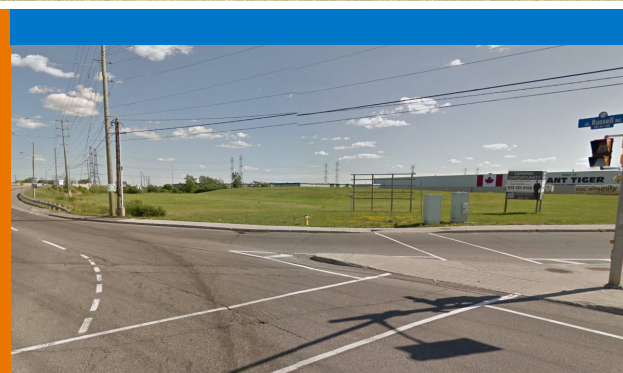
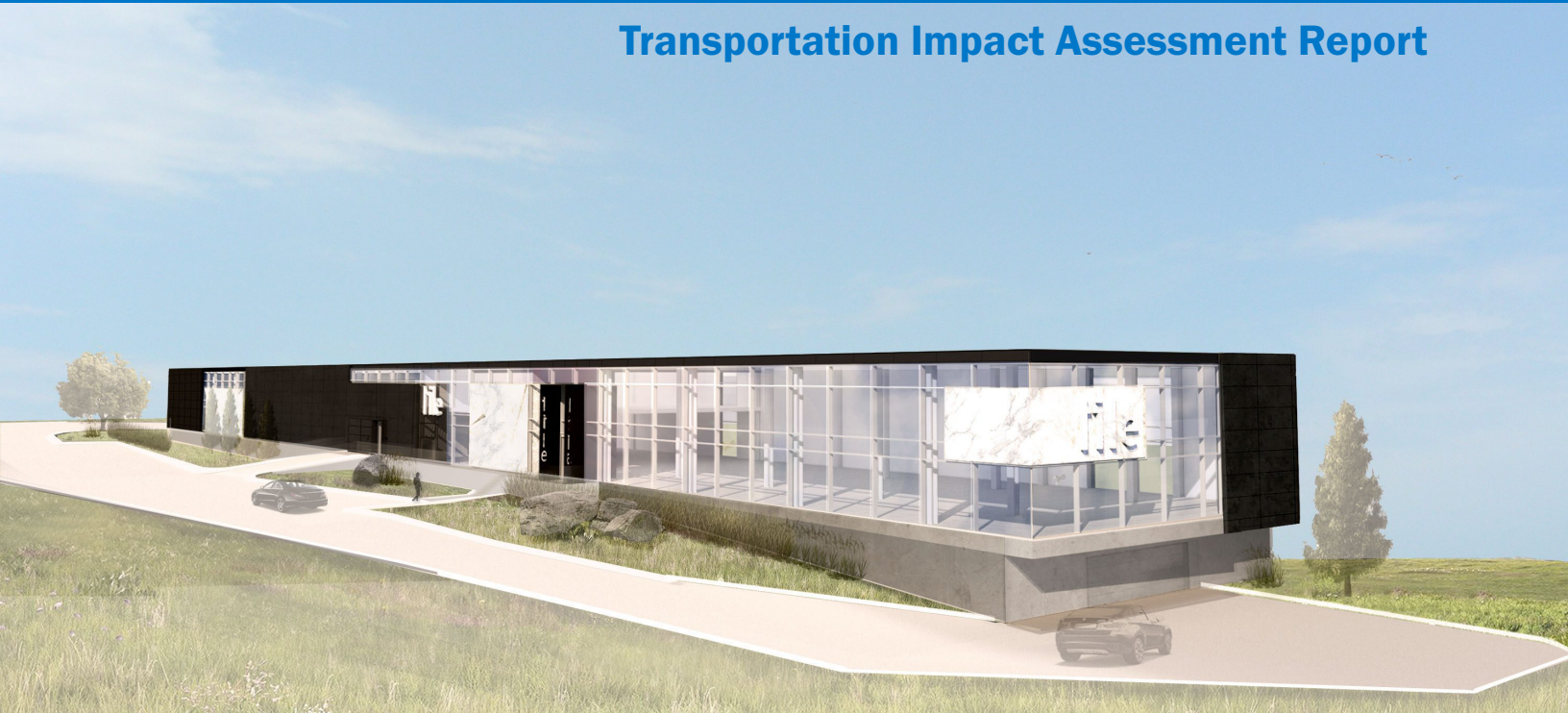


