 6<sup>th</sup> Edition*. Table 4.16 summarizes the analysis for the signalized intersections.

**TABLE 4.16**  
**PEDESTRIAN LEVEL OF SERVICE (PLOS) – INTERSECTION ANALYSIS**

INTERSECTION	APPROACH							
	EB		WB		NB		SB	
	AM	PM	AM	PM	AM	PM	AM	PM
Industrial/Sandford Fleming	C	C	B	B	C	C	D	D
Industrial/Riverside	B	B	C	C	B	B	B	B
Terminal/Trainyards	B	B	B	B	B	B	B	B
Trainyards/Belfast	B	C	A	A	C	C	C	C
Trainyards/Railmarket	B	B	B	B	B	B	B	B
Trainyards/Industrial	B	B	B	C	C	C	C	C

## **BICYCLE LEVEL OF SERVICE (BLOS)**

The bicycle level of service was determined utilizing the City of Ottawa publication, *Multi-Modal Level of Service (MMLOS) Guidelines*. Table 4.17 presents the level of service for street segments within the study area, with the analysis for the 2029 traffic provided in the Appendix.

**TABLE 4.17**  
**BICYCLE LEVEL OF SERVICE (BLOS) – STREET SEGMENT**

Street	Segment	Level of Service	Analysis
Sandford Fleming Ave.	Industrial Ave. to Terminal Ave.	B	Exhibit 62
Terminal Ave.	Sandford Fleming Ave. to Trainyards Dr.	D	Exhibit 63
Industrial Ave.	Riverside Dr. to Trainyards Dr.	F	Exhibit 64
Trainyards Drive	Belfast Ave. to Industrial Ave.	B	Exhibit 65

The Bicycle Level of Service (BLOS) was determined from the intersection capacity analysis for the 2029 traffic which was conducted using the *Highway Capacity Software*. Table 4.18 summarizes the analysis for the signalized intersections.

**TABLE 4.18**  
**BICYCLE LEVEL OF SERVICE (BLOS) – INTERSECTION ANALYSIS**

INTERSECTION	APPROACH							
	EB		WB		NB		SB	
	AM	PM	AM	PM	AM	PM	AM	PM
Industrial/Sandford Fleming	B	B	B	C	C	C	C	B
Industrial/Riverside	A	A	A	A	A	A	B	B
Terminal/Trainyards	A	A	A	A	A	A	A	A
Trainyards/Belfast	B	B	B	B	F	F	-	-
Trainyards/Railmarket	A	A	A	A	A	A	A	A
Trainyards/Industrial	B	B	B	B	B	B	B	C

## TRANSIT LEVEL OF SERVICE (TLOS)

The apartment development is located within the Transit Oriented Development area and is in close proximity to the Hurdman transit station and the future LRT station at the VIA rail station. OC Transpo bus service provides access to the transit stations and downtown core with routes along both Terminal Avenue and Sandford Fleming Avenue. On-street parking along both roads is limited with no dedicated transit lanes. Table 4.19 presents the level of service along Terminal Avenue and Sandford Fleming Avenue which were determined from Exhibit 15 of the MMLOS Guidelines.

**TABLE 4.19**  
**TRANSIT LEVEL OF SERVICE (TLOS) – STREET SEGMENT**

Street	Segment	Level of Service
Sandford Fleming Ave.	Industrial Ave. to Terminal Ave.	D
Terminal Ave.	Sandford Fleming Ave. to Trainyards Dr.	D

The transit level of service at the intersections along the route was determined from the intersection capacity analysis for the approach delay at the intersections using the 2029 traffic. Table 4.20 presents the intersection TLOS.

**TABLE 4.20**  
**TRANSIT LEVEL OF SERVICE (TLOS) – INTERSECTION ANALYSIS**

INTERSECTION	APPROACH							
	EB		WB		NB		SB	
	AM	PM	AM	PM	AM	PM	AM	PM
Terminal/Sandford Fleming	B	B	B	C	A	B	A	B
Industrial/Sandford Fleming	B	C	B	C	D	D	E	E
Terminal/Trainyards	C	C	D	D	A	A	A	A

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

### **Element 4.5.1 – Context for TDM**

The apartment development is located in the Transit Oriented Development area in close proximity to transit service. The apartment units are proposed as rental apartments with tenants desiring easy access to transit and possibly within walking distance of areas of employment, shopping and other amenities. The location of the apartment development promotes transit use, walking and cycling.

### **Element 4.5.2 – Need and Opportunity**

Future development in the area would comprise of additional office space on the north side of Steamline Street (400 Terminal Avenue) as well as future office/commercial along Terminal Avenue. These future land uses would increase employment and promote walking and cycling which would reduce the impact on the surrounding road network.

### **Element 4.5.3 – TDM Program**

Post-occupancy TDM measures would comprise of ensuring that a sidewalk system is in place to provide the safe and efficient movement of pedestrians to adjacent employment areas and to transit stations. Additional bus routes should be examined, and the location of bus stops should be evaluated to ensure that the stops are in close proximity to the development and access to the stops is safe (road crossing).



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

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

Access routes to the apartment development are from arterial and collector roads. There would be little impact on neighbouring areas.

## **MODULE 4.7 - Transit**

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

Future transit passenger demands can be accommodated at both the Hurdman Transit station and the future LRT station which is expected to be completed and operational by the end of Phase 1 of the apartment development.

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

The travel demands of the proposed apartment development would not trigger any changes to the Transportation Master Plan (TMP) concepts for auto or transit networks.

## **MODULE 4.9 – Intersection Design**

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

The intersection of Sandford Fleming Avenue and Steamline Street was examined for traffic controls using the expected 2029 traffic. A traffic signal warrant analysis determined that the intersection met 36 percent of the warrants for the installation of traffic control signals. The intersection would therefore be designed as a two-way stop controlled intersection with stop signs at the westbound Steamline Street approach.

A traffic signal warrant analysis was conducted for the intersection of Steamline Street and Terminal Avenue using the 2029 traffic. The warrant analysis determined that the intersection met 10 percent of the traffic signal warrants. The intersection would be designed as a two-way stop controlled intersection with a stop sign installed at the northbound Steamline Street approach.

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

The transportation analysis for the study area determined the following intersection design modifications.

#### **Triggered by the Steamline Street Apartment Development**

Phase 1 and Phase 2 – The site would have one access point onto Sandford Fleming Avenue from Steamline Street. Modifications to the Sandford Fleming/Steamline intersection would comprise of pavement markings which provide a Sandford Fleming shared southbound left/through lane, a shared northbound through/right lane, and a Steamline shared westbound

left/right lane. Figure 4.6 shows the intersection lane configuration which would be completed at Phase 1 by the year 2019. All pavement markings can be done within the pavement width of the road.

Phase 3 – At the completion of Phase 3 by the year 2029, Steamline Street would be extended to Terminal Avenue. Modifications to the pavement markings at the Sandford Fleming/Steamline intersection would comprise of providing an exclusive Sandford Fleming southbound left turn lane and exclusive westbound Steamline left turn and right turn lanes. The Terminal/Steamline intersection would require an exclusive Terminal westbound left turn lane and exclusive northbound Steamline left turn and right turn lanes.

The 95<sup>th</sup> percentile queue in the intersection operational analysis determined that the queuing at the exclusive left turn lanes at both intersections was less than one vehicle. The pavement marking would provide all exclusive left turn lanes with 15 m of vehicular storage.

The width of lanes at the intersections would be the following:

Steamline St. & Terminal Ave.			Sandford Fleming Ave.		
11 m	Left turn lane	3.25 m	14 m	Left turn lane	3.50 m
Pavement	Through/Right lane	3.50 m	Pavement	Through/Right lane	3.75 m
	Opposing lane	4.25 m		Opposing lane	6.75 m

Figure 4.7 shows the intersection lane configuration which would be completed at Phase 3 by the year 2029. All pavement markings can be done within the existing right-of-way of Sandford Fleming Avenue, Terminal Avenue and Steamline Street.

#### Triggered by the Increase in Background Traffic

The transportation analysis determined that the all-way stop controlled intersection of Terminal Avenue and Sandford Fleming Avenue was beginning to show operational problems at the westbound approach due to the increasing background traffic. The proposed apartment development on Steamline Street would have little impact on the westbound Terminal approach to the intersection. It is recommended that the westbound Terminal Avenue approach to the all-way stop controlled intersection be modified to provide an exclusive left turn lane and a shared through/right lane.

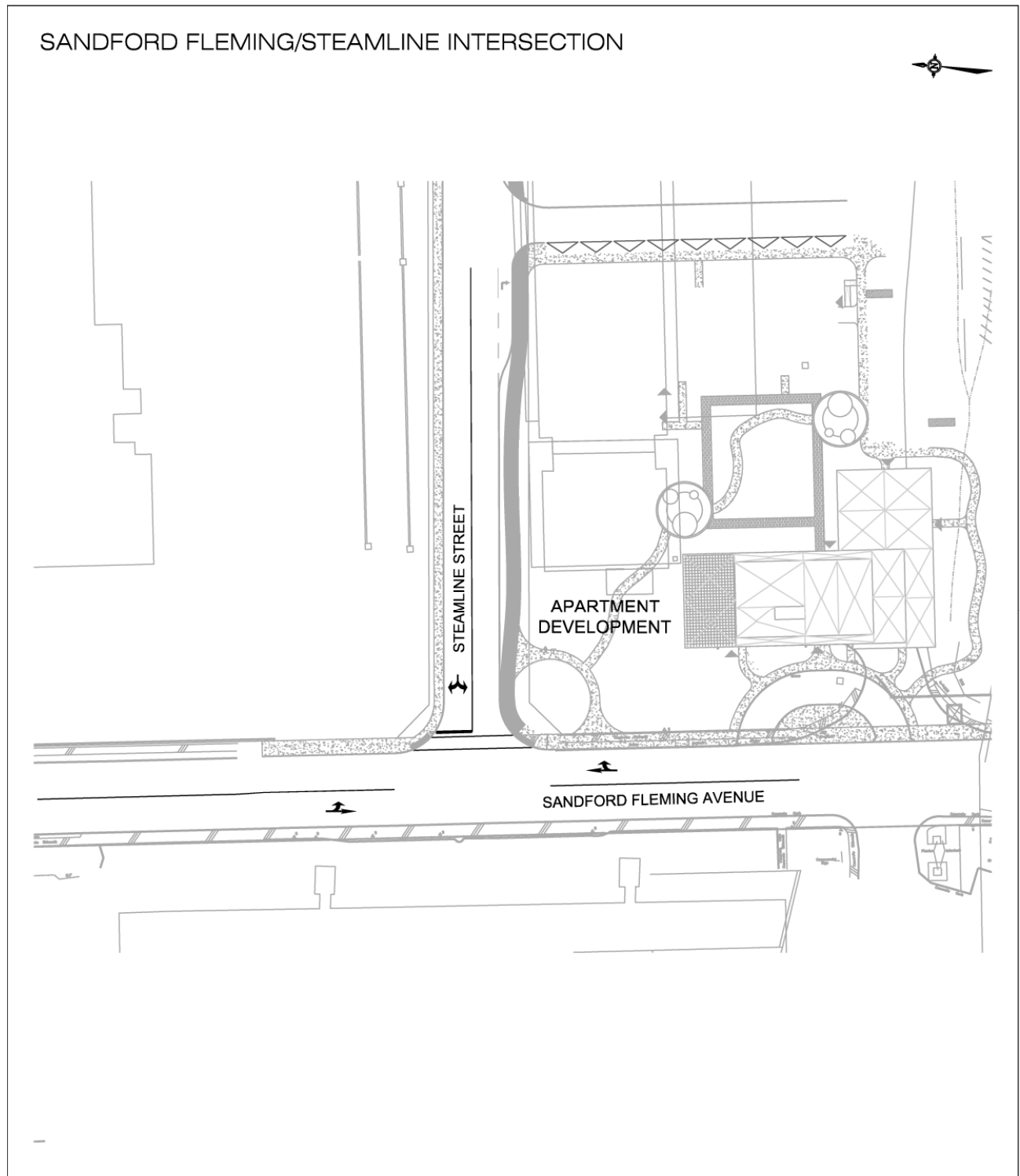
Prepared by:

*David J. Halpenny*

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

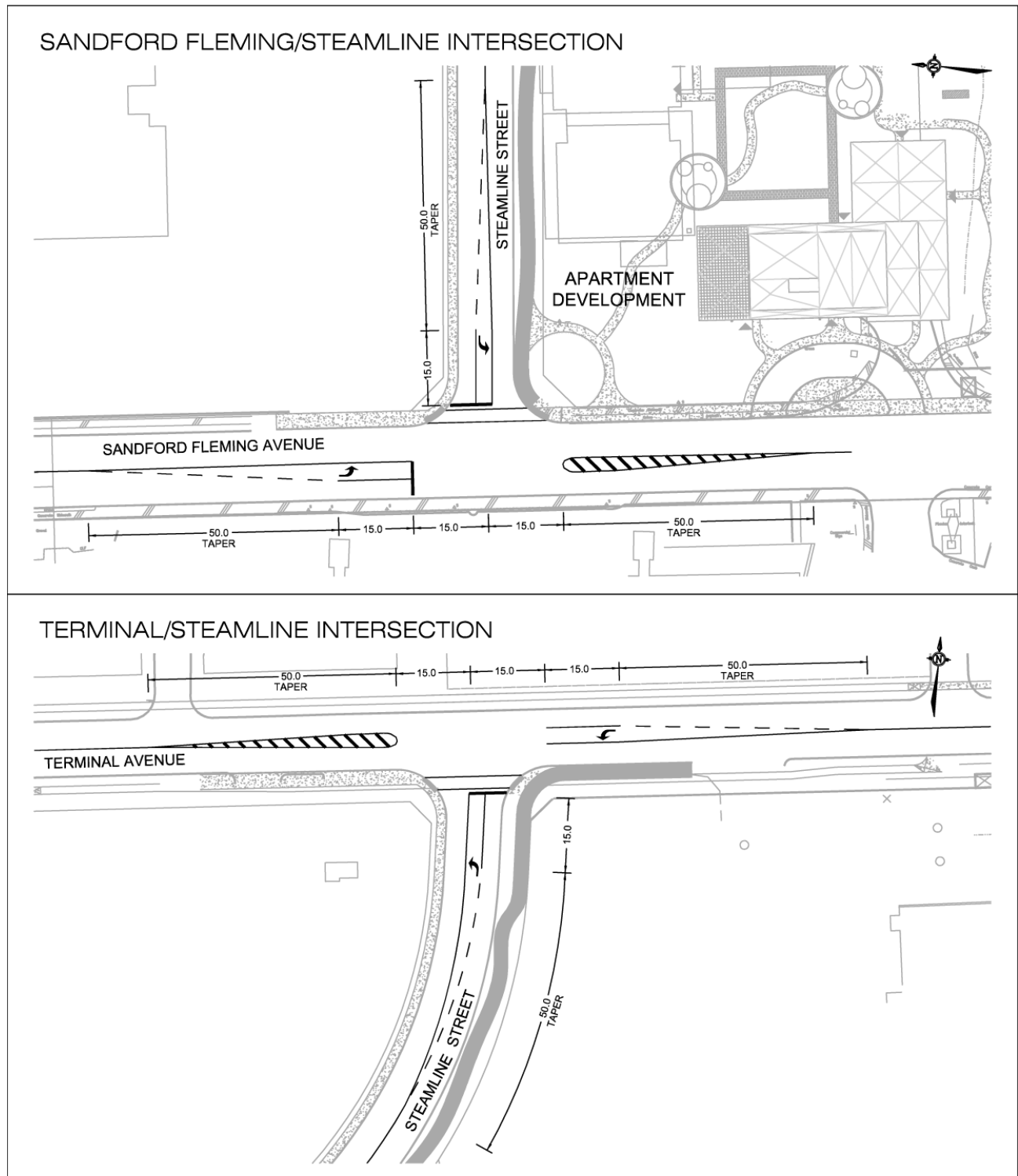


**FIGURE 4.6**  
**LANE CONFIGURATION –Phase 1 at 2019**



NOT TO SCALE

**FIGURE 4.7**  
**LANE CONFIGURATION –Phase 3 at 2029**



NOT TO SCALE

## **APPENDIX**

### **SCREENING FORM**

#### **LEFT TURN LANE WARRANT ANALYSIS**

#### **VEHICULAR TRAFFIC ANALYSIS**

#### **PLOS and BLOS SEGMENT EVALUATIONS**

## EXHIBIT 1 SCREENING FORM

### TIA SCREENING FORM

1. Description of Proposed Development	
Municipal Address	Steamline Street, Ottawa
Description of Location	Located on the east side of Sandford Fleming Avenue, south of Steamline Street.
Land Use Classification	Transit Oriented TD2[1979]
Development Size (units)	1,845 units
Development Size (m <sup>2</sup> )	
Number of Accesses and Locations	Two accesses onto Steamline Avenue and a layby on Sandford Fleming Avenue.
Phase of Development	3 Phases
Buildout Year	2029

2. Trip Generation Trigger	
Land Use Type	Residential Apartment Buildings
Development Size	90 units < 1,845 units
Trip Generation Trigger Satisfied?	Yes

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?	No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	No
Location Trigger Satisfied?	No

4. Safety Triggers	
	Yes/No
Are posted speed limits on a boundary road 80 km/h or greater?	No

Are there any horizontal/vertical curvatures on a boundary street which limits sight lines at a proposed driveway?	No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (300 m rural conditions or 150 m urban/suburban conditions)?	No
Is the proposed driveway within the auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger Satisfied?	No

<b>5. Summary</b>	
	Yes/No
Does the development satisfy the Trip Generation Trigger?	Yes
Does the development satisfy the Location Trigger?	No
Does the development satisfy the Safety Trigger?	No

### MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL USING PROJECTED VOLUME

**Municipality** City of Ottawa **Projected Volume** Year 2029

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE		
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %
				NUMBER	%	
1. VEHICULAR VOLUME	1. A. Vehicle volume all approaches (Average hour)	480	720	334	46	21%
	B. Vehicle volume, along minor roads, (Average hour)	120	255 170	53	21	
2. DELAY TO CROSS TRAFFIC	1. A. Vehicle volume, along artery (Average hour)	480	720	303	42	36%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads, (Average hour)	50	75	27	36	

NOTES:

1. Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction, should be 25% higher than the values given above.
2. Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 Km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
3. Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 Km/h.
4. The lowest sectional percentage governs the entire Warrant.
5. For "T" intersections the warrant values for minor road should be increased by 50 % (Warrant 1B only).
6. The crossing volumes are defined as:
  - (a) Left turns from both minor road approaches
  - (b) The heaviest through volume from the minor road
  - (c) 50% of the heavier left turn movement from major road when both of the following are met:
    - (i) the left turn volume > 120 vph.
    - (ii) the left turn volume plus the opposing volume > 720 vph.
  - (d) Pedestrians crossing the major road.