2510 Russell Road Industrial/Retail Tile Centre

Transportation Impact Assessment Report



ciot

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Industrial/Retail Tile Centre
Transportation Impact Assessment Report**

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1.0 INTRODUCTION

This Transportation Impact Assessment report is a compilation of the previously submitted and reviewed Screening Form (**Appendix A**), Scoping Report, Forecasting Report and Strategy Report and it addresses City comments on these reports. It also includes a detailed description of the design details of the proposed right-turn/right-out site driveway connection (150 m south of Walkley/Russell intersection) based on subsequent discussions with City staff.

2.0 EXISTING AND PLANNED CONDITIONS

2.1 Proposed Development

The proposed industrial/retail development is a tile centre comprised of 2,323 m² of drive-in warehouse, a 929 m² of retail showroom, 23 outdoor parking spaces and 24 indoor parking spaces, to be located on a narrow piece of vacant land at the southwest corner of the Russell/Walkley intersection. The site's context is shown in **Figure 1** and the Site Plan is included as **Figure 2**. As shown on the Site Plan, the proposed site driveway is located toward the south end of the site and the truck docks and truck count for material delivery are also located at the south end of the building for easy access. All visitors/staff parking is located north of the site driveway to Russell Road.

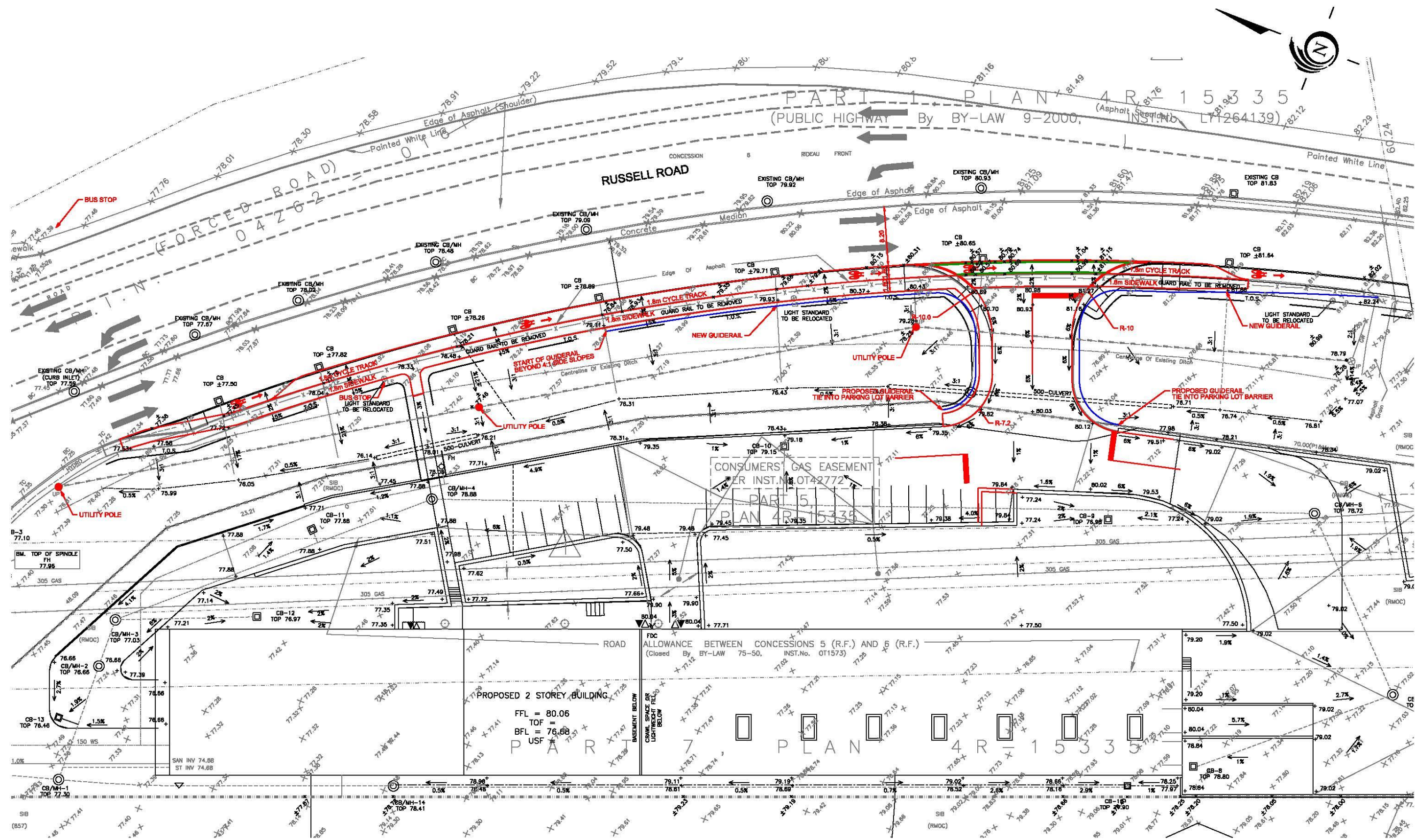
Figure 1: Site Context



As there is insufficient site frontage on Walkley Road, the only proposed site driveway connection is a right-in/right-out only to Russell Road towards the south end of the property. The left-turn restrictions will be controlled by the existing raised median. The property is relatively flat, however, the adjacent Russell Road is on a grade as it rises up to pass over the rail corridor that forms the south boundary of the site. The grade differential from site to Russell Road influences the location of the driveway as it is more challenging to accommodate the further south you go.

There is no phasing associated with this project. It is hoped that Site Plan Approval will be obtained in 2018, followed by construction and store opening in 2019.

Figure 2: Site Plan



2.2 Existing Conditions

2.2.1 Adjacent Roads

Both Walkley Road and Russell Road are City of Ottawa arterial roads. Both are four-lane divided with turn lanes provided at intersections. The Walkley/Russell intersection is traffic signal controlled and is shown as **Figure 3**.

Figure 3: Walkley/Russell Intersection



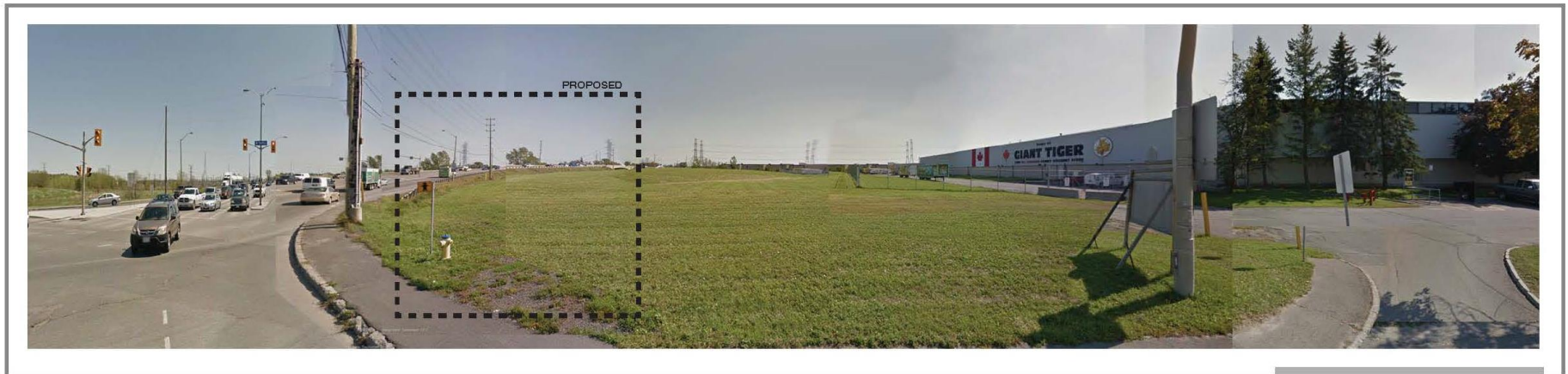
Russell Road provides a continuous north-south link between St. Laurent Boulevard and Hawthorne Road. The posted speed on the adjacent section of Russell Road where site access is proposed is 70 km/h. The next intersection to the south is the signalized Russell/Hawthorne intersection which is approximately 400 m from the Walkley intersection. There are no existing driveway connections between these two intersections. Photos of the site's Russell and Walkley frontages are provided in **Figure 4**. Walkley is an east-west road that has an interchange with Highway 417 approximately 1.2 km east of Russell Road.