### EXHIBIT 3 LEFT TURN LANE WARRANT ANALYSIS – Terminal/Steamline (2029 Traffic)

#### MINIMUM WARRANTS FOR INSTALLATION OF TRAFFIC SIGNAL USING PROJECTED VOLUME

**Location** Steamline Street and Terminal Avenue **of** \_\_\_\_\_  
**(Roadway)** **(Intersecting Road)**

**Municipality** City of Ottawa **Projected Volume** Year 2029

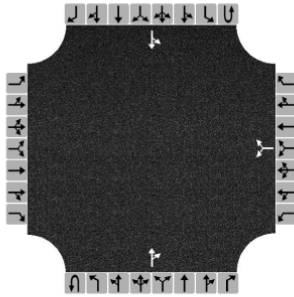
WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS		COMPLIANCE		
		2. FREE FLOW	3. RESTRICT. FLOW	SECTIONAL		4. ENTIRE %
				NUMBER	%	
1. VEHICULAR VOLUME	1. A. Vehicle volume all approaches (Average hour)	480	(720)	379	53	(10%)
	B. Vehicle volume, along minor roads, (Average hour)	120	(255) 170	25	10	
2. DELAY TO CROSS TRAFFIC	1. A. Vehicle volume, along artery (Average hour)	480	(720)	366	51	3%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads, (Average hour)	50	(75)	2	3	

**Projected Average Hour - Use the sum of the AM and PM Peak volumes divided by 4**

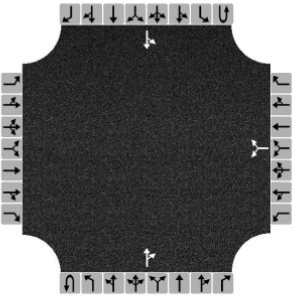
**NOTES:**

- Vehicle volume warrants (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction, should be 25% higher than the values given above.
- Warrant values for free flow apply when the 85 percentile speed of artery traffic equals or exceeds 70 Km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.
- Warrant values for restricted flow apply to large urban communities when the 85 percentile speed of artery traffic does not exceed 70 Km/h.
- The lowest sectional percentage governs the entire Warrant.
- For "T" intersections the warrant values for minor road should be increased by 50 % (Warrant 1B only).
- The crossing volumes are defined as:
  - Left turns from both minor road approaches
  - The heaviest through volume from the minor road
  - 50% of the heavier left turn movement from major road when both of the following are met:
    - the left turn volume > 120 vph.
    - the left turn volume plus the opposing volume > 720 vph.
  - Pedestrians crossing the major road.

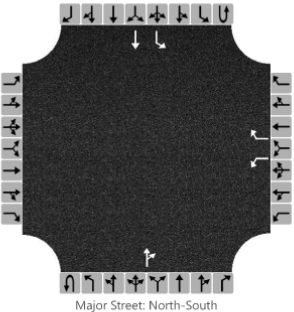
## EXHIBIT 4 YEAR 2025 PEAK AM HOUR TRAFFIC – Sanford Fleming/Steamline

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection	Sandford/Steamline							
Agency/Co.								Jurisdiction								
Date Performed	11/22/2017							East/West Street	Steamline Street							
Analysis Year	2025							North/South Street	Sandford Fleming Avenue							
Time Analyzed	Peak AM Hour							Peak Hour Factor	1.00							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	OTY Residential Development															
<b>Lanes</b>																
 <p style="font-size: small; margin-top: 5px;">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	1	0		0	1	0
Configuration							LR					TR			LT	
Volume, V (veh/h)						55		23			219	15			10	182
Percent Heavy Vehicles (%)						1		1							1	
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															
<b>Critical and Follow-up Headways</b>																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
<b>Delay, Queue Length, and Level of Service</b>																
Flow Rate, v (veh/h)							78								10	
Capacity, c (veh/h)							635								1339	
v/c Ratio							0.12								0.01	
95% Queue Length, Q <sub>95</sub> (veh)							0.4								0.0	
Control Delay (s/veh)							11.5								7.7	
Level of Service, LOS							B								A	
Approach Delay (s/veh)					11.5								0.5			
Approach LOS					B											

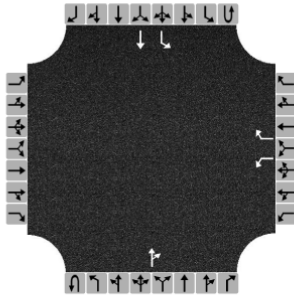
## EXHIBIT 5 YEAR 2025 PEAK PM HOUR TRAFFIC – Sanford Fleming/Steamline

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection	Sandford/Steamline							
Agency/Co.								Jurisdiction								
Date Performed	11/22/2017							East/West Street	Steamline Street							
Analysis Year	2025							North/South Street	Sandford Fleming Avenue							
Time Analyzed	Peak PM Hour							Peak Hour Factor	1.00							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	OTY Residential Development															
<b>Lanes</b>																
 <p style="font-size: small; margin-top: 5px;">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	1	0	0	0	1	0
Configuration							LR					TR			LT	
Volume, V (veh/h)						29		13			231	39			26	430
Percent Heavy Vehicles (%)						1		1							1	
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															
<b>Critical and Follow-up Headways</b>																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
<b>Delay, Queue Length, and Level of Service</b>																
Flow Rate, v (veh/h)							42								26	
Capacity, c (veh/h)							455								1299	
v/c Ratio							0.09								0.02	
95% Queue Length, Q <sub>95</sub> (veh)							0.3								0.1	
Control Delay (s/veh)							13.7								7.8	
Level of Service, LOS							B								A	
Approach Delay (s/veh)					13.7								0.6			
Approach LOS					B											

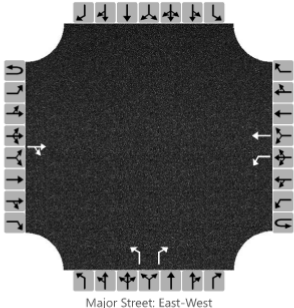
## EXHIBIT 6 YEAR 2029 PEAK AM HOUR TRAFFIC – Sanford Fleming/Steamline

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection	Sandford/Steamline							
Agency/Co.								Jurisdiction								
Date Performed	11/22/2017							East/West Street	Steamline Street							
Analysis Year	2029							North/South Street	Sandford Fleming Avenue							
Time Analyzed	Peak AM Hour							Peak Hour Factor	1.00							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	OTY Residential Development															
<b>Lanes</b>																
 <p style="font-size: small; margin-top: 5px;">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		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume, V (veh/h)						70		12			226	18		5	201	
Percent Heavy Vehicles (%)						1		1						1		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															
<b>Critical and Follow-up Headways</b>																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
<b>Delay, Queue Length, and Level of Service</b>																
Flow Rate, v (veh/h)						70		12						5		
Capacity, c (veh/h)						570		806						1328		
v/c Ratio						0.12		0.01						0.00		
95% Queue Length, Q <sub>95</sub> (veh)						0.4		0.0						0.0		
Control Delay (s/veh)						12.2		9.5						7.7		
Level of Service, LOS						B		A						A		
Approach Delay (s/veh)					11.8								0.2			
Approach LOS					B											

## EXHIBIT 7 YEAR 2029 PEAK PM HOUR TRAFFIC – Sanford Fleming/Steamline

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst								Intersection	Sandford/Steamline							
Agency/Co.								Jurisdiction								
Date Performed	11/22/2017							East/West Street	Steamline Street							
Analysis Year	2029							North/South Street	Sandford Fleming Avenue							
Time Analyzed	Peak PM Hour							Peak Hour Factor	1.00							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	OTY Residential Development															
<b>Lanes</b>																
 <p style="font-size: small; margin-top: 5px;">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		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume, V (veh/h)						37		6			251	49		15	446	
Percent Heavy Vehicles (%)						1		1						1		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															
<b>Critical and Follow-up Headways</b>																
Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																
<b>Delay, Queue Length, and Level of Service</b>																
Flow Rate, v (veh/h)						37		6						15		
Capacity, c (veh/h)						375		765						1266		
v/c Ratio						0.10		0.01						0.01		
95% Queue Length, Q <sub>95</sub> (veh)						0.3		0.0						0.0		
Control Delay (s/veh)						15.7		9.7						7.9		
Level of Service, LOS						C		A						A		
Approach Delay (s/veh)					14.8								0.3			
Approach LOS					B											

## EXHIBIT 8 YEAR 2029 PEAK AM HOUR TRAFFIC – Terminal/Steamline

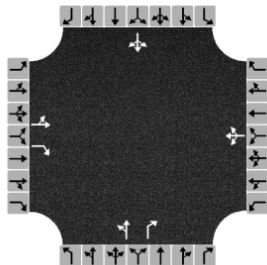
HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Terminal/Steamline								
Agency/Co.								Jurisdiction									
Date Performed	11/22/2017							East/West Street	Terminal Avenue								
Analysis Year	2029							North/South Street	Steamline Street								
Time Analyzed	Peak AM Hour							Peak Hour Factor	1.00								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	OTY Residential Development																
<b>Lanes</b>																	
 <p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0			1	0	1		0	0	0
Configuration				TR		L	T				L		R				
Volume, V (veh/h)			179	4		9	405				6		29				
Percent Heavy Vehicles (%)						1					1		1				
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)						9					6		29				
Capacity, c (veh/h)						1398					460		864				
v/c Ratio						0.01					0.01		0.03				
95% Queue Length, Q <sub>95</sub> (veh)						0.0					0.0		0.1				
Control Delay (s/veh)						7.6					12.9		9.3				
Level of Service, LOS						A					B		A				
Approach Delay (s/veh)					0.2				9.9								
Approach LOS									A								

## EXHIBIT 9 YEAR 2029 PEAK PM HOUR TRAFFIC – Terminal/Steamline

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst								Intersection	Terminal/Steamline									
Agency/Co.								Jurisdiction										
Date Performed	11/22/2017							East/West Street	Terminal Avenue									
Analysis Year	2029							North/South Street	Steamline Street									
Time Analyzed	Peak PM Hour							Peak Hour Factor	1.00									
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25									
Project Description	OTY Residential Development																	
<b>Lanes</b>																		
<p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11	12
Number of Lanes	0	0	1	0	0	1	1	0			1	0	1			0	0	0
Configuration				TR		L	T				L		R					
Volume, V (veh/h)			471	10		25	359				3		15					
Percent Heavy Vehicles (%)						1					1		1					
Proportion Time Blocked																		
Percent Grade (%)									0									
Right Turn Channelized	No				No				No				No					
Median Type/Storage	Undivided																	
<b>Critical and Follow-up Headways</b>																		
Base Critical Headway (sec)																		
Critical Headway (sec)																		
Base Follow-Up Headway (sec)																		
Follow-Up Headway (sec)																		
<b>Delay, Queue Length, and Level of Service</b>																		
Flow Rate, v (veh/h)						25					3		15					
Capacity, c (veh/h)						1086					309		591					
v/c Ratio						0.02					0.01		0.03					
95% Queue Length, Q <sub>95</sub> (veh)						0.1					0.0		0.1					
Control Delay (s/veh)						8.4					16.7		11.3					
Level of Service, LOS						A					C		B					
Approach Delay (s/veh)					0.5				12.2									
Approach LOS									B									

## EXHIBIT 10

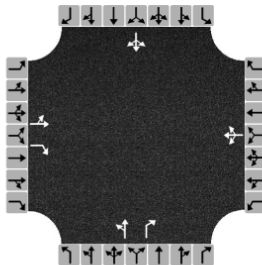
### EXISTING 2014 PEAK AM HOUR TRAFFIC – Terminal/Sandford Fleming

HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2014					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			0.90			
Time Analyzed	Peak AM Hour											
Project Description	OTY Residential Development											
Lanes												
												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	14	166	50	120	48	12	21	13	120	7	8	1
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		LTR			LT	R		LTR		
Flow Rate, v (veh/h)	200	56		200			38	133		18		
Percent Heavy Vehicles	0	5		2			5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20			3.20	3.20		3.20		
Initial Degree of Utilization, x	0.178	0.049		0.178			0.034	0.119		0.016		
Final Departure Headway, hd (s)	5.26	4.60		5.44			6.08	4.98		5.98		
Final Degree of Utilization, x	0.292	0.071		0.302			0.064	0.184		0.030		
Move-Up Time, m (s)	2.3	2.3		2.0			2.3	2.3		2.0		
Service Time, ts (s)	2.96	2.30		3.44			3.78	2.68		3.98		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	200	56		200			38	133		18		
Capacity	685	783		662			592	723		602		
95% Queue Length, Q <sub>95</sub> (veh)	1.2	0.2		1.3			0.2	0.7		0.1		
Control Delay (s/veh)	10.1	7.7		10.8			9.2	8.8		9.2		
Level of Service, LOS	B	A		B			A	A		A		
Approach Delay (s/veh)	9.6			10.8			8.9			9.2		
Approach LOS	A			B			A			A		
Intersection Delay, s/veh   LOS	9.8						A					



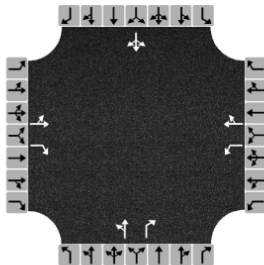
## EXHIBIT 11

### EXISTING 2014 PEAK PM HOUR TRAFFIC – Terminal/Sandford Fleming

HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2014					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			0.90			
Time Analyzed	Peak PM Hour											
Project Description	OTY Residential Development											
Lanes												
												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	13	73	53	272	146	5	20	9	186	12	23	10
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		LTR			LT	R		LTR		
Flow Rate, v (veh/h)	96	59		470			32	207		50		
Percent Heavy Vehicles	0	5		2			5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20			3.20	3.20		3.20		
Initial Degree of Utilization, x	0.085	0.052		0.418			0.029	0.184		0.044		
Final Departure Headway, hd (s)	6.09	5.39		5.74			6.80	5.66		6.68		
Final Degree of Utilization, x	0.162	0.088		0.750			0.061	0.325		0.093		
Move-Up Time, m (s)	2.3	2.3		2.0			2.3	2.3		2.0		
Service Time, ts (s)	3.79	3.09		3.74			4.50	3.36		4.68		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	96	59		470			32	207		50		
Capacity	592	668		627			529	636		539		
95% Queue Length, Q <sub>95</sub> (veh)	0.6	0.3		6.7			0.2	1.4		0.3		
Control Delay (s/veh)	10.0	8.6		23.9			9.9	11.1		10.4		
Level of Service, LOS	A	A		C			A	B		B		
Approach Delay (s/veh)	9.4			23.9			10.9			10.4		
Approach LOS	A			C			B			B		
Intersection Delay, s/veh   LOS	17.3						C					

## EXHIBIT 12

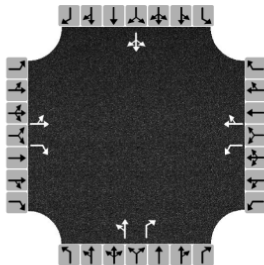
### YEAR 2025 PEAK AM HOUR TRAFFIC – Terminal/Sandford Fleming

HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2025					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			1.00			
Time Analyzed	Peak AM Hour											
Project Description	OTY Residential Development											
Lanes												
												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	16	252	45	138	62	13	33	15	194	8	9	1
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		L	TR		LT	R		LTR		
Flow Rate, v (veh/h)	268	45		138	75		48	194		18		
Percent Heavy Vehicles	0	5		2	2		5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20		
Initial Degree of Utilization, x	0.238	0.040		0.123	0.067		0.043	0.172		0.016		
Final Departure Headway, hd (s)	5.49	4.85		6.09	5.47		6.28	5.15		6.23		
Final Degree of Utilization, x	0.409	0.061		0.234	0.114		0.084	0.278		0.031		
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.0		
Service Time, ts (s)	3.19	2.55		3.79	3.17		3.98	2.85		4.23		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	268	45		138	75		48	194		18		
Capacity	655	743		591	659		573	699		578		
95% Queue Length, Q <sub>95</sub> (veh)	2.0	0.2		0.9	0.4		0.3	1.1		0.1		
Control Delay (s/veh)	11.9	7.9		10.6	8.9		9.6	9.8		9.4		
Level of Service, LOS	B	A		B	A		A	A		A		
Approach Delay (s/veh)	11.4			10.0			9.8			9.4		
Approach LOS	B			B			A			A		
Intersection Delay, s/veh   LOS	10.5						B					

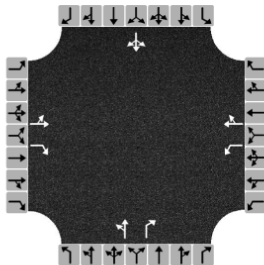
## EXHIBIT 13 YEAR 2025 PEAK PM HOUR TRAFFIC – Terminal/Sandford Fleming

HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2025					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			1.00			
Time Analyzed	Peak PM Hour											
Project Description	OTY Residential Development											
Lanes												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	15	94	73	357	223	6	18	10	216	13	26	11
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		L	TR		LT	R		LTR		
Flow Rate, v (veh/h)	109	73		357	229		28	216		50		
Percent Heavy Vehicles	0	5		2	2		5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20		
Initial Degree of Utilization, x	0.097	0.065		0.317	0.204		0.025	0.192		0.044		
Final Departure Headway, hd (s)	6.26	5.57		6.18	5.66		6.91	5.81		6.66		
Final Degree of Utilization, x	0.189	0.113		0.613	0.360		0.054	0.348		0.092		
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.0		
Service Time, ts (s)	3.96	3.27		3.88	3.36		4.61	3.51		4.66		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	109	73		357	229		28	216		50		
Capacity	575	647		583	636		521	620		541		
95% Queue Length, Q <sub>95</sub> (veh)	0.7	0.4		4.1	1.6		0.2	1.6		0.3		
Control Delay (s/veh)	10.4	9.0		18.2	11.5		10.0	11.6		10.3		
Level of Service, LOS	B	A		C	B		B	B		B		
Approach Delay (s/veh)	9.8			15.6			11.4			10.3		
Approach LOS	A			C			B			B		
Intersection Delay, s/veh   LOS	13.4						B					

## EXHIBIT 14 YEAR 2029 PEAK AM HOUR TRAFFIC – Terminal/Sandford Fleming

HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2029					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			1.00			
Time Analyzed	Peak AM Hour											
Project Description	OTY Residential Development											
Lanes												
												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	17	259	51	146	69	14	34	16	188	8	9	1
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		L	TR		LT	R		LTR		
Flow Rate, v (veh/h)	276	51		146	83		50	188		18		
Percent Heavy Vehicles	0	5		2	2		5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20		
Initial Degree of Utilization, x	0.245	0.045		0.130	0.074		0.044	0.167		0.016		
Final Departure Headway, hd (s)	5.51	4.87		6.11	5.48		6.34	5.22		6.30		
Final Degree of Utilization, x	0.423	0.069		0.248	0.126		0.088	0.273		0.031		
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.0		
Service Time, ts (s)	3.21	2.57		3.81	3.18		4.04	2.92		4.30		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	276	51		146	83		50	188		18		
Capacity	653	740		590	656		567	690		572		
95% Queue Length, Q <sub>95</sub> (veh)	2.1	0.2		1.0	0.4		0.3	1.1		0.1		
Control Delay (s/veh)	12.2	7.9		10.8	9.0		9.7	9.9		9.5		
Level of Service, LOS	B	A		B	A		A	A		A		
Approach Delay (s/veh)	11.5			10.1			9.8			9.5		
Approach LOS	B			B			A			A		
Intersection Delay, s/veh   LOS	10.6						B					