With regard to facilities for active transportation modes, there are sidewalks on both sides of Walkley, but no separate cycling facilities. An OC Transpo bus stop is provided on Walkley Road in the northwest quadrant of the intersection serving Route 112. Along the site's Russell Road frontage there are no sidewalks; however, the shoulders are paved for cyclists and pedestrians and Route 112 has a bus stop on both sides of Russell Road south of the Walkley intersection. Both Walkley and Russell are classified as "spine" cycling routes in the Ottawa Cycling Plan.

Figure 4: Site Frontage Photos



RUSSELL ROAD



WALKLEY ROAD

2.2.2 Peak Hour Traffic Volumes, Vehicle Speeds and Collision History

The most recent available traffic count (from the City) for the adjacent Walkley/Russell intersection is dated 17 September 2015. As this count is after the opening of the Hunt Club/Highway 417 interchange, it is considered current. The full count is included as **Appendix B**. Southbound traffic on Russell, adjacent to the site and where the site driveway is proposed, is approximately 755 veh/h in the morning peak hour, 850 veh/h in the mid-day peak hour and 1125 veh/h in the afternoon peak hour.

With regard to vehicle speeds, a July 2017 vehicle speed survey was conducted for southbound traffic at a location 100 m south of the Walkley/Russell intersection, where the posted speed is 70 km/h. Between 9:45 am and 10:45 am, a total of 141 vehicle speeds were recorded including 46 heavy trucks and 2 OC Transpo buses. As summarized in **Appendix C**, the average vehicle speed was 57 km/h, the 85th speed was 68 km/h and there was 93% compliance for the 70 km/h posted speed limit. When considering trucks only, the average speed was 47 km/h as the 85th speed was 54 km/h. The foregoing speeds are low compared to the posted speed because of the combination of the up-grade on this section of Russell Road and the fact that the majority of the vehicles leaving the Walkley/Russell intersection to go south are doing so from a stop condition or making a 90-degree left turn from westbound Walkley Road to southbound Russell Road.

2.2.3 Vehicle Collision Overview

As the proposed site driveway connection to Russell Road is located approximately 150 m south of the Walkley/Russell intersection, and as it will be right-in/right-out only, the most relevant collision data is for southbound traffic flow along the site's frontage south of Walkley Road. The City has provided four years of collision data (**Appendix D**) for this section of road from 2012 to 2016, with there being no 2013 data. Review of this data indicated there were 6 southbound collisions over four years, with 3 of them being side swipes resulting from lane changes, 2 being single vehicle collisions due to road ice, and 1 being a rear end due to a stopped vehicle. This is a very low number of collisions for a high-volume road and is indicative of no safety concerns on this section of Russell Road south of Walkley Road.

Following review of the Scoping Report, the City asked that collision data at the Walkley/Russell intersection also be assessed. Although this intersection is not particularly relevant to the operation of the proposed right-in/right-out site driveway, its assessment was reviewed and summarized as follows, with the City data included as **Appendix E**.

At the Walkley/Russell intersection from 2012 to 2016 inclusive, a total of 133 collisions occurred, averaging approximately 26 collisions per year. Most collisions (77%) involve only property damage, indicating low impact speeds, and 23% involved person injuries. The primary causes of collisions cited by police include; rear end (66%), sideswipes (15%) and angle (8%) type collisions.

The majority of collisions were rear-ending collisions, totaling 88 in 5 years. Rear-end collisions occurred in all four directions, with the highest occurring in the northbound direction on Russell Road. Thirty-nine (39) rear-end collisions occurred in the northbound direction and between 13 to 20 rear-end collisions occurred in the east, west and southbound directions of the 5-year period.

A standard unit of measure for assessing collisions at an intersection is based on the number of collisions per million entering vehicles (MEV). At the Walkley/Russell intersection, reported collisions have historically occurred at a rate of 1.43 collisions per MEV.

It is noteworthy that within the 5-years of recorded collision data, no collisions involved pedestrians and two involved cyclists, resulting in non-fatal injuries.

2.3 Planned Conditions

To our knowledge, there are no significant planned transportation network changes in close proximity to the site. The big recent change was the construction of the Highway 417/Hunt Club interchange which has resulted in a

reduction in traffic volumes through the Walkley/Russell intersection and on Russell Road adjacent to the site. We are also not aware of any other meaningful new development projects in close proximity to the site.