## EXHIBIT 15 YEAR 2029 PEAK PM HOUR TRAFFIC – Terminal/Sandford Fleming

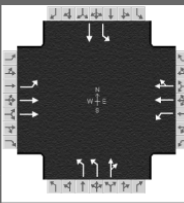
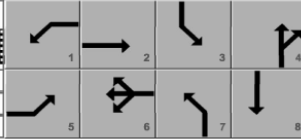
HCS7 All-Way Stop Control Report												
General Information						Site Information						
Analyst						Intersection			Terminal/Sandford Fleming			
Agency/Co.						Jurisdiction						
Date Performed	11/22/2017					East/West Street			Terminal Avenue			
Analysis Year	2029					North/South Street			Sandford Fleming Avenue			
Analysis Time Period (hrs)	0.25					Peak Hour Factor			1.00			
Time Analyzed	Peak PM Hour											
Project Description	OTY Residential Development											
Lanes												
												
Vehicle Volume and Adjustments												
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	16	106	74	360	231	6	21	10	226	14	27	11
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT	R		L	TR		LT	R		LTR		
Flow Rate, v (veh/h)	122	74		360	237		31	226		52		
Percent Heavy Vehicles	0	5		2	2		5	0		0		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)	3.20	3.20		3.20	3.20		3.20	3.20		3.20		
Initial Degree of Utilization, x	0.108	0.066		0.320	0.211		0.028	0.201		0.046		
Final Departure Headway, hd (s)	6.34	5.66		6.26	5.74		7.01	5.88		6.77		
Final Degree of Utilization, x	0.215	0.116		0.626	0.378		0.060	0.369		0.098		
Move-Up Time, m (s)	2.3	2.3		2.3	2.3		2.3	2.3		2.0		
Service Time, ts (s)	4.04	3.36		3.96	3.44		4.71	3.58		4.77		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)	122	74		360	237		31	226		52		
Capacity	568	637		575	627		514	612		532		
95% Queue Length, Q <sub>95</sub> (veh)	0.8	0.4		4.3	1.8		0.2	1.7		0.3		
Control Delay (s/veh)	10.8	9.1		18.9	11.9		10.2	12.0		10.5		
Level of Service, LOS	B	A		C	B		B	B		B		
Approach Delay (s/veh)	10.1			16.1			11.8			10.5		
Approach LOS	B			C			B			B		
Intersection Delay, s/veh   LOS	13.8						B					

## EXHIBIT 16 EXISTING 2015 PEAK AM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary															
General Information							Intersection Information								
Agency							Duration, h		0.25						
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		0.90					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2015		Analysis Period		1> 7:00					
Intersection		Sandford/Industrial		File Name		2015_ex_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				67	525		77	528	30	513	73	86	26	50	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
Green	6.8	0.9	55.5	3.1	14.3	9.7									
Yellow	3.7	0.0	3.7	3.3	3.3	3.3									
Red	2.2	0.0	2.2	2.7	2.7	2.7									
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	3	8	7	4				
Case Number				2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				12.7	61.4	13.5	62.3	29.4	36.0	9.1	15.7				
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0				
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2				
Queue Clearance Time ( g s ), s				7.3		8.0		22.2	14.8	4.4	5.5				
Green Extension Time ( g e ), s				0.1	0.0	0.1	0.0	1.2	0.3	0.0	0.1				
Phase Call Probability				0.92		0.94		1.00	1.00	0.62	1.00				
Max Out Probability				0.00		0.00		0.00	0.00	0.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2		1	6	16	3	8	18	7	4	
Adjusted Flow Rate ( v ), veh/h				74	583		86	313	307	570	177		29	56	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1647		1674	1730	1689	1652	1362		1447	1730	
Queue Service Time ( g s ), s				5.3	8.8		6.0	8.8	9.0	20.2	12.8		2.4	3.5	
Cycle Queue Clearance Time ( g c ), s				5.3	8.8		6.0	8.8	9.0	20.2	12.8		2.4	3.5	
Green Ratio ( g/C )				0.06	0.51		0.06	0.52	0.52	0.19	0.30		0.03	0.13	
Capacity ( c ), veh/h				93	1685		107	897	793	643	340		37	226	
Volume-to-Capacity Ratio ( X )				0.799	0.346		0.803	0.349	0.387	0.886	0.519		0.775	0.246	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				60.2	76.8		67.3	83.3	94.6	218.5	126.2		28.7	38.9	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				2.3	3.0		2.6	3.2	3.3	8.7	4.4		1.0	1.5	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay ( d 1 ), s/veh				54.8	11.7		54.2	11.2	10.5	47.0	35.2		58.1	49.5	
Incremental Delay ( d 2 ), s/veh				5.8	0.6		5.2	1.1	1.4	5.5	0.7		11.9	0.2	
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh				60.6	12.3		59.4	12.3	12.0	52.6	35.9		70.0	49.7	
Level of Service ( LOS )				E	B		E	B	B	D	D		E	D	
Approach Delay, s/veh / LOS				17.7		B	17.9		B	48.6		D	56.6		E
Intersection Delay, s/veh / LOS				29.8						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.59		C	2.21		B	2.73		C	3.53		D
Bicycle LOS Score / LOS				2.10		B	2.14		B	2.79		C	1.70		B

## EXHIBIT 17

### EXISTING 2015 PEAK PM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		11/22/2017		Area Type		Other					
Jurisdiction				Time Period		Peak PM Hour		PHF		0.90					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2015		Analysis Period		1> 7:00					
Intersection		Sandford/Industrial		File Name		2015_ex_pm.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				70	722		114	907	23	689	64	81	56	94	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
				Green	7.1	0.2	48.6	6.3	18.3	9.8					
				Yellow	3.7	0.0	3.7	3.3	3.3	3.3					
				Red	2.2	0.0	2.2	2.7	2.7	2.7					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	7	4	3	8				
Case Number				2.0	4.0	1.1	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				13.0	54.5	13.2	54.6	36.6	40.1	12.3	15.8				
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0				
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2				
Queue Clearance Time ( g s ), s				7.6		7.2		29.0	11.7	7.1	9.0				
Green Extension Time ( g e ), s				0.1	0.0	0.2	0.0	1.6	0.3	0.1	0.1				
Phase Call Probability				0.93		0.99		1.00	1.00	0.87	1.00				
Max Out Probability				0.00		0.00		0.04	0.03	0.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2		1	6	16	7	4	14	3	8	
Adjusted Flow Rate ( v ), veh/h				78	802		127	520	514	766	161		62	104	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1674		1701	1772	1752	1652	1532		1447	1660	
Queue Service Time ( g s ), s				5.6	16.7		5.2	22.7	22.8	27.0	9.7		5.1	7.0	
Cycle Queue Clearance Time ( g c ), s				5.6	16.7		5.2	22.7	22.8	27.0	9.7		5.1	7.0	
Green Ratio ( g/C )				0.06	0.45		0.47	0.46	0.46	0.25	0.33		0.05	0.13	
Capacity ( c ), veh/h				97	1519		344	807	712	842	435		76	218	
Volume-to-Capacity Ratio ( X )				0.799	0.528		0.368	0.644	0.722	0.909	0.370		0.819	0.479	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				62.6	143.1		50	216.4	256.8	297.8	94.2		58.5	78.8	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				2.4	5.6		2.0	8.5	8.9	11.8	3.6		2.0	2.9	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay ( d 1 ), s/veh				54.6	17.6		19.5	18.8	17.5	43.4	31.1		56.3	51.0	
Incremental Delay ( d 2 ), s/veh				5.6	1.3		0.2	3.9	6.3	8.4	0.2		7.9	0.6	
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh				60.1	18.9		19.8	22.8	23.7	51.7	31.3		64.2	51.6	
Level of Service ( LOS )				E	B		B	C	C	D	C		E	D	
Approach Delay, s/veh / LOS				22.6		C	22.9		C	48.2		D	56.3		E
Intersection Delay, s/veh / LOS				32.0						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.69		C	2.23		B	2.93		C	3.92		D
Bicycle LOS Score / LOS				2.29		B	2.52		C	3.09		C	1.83		B



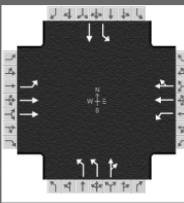
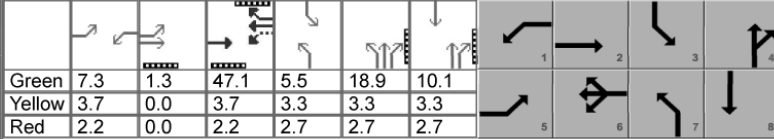
## EXHIBIT 18 YEAR 2025 PEAK AM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary															
General Information							Intersection Information								
Agency							Duration, h		0.25						
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00					
Intersection		Sandford/Industrial		File Name		2025_tot_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				91	580		85	583	22	567	96	95	47	65	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
				Green	7.6	0.6	55.1	4.7	12.6	9.7					
				Yellow	3.7	0.0	3.7	3.3	3.3	3.3					
				Red	2.2	0.0	2.2	2.7	2.7	2.7					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	3	8	7	4				
Case Number				2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				14.1	61.6	13.5	61.0	29.3	34.2	10.7	15.7				
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0				
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2				
Queue Clearance Time ( g s ), s				8.5		8.0		22.0	16.1	5.9	6.1				
Green Extension Time ( g e ), s				0.1	0.0	0.1	0.0	1.2	0.3	0.1	0.1				
Phase Call Probability				0.95		0.94		1.00	1.00	0.79	1.00				
Max Out Probability				0.00		0.00		0.00	0.02	0.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2		1	6	16	3	8	18	7	4	
Adjusted Flow Rate ( v ), veh/h				91	580		85	305	300	567	191		47	65	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1647		1674	1730	1702	1652	1373		1447	1730	
Queue Service Time ( g s ), s				6.5	8.7		6.0	8.9	9.0	20.0	14.1		3.9	4.1	
Cycle Queue Clearance Time ( g c ), s				6.5	8.7		6.0	8.9	9.0	20.0	14.1		3.9	4.1	
Green Ratio ( g/C )				0.07	0.51		0.06	0.51	0.51	0.19	0.29		0.04	0.13	
Capacity ( c ), veh/h				112	1690		106	879	781	640	323		57	226	
Volume-to-Capacity Ratio ( X )				0.811	0.343		0.803	0.346	0.384	0.886	0.591		0.830	0.288	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				72.4	75.8		66.9	84.9	96.2	217.1	143.6		45.7	45.9	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				2.8	2.9		2.6	3.3	3.3	8.6	5.0		1.6	1.8	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay ( d 1 ), s/veh				53.8	11.6		54.2	11.9	11.1	47.1	36.9		57.3	49.8	
Incremental Delay ( d 2 ), s/veh				5.2	0.6		5.2	1.1	1.4	5.4	2.0		10.9	0.3	
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh				59.0	12.1		59.4	13.0	12.6	52.5	38.9		68.2	50.0	
Level of Service ( LOS )				E	B		E	B	B	D	D		E	D	
Approach Delay, s/veh / LOS				18.5		B	18.5		B	49.1		D	57.7		E
Intersection Delay, s/veh / LOS				30.9						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.59		C	2.23		B	2.73		C	3.53		D
Bicycle LOS Score / LOS				2.11		B	2.13		B	2.81		C	1.74		B



## EXHIBIT 19

### YEAR 2025 PEAK PM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		11/22/2017		Area Type		Other					
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00					
Intersection		Sandford/Industrial		File Name		2025_tot_pm.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				96	798		126	1002	38	761	80	90	55	118	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On												
Force Mode	Float	Simult. Gap N/S	On												
				Green	7.3	1.3	47.1	5.5	18.9	10.1					
				Yellow	3.7	0.0	3.7	3.3	3.3	3.3					
				Red	2.2	0.0	2.2	2.7	2.7	2.7					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	7	4	3	8				
Case Number				2.0	4.0	1.1	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				14.5	54.2	13.2	53.0	36.4	41.0	11.5	16.1				
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0				
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2				
Queue Clearance Time ( g s ), s				8.9		7.3		28.8	12.1	6.5	10.0				
Green Extension Time ( g e ), s				0.1	0.0	0.2	0.0	1.6	0.3	0.1	0.2				
Phase Call Probability				0.96		0.99		1.00	1.00	0.84	1.00				
Max Out Probability				0.00		0.00		0.03	0.05	0.00	0.01				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2		1	6	16	7	4	14	3	8	
Adjusted Flow Rate ( v ), veh/h				96	798		126	524	516	761	170		55	118	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1674		1701	1772	1742	1652	1542		1447	1660	
Queue Service Time ( g s ), s				6.9	16.7		5.3	24.1	24.3	26.8	10.1		4.5	8.0	
Cycle Queue Clearance Time ( g c ), s				6.9	16.7		5.3	24.1	24.3	26.8	10.1		4.5	8.0	
Green Ratio ( g/C )				0.07	0.45		0.45	0.44	0.44	0.25	0.34		0.05	0.13	
Capacity ( c ), veh/h				118	1512		334	782	683	838	450		67	223	
Volume-to-Capacity Ratio ( X )				0.812	0.528		0.378	0.671	0.755	0.909	0.378		0.822	0.530	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				76	143.3		51.1	235.6	281.9	295.4	98.5		52.4	89.5	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				2.9	5.6		2.0	9.3	9.7	11.7	3.8		1.8	3.3	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay ( d 1 ), s/veh				53.5	17.8		20.5	20.4	19.0	43.4	30.5		56.7	51.2	
Incremental Delay ( d 2 ), s/veh				5.0	1.3		0.3	4.5	7.6	8.3	0.2		9.0	0.7	
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh				58.5	19.1		20.7	25.0	26.6	51.7	30.7		65.7	51.9	
Level of Service (LOS)				E	B		C	C	C	D	C		E	D	
Approach Delay, s/veh / LOS				23.3		C	25.2		C	47.9		D	56.3		E
Intersection Delay, s/veh / LOS				33.0						C					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.69		C	2.25		B	2.93		C	3.92		D
Bicycle LOS Score / LOS				2.30		B	2.52		C	3.10		C	1.85		B

## EXHIBIT 20 YEAR 2029 PEAK AM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary																
General Information							Intersection Information									
Agency							Duration, h		0.25							
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other						
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00						
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2029		Analysis Period		1> 7:00						
Intersection		Sandford/Industrial		File Name		2029_tot_am.xus										
Project Description		OTY Residential Development														
Demand Information				EB			WB			NB			SB			
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R	
Demand ( v ), veh/h				96	604		88	607	28	590	100	99	50	68		
Signal Information																
Cycle, s	120.0	Reference Phase	2													
Offset, s	0	Reference Point	Begin													
Uncoordinated	No	Simult. Gap E/W	On													
Force Mode	Float	Simult. Gap N/S	On													
Green	7.8	0.7	53.9	5.0	13.1	9.7										
Yellow	3.7	0.0	3.7	3.3	3.3	3.3										
Red	2.2	0.0	2.2	2.7	2.7	2.7										
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT					
Assigned Phase				5	2	1	6	3	8	7	4					
Case Number				2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0					
Phase Duration, s				14.5	60.5	13.7	59.8	30.1	34.7	11.0	15.7					
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0					
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2					
Queue Clearance Time ( g s ), s				8.9		8.2		22.9	16.7	6.1	6.3					
Green Extension Time ( g e ), s				0.1	0.0	0.1	0.0	1.2	0.3	0.1	0.1					
Phase Call Probability				0.96		0.95		1.00	1.00	0.81	1.00					
Max Out Probability				0.00		0.00		0.01	0.03	0.00	0.00					
Movement Group Results				EB			WB			NB			SB			
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement				5	2		1	6	16	3	8	18	7	4		
Adjusted Flow Rate ( v ), veh/h				96	604		88	320	315	590	199		50	68		
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1647		1674	1730	1696	1652	1373		1447	1730		
Queue Service Time ( g s ), s				6.9	9.5		6.2	9.9	10.1	20.9	14.7		4.1	4.3		
Cycle Queue Clearance Time ( g c ), s				6.9	9.5		6.2	9.9	10.1	20.9	14.7		4.1	4.3		
Green Ratio ( g/C )				0.07	0.50		0.07	0.50	0.50	0.20	0.29		0.04	0.13		
Capacity ( c ), veh/h				118	1661		109	862	761	663	329		60	226		
Volume-to-Capacity Ratio ( X )				0.815	0.364		0.805	0.372	0.413	0.890	0.605		0.827	0.301		
Back of Queue ( Q ), ft/ln ( 50 th percentile)				76.1	82.8		69	94.3	107.2	227.6	150.2		48.2	48.1		
Back of Queue ( Q ), veh/ln ( 50 th percentile)				2.9	3.2		2.7	3.6	3.7	9.0	5.2		1.7	1.8		
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Uniform Delay ( d 1 ), s/veh				53.5	12.3		54.0	12.8	12.0	46.7	36.8		57.1	49.9		
Incremental Delay ( d 2 ), s/veh				5.1	0.6		5.1	1.2	1.7	6.2	2.3		10.1	0.3		
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Control Delay ( d ), s/veh				58.6	12.9		59.2	14.1	13.7	52.9	39.0		67.2	50.2		
Level of Service ( LOS )				E	B		E	B	B	D	D		E	D		
Approach Delay, s/veh / LOS				19.2		B	19.4		B	49.4		D	57.4		E	
Intersection Delay, s/veh / LOS				31.4						C						
Multimodal Results				EB			WB			NB			SB			
Pedestrian LOS Score / LOS				2.60		C	2.24		B	2.75		C	3.54		D	
Bicycle LOS Score / LOS				2.14		B	2.16		B	2.86		C	1.75		B	