3.0 STUDY AREA AND TIME PERIODS

As the proposed development is an extremely low traffic generator (10 veh/h and 30 veh/h during morning and afternoon peak hours respectively) and as its only traffic impact is on the immediate adjacent section of southbound Russell Road, the study area is the Walkley/Russell intersection and Russell Road adjacent to the site.

Again, as site-generated traffic is very low and spread out throughout the day, only the weekday morning and afternoon peak hours are analyzed as this is when background traffic on Russell Road is highest. As the project is expected to be built in 2018 and operational in 2018/19, and as site traffic is so low (it does not meet the TIA Guidelines trip generation trigger), no horizon year analysis was considered necessary. If there are any real or perceived traffic operations issues associated with the proposed development, they can be fully assessed based on current volumes.

4.0 EXEMPTIONS REVIEW

Based on the type and size of the proposed development for which a Site Plan Application is being submitted, the following identifies which analyses are required and which are exempt in further analysis/modules, according to the City's new TIA Guidelines.

Design Review Component:

Development Design

- Circulation and Access REQUIRED
- New Street Networks EXEMPT

Parking

- Parking Supply REQUIRED
- Spillover Parking EXEMPT

Network Impact Component:

Development Design

- Transportation Demand Management EXEMPT
- Neighbourhood Traffic Management EXEMPT
- Network Concept EXEMPT

In summary, as this submission accompanies a Site Plan Application for a very low traffic generator, the only items that need any level of assessment are on-site operation and the design of the site driveway connection to Russell Road.

5.0 DEVELOPMENT GENERATED TRAFFIC

5.1 Vehicle Trip Generation

Using appropriate trip generation rates (Table 1) from a number of relevant land uses identified in the 9th Edition ITE Trip Generation Manual, the resultant two-way peak hour site-trip generation for the proposed 2,323 m² tile warehouse and 929 m² retail showroom is estimated to be in the range of 10 to 35 veh/h two-way total.

Table 1: Peak Hour Trip Generation Rates

Land Use	Average Rate AM (PM)	Trip Generation Two-Way AM (PM)
General Light Industrial	0.92 (0.97)	33 (35) veh/h
Manufacturing	0.73 (0.73)	26 (26) veh/h
Warehousing	0.30 (0.32)	11 (12) veh/h

Our familiarity with other Ottawa area tile warehouses is that the estimated peak hour vehicle trip generation using the ITE trip rates is in the correct range. For analysis purposes, we are assuming 10 veh/h in and 5 veh/h out during the morning peak hour and 15 veh/h in and 15 veh/h out during the afternoon peak hour.

Weekend peak hour trip generation is determined to be the same as the afternoon peak hour, however, as Saturday traffic is less than weekday traffic on Russell Road adjacent to the site, this time period was not assessed.

5.2 Modal Shares

Given the site's location, somewhat remote from any significant residential development, combined with the type and weight of products being sold, we do not foresee any patron walking/cycling component. For similar reasons, even though there are adjacent bus routes, we foresee very low, if any, transit ridership. We would expect transit ridership would be primarily employees and would be in the 0 to 3 person range during peak hours, as summarized in Table 2.

Table 2: Future Mode Share Targets for the Development

Travel Mode	Mode Share Target	Rationale
Transit	15%	Some employees may use transit but no customers due to products sold.
Walking	0%	Due to somewhat remote location, type of business and products sold.
Cycling	0%	Due to somewhat remote location, type of business and products sold.
Auto Passenger	20%	Often 2 persons/car looking at product.
Auto Driver	65%	Highly car-oriented due to location, and type of product sold.

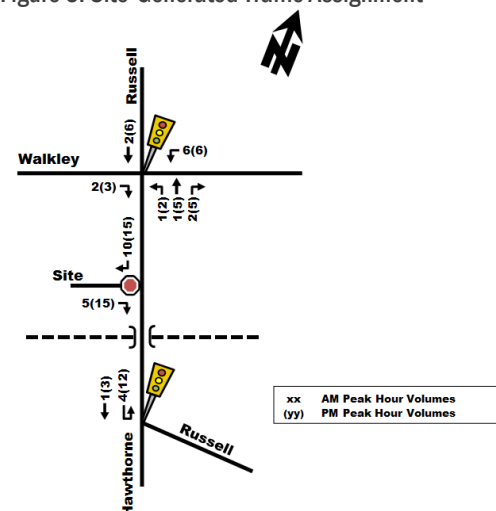
5.3 Trip Distribution and Assignment

As the proposed site driveway is on Russell Road and would be restricted to right-in/right-out only, trip distribution and assignment is quite straight-forward. It has been assumed that site-generated traffic at the Russell I/Walkley and Russell/Hawthorne intersections would distribute similar to the distribution of existing volumes at this intersection as depicted in Figure 5.