## EXHIBIT 21

### YEAR 2029 PEAK PM HOUR TRAFFIC – Industrial/Sandford Fleming

HCS7 Signalized Intersection Results Summary															
General Information							Intersection Information								
Agency							Duration, h		0.25						
Analyst							Analysis Date		11/22/2017		Area Type		Other		
Jurisdiction							Time Period		Peak PM Hour		PHF		1.00		
Urban Street		200, 230 & 260 Streamli...					Analysis Year		2029		Analysis Period		1> 7:00		
Intersection		Sandford/Industrial					File Name		2029_tot_pm.xus						
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				108	831		131	1043	38	792	86	94	62	124	
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	On	Green	7.8	1.8	44.6	6.3	19.2	10.5					
Force Mode	Float	Simult. Gap N/S	On	Yellow	3.7	0.0	3.7	3.3	3.3	3.3					
				Red	2.2	0.0	2.2	2.7	2.7	2.7					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2	1	6	7	4	3	8				
Case Number				2.0	4.0	1.1	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				15.5	52.3	13.7	50.5	37.5	41.8	12.3	16.5				
Change Period, ( Y+R c ), s				5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0				
Max Allow Headway ( MAH ), s				3.1	0.0	3.1	0.0	3.1	3.2	3.1	3.2				
Queue Clearance Time ( g s ), s				9.7		7.7		29.9	12.6	7.1	10.4				
Green Extension Time ( g e ), s				0.1	0.0	0.2	0.0	1.6	0.3	0.1	0.2				
Phase Call Probability				0.97		0.99		1.00	1.00	0.87	1.00				
Max Out Probability				0.00		0.00		0.06	0.08	0.00	0.01				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2		1	6	16	7	4	14	3	8	
Adjusted Flow Rate ( v ), veh/h				108	831		131	545	536	792	180		62	124	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1647	1674		1701	1772	1743	1652	1545		1447	1660	
Queue Service Time ( g s ), s				7.7	18.7		5.7	27.5	27.6	27.9	10.6		5.1	8.4	
Cycle Queue Clearance Time ( g c ), s				7.7	18.7		5.7	27.5	27.6	27.9	10.6		5.1	8.4	
Green Ratio ( g/C )				0.08	0.44		0.44	0.42	0.42	0.26	0.35		0.05	0.14	
Capacity ( c ), veh/h				131	1459		313	746	648	868	460		76	228	
Volume-to-Capacity Ratio ( X )				0.822	0.570		0.419	0.731	0.828	0.913	0.391		0.819	0.543	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				84.8	164.4		55.3	279.2	340.4	309.4	103.8		58.3	94	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				3.3	6.4		2.2	11.0	11.7	12.3	4.0		2.0	3.5	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay ( d 1 ), s/veh				52.8	19.6		22.0	23.2	21.5	42.9	30.1		56.3	51.0	
Incremental Delay ( d 2 ), s/veh				4.8	1.6		0.3	6.2	11.6	9.1	0.2		7.9	0.7	
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh				57.6	21.2		22.3	29.4	33.1	52.0	30.3		64.2	51.7	
Level of Service (LOS)				E	C		C	C	C	D	C		E	D	
Approach Delay, s/veh / LOS				25.4		C	30.3		C	48.0		D	55.9		E
Intersection Delay, s/veh / LOS				35.5						D					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.70		C	2.27		B	2.95		C	3.93		D
Bicycle LOS Score / LOS				2.33		B	2.56		C	3.16		C	1.87		B

### HCS7 Signalized Intersection Results Summary

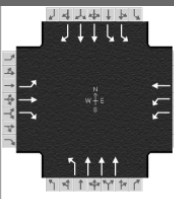
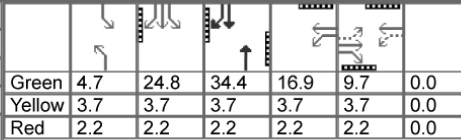
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### HCS7 Signalized Intersection Results Summary

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## EXHIBIT 24 YEAR 2025 PEAK AM HOUR TRAFFIC – Industrial/Riverside

HCS7 Signalized Intersection Results Summary															
General Information							Intersection Information								
Agency							Duration, h		0.25						
Analyst				Analysis Date		12/19/2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2025		Analysis Period		1> 7:00					
Intersection		Industrial/Riverside		File Name		2025_tot_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				33	20	53	485	9		52	1179		981	1181	320
Signal Information															
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	No	Simult. Gap E/W	Off												
Force Mode	Fixed	Simult. Gap N/S	Off												
Green	4.7	24.8	34.4	16.9	9.7	0.0									
Yellow	3.7	3.7	3.7	3.7	3.7	0.0									
Red	2.2	2.2	2.2	2.2	2.2	0.0									
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					8	7	4	1	6	5	2				
Case Number					5.3	1.0	4.0	2.0	4.0	2.0	3.0				
Phase Duration, s					15.6	22.8	38.4	10.6	40.3	41.3	71.0				
Change Period, ( Y+R c ), s					5.9	5.9	5.9	5.9	5.9	5.9	5.9				
Max Allow Headway ( MAH ), s					3.2	3.1	3.0	3.1	0.0	3.1	0.0				
Queue Clearance Time ( g s ), s					4.7	16.1	2.6	5.7		35.2					
Green Extension Time ( g e ), s					0.0	0.8	0.0	0.0	0.0	0.2	0.0				
Phase Call Probability					0.92	1.00	1.00	0.82		1.00					
Max Out Probability					0.01	0.03	0.00	0.04		1.00					
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	7	4		1	6		5	2	12
Adjusted Flow Rate ( v ), veh/h				33	20	23	485	9		52	1179		981	1181	120
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1368	1589	1006	1613	1309		1674	1596		1652	1687	1466
Queue Service Time ( g s ), s				2.7	1.4	2.6	14.1	0.6		3.7	28.0		33.2	29.6	4.9
Cycle Queue Clearance Time ( g c ), s				2.7	1.4	2.6	14.1	0.6		3.7	28.0		33.2	29.6	4.9
Green Ratio ( g/C )				0.08	0.08	0.08	0.34	0.27		0.04	0.29		0.34	0.54	0.54
Capacity ( c ), veh/h				171	129	82	1058	355		66	1371		1137	1829	795
Volume-to-Capacity Ratio ( X )				0.193	0.155	0.282	0.458	0.025		0.792	0.860		0.863	0.646	0.151
Back of Queue ( Q ), ft/ln ( 50 th percentile)				24.2	15.7	21	138.4	6.1		43	296.5		351.5	286.4	42.9
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.9	0.6	0.7	5.4	0.2		1.7	11.6		13.9	11.3	1.6
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00
Uniform Delay ( d 1 ), s/veh				51.9	51.3	51.8	31.1	32.1		57.2	40.5		36.7	19.4	13.7
Incremental Delay ( d 2 ), s/veh				0.2	0.2	0.7	0.1	0.0		7.7	7.2		6.6	1.8	0.4
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Control Delay ( d ), s/veh				52.1	51.5	52.5	31.2	32.1		64.9	47.8		43.3	21.1	14.1
Level of Service ( LOS)				D	D	D	C	C		E	D		D	C	B
Approach Delay, s/veh / LOS				52.1		D	31.2		C	48.5		D	30.3		C
Intersection Delay, s/veh / LOS				36.3						D					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.47		B	3.01		C	2.29		B	2.13		B
Bicycle LOS Score / LOS				0.61		A	1.30		A	1.16		A	2.37		B

### HCS7 Signalized Intersection Results Summary

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### HCS7 Signalized Intersection Results Summary

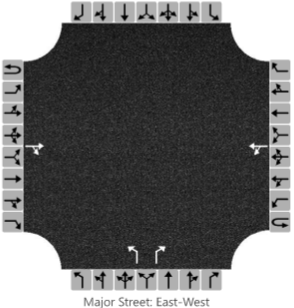
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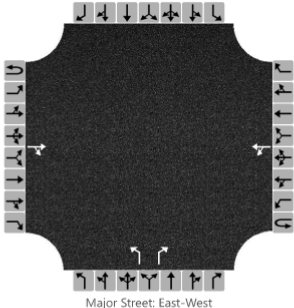
### HCS7 Signalized Intersection Results Summary

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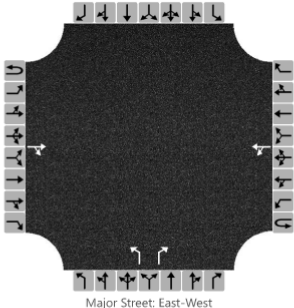
## EXHIBIT 28 EXISTING 2013 PEAK AM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst								Intersection	Terminal/Railmarket									
Agency/Co.								Jurisdiction										
Date Performed	11/22/2017							East/West Street	Terminal Avenue									
Analysis Year	2013							North/South Street	Railmarket Private									
Time Analyzed	Peak AM Hour							Peak Hour Factor	0.90									
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25									
Project Description	OTY Residential Development																	
<b>Lanes</b>																		
 <p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1			0	0	0
Configuration				TR			LT				L		R					
Volume, V (veh/h)			127	18			37	279			15		25					
Percent Heavy Vehicles (%)							1				1		1					
Proportion Time Blocked																		
Percent Grade (%)									0									
Right Turn Channelized	No				No				No				No					
Median Type/Storage	Undivided																	
<b>Critical and Follow-up Headways</b>																		
Base Critical Headway (sec)																		
Critical Headway (sec)																		
Base Follow-Up Headway (sec)																		
Follow-Up Headway (sec)																		
<b>Delay, Queue Length, and Level of Service</b>																		
Flow Rate, v (veh/h)						41					17		28					
Capacity, c (veh/h)						1424					488		898					
v/c Ratio						0.03					0.03		0.03					
95% Queue Length, Q <sub>95</sub> (veh)						0.1					0.1		0.1					
Control Delay (s/veh)						7.6					12.6		9.1					
Level of Service, LOS						A					B		A					
Approach Delay (s/veh)					1.1				10.5									
Approach LOS									B									

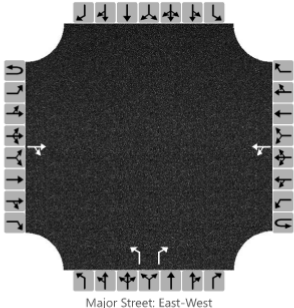
## EXHIBIT 29 EXISTING 2013 PEAK PM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Terminal/Railmarket								
Agency/Co.								Jurisdiction									
Date Performed	11/22/2017							East/West Street	Terminal Avenue								
Analysis Year	2013							North/South Street	Railmarket Private								
Time Analyzed	Peak PM Hour							Peak Hour Factor	0.90								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	OTY Residential Development																
<b>Lanes</b>																	
 <p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1		0	0	0
Configuration				TR		LT					L		R				
Volume, V (veh/h)			289	70		87	220				76		98				
Percent Heavy Vehicles (%)						1					1		1				
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)						97					84		109				
Capacity, c (veh/h)						1165					327		687				
v/c Ratio						0.08					0.26		0.16				
95% Queue Length, Q <sub>95</sub> (veh)						0.3					1.0		0.6				
Control Delay (s/veh)						8.4					19.8		11.2				
Level of Service, LOS						A					C		B				
Approach Delay (s/veh)					2.9				15.0								
Approach LOS									B								

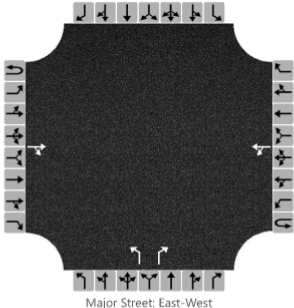
## EXHIBIT 30 YEAR 2025 PEAK AM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Terminal/Railmarket								
Agency/Co.								Jurisdiction									
Date Performed	11/22/2017							East/West Street	Terminal Avenue								
Analysis Year	2025							North/South Street	Railmarket Private								
Time Analyzed	Peak AM Hour							Peak Hour Factor	1.00								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	OTY Residential Development																
<b>Lanes</b>																	
 <p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1			0	0
Configuration				TR		LT					L		R				
Volume, V (veh/h)			162	22		42	373				27		28				
Percent Heavy Vehicles (%)						1					1		1				
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)						42					27		28				
Capacity, c (veh/h)						1396					434		873				
v/c Ratio						0.03					0.06		0.03				
95% Queue Length, Q <sub>95</sub> (veh)						0.1					0.2		0.1				
Control Delay (s/veh)						7.7					13.9		9.3				
Level of Service, LOS						A					B		A				
Approach Delay (s/veh)					1.0				11.5								
Approach LOS									B								

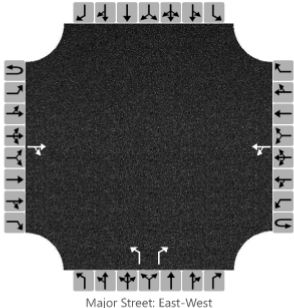
## EXHIBIT 31 YEAR 2025 PEAK PM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst								Intersection	Terminal/Railmarket									
Agency/Co.								Jurisdiction										
Date Performed	11/22/2017							East/West Street	Terminal Avenue									
Analysis Year	2025							North/South Street	Railmarket Private									
Time Analyzed	Peak PM Hour							Peak Hour Factor	1.00									
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25									
Project Description	OTY Residential Development																	
<b>Lanes</b>																		
 <p style="font-size: small; margin-top: 5px;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1			0	0	0
Configuration				TR		LT					L		R					
Volume, V (veh/h)			379	87		98	269				87		110					
Percent Heavy Vehicles (%)						1					1		1					
Proportion Time Blocked																		
Percent Grade (%)									0									
Right Turn Channelized	No				No				No				No					
Median Type/Storage	Undivided																	
<b>Critical and Follow-up Headways</b>																		
Base Critical Headway (sec)																		
Critical Headway (sec)																		
Base Follow-Up Headway (sec)																		
Follow-Up Headway (sec)																		
<b>Delay, Queue Length, and Level of Service</b>																		
Flow Rate, v (veh/h)						98					87		110					
Capacity, c (veh/h)						1100					287		634					
v/c Ratio						0.09					0.30		0.17					
95% Queue Length, Q <sub>95</sub> (veh)						0.3					1.2		0.6					
Control Delay (s/veh)						8.6					22.9		11.9					
Level of Service, LOS						A					C		B					
Approach Delay (s/veh)					3.0				16.7									
Approach LOS									C									

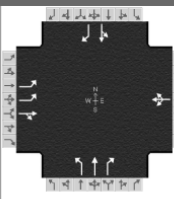
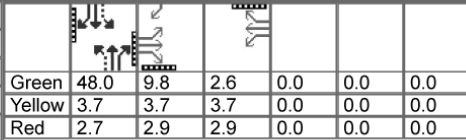
## EXHIBIT 32 YEAR 2029 PEAK AM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst								Intersection	Terminal/Railmarket								
Agency/Co.								Jurisdiction									
Date Performed	11/22/2017							East/West Street	Terminal Avenue								
Analysis Year	2029							North/South Street	Railmarket Private								
Time Analyzed	Peak AM Hour							Peak Hour Factor	1.00								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	OTY Residential Development																
<b>Lanes</b>																	
 <p style="font-size: small; text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1			0	0
Configuration				TR		LT					L		R				
Volume, V (veh/h)			185	23		44	386				28		29				
Percent Heavy Vehicles (%)						1					1		1				
Proportion Time Blocked																	
Percent Grade (%)									0								
Right Turn Channelized	No				No				No				No				
Median Type/Storage	Undivided																
<b>Critical and Follow-up Headways</b>																	
Base Critical Headway (sec)																	
Critical Headway (sec)																	
Base Follow-Up Headway (sec)																	
Follow-Up Headway (sec)																	
<b>Delay, Queue Length, and Level of Service</b>																	
Flow Rate, v (veh/h)						44					28		29				
Capacity, c (veh/h)						1369					410		848				
v/c Ratio						0.03					0.07		0.03				
95% Queue Length, Q <sub>95</sub> (veh)						0.1					0.2		0.1				
Control Delay (s/veh)						7.7					14.4		9.4				
Level of Service, LOS						A					B		A				
Approach Delay (s/veh)					1.1				11.9								
Approach LOS									B								

## EXHIBIT 33 YEAR 2029 PEAK PM HOUR TRAFFIC – Terminal/Railmarket

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst								Intersection	Terminal/Railmarket									
Agency/Co.								Jurisdiction										
Date Performed	11/22/2017							East/West Street	Terminal Avenue									
Analysis Year	2029							North/South Street	Railmarket Private									
Time Analyzed	Peak PM Hour							Peak Hour Factor	1.00									
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25									
Project Description	OTY Residential Development																	
<b>Lanes</b>																		
 <p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			1	0	1			0	0	0
Configuration				TR		LT					L		R					
Volume, V (veh/h)			396	90		102	293				91		115					
Percent Heavy Vehicles (%)						1					1		1					
Proportion Time Blocked																		
Percent Grade (%)									0									
Right Turn Channelized	No				No				No				No					
Median Type/Storage	Undivided																	
<b>Critical and Follow-up Headways</b>																		
Base Critical Headway (sec)																		
Critical Headway (sec)																		
Base Follow-Up Headway (sec)																		
Follow-Up Headway (sec)																		
<b>Delay, Queue Length, and Level of Service</b>																		
Flow Rate, v (veh/h)						102					91		115					
Capacity, c (veh/h)						1082					267		618					
v/c Ratio						0.09					0.34		0.19					
95% Queue Length, Q <sub>95</sub> (veh)						0.3					1.5		0.7					
Control Delay (s/veh)						8.7					25.3		12.1					
Level of Service, LOS						A					D		B					
Approach Delay (s/veh)					3.0				18.0									
Approach LOS									C									

## EXHIBIT 34 EXISTING 2014 PEAK AM HOUR TRAFFIC – Terminal/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		0.90									
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2014		Analysis Period		1> 7:00									
Intersection		Traintards/Terminal		File Name		2014_ex_am.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				65	15	36	7	3	1	79	82	21	1	57	168				
Signal Information							Cycle, s		80.0	Reference Phase		2							
Offset, s		0	Reference Point				Begin												
Uncoordinated		No	Simult. Gap E/W				On												
Force Mode		Fixed	Simult. Gap N/S				On												
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						16.4				9.2				54.4				54.4	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.2				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						4.4				2.6									
Green Extension Time ( g e ), s						0.2				0.0				0.0				0.0	
Phase Call Probability						0.94				0.24									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				72	51			12		88	91	1		64	20				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1600	1546			1717		1301	1688	1477		1686	1339				
Queue Service Time ( g s ), s				1.6	2.4			0.6		2.0	1.8	0.0		0.0	0.3				
Cycle Queue Clearance Time ( g c ), s				1.6	2.4			0.6		3.3	1.8	0.0		1.3	0.3				
Green Ratio ( g/C )				0.12	0.12			0.03		0.60	0.60	0.60		0.60	0.72				
Capacity ( c ), veh/h				390	189			56		945	1013	887		1180	968				
Volume-to-Capacity Ratio ( X )				0.185	0.271			0.218		0.093	0.090	0.001		0.055	0.021				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				15.9	22.2			5.9		12.4	16.1	0.2		9.9	2				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.6	0.9			0.2		0.5	0.6	0.0		0.4	0.1				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d 1 ), s/veh				31.5	31.9			37.7		5.1	5.6	6.4		5.5	3.1				
Incremental Delay ( d 2 ), s/veh				0.1	0.3			0.7		0.2	0.2	0.0		0.1	0.0				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.6	32.2			38.4		5.2	5.8	6.4		5.6	3.2				
Level of Service ( LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.9		C	38.4		D	5.5		A	5.0		A				
Intersection Delay, s/veh / LOS				14.5						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.14		B	2.32		B	1.69		B	2.11		B				
Bicycle LOS Score / LOS				0.69		A	0.51		A	0.78		A	0.63		A				