5.4 Pass-By Traffic

Due to the site's location and type of products it sells, it is considered a "destination" site and we do not foresee any pass-by traffic.

Figure 5: Site-Generated Traffic Assignment



6.0 BACKGROUND NETWORK

To our knowledge, there are no significant planned transportation network changes in close proximity to the site. The big recent change was the construction of the Highway 417/Hunt Club interchange which has resulted in a reduction in traffic volumes through the Walkley/Russell intersection and on Russell Road adjacent to the site. We are also not aware of any other meaningful new development projects in close proximity to the site. As City traffic counts show that traffic on Russell Road has reduced in the last couple of years due to the opening of the Hunt Club/Highway 417 interchange, as the proposed development is such a low traffic generator and as the proposed driveway is a right-in/right-out only, there is no need/value in identifying/analyzing background traffic growth. It does not inform the pending decision making with regard to the site access.

7.0 DEMAND RATIONALIZATION

As the site is such a low peak hour traffic generator (15 veh/h to 30 veh/h), as background traffic has decreased in recent years and as the proposed driveway is a right-in/right-out only (no left turns in or out), there is no demand rationalization required. What is required is analysis with regard to the warrants for a southbound right-turn lane, stopping sight distance, and driveway design.

8.0 DEVELOPMENT DESIGN

8.1 Design for Sustainable Modes

Automobile parking is proposed along the east frontage of the building (23 spaces) in close proximity to the showroom's front door. It is off-set somewhat from the building due to the location of an Enbridge gas line that runs north-south through the site. There are an additional 24 automobile parking spaces planned within the building and accessed from the north end of the building. Many of these would be for staff parking. The total of 47 spaces exceeds the By-Law requirement of 44 spaces. The identified dimensions for isle widths and parking spaces meet By-Law Requirements.

With regard to **bicycle parking**, the By-Law requires 1 space and 3 are proposed. These will be located adjacent to the east face of the building in fairly close proximity to the showroom front door.

Bus stops exist on both sides of Walkley Road just west of Russell Road and on both sides of Russell Road just south of Walkley Road, as shown in Figure 6.

Sidewalks exist on both sides of Walkley Road and wide paved shoulders exist on both sides of Russell Road adjacent to the site. The City will require/request the provision of a raised 1.8 m wide concrete sidewalk on the west side of Walkley Road for the full length of the site's frontage.

With regard to **cycling facilities**, as Russell Road is a cycling spine route, the City is requesting a raised 1.8 m wide bicycle track along the site's Russell Road frontage (replacing the existing bicycle lane).

The foregoing Figure 2 Site Plan depicts the requested sidewalk and bike track and how the building's front door is connected to the sidewalk. It is noteworthy that the showroom front door is located within 200 m of the northbound and southbound bus stops on Russell Road and the westbound bus stop on Walkley Road. The eastbound bus stop on Walkley Road is approximately 360 m away.