## EXHIBIT 35

### EXISTING 2014 PEAK PM HOUR TRAFFIC – Terminal/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak PM Hour		PHF		0.90									
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2014		Analysis Period		1> 7:00									
Intersection		Traintards/Terminal		File Name		2014_ex_pm.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				99	2	53	4	1	0	41	117	8	4	105	187				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Green	48.8	10.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Yellow	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Red	2.7	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						17.4				7.4				55.2				55.2	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.2				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						4.7				2.3									
Green Extension Time ( g e ), s						0.3				0.0				0.0				0.0	
Phase Call Probability						0.97				0.12									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				110	56			6		46	130	3		121	41				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1470	1479			1731		1284	1730	1519		1720	1226				
Queue Service Time ( g s ), s				2.7	2.7			0.3		1.0	2.5	0.1		0.0	0.7				
Cycle Queue Clearance Time ( g c ), s				2.7	2.7			0.3		3.3	2.5	0.1		2.3	0.7				
Green Ratio ( g/C )				0.13	0.13			0.01		0.61	0.61	0.61		0.61	0.74				
Capacity ( c ), veh/h				395	199			18		929	1055	927		1220	913				
Volume-to-Capacity Ratio ( X )				0.278	0.279			0.304		0.049	0.123	0.004		0.099	0.045				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				26	23.8			3.1		6.1	22.2	0.5		18.1	4				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.9	0.9			0.1		0.2	0.9	0.0		0.7	0.1				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d r ), s/veh				31.1	31.1			39.3		5.0	5.4	6.1		5.4	2.7				
Incremental Delay ( d z ), s/veh				0.1	0.3			3.4		0.1	0.2	0.0		0.2	0.1				
Initial Queue Delay ( d s ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.3	31.4			42.7		5.1	5.7	6.1		5.5	2.8				
Level of Service (LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.3	C		42.7	D		5.5	A		4.8	A					
Intersection Delay, s/veh / LOS				14.1						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.12	B		2.32	B		1.69	B		2.11	B					
Bicycle LOS Score / LOS				0.76	A		0.50	A		0.78	A		0.76	A					

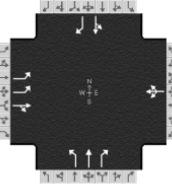
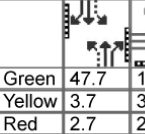

## EXHIBIT 36 YEAR 2025 PEAK AM HOUR TRAFFIC – Terminal/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst							Area Type		Other										
Jurisdiction							Time Period		Peak AM Hour										
Urban Street		200, 230 & 260 Steamli...					Analysis Year		2025										
Intersection		Traintards/Terminal					Analysis Period		1> 7:00										
Project Description		OTY Residential Development					File Name		2025_tot_am.xus										
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				88	17	45	8	3	1	125	92	23	1	64	209				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Green	47.8	10.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Yellow	3.7	3.7	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Red	2.7	2.9	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						16.6				9.2				54.2				54.2	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.2				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						4.7				2.5									
Green Extension Time ( g e ), s						0.2				0.0				0.0				0.0	
Phase Call Probability						0.96				0.23									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				88	57			12		125	92	3		65	59				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1600	1538			1717		1300	1688	1477		1686	1339				
Queue Service Time ( g s ), s				2.0	2.7			0.5		2.9	1.9	0.1		0.0	1.0				
Cycle Queue Clearance Time ( g c ), s				2.0	2.7			0.5		4.2	1.9	0.1		1.3	1.0				
Green Ratio ( g/C )				0.13	0.13			0.03		0.60	0.60	0.60		0.60	0.72				
Capacity ( c ), veh/h				400	192			55		941	1009	883		1176	969				
Volume-to-Capacity Ratio ( X )				0.220	0.296			0.217		0.133	0.091	0.003		0.055	0.061				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				19.3	24.8			5.8		18.4	16.4	0.5		10.1	6.1				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.7	1.0			0.2		0.7	0.6	0.0		0.4	0.2				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d 1 ), s/veh				31.5	31.8			37.7		5.3	5.7	6.5		5.5	3.2				
Incremental Delay ( d 2 ), s/veh				0.1	0.3			0.7		0.3	0.2	0.0		0.1	0.1				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.6	32.1			38.4		5.6	5.9	6.5		5.6	3.3				
Level of Service (LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.8	C		38.4	D		5.7	A		4.5		A				
Intersection Delay, s/veh / LOS				13.8						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.14	B		2.32	B		1.69	B		2.11	B					
Bicycle LOS Score / LOS				0.73	A		0.51	A		0.85	A		0.69	A					

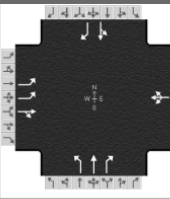
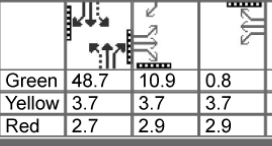
## EXHIBIT 37 YEAR 2025 PEAK PM HOUR TRAFFIC – Terminal/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2025		Analysis Period		1> 7:00									
Intersection		Traintards/Terminal		File Name		2025_tot_pm.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				131	2	91	4	1	0	53	131	9	4	117	223				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Green	48.7	10.9	0.8	0.0	0.0	0.0	0.0												
Yellow	3.7	3.7	3.7	0.0	0.0	0.0	0.0												
Red	2.7	2.9	2.9	0.0	0.0	0.0	0.0												
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						17.5				7.4				55.1				55.1	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.3				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						6.4				2.2									
Green Extension Time ( g e ), s						0.4				0.0				0.0				0.0	
Phase Call Probability						0.99				0.11									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				131	88			5		53	131	4		121	73				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1470	1475			1731		1284	1730	1519		1722	1226				
Queue Service Time ( g s ), s				3.2	4.4			0.2		1.2	2.6	0.1		0.0	1.3				
Cycle Queue Clearance Time ( g c ), s				3.2	4.4			0.2		3.5	2.6	0.1		2.3	1.3				
Green Ratio ( g/C )				0.14	0.14			0.01		0.61	0.61	0.61		0.61	0.75				
Capacity ( c ), veh/h				401	201			17		927	1053	925		1219	914				
Volume-to-Capacity Ratio ( X )				0.327	0.437			0.292		0.057	0.124	0.004		0.099	0.080				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				31.1	38.7			2.8		7.2	22.5	0.6		18.2	7.1				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				1.1	1.5			0.1		0.3	0.9	0.0		0.7	0.2				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d 1 ), s/veh				31.2	31.7			39.3		5.1	5.5	6.1		5.4	2.8				
Incremental Delay ( d 2 ), s/veh				0.2	0.6			3.4		0.1	0.2	0.0		0.2	0.2				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.4	32.3			42.8		5.2	5.7	6.1		5.6	2.9				
Level of Service (LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.8	C		42.8	D		5.6	A		4.6	A					
Intersection Delay, s/veh / LOS				15.0						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.12	B		2.32	B		1.69	B		2.11	B					
Bicycle LOS Score / LOS				0.85	A		0.50	A		0.80	A		0.81	A					

## EXHIBIT 38 YEAR 2029 PEAK AM HOUR TRAFFIC – Terminal/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2029		Analysis Period		1> 7:00									
Intersection		Traintards/Terminal		File Name		2029_tot_am.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				97	18	57	8	3	1	128	96	24	1	67	218				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Green	47.7	10.1	2.6	0.0	0.0	0.0	0.0												
Yellow	3.7	3.7	3.7	0.0	0.0	0.0	0.0												
Red	2.7	2.9	2.9	0.0	0.0	0.0	0.0												
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						16.7				9.2				54.1				54.1	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.2				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						5.4				2.5									
Green Extension Time ( g e ), s						0.3				0.0				0.0				0.0	
Phase Call Probability						0.98				0.23									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				97	70			12		128	96	4		68	68				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1600	1526			1717		1297	1688	1477		1686	1339				
Queue Service Time ( g s ), s				2.2	3.4			0.5		3.1	1.9	0.1		0.0	1.2				
Cycle Queue Clearance Time ( g c ), s				2.2	3.4			0.5		4.4	1.9	0.1		1.3	1.2				
Green Ratio ( g/C )				0.13	0.13			0.03		0.60	0.60	0.60		0.60	0.72				
Capacity ( c ), veh/h				406	194			55		935	1006	880		1173	969				
Volume-to-Capacity Ratio ( X )				0.239	0.362			0.217		0.137	0.095	0.005		0.058	0.070				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				21.4	30.7			5.8		19.2	17.3	0.7		10.7	7.1				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.8	1.2			0.2		0.7	0.7	0.0		0.4	0.3				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d r ), s/veh				31.4	32.0			37.7		5.4	5.8	6.5		5.6	3.2				
Incremental Delay ( d z ), s/veh				0.1	0.4			0.7		0.3	0.2	0.0		0.1	0.1				
Initial Queue Delay ( d s ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.6	32.4			38.4		5.7	5.9	6.6		5.7	3.4				
Level of Service (LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.9	C		38.4	D		5.8	A		4.5		A				
Intersection Delay, s/veh / LOS				14.2						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.14	B		2.32	B		1.69	B		2.11	B					
Bicycle LOS Score / LOS				0.76	A		0.51	A		0.86	A		0.71	A					

## EXHIBIT 39 YEAR 2029 PEAK PM HOUR TRAFFIC – Terminal/Trainyards

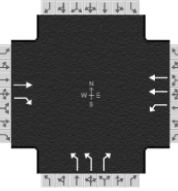
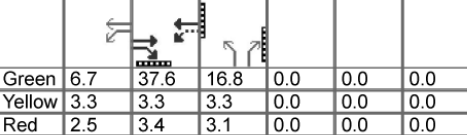

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst							Area Type		Other										
Jurisdiction							PHF		1.00										
Urban Street		200, 230 & 260 Steamli...					Analysis Year		2029										
Intersection		Traintards/Terminal					File Name		2029_tot_pm.xus										
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				139	2	94	4	1	0	64	136	9	4	122	237				
Signal Information							1		2		3		4						
Cycle, s	80.0	Reference Phase	2				5		6		7		8						
Offset, s	0	Reference Point	Begin				Green		Yellow		Red								
Uncoordinated	No	Simult. Gap E/W	On				48.7		10.9		0.8		0.0						
Force Mode	Fixed	Simult. Gap N/S	On				3.7		3.7		3.7		0.0						
				2.7		2.9		2.9		0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						8				4				2				6	
Case Number						10.0				12.0				5.0				7.0	
Phase Duration, s						17.5				7.4				55.1				55.1	
Change Period, ( Y+R c ), s						6.6				6.6				6.4				6.4	
Max Allow Headway ( MAH ), s						3.3				3.1				0.0				0.0	
Queue Clearance Time ( g s ), s						6.5				2.2									
Green Extension Time ( g e ), s						0.4				0.0				0.0				0.0	
Phase Call Probability						0.99				0.11									
Max Out Probability						0.00				0.00									
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				3	8	18	7	4	14	5	2	12	1	6	16				
Adjusted Flow Rate ( v ), veh/h				139	91			5		64	136	4		126	87				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1470	1475			1731		1278	1730	1519		1722	1226				
Queue Service Time ( g s ), s				3.4	4.5			0.2		1.5	2.7	0.1		0.0	1.6				
Cycle Queue Clearance Time ( g c ), s				3.4	4.5			0.2		3.9	2.7	0.1		2.4	1.6				
Green Ratio ( g/C )				0.14	0.14			0.01		0.61	0.61	0.61		0.61	0.75				
Capacity ( c ), veh/h				402	202			17		921	1053	924		1219	914				
Volume-to-Capacity Ratio ( X )				0.346	0.452			0.292		0.069	0.129	0.004		0.103	0.095				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				33.1	40.1			2.8		8.8	23.4	0.6		19	8.7				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				1.2	1.6			0.1		0.4	0.9	0.0		0.7	0.3				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00			0.00		0.00	0.00	0.00		0.00	0.00				
Uniform Delay ( d 1 ), s/veh				31.3	31.8			39.3		5.1	5.5	6.1		5.4	2.8				
Incremental Delay ( d 2 ), s/veh				0.2	0.6			3.4		0.1	0.3	0.0		0.2	0.2				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0			0.0		0.0	0.0	0.0		0.0	0.0				
Control Delay ( d ), s/veh				31.5	32.4			42.8		5.3	5.8	6.2		5.6	3.0				
Level of Service (LOS)				C	C			D		A	A	A		A	A				
Approach Delay, s/veh / LOS				31.8	C		42.8	D		5.6	A		4.5	A					
Intersection Delay, s/veh / LOS				14.8						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.12	B		2.32	B		1.69	B		2.11	B					
Bicycle LOS Score / LOS				0.87	A		0.50	A		0.82	A		0.84	A					



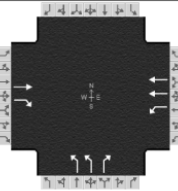
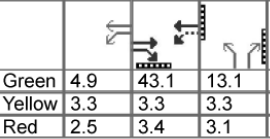

## EXHIBIT 40 EXISTING 2010 PEAK AM HOUR TRAFFIC – Trainyards/Belfast

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		0.90									
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2010		Analysis Period		1> 7:00									
Intersection		Trainyards/Belfast		File Name		2010_ex_am.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h					214	139	156	191		111		155							
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	Off																
Force Mode	Float	Simult. Gap N/S	Off																
				Green	4.9	44.1	12.1	0.0	0.0	0.0	0.0								
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0	0.0								
				Red	2.5	3.4	3.1	0.0	0.0	0.0	0.0								
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						2		1		6				8					
Case Number						7.3		1.0		4.0				9.0					
Phase Duration, s						50.8		10.7		61.5				18.5					
Change Period, ( Y+R c ), s						6.7		5.8		6.7				6.4					
Max Allow Headway ( MAH ), s						0.0		3.1		0.0				3.3					
Queue Clearance Time ( g s ), s								4.0						11.3					
Green Extension Time ( g e ), s						0.0		0.2		0.0				0.6					
Phase Call Probability								0.98						1.00					
Max Out Probability								0.00						0.00					
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement					2	12	1	6		3		18							
Adjusted Flow Rate ( v ), veh/h					238	43	173	212		123		172							
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1465	1647	1674		1584		1425							
Queue Service Time ( g s ), s					5.6	1.1	2.0	1.7		2.8		9.3							
Cycle Queue Clearance Time ( g c ), s					5.6	1.1	2.0	1.7		2.8		9.3							
Green Ratio ( g/C )					0.55	0.55	0.78	0.69		0.15		0.15							
Capacity ( c ), veh/h					970	808	928	2294		478		215							
Volume-to-Capacity Ratio ( X )					0.245	0.054	0.187	0.093		0.258		0.801							
Back of Queue ( Q ), ft/ln ( 50 th percentile)					52.3	8.7	8.8	11.9		26.5		84.3							
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.0	0.3	0.3	0.5		1.0		3.2							
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00							
Uniform Delay ( d 1 ), s/veh					9.3	8.3	2.5	4.2		30.0		32.8							
Incremental Delay ( d 2 ), s/veh					0.6	0.1	0.0	0.1		0.1		2.6							
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0							
Control Delay ( d ), s/veh					9.9	8.4	2.6	4.3		30.1		35.4							
Level of Service ( LOS )					A	A	A	A		C		D							
Approach Delay, s/veh / LOS				9.7	A		3.5	A		33.2	C		0.0						
Intersection Delay, s/veh / LOS				14.4						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.32	B		0.84	A		2.49	B		2.51	C					
Bicycle LOS Score / LOS				2.02	B		1.88	B			F								

## EXHIBIT 41 EXISTING 2010 PEAK PM HOUR TRAFFIC – Trainyards/Belfast

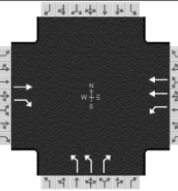
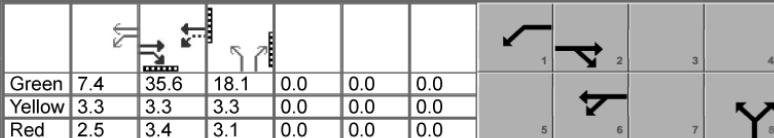

HCS7 Signalized Intersection Results Summary																		
General Information								Intersection Information										
Agency								Duration, h		0.25								
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other								
Jurisdiction				Time Period		Peak PM Hour		PHF		0.90								
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2010		Analysis Period		1> 7:00								
Intersection		Trainyards/Belfast		File Name		2010_ex_pm.xus												
Project Description		OTY Residential Development																
Demand Information				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Demand ( v ), veh/h					192	237	249	210		270		227						
Signal Information																		
Cycle, s		80.0	Reference Phase													2		
Offset, s		0	Reference Point													Begin		
Uncoordinated		No	Simult. Gap E/W													Off		
Force Mode		Float	Simult. Gap N/S													Off		
				Green	6.7	37.6	16.8	0.0	0.0	0.0	0.0							
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0	0.0							
				Red	2.5	3.4	3.1	0.0	0.0	0.0	0.0							
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT							
Assigned Phase					2	1	6		8									
Case Number					7.3	1.0	4.0		9.0									
Phase Duration, s					44.3	12.5	56.8		23.2									
Change Period, ( Y+R c ), s					6.7	5.8	6.7		6.4									
Max Allow Headway ( MAH ), s					0.0	3.1	0.0		3.3									
Queue Clearance Time ( g s ), s						6.5			15.6									
Green Extension Time ( g e ), s					0.0	0.3	0.0		1.2									
Phase Call Probability						1.00			1.00									
Max Out Probability						0.11			0.00									
Movement Group Results				EB			WB			NB			SB					
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R			
Assigned Movement					2	12	1	6		3		18						
Adjusted Flow Rate ( v ), veh/h					213	152	277	233		300		252						
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1464	1647	1674		1588		1428						
Queue Service Time ( g s ), s					5.9	4.9	4.5	2.2		6.6		13.6						
Cycle Queue Clearance Time ( g c ), s					5.9	4.9	4.5	2.2		6.6		13.6						
Green Ratio ( g/C )					0.47	0.47	0.72	0.63		0.21		0.21						
Capacity ( c ), veh/h					826	688	883	2096		667		300						
Volume-to-Capacity Ratio ( X )					0.258	0.221	0.313	0.111		0.450		0.841						
Back of Queue ( Q ), ft/ln ( 50 th percentile)					58.5	42.1	26.3	17.5		62.7		120.3						
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.3	1.6	1.0	0.7		2.4		4.6						
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00						
Uniform Delay ( d 1 ), s/veh					12.8	12.6	4.2	6.0		27.6		30.3						
Incremental Delay ( d 2 ), s/veh					0.8	0.7	0.1	0.1		0.2		2.5						
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0						
Control Delay ( d ), s/veh					13.6	13.3	4.3	6.1		27.7		32.8						
Level of Service ( LOS )					B	B	A	A		C		C						
Approach Delay, s/veh / LOS				13.4	B		5.1	A		30.1	C		0.0					
Intersection Delay, s/veh / LOS				16.9						B								
Multimodal Results				EB			WB			NB			SB					
Pedestrian LOS Score / LOS				2.47	B		0.84	A		2.55	C		2.60	C				
Bicycle LOS Score / LOS				2.16	B		1.98	B		F								

## EXHIBIT 42 YEAR 2025 PEAK AM HOUR TRAFFIC – Trainyards/Belfast

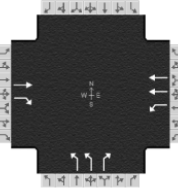
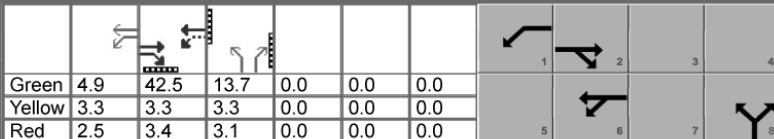
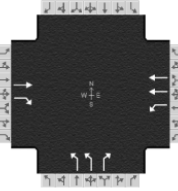
HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00					
Intersection		Trainyards/Belfast		File Name		2025_tot_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h					248	168	196	222		134		190			
Signal Information															
Cycle, s	80.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	Off												
Force Mode	Float	Simult. Gap N/S	Off												
				Green	4.9	43.1	13.1	0.0	0.0	0.0					
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0					
				Red	2.5	3.4	3.1	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					2	1	6		8						
Case Number					7.3	1.0	4.0		9.0						
Phase Duration, s					49.8	10.7	60.5		19.5						
Change Period, ( Y+R c ), s					6.7	5.8	6.7		6.4						
Max Allow Headway ( MAH ), s					0.0	3.1	0.0		3.3						
Queue Clearance Time ( g s ), s						4.5			12.3						
Green Extension Time ( g e ), s					0.0	0.2	0.0		0.7						
Phase Call Probability						0.99			1.00						
Max Out Probability						0.01			0.00						
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					2	12	1	6		3		18			
Adjusted Flow Rate ( v ), veh/h					248	68	196	222		134		190			
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1465	1647	1674		1585		1426			
Queue Service Time ( g s ), s					6.1	1.8	2.5	1.9		3.0		10.3			
Cycle Queue Clearance Time ( g c ), s					6.1	1.8	2.5	1.9		3.0		10.3			
Green Ratio ( g/C )					0.54	0.54	0.77	0.67		0.16		0.16			
Capacity ( c ), veh/h					947	789	902	2252		518		233			
Volume-to-Capacity Ratio ( X )					0.262	0.086	0.217	0.099		0.259		0.815			
Back of Queue ( Q ), ft/ln ( 50 th percentile)					57.4	14.5	11.6	13.3		28.3		92.6			
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.2	0.6	0.4	0.5		1.1		3.6			
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay ( d 1 ), s/veh					9.9	8.9	2.9	4.6		29.2		32.3			
Incremental Delay ( d 2 ), s/veh					0.7	0.2	0.0	0.1		0.1		2.6			
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay ( d ), s/veh					10.6	9.1	2.9	4.7		29.3		34.9			
Level of Service ( LOS )					B	A	A	A		C		C			
Approach Delay, s/veh / LOS				10.3	B		3.9	A		32.6	C		0.0		
Intersection Delay, s/veh / LOS				14.6						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.34	B		0.84	A		2.51	C		2.53	C	
Bicycle LOS Score / LOS				2.08	B		1.90	B			F				



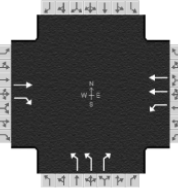
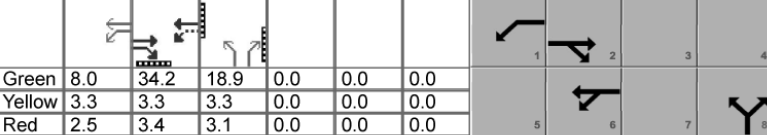
## EXHIBIT 43 YEAR 2025 PEAK PM HOUR TRAFFIC – Trainyards/Belfast

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00					
Intersection		Trainyards/Belfast		File Name		2025_tot_pm.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h					223	280	298	244		320		276			
Signal Information															
Cycle, s	80.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	Off												
Force Mode	Float	Simult. Gap N/S	Off												
				Green	7.4	35.6	18.1	0.0	0.0	0.0					
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0					
				Red	2.5	3.4	3.1	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					2	1	6		8						
Case Number					7.3	1.0	4.0		9.0						
Phase Duration, s					42.3	13.2	55.5		24.5						
Change Period, ( Y+R c ), s					6.7	5.8	6.7		6.4						
Max Allow Headway ( MAH ), s					0.0	3.1	0.0		3.3						
Queue Clearance Time ( g s ), s						7.2			16.8						
Green Extension Time ( g e ), s					0.0	0.3	0.0		1.2						
Phase Call Probability						1.00			1.00						
Max Out Probability						0.21			0.01						
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					2	12	1	6		3		18			
Adjusted Flow Rate ( v ), veh/h					223	180	298	244		320		276			
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1464	1647	1674		1589		1429			
Queue Service Time ( g s ), s					6.5	6.2	5.2	2.5		6.9		14.8			
Cycle Queue Clearance Time ( g c ), s					6.5	6.2	5.2	2.5		6.9		14.8			
Green Ratio ( g/C )					0.44	0.44	0.71	0.61		0.23		0.23			
Capacity ( c ), veh/h					781	651	856	2041		719		323			
Volume-to-Capacity Ratio ( X )					0.285	0.277	0.348	0.120		0.445		0.854			
Back of Queue ( Q ), ft/ln ( 50 th percentile)					65.5	54.2	32.2	19.6		65.5		136.1			
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.6	2.1	1.2	0.8		2.5		5.2			
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay ( d 1 ), s/veh					14.1	14.1	4.8	6.6		26.6		29.7			
Incremental Delay ( d 2 ), s/veh					0.9	1.1	0.1	0.1		0.2		4.7			
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay ( d ), s/veh					15.1	15.1	4.9	6.7		26.8		34.4			
Level of Service ( LOS )					B	B	A	A		C		C			
Approach Delay, s/veh / LOS				15.1	B		5.7	A		30.3	C		0.0		
Intersection Delay, s/veh / LOS				17.7						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.50	C		0.84	A		2.57	C		2.63	C	
Bicycle LOS Score / LOS				2.22	B		2.01	B		F					

## EXHIBIT 44 YEAR 2029 PEAK AM HOUR TRAFFIC – Trainyards/Belfast

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2029		Analysis Period		1> 7:00					
Intersection		Trainyards/Belfast		File Name		2029_tot_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h					258	175	204	231		141		201			
Signal Information															
Cycle, s	80.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	Off												
Force Mode	Float	Simult. Gap N/S	Off												
				Green	4.9	42.5	13.7	0.0	0.0	0.0					
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0					
				Red	2.5	3.4	3.1	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					2	1	6		8						
Case Number					7.3	1.0	4.0		9.0						
Phase Duration, s					49.2	10.7	59.9		20.1						
Change Period, ( Y+R c ), s					6.7	5.8	6.7		6.4						
Max Allow Headway ( MAH ), s					0.0	3.1	0.0		3.3						
Queue Clearance Time ( g s ), s						4.7			12.9						
Green Extension Time ( g e ), s					0.0	0.2	0.0		0.7						
Phase Call Probability						0.99			1.00						
Max Out Probability						0.01			0.00						
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					2	12	1	6		3		18			
Adjusted Flow Rate ( v ), veh/h					258	75	204	231		141		201			
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1465	1647	1674		1586		1426			
Queue Service Time ( g s ), s					6.5	2.0	2.7	2.0		3.1		10.9			
Cycle Queue Clearance Time ( g c ), s					6.5	2.0	2.7	2.0		3.1		10.9			
Green Ratio ( g/C )					0.53	0.53	0.76	0.67		0.17		0.17			
Capacity ( c ), veh/h					933	777	883	2226		543		244			
Volume-to-Capacity Ratio ( X )					0.277	0.096	0.231	0.104		0.260		0.823			
Back of Queue ( Q ), ft/ln ( 50 th percentile)					61.6	16.4	13.1	14.5		29.6		97.8			
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.4	0.6	0.5	0.6		1.1		3.8			
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay ( d 1 ), s/veh					10.3	9.3	3.1	4.8		28.8		32.0			
Incremental Delay ( d 2 ), s/veh					0.7	0.2	0.0	0.1		0.1		2.7			
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay ( d ), s/veh					11.1	9.5	3.2	4.9		28.8		34.6			
Level of Service ( LOS )					B	A	A	A		C		C			
Approach Delay, s/veh / LOS				10.7	B		4.1	A		32.3	C		0.0		
Intersection Delay, s/veh / LOS				14.8						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.35	B		0.84	A		2.53	C		2.54	C	
Bicycle LOS Score / LOS				2.11	B		1.92	B			F				

## EXHIBIT 45 YEAR 2029 PEAK PM HOUR TRAFFIC – Trainyards/Belfast

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2029		Analysis Period		1> 7:00					
Intersection		Trainyards/Belfast		File Name		2029_tot_pm.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h					232	293	313	254		334		291			
Signal Information															
Cycle, s	80.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	Off												
Force Mode	Float	Simult. Gap N/S	Off												
				Green	8.0	34.2	18.9	0.0	0.0	0.0	0.0				
				Yellow	3.3	3.3	3.3	0.0	0.0	0.0	0.0				
				Red	2.5	3.4	3.1	0.0	0.0	0.0	0.0				
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					2	1	6		8						
Case Number					7.3	1.0	4.0		9.0						
Phase Duration, s					40.9	13.8	54.7		25.3						
Change Period, ( Y+R c ), s					6.7	5.8	6.7		6.4						
Max Allow Headway ( MAH ), s					0.0	3.1	0.0		3.3						
Queue Clearance Time ( g s ), s						7.7			17.6						
Green Extension Time ( g e ), s					0.0	0.3	0.0		1.3						
Phase Call Probability						1.00			1.00						
Max Out Probability						0.33			0.02						
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement					2	12	1	6		3		18			
Adjusted Flow Rate ( v ), veh/h					232	193	313	254		334		291			
Adjusted Saturation Flow Rate ( s ), veh/h/ln					1758	1464	1647	1674		1590		1429			
Queue Service Time ( g s ), s					7.0	7.0	5.7	2.6		7.2		15.6			
Cycle Queue Clearance Time ( g c ), s					7.0	7.0	5.7	2.6		7.2		15.6			
Green Ratio ( g/C )					0.43	0.43	0.70	0.60		0.24		0.24			
Capacity ( c ), veh/h					752	626	836	2007		752		338			
Volume-to-Capacity Ratio ( X )					0.309	0.308	0.374	0.127		0.444		0.861			
Back of Queue ( Q ), ft/ln ( 50 th percentile)					71.4	61.2	36.6	21.3		67.6		146.7			
Back of Queue ( Q ), veh/ln ( 50 th percentile)					2.8	2.4	1.4	0.8		2.6		5.6			
Queue Storage Ratio ( RQ ) ( 50 th percentile)					0.00	0.00	0.00	0.00		0.00		0.00			
Uniform Delay ( d 1 ), s/veh					15.1	15.1	5.2	6.9		26.0		29.3			
Incremental Delay ( d 2 ), s/veh					1.1	1.3	0.1	0.1		0.2		6.2			
Initial Queue Delay ( d 3 ), s/veh					0.0	0.0	0.0	0.0		0.0		0.0			
Control Delay ( d ), s/veh					16.2	16.4	5.3	7.1		26.2		35.5			
Level of Service ( LOS )					B	B	A	A		C		D			
Approach Delay, s/veh / LOS				16.3	B		6.1	A		30.5	C		0.0		
Intersection Delay, s/veh / LOS				18.2						B					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.52	C		0.84	A		2.59	C		2.64	C	
Bicycle LOS Score / LOS				2.26	B		2.03	B		F					

## EXHIBIT 46

### EXISTING 2014 PEAK AM HOUR TRAFFIC – Trainyards/Railmarket

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		0.90									
Urban Street		200, 230 & 260 Steamli...			Analysis Year		2014		Analysis Period						1> 7:00				
Intersection		Traintards/Railmarket			File Name		2014_ex_am.xus												
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				16	27	53	31	22	21	73	66	23	23	106	31				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	Off																
Force Mode	Fixed	Simult. Gap N/S	Off																
				Green	2.2	2.0	49.2	8.9	0.0	0.0									
				Yellow	3.3	0.0	3.3	3.3	0.0	0.0									
				Red	2.5	0.0	2.9	2.4	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		1		6		5		2	
Case Number						6.0				6.0		1.1		4.0		1.1		3.0	
Phase Duration, s						14.6				14.6		10.0		57.4		8.0		55.4	
Change Period, ( Y+R c ), s						5.7				5.7		5.8		6.2		5.8		6.2	
Max Allow Headway ( MAH ), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time ( g s ), s						6.0				8.1		2.7				2.3			
Green Extension Time ( g e ), s						0.1				0.1		0.1		0.0		0.0		0.0	
Phase Call Probability						0.89				0.83		0.84				0.43			
Max Out Probability						0.00				0.00		0.00				0.00			
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	1	6	16	5	2	12				
Adjusted Flow Rate ( v ), veh/h				18	83		34	46		81	97		26	118	1				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1318	1564		1283	1635		1701	1684		1647	1660	1478				
Queue Service Time ( g s ), s				1.0	4.0		2.1	2.0		0.7	1.8		0.3	2.4	0.0				
Cycle Queue Clearance Time ( g c ), s				3.0	4.0		6.1	2.0		0.7	1.8		0.3	2.4	0.0				
Green Ratio ( g/C )				0.11	0.11		0.11	0.11		0.84	0.64		0.79	0.61	0.61				
Capacity ( c ), veh/h				204	175		169	183		1147	1078		1006	1020	908				
Volume-to-Capacity Ratio ( X )				0.087	0.477		0.203	0.249		0.071	0.090		0.025	0.115	0.001				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				8.2	38.7		16.6	19.8		1.1	14.1		1.1	20.5	0.2				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.3	1.5		0.6	0.8		0.0	0.6		0.0	0.8	0.0				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00				
Uniform Delay ( d 1 ), s/veh				33.8	33.3		36.2	32.5		1.2	5.5		2.2	6.4	5.9				
Incremental Delay ( d 2 ), s/veh				0.1	0.8		0.2	0.3		0.0	0.2		0.0	0.2	0.0				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0				
Control Delay ( d ), s/veh				33.9	34.1		36.4	32.7		1.3	5.7		2.2	6.6	5.9				
Level of Service ( LOS )				C	C		D	C		A	A		A	A	A				
Approach Delay, s/veh / LOS				34.1		C	34.3		C	3.7		A	5.8		A				
Intersection Delay, s/veh / LOS				15.3						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.92		B	2.15		B	1.92		B	1.92		B				
Bicycle LOS Score / LOS				0.65		A	0.62		A	0.78		A	0.73		A				

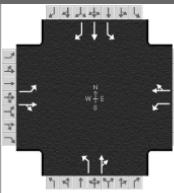

## EXHIBIT 47

### EXISTING 2014 PEAK PM HOUR TRAFFIC – Trainyards/Railmarket

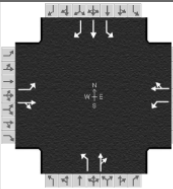
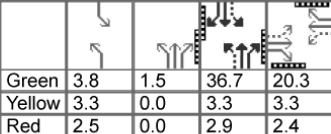

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst							Area Type		Other										
Jurisdiction		Time Period		Peak PM Hour			PHF		0.90										
Urban Street		200, 230 & 260 Steamli...			Analysis Year		2014		Analysis Period						1> 7:00				
Intersection		Traintards/Railmarket			File Name		2014_ex_pm.xus												
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				47	56	184	107	89	31	179	96	111	57	133	41				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	Off																
Force Mode	Fixed	Simult. Gap N/S	Off																
Green				3.8	1.5	36.7	20.3	0.0	0.0										
Yellow				3.3	0.0	3.3	3.3	0.0	0.0										
Red				2.5	0.0	2.9	2.4	0.0	0.0										
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		1		6		5		2	
Case Number						6.0				6.0		1.1		4.0		1.1		3.0	
Phase Duration, s						26.0				26.0		11.1		44.4		9.6		42.9	
Change Period, ( Y+R c ), s						5.7				5.7		5.8		6.2		5.8		6.2	
Max Allow Headway ( MAH ), s						3.3				3.5		3.1		0.0		3.1		0.0	
Queue Clearance Time ( g s ), s						14.4				22.3		5.2				3.1			
Green Extension Time ( g e ), s						0.4				0.0		0.1		0.0		0.0		0.0	
Phase Call Probability						1.00				1.00		0.99				0.76			
Max Out Probability						0.15				1.00		0.43				0.01			
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	1	6	16	5	2	12				
Adjusted Flow Rate ( v ), veh/h				52	261		119	131		199	228		63	148	12				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1220	1519		1086	1706		1701	1580		1647	1660	1475				
Queue Service Time ( g s ), s				2.9	12.4		7.9	5.0		3.2	7.0		1.1	4.2	0.4				
Cycle Queue Clearance Time ( g c ), s				7.9	12.4		20.3	5.0		3.2	7.0		1.1	4.2	0.4				
Green Ratio ( g/C )				0.25	0.25		0.25	0.25		0.69	0.48		0.66	0.46	0.46				
Capacity ( c ), veh/h				324	386		197	433		924	755		698	761	677				
Volume-to-Capacity Ratio ( X )				0.161	0.677		0.602	0.303		0.215	0.302		0.091	0.194	0.018				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				21.2	120.2		63.8	48.2		20.9	63.3		7.8	42.3	3				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.8	4.7		2.5	1.9		0.8	2.5		0.3	1.6	0.1				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00				
Uniform Delay ( d 1 ), s/veh				27.3	26.9		36.4	24.1		4.5	12.7		6.2	12.9	11.8				
Incremental Delay ( d 2 ), s/veh				0.1	3.9		3.6	0.1		0.0	1.0		0.0	0.6	0.0				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0				
Control Delay ( d ), s/veh				27.4	30.8		40.1	24.3		4.5	13.8		6.2	13.4	11.9				
Level of Service ( LOS )				C	C		D	C		A	B		A	B	B				
Approach Delay, s/veh / LOS				30.2	C		31.8	C		9.5	A		11.3	B					
Intersection Delay, s/veh / LOS				19.8						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.92	B		2.15	B		1.92	B		1.92	B					
Bicycle LOS Score / LOS				1.00	A		0.90	A		1.19	A		0.86	A					



## EXHIBIT 48 YEAR 2025 PEAK AM HOUR TRAFFIC – Trainyards/Railmarket

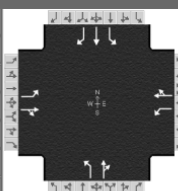
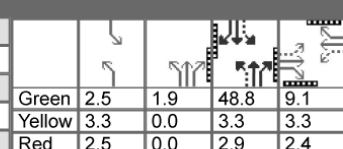

HCS7 Signalized Intersection Results Summary																														
General Information							Intersection Information																							
Agency							Duration, h		0.25																					
Analyst							Area Type		Other																					
Jurisdiction							PHF		1.00																					
Urban Street		200, 230 & 260 Steamli...					Analysis Year		2025																					
Intersection		Traintards/Railmarket					Analysis Period		1> 7:00																					
Project Description		OTY Residential Development					File Name		2025_tot_am.xus																					
Demand Information							EB			WB			NB			SB														
Approach Movement							L	T	R	L	T	R	L	T	R	L	T	R												
Demand ( v ), veh/h							18	30	61	35	25	23	91	111	26	30	122	35												
Signal Information																														
Cycle, s	80.0	Reference Phase	2																											
Offset, s	0	Reference Point	End																											
Uncoordinated	No	Simult. Gap E/W	Off																											
Force Mode	Fixed	Simult. Gap N/S	Off																											
							Green	2.4	1.9	49.0	9.0	0.0	0.0	Yellow	3.3	0.0	3.3	3.3	0.0	0.0	Red	2.5	0.0	2.9	2.4	0.0	0.0			
Timer Results							EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase										4			8			1			6			5			2					
Case Number										6.0			6.0			1.1			4.0			1.1			3.0					
Phase Duration, s										14.7			14.7			10.1			57.1			8.2			55.2					
Change Period, ( Y+R c ), s										5.7			5.7			5.8			6.2			5.8			6.2					
Max Allow Headway ( MAH ), s										3.3			3.3			3.1			0.0			3.1			0.0					
Queue Clearance Time ( g s ), s										6.1			8.2			2.7						2.3								
Green Extension Time ( g e ), s										0.1			0.1			0.1			0.0			0.0			0.0					
Phase Call Probability										0.90			0.83			0.87						0.49								
Max Out Probability										0.00			0.00			0.00						0.00								
Movement Group Results							EB			WB			NB			SB														
Approach Movement							L	T	R	L	T	R	L	T	R	L	T	R												
Assigned Movement							7	4	14	3	8	18	1	6	16	5	2	12												
Adjusted Flow Rate ( v ), veh/h							18	86		35	46		91	135		30	122	5												
Adjusted Saturation Flow Rate ( s ), veh/h/ln							1318	1561		1280	1637		1701	1703		1647	1660	1477												
Queue Service Time ( g s ), s							1.0	4.1		2.1	2.1		0.7	2.5		0.3	2.5	0.1												
Cycle Queue Clearance Time ( g c ), s							3.1	4.1		6.2	2.1		0.7	2.5		0.3	2.5	0.1												
Green Ratio ( g/C )							0.11	0.11		0.11	0.11		0.84	0.64		0.79	0.61	0.61												
Capacity ( c ), veh/h							205	176		168	184		1142	1083		969	1016	904												
Volume-to-Capacity Ratio ( X )							0.088	0.489		0.208	0.249		0.080	0.125		0.031	0.120	0.006												
Back of Queue ( Q ), ft/ln ( 50 th percentile)							8.3	39.9		16.9	20		1.3	20.5		1.3	21.4	0.8												
Back of Queue ( Q ), veh/ln ( 50 th percentile)							0.3	1.5		0.6	0.8		0.1	0.8		0.0	0.8	0.0												
Queue Storage Ratio ( RQ ) ( 50 th percentile)							0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00												
Uniform Delay ( d r ), s/veh							33.8	33.3		36.3	32.4		1.3	5.8		2.3	6.5	6.0												
Incremental Delay ( d 2 ), s/veh							0.1	0.8		0.2	0.3		0.0	0.2		0.0	0.2	0.0												
Initial Queue Delay ( d 3 ), s/veh							0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0												
Control Delay ( d ), s/veh							33.9	34.1		36.5	32.7		1.3	6.0		2.3	6.7	6.1												
Level of Service (LOS)							C	C		D	C		A	A		A	A	A												
Approach Delay, s/veh / LOS							34.1	C		34.3	C		4.1	A		5.9	A													
Intersection Delay, s/veh / LOS							14.4						B																	
Multimodal Results							EB			WB			NB			SB														
Pedestrian LOS Score / LOS							1.92	B		2.15	B		1.92	B		1.92	B													
Bicycle LOS Score / LOS							0.66	A		0.62	A		0.86	A		0.75	A													

## EXHIBIT 49 YEAR 2025 PEAK PM HOUR TRAFFIC – Trainyards/Railmarket

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst							Area Type		Other										
Jurisdiction							Time Period		Peak PM Hour										
Urban Street		200, 230 & 260 Steamli...					Analysis Year		2025										
Intersection		Traintards/Railmarket					File Name		2025_tot_pm.xus										
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				52	62	213	119	99	35	201	114	124	64	180	46				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	Off																
Force Mode	Fixed	Simult. Gap N/S	Off																
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		1		6		5		2	
Case Number						6.0				6.0		1.1		4.0		1.1		3.0	
Phase Duration, s						26.0				26.0		11.1		44.4		9.6		42.9	
Change Period, ( Y+R c ), s						5.7				5.7		5.8		6.2		5.8		6.2	
Max Allow Headway ( MAH ), s						3.3				3.5		3.1		0.0		3.1		0.0	
Queue Clearance Time ( g s ), s						14.9				22.3		5.3				3.1			
Green Extension Time ( g e ), s						0.4				0.0		0.1		0.0		0.0		0.0	
Phase Call Probability						1.00				1.00		0.99				0.76			
Max Out Probability						0.23				1.00		0.45				0.01			
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	1	6	16	5	2	12				
Adjusted Flow Rate ( v ), veh/h				52	270		119	132		201	236		64	180	16				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1219	1517		1078	1704		1701	1585		1647	1660	1475				
Queue Service Time ( g s ), s				2.9	12.9		7.4	5.0		3.3	7.3		1.1	5.3	0.5				
Cycle Queue Clearance Time ( g c ), s				7.9	12.9		20.3	5.0		3.3	7.3		1.1	5.3	0.5				
Green Ratio ( g/C )				0.25	0.25		0.25	0.25		0.69	0.48		0.66	0.46	0.46				
Capacity ( c ), veh/h				323	385		189	432		891	757		691	760	676				
Volume-to-Capacity Ratio ( X )				0.161	0.701		0.628	0.305		0.226	0.312		0.093	0.237	0.024				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				21.2	127.4		65.8	48.6		21.1	66		7.9	52.9	3.9				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.8	4.9		2.5	1.9		0.8	2.6		0.3	2.0	0.2				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00				
Uniform Delay ( d 1 ), s/veh				27.3	27.1		36.9	24.1		4.6	12.8		6.2	13.2	11.9				
Incremental Delay ( d 2 ), s/veh				0.1	4.8		4.9	0.1		0.0	1.1		0.0	0.7	0.1				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0				
Control Delay ( d ), s/veh				27.4	31.9		41.9	24.3		4.7	13.9		6.2	13.9	11.9				
Level of Service ( LOS )				C	C		D	C		A	B		A	B	B				
Approach Delay, s/veh / LOS				31.2	C		32.6	C		9.7	A		11.9	B					
Intersection Delay, s/veh / LOS				20.1						C									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.92	B		2.15	B		1.92	B		1.92	B					
Bicycle LOS Score / LOS				1.02	A		0.90	A		1.21	A		0.92	A					

## EXHIBIT 50

### YEAR 2029 PEAK AM HOUR TRAFFIC – Trainyards/Railmarket

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		12/18/2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Steamli...		Analysis Year		2029		Analysis Period		1> 7:00									
Intersection		Traintards/Railmarket		File Name		2029_tot_am.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				19	31	63	35	26	24	94	113	27	31	138	36				
Signal Information																			
Cycle, s	80.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	Off																
Force Mode	Fixed	Simult. Gap N/S	Off																
				Green	2.5	1.9	48.8	9.1	0.0	0.0									
				Yellow	3.3	0.0	3.3	3.3	0.0	0.0									
				Red	2.5	0.0	2.9	2.4	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		1		6		5		2	
Case Number						6.0				6.0		1.1		4.0		1.1		3.0	
Phase Duration, s						14.8				14.8		10.2		56.9		8.3		55.0	
Change Period, ( Y+R c ), s						5.7				5.7		5.8		6.2		5.8		6.2	
Max Allow Headway ( MAH ), s						3.3				3.3		3.1		0.0		3.1		0.0	
Queue Clearance Time ( g s ), s						6.3				8.4		2.8				2.3			
Green Extension Time ( g e ), s						0.1				0.1		0.1		0.0		0.0		0.0	
Phase Call Probability						0.91				0.84		0.88				0.50			
Max Out Probability						0.00				0.00		0.00				0.00			
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	1	6	16	5	2	12				
Adjusted Flow Rate ( v ), veh/h				19	89		35	48		94	138		31	138	6				
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1315	1561		1277	1637		1701	1702		1647	1660	1477				
Queue Service Time ( g s ), s				1.1	4.3		2.1	2.1		0.8	2.6		0.3	2.8	0.1				
Cycle Queue Clearance Time ( g c ), s				3.2	4.3		6.4	2.1		0.8	2.6		0.3	2.8	0.1				
Green Ratio ( g/C )				0.11	0.11		0.11	0.11		0.84	0.63		0.79	0.61	0.61				
Capacity ( c ), veh/h				204	177		167	186		1123	1079		965	1013	902				
Volume-to-Capacity Ratio ( X )				0.093	0.502		0.210	0.258		0.084	0.128		0.032	0.136	0.007				
Back of Queue ( Q ), ft/ln ( 50 th percentile)				8.7	41.5		16.9	20.9		1.4	21.1		1.3	24.7	0.9				
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.3	1.6		0.7	0.8		0.1	0.8		0.1	0.9	0.0				
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00				
Uniform Delay ( d 1 ), s/veh				33.8	33.3		36.3	32.4		1.3	5.8		2.3	6.6	6.1				
Incremental Delay ( d 2 ), s/veh				0.1	0.8		0.2	0.3		0.0	0.2		0.0	0.3	0.0				
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0				
Control Delay ( d ), s/veh				33.9	34.1		36.6	32.6		1.3	6.1		2.3	6.9	6.1				
Level of Service (LOS)				C	C		D	C		A	A		A	A	A				
Approach Delay, s/veh / LOS				34.1	C		34.3	C		4.1	A		6.1	A					
Intersection Delay, s/veh / LOS				14.3						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.92	B		2.15	B		1.92	B		1.92	B					
Bicycle LOS Score / LOS				0.67	A		0.62	A		0.87	A		0.78	A					



## EXHIBIT 51 YEAR 2029 PEAK PM HOUR TRAFFIC – Trainyards/Railmarket

HCS7 Signalized Intersection Results Summary																						
General Information							Intersection Information															
Agency							Duration, h		0.25													
Analyst							Analysis Date		12/18/2017													
Jurisdiction							Area Type		Other													
Urban Street		200, 230 & 260 Steamli...					Time Period		Peak PM Hour													
Intersection		Traintards/Railmarket					PHF		1.00													
Project Description		OTY Residential Development					Analysis Year		2029													
							Analysis Period		1> 7:00													
							File Name		2029_tot_pm.xus													
Demand Information							EB			WB			NB			SB						
Approach Movement							L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h							54	65	221	124	103	36	209	127	129	67	187	48				
Signal Information																						
Cycle, s	80.0	Reference Phase	2																			
Offset, s	0	Reference Point	End																			
Uncoordinated	No	Simult. Gap E/W	Off																			
Force Mode	Fixed	Simult. Gap N/S	Off																			
				Green	3.9	1.6	36.5	20.3	0.0	0.0												
				Yellow	3.3	0.0	3.3	3.3	0.0	0.0												
				Red	2.5	0.0	2.9	2.4	0.0	0.0												
Timer Results							EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase									4				8		1		6		5		2	
Case Number									6.0				6.0		1.1		4.0		1.1		3.0	
Phase Duration, s									26.0				26.0		11.3		44.3		9.7		42.7	
Change Period, ( Y+R c ), s									5.7				5.7		5.8		6.2		5.8		6.2	
Max Allow Headway ( MAH ), s									3.4				3.5		3.1		0.0		3.1		0.0	
Queue Clearance Time ( g s ), s									15.6				22.3		5.4				3.2			
Green Extension Time ( g e ), s									0.4				0.0		0.1		0.0		0.0		0.0	
Phase Call Probability									1.00				1.00		0.99				0.77			
Max Out Probability									0.38				1.00		0.53				0.01			
Movement Group Results							EB			WB			NB			SB						
Approach Movement							L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement							7	4	14	3	8	18	1	6	16	5	2	12				
Adjusted Flow Rate ( v ), veh/h							54	281		124	137		209	254		67	187	18				
Adjusted Saturation Flow Rate ( s ), veh/h/ln							1214	1517		1067	1705		1701	1590		1647	1660	1475				
Queue Service Time ( g s ), s							3.0	13.6		6.7	5.2		3.4	8.0		1.2	5.5	0.5				
Cycle Queue Clearance Time ( g c ), s							8.2	13.6		20.3	5.2		3.4	8.0		1.2	5.5	0.5				
Green Ratio ( g/C )							0.25	0.25		0.25	0.25		0.69	0.48		0.65	0.46	0.46				
Capacity ( c ), veh/h							319	385		180	433		885	758		676	757	673				
Volume-to-Capacity Ratio ( X )							0.169	0.730		0.690	0.317		0.236	0.335		0.099	0.247	0.027				
Back of Queue ( Q ), ft/ln ( 50 th percentile)							22.2	136.5		73.2	50.6		22.1	72.4		8.3	55.6	4.5				
Back of Queue ( Q ), veh/ln ( 50 th percentile)							0.9	5.3		2.8	2.0		0.9	2.8		0.3	2.1	0.2				
Queue Storage Ratio ( RQ ) ( 50 th percentile)							0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00				
Uniform Delay ( d r ), s/veh							27.6	27.3		37.6	24.2		4.7	13.0		6.4	13.3	12.0				
Incremental Delay ( d 2 ), s/veh							0.1	6.0		9.0	0.2		0.1	1.2		0.0	0.8	0.1				
Initial Queue Delay ( d 3 ), s/veh							0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0				
Control Delay ( d ), s/veh							27.7	33.4		46.5	24.4		4.7	14.2		6.4	14.1	12.0				
Level of Service (LOS)							C	C		D	C		A	B		A	B	B				
Approach Delay, s/veh / LOS							32.5		C	34.9		C	9.9		A	12.1		B				
Intersection Delay, s/veh / LOS							20.9						C									
Multimodal Results							EB			WB			NB			SB						
Pedestrian LOS Score / LOS							1.92		B	2.15		B	1.92		B	1.92		B				
Bicycle LOS Score / LOS							1.04		A	0.92		A	1.25		A	0.94		A				

## EXHIBIT 52

### EXISTING 2015 PEAK AM HOUR TRAFFIC – Industrial/Trainyards

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		0.90					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2015		Analysis Period		1> 7:00					
Intersection		Industrial/Trainyards		File Name		2015_ex_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				66	711	0	7	647	152	0	0	0	68	0	26
Signal Information															
Cycle, s	95.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin												
Uncoordinated	No	Simult. Gap E/W	On	Green	4.3	61.9	10.1	0.0	0.0	0.0	0.0				
				Yellow	3.7	3.7	3.3	0.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.7	2.7	2.6	0.0	0.0	0.0	0.0				
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2		6		8		4				
Case Number				1.0	4.0		6.3		8.0		6.0				
Phase Duration, s				10.7	79.0		68.3		16.0		16.0				
Change Period, ( Y+R <sub>c</sub> ), s				6.4	6.4		6.4		5.9		5.9				
Max Allow Headway ( MAH ), s				3.1	0.0		0.0		0.0		3.1				
Queue Clearance Time ( g <sub>s</sub> ), s				2.6							6.0				
Green Extension Time ( g <sub>e</sub> ), s				0.1	0.0		0.0		0.0		0.1				
Phase Call Probability				0.86							0.94				
Max Out Probability				0.00							0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h				73	790	0	8	443	445		0		76	29	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1688	1562	0	686	1599	1604		0		1683	1489	
Queue Service Time ( g <sub>s</sub> ), s				0.6	5.4	0.0	0.4	12.7	12.7		0.0		4.0	1.7	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s				0.6	5.4	0.0	0.4	12.7	12.7		0.0		4.0	1.7	
Green Ratio ( g/C )				0.85	0.83		0.65	0.65	0.65				0.11	0.11	
Capacity ( c ), veh/h				632	2597		523	1042	1045				255	159	
Volume-to-Capacity Ratio ( X )				0.116	0.304	0.000	0.015	0.425	0.426		0.000		0.296	0.182	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				2.2	21.1	0	1.4	106.9	119.6		0		41.5	15.5	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.1	0.8	0.0	0.1	4.1	4.1		0.0		1.6	0.6	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay ( d <sub>1</sub> ), s/veh				2.4	2.4		5.8	8.0	8.0				39.7	38.7	
Incremental Delay ( d <sub>2</sub> ), s/veh				0.0	0.3	0.0	0.1	1.3	1.3		0.0		0.2	0.2	
Initial Queue Delay ( d <sub>3</sub> ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay ( d ), s/veh				2.4	2.7		5.9	9.3	9.3				39.9	38.9	
Level of Service ( LOS )				A	A		A	A	A				D	D	
Approach Delay, s/veh / LOS				2.6	A		9.2	A		0.0			39.6	D	
Intersection Delay, s/veh / LOS				7.9						A					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.72	B		2.17	B		2.85	C		2.72	C	
Bicycle LOS Score / LOS				2.27	B		2.30	B		1.56	B		1.73	B	

## EXHIBIT 53

### EXISTING 2015 PEAK PM HOUR TRAFFIC – Industrial/Trainyards

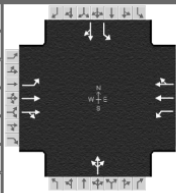
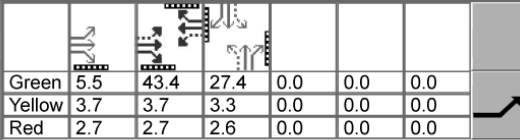
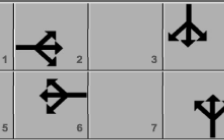
HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other									
Jurisdiction				Time Period		Peak PM Hour		PHF		0.90									
Urban Street		200, 230 & 260 Streamli...			Analysis Year		2015		Analysis Period						1> 7:00				
Intersection		Industrial/Trainyards			File Name		2015_ex_pm.xus												
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				149	589	0	6	623	193	0	0	1	306	1	160				
Signal Information																			
Cycle, s	95.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase				5		2				6				8				4	
Case Number				1.0		4.0				6.3				8.0				6.0	
Phase Duration, s				11.7		64.1				52.4				30.9				30.9	
Change Period, ( Y+R c ), s				6.4		6.4				6.4				5.9				5.9	
Max Allow Headway ( MAH ), s				3.1		0.0				0.0				3.2				3.2	
Queue Clearance Time ( g s ), s				5.2										2.1				24.3	
Green Extension Time ( g e ), s				0.2		0.0				0.0				1.1				0.8	
Phase Call Probability				0.99										1.00				1.00	
Max Out Probability				0.01										0.00				0.07	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate ( v ), veh/h				166	654	0	7	448	459		0		340	179					
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1674	1739	0	778	1540	1577		0		1411	1483					
Queue Service Time ( g s ), s				3.2	7.2	0.0	0.4	20.1	20.1		0.0		22.2	9.6					
Cycle Queue Clearance Time ( g c ), s				3.2	7.2	0.0	0.4	20.1	20.1		0.0		22.3	9.6					
Green Ratio ( g/C )				0.70	0.67		0.48	0.48	0.48				0.26	0.26					
Capacity ( c ), veh/h				489	2346		453	745	763				447	391					
Volume-to-Capacity Ratio ( X )				0.339	0.279	0.000	0.015	0.601	0.601		0.000		0.761	0.458					
Back of Queue ( Q ), ft/ln ( 95 th percentile)				42.5	105.4	0	3.6	307.7	349.5		0		313.5	153.3					
Back of Queue ( Q ), veh/ln ( 95 th percentile)				1.7	4.1	0.0	0.1	11.8	12.1		0.0		12.3	6.0					
Queue Storage Ratio ( RQ ) ( 95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00					
Uniform Delay ( d 1 ), s/veh				8.4	7.3		12.8	17.8	17.8				34.0	29.3					
Incremental Delay ( d 2 ), s/veh				0.2	0.3	0.0	0.1	3.6	3.5		0.0		3.6	0.3					
Initial Queue Delay ( d 3 ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0					
Control Delay ( d ), s/veh				8.6	7.6		12.8	21.4	21.3				37.6	29.6					
Level of Service (LOS)				A	A		B	C	C				D	C					
Approach Delay, s/veh / LOS				7.8		A	21.3		C	25.8		C	34.9		C				
Intersection Delay, s/veh / LOS				19.5						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.72		B	2.53		C	3.21		C	2.72		C				
Bicycle LOS Score / LOS				2.24		B	2.31		B	1.56		B	2.42		B				

## EXHIBIT 54 YEAR 2025 PEAK AM HOUR TRAFFIC – Industrial/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other									
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00									
Intersection		Industrial/Trainyards		File Name		2025_tot_am.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				73	804	0	8	704	215	0	0	0	81	0	29				
Signal Information																			
Cycle, s	95.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On		Green	4.3	61.8	10.2	0.0	0.0	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On		Yellow	3.7	3.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0					
				Red	2.7	2.7	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase				5		2				6				8				4	
Case Number				1.0		4.0				6.3				8.0				6.0	
Phase Duration, s				10.7		78.9				68.2				16.1				16.1	
Change Period, ( Y+R <sub>c</sub> ), s				6.4		6.4				6.4				5.9				5.9	
Max Allow Headway ( MAH ), s				3.1		0.0				0.0				0.0				3.1	
Queue Clearance Time ( g <sub>s</sub> ), s				2.6														6.3	
Green Extension Time ( g <sub>e</sub> ), s				0.1		0.0				0.0				0.0				0.1	
Phase Call Probability				0.85														0.95	
Max Out Probability				0.00														0.00	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate ( v ), veh/h				73	804	0	8	482	437		0		81	29					
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1688	1758	0	677	1730	1570		0		1683	1489					
Queue Service Time ( g <sub>s</sub> ), s				0.6	4.8	0.0	0.4	12.8	12.8		0.0		4.3	1.7					
Cycle Queue Clearance Time ( g <sub>c</sub> ), s				0.6	4.8	0.0	0.4	12.8	12.8		0.0		4.3	1.7					
Green Ratio ( g/C )				0.85	0.83		0.65	0.65	0.65				0.11	0.11					
Capacity ( c ), veh/h				620	2919		516	1125	1021				257	160					
Volume-to-Capacity Ratio ( X )				0.118	0.275	0.000	0.015	0.428	0.428		0.000		0.315	0.181					
Back of Queue ( Q ), ft/ln ( 50 th percentile)				2.3	20.7	0	1.5	115.4	117.9		0		44.6	15.6					
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.1	0.8	0.0	0.1	4.4	4.1		0.0		1.8	0.6					
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00					
Uniform Delay ( d <sub>1</sub> ), s/veh				2.4	2.3		5.9	8.0	8.0				39.7	38.6					
Incremental Delay ( d <sub>2</sub> ), s/veh				0.0	0.2	0.0	0.1	1.2	1.3		0.0		0.3	0.2					
Initial Queue Delay ( d <sub>3</sub> ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0					
Control Delay ( d ), s/veh				2.4	2.6		5.9	9.2	9.3				40.0	38.8					
Level of Service ( LOS )				A	A		A	A	A				D	D					
Approach Delay, s/veh / LOS				2.6		A	9.3		A	0.0			39.7		D				
Intersection Delay, s/veh / LOS				7.9						A									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.72		B	2.20		B	2.87		C	2.72		C				
Bicycle LOS Score / LOS				2.28		B	2.32		B	1.56		B	1.74		B				

## EXHIBIT 55

### YEAR 2025 PEAK PM HOUR TRAFFIC – Industrial/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information							Intersection Information												
Agency							Duration, h		0.25										
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other									
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2025		Analysis Period		1> 7:00									
Intersection		Industrial/Trainyards		File Name		2025_tot_pm.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				165	644	0	7	701	221	0	0	1	378	1	177				
Signal Information																			
Cycle, s	95.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	5.5	43.4	27.4	0.0	0.0	0.0									
				Yellow	3.7	3.7	3.3	0.0	0.0	0.0									
				Red	2.7	2.7	2.6	0.0	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase				5		2				6				8				4	
Case Number				1.0		4.0				6.3				8.0				6.0	
Phase Duration, s				11.9		61.7				49.8				33.3				33.3	
Change Period, ( Y+R <sub>c</sub> ), s				6.4		6.4				6.4				5.9				5.9	
Max Allow Headway ( MAH ), s				3.1		0.0				0.0				3.2				3.2	
Queue Clearance Time ( g <sub>s</sub> ), s				5.4										2.0				26.8	
Green Extension Time ( g <sub>e</sub> ), s				0.1		0.0				0.0				1.1				0.7	
Phase Call Probability				0.99										1.00				1.00	
Max Out Probability				0.16										0.00				0.31	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate ( v ), veh/h				165	644	0	7	484	438		0		378	178					
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1674	1772	0	786	1730	1566		0		1412	1484					
Queue Service Time ( g <sub>s</sub> ), s				3.4	7.4	0.0	0.5	20.0	20.1		0.0		24.7	9.2					
Cycle Queue Clearance Time ( g <sub>c</sub> ), s				3.4	7.4	0.0	0.5	20.0	20.1		0.0		24.8	9.2					
Green Ratio ( g/C )				0.67	0.65		0.46	0.46	0.46				0.29	0.29					
Capacity ( c ), veh/h				473	2300		435	790	715				483	429					
Volume-to-Capacity Ratio ( X )				0.349	0.280	0.000	0.016	0.612	0.613		0.000		0.783	0.415					
Back of Queue ( Q ), ft/ln ( 95 th percentile)				47.9	115.3	0	4	339.6	352		0		347.5	146					
Back of Queue ( Q ), veh/ln ( 95 th percentile)				1.9	4.5	0.0	0.2	13.1	12.1		0.0		13.7	5.7					
Queue Storage Ratio ( RQ ) ( 95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00					
Uniform Delay ( d <sub>1</sub> ), s/veh				9.3	8.3		14.1	19.5	19.5				32.9	27.3					
Incremental Delay ( d <sub>2</sub> ), s/veh				0.2	0.3	0.0	0.1	3.5	3.9		0.0		5.3	0.2					
Initial Queue Delay ( d <sub>3</sub> ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0					
Control Delay ( d ), s/veh				9.4	8.6		14.2	23.0	23.4				38.2	27.5					
Level of Service ( LOS )				A	A		B	C	C				D	C					
Approach Delay, s/veh / LOS				8.8		A	23.1		C	24.0		C	34.8		C				
Intersection Delay, s/veh / LOS				20.9						C									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.72		B	2.55		C	3.22		C	2.72		C				
Bicycle LOS Score / LOS				2.23		B	2.33		B	1.56		B	2.48		B				

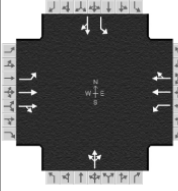
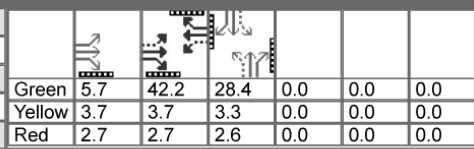



## EXHIBIT 56

### YEAR 2029 PEAK AM HOUR TRAFFIC – Industrial/Trainyards

HCS7 Signalized Intersection Results Summary															
General Information								Intersection Information							
Agency								Duration, h		0.25					
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other					
Jurisdiction				Time Period		Peak AM Hour		PHF		1.00					
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2029		Analysis Period		1> 7:00					
Intersection		Industrial/Trainyards		File Name		2029_tot_am.xus									
Project Description		OTY Residential Development													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h				76	835	0	8	734	221	0	0	0	95	0	30
Signal Information															
Cycle, s	95.0	Reference Phase	2												
Offset, s	0	Reference Point	Begin	Green	4.3	61.6	10.4	0.0	0.0	0.0	0.0	1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.7	3.7	3.3	0.0	0.0	0.0	0.0	5	6	7	8
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.7	2.7	2.6	0.0	0.0	0.0	0.0				
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				5	2		6		8		4				
Case Number				1.0	4.0		6.3		8.0		6.0				
Phase Duration, s				10.7	78.7		68.0		16.3		16.3				
Change Period, ( Y+R <sub>c</sub> ), s				6.4	6.4		6.4		5.9		5.9				
Max Allow Headway ( MAH ), s				3.1	0.0		0.0		0.0		3.1				
Queue Clearance Time ( g <sub>s</sub> ), s				2.7							7.1				
Green Extension Time ( g <sub>e</sub> ), s				0.1	0.0		0.0		0.0		0.2				
Phase Call Probability				0.87							0.96				
Max Out Probability				0.00							0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate ( v ), veh/h				76	835	0	8	500	455		0		95	30	
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1688	1758	0	658	1730	1572		0		1683	1489	
Queue Service Time ( g <sub>s</sub> ), s				0.7	5.1	0.0	0.4	13.6	13.6		0.0		5.1	1.7	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s				0.7	5.1	0.0	0.4	13.6	13.6		0.0		5.1	1.7	
Green Ratio ( g/C )				0.85	0.83		0.65	0.65	0.65				0.11	0.11	
Capacity ( c ), veh/h				603	2913		502	1121	1019				260	163	
Volume-to-Capacity Ratio ( X )				0.126	0.287	0.000	0.016	0.446	0.446		0.000		0.366	0.184	
Back of Queue ( Q ), ft/ln ( 50 th percentile)				2.9	22.2	0	1.5	123.5	126.2		0		52.7	16.1	
Back of Queue ( Q ), veh/ln ( 50 th percentile)				0.1	0.9	0.0	0.1	4.8	4.4		0.0		2.1	0.6	
Queue Storage Ratio ( RQ ) ( 50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay ( d <sub>1</sub> ), s/veh				2.6	2.4		6.0	8.3	8.3				39.9	38.5	
Incremental Delay ( d <sub>2</sub> ), s/veh				0.0	0.2	0.0	0.1	1.3	1.4		0.0		0.3	0.2	
Initial Queue Delay ( d <sub>3</sub> ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay ( d ), s/veh				2.6	2.6		6.0	9.6	9.7				40.3	38.7	
Level of Service ( LOS )				A	A		A	A	A				D	D	
Approach Delay, s/veh / LOS				2.6	A		9.6	A		0.0			39.9	D	
Intersection Delay, s/veh / LOS				8.3						A					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.72	B		2.21	B		2.89	C		2.73	C	
Bicycle LOS Score / LOS				2.31	B		2.35	B		1.56	B		1.77	B	

## EXHIBIT 57 YEAR 2029 PEAK PM HOUR TRAFFIC – Industrial/Trainyards

HCS7 Signalized Intersection Results Summary																			
General Information								Intersection Information											
Agency								Duration, h		0.25									
Analyst				Analysis Date		Dec 16, 2017		Area Type		Other									
Jurisdiction				Time Period		Peak PM Hour		PHF		1.00									
Urban Street		200, 230 & 260 Streamli...		Analysis Year		2029		Analysis Period		1> 7:00									
Intersection		Industrial/Trainyards		File Name		2029_tot_pm.xus													
Project Description		OTY Residential Development																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand ( v ), veh/h				172	675	0	7	728	239	0	0	1	393	1	184				
Signal Information																			
Cycle, s	95.0	Reference Phase	2																
Offset, s	0	Reference Point	Begin																
Uncoordinated	No	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	5.7	42.2	28.4	0.0	0.0	0.0									
				Yellow	3.7	3.7	3.3	0.0	0.0	0.0									
				Red	2.7	2.7	2.6	0.0	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase				5		2				6				8				4	
Case Number				1.0		4.0				6.3				8.0				6.0	
Phase Duration, s				12.1		60.7				48.6				34.3				34.3	
Change Period, ( Y+R <sub>c</sub> ), s				6.4		6.4				6.4				5.9				5.9	
Max Allow Headway ( MAH ), s				3.1		0.0				0.0				3.2				3.2	
Queue Clearance Time ( g <sub>s</sub> ), s				5.7										2.0				27.8	
Green Extension Time ( g <sub>e</sub> ), s				0.1		0.0				0.0				1.2				0.6	
Phase Call Probability				0.99										1.00				1.00	
Max Out Probability				0.59										0.00				0.54	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate ( v ), veh/h				172	675	0	7	508	459		0		393	185					
Adjusted Saturation Flow Rate ( s ), veh/h/ln				1674	1772	0	764	1730	1561		0		1412	1485					
Queue Service Time ( g <sub>s</sub> ), s				3.7	8.1	0.0	0.5	22.0	22.0		0.0		25.7	9.5					
Cycle Queue Clearance Time ( g <sub>c</sub> ), s				3.7	8.1	0.0	0.5	22.0	22.0		0.0		25.8	9.5					
Green Ratio ( g/C )				0.66	0.64		0.44	0.44	0.44				0.30	0.30					
Capacity ( c ), veh/h				451	2265		415	768	693				497	444					
Volume-to-Capacity Ratio ( X )				0.381	0.298	0.000	0.017	0.662	0.662		0.000		0.791	0.417					
Back of Queue ( Q ), ft/ln ( 95 th percentile)				52.7	127	0	4.1	371.2	383.9		0		361	150					
Back of Queue ( Q ), veh/ln ( 95 th percentile)				2.1	5.0	0.0	0.2	14.3	13.2		0.0		14.2	5.9					
Queue Storage Ratio ( RQ ) ( 95 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00					
Uniform Delay ( d <sub>1</sub> ), s/veh				10.4	8.8		14.8	20.8	20.8				32.4	26.7					
Incremental Delay ( d <sub>2</sub> ), s/veh				0.2	0.3	0.0	0.1	4.5	4.9		0.0		6.0	0.2					
Initial Queue Delay ( d <sub>3</sub> ), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0					
Control Delay ( d ), s/veh				10.6	9.2		14.9	25.2	25.7				38.5	26.9					
Level of Service ( LOS )				B	A		B	C	C				D	C					
Approach Delay, s/veh / LOS				9.5		A	25.4		C	23.4		C	34.8		C				
Intersection Delay, s/veh / LOS				22.0						C									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.72		B	2.57		C	3.25		C	2.74		C				
Bicycle LOS Score / LOS				2.26		B	2.36		B	1.56		B	2.51		C				

## EXHIBIT 58 SANDFORD FLEMING AVENUE – PLOS SEGMENT EVALUATION

STREET Sandford Fleming Avenue  
FROM Industrial Avenue  
TO Terminal Avenue  
YEAR 2029  
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 59 TERMINAL AVENUE – PLOS SEGMENT EVALUATION

STREET                      Terminal Avenue  
FROM                        Sandford Fleming Avenue  
TO                            Railmarket Private  
YEAR                        2029  
DIRECTION                Eastbound–Westbound  
MMLOS MODE            PLOS

SEGMENT SCORE    **D**

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	<b>D</b>	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 60 INDUSTRIAL AVENUE – PLOS SEGMENT EVALUATION

STREET Industrial Avenue  
FROM Riverside Drive  
TO Trainyards Drive  
YEAR 2029  
DIRECTION Eastbound–Westbound  
MMLOS MODE PLOS

SEGMENT SCORE **E**

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	<b>E</b>
	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 61 TRAINYARDS DRIVE – PLOS SEGMENT EVALUATION

STREET Trainyards Drive  
FROM Belfast Road  
TO Industrial Avenue  
YEAR 2029  
DIRECTION Northbound–Southbound  
MMLOS MODE PLOS

SEGMENT SCORE **D**

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	<b>D</b>	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 62 SANDFORD FLEMING AVENUE – BLOS SEGMENT EVALUATION

STREET	Sandford Fleming Avenue		
FROM	Industrial Avenue		
TO	Terminal Avenue	SEGMENT SCORE	<b>B</b>
YEAR	2029		
DIRECTION	Northbound–Southbound		
MMLOS MODE	BLOS		

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
	≤ 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	E
	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
	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 63 TERMINAL AVENUE – BLOS SEGMENT EVALUATION

STREET	Terminal Avenue		
FROM	Sandford Fleming Avenue		
TO	Trainyards Drive	SEGMENT SCORE	<b>D</b>
YEAR	2029		
DIRECTION	Eastbound–Westbound		
MMLOS MODE	BLOS		

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
	≤ 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	<b>D</b>
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	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	<b>A</b>
	4 to 5 lanes being crossed; ≤ 40 km/h	B
	3 or less lanes being crossed; 50 km/h	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 64 INDUSTRIAL AVENUE – BLOS SEGMENT EVALUATION

STREET Industrial Avenue Avenue  
FROM Riverside Drive  
TO Trainyards Drive  
YEAR 2029  
DIRECTION Eastbound–Westbound  
MMLOS MODE BLOS

SEGMENT SCORE **F**

Type of Bikeway		LOS
Physically Separated Bikeway (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).		A
Bike Lanes Not Adjacent Parking Lane - Select Worst Scoring Criteria		
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
Bike Lanes Adjacent to curbside Parking Lane - Select Worst Scoring Criteria		
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
	≤ 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
Mixed Traffic		
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	E
	6 or more travel lanes; ≤ 40 km/h	E
	≥ 60 km/h	F
Unsignalized Crossing along Route: no median refuge		
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
	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
Unsignalized Crossing along Route: with median refuge (> 1.8 m wide)		
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 65 TRAINYARDS DRIVE – BLOS SEGMENT EVALUATION

STREET Trainyards Drive  
FROM Belfast Road  
TO Industrial Avenue  
YEAR 2029  
DIRECTION Northbound–Southbound  
MMLOS MODE BLOS

SEGMENT SCORE **B**

Type of Bikeway		LOS
Physically Separated Bikeway (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).		A
<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
	≤ 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; 60 km/h	D
	4 to 5 travel lanes; ≤ 40 km/h	D
	4 to 5 travel lanes; ≥ 50 km/h	E
	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
	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