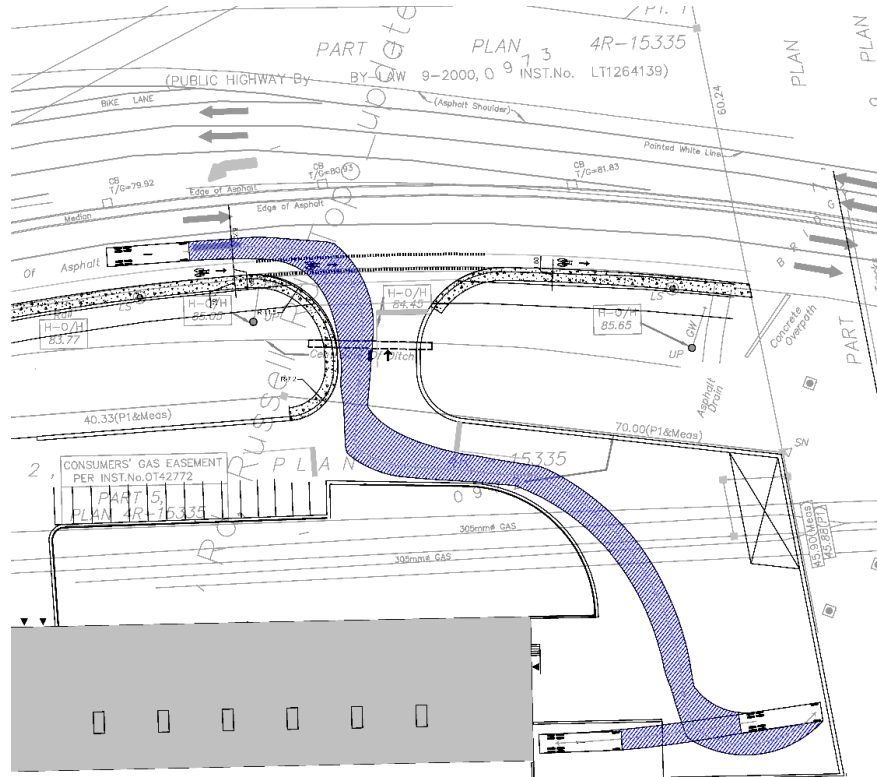
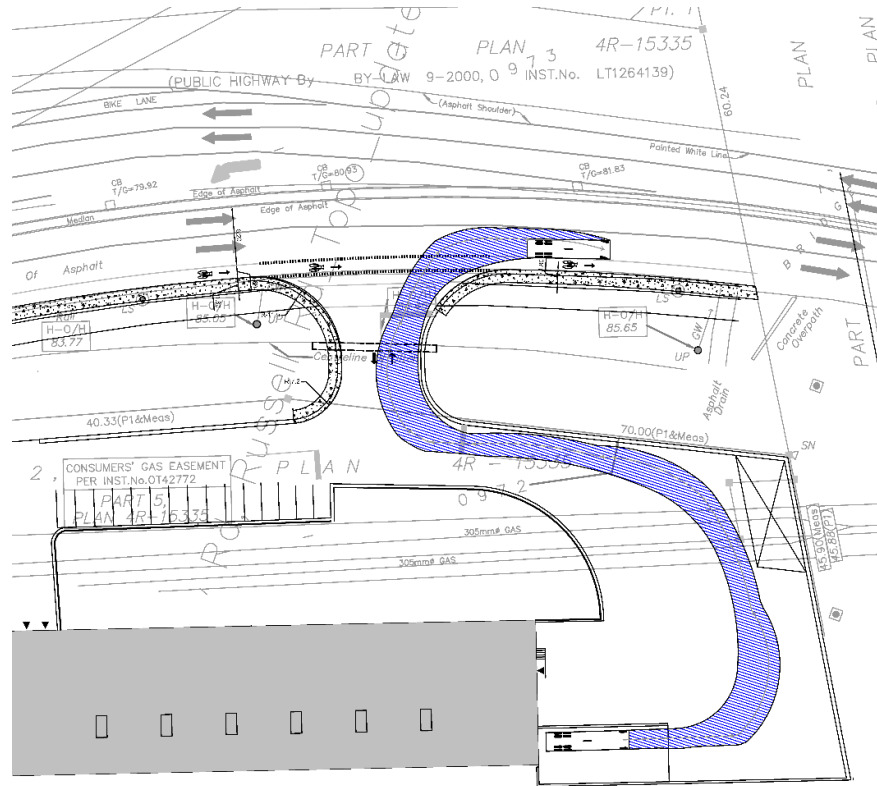
8.2 Circulation and Access

As shown in Figure 7: Flat Bed Truck Accommodation, the design of the proposed site driveway connection to Russell Road and the design of the truck court at the south end of the site can accommodate the turn requirements of the identified size of flat bed delivery truck (35' long Kenworth) that will be making weekly deliveries. The truck, which will arrive approximately once a week during off-peak hours, can turn into and out of the site staying within its lane, and as the width of the driveway is 11 m, these flat bed trucks can enter or leave the site while a car is entering or leaving in the opposite direction. This will ensure that there will be no delay for vehicles entering the site from southbound Russell Road.

Figure 6: Study Area Bus Stops



Figure 7: Flat Bed Truck Accommodation



9.0 PARKING

This topic is addressed in the foregoing Section 8.1. Sufficient parking is proposed for the identified land use and due to the site's relative isolation from adjacent businesses and residences, there is no potential for spill over parking.

10.0 BOUNDARY STREETS

10.1 Rational for No Southbound Right-turn Lane

As previously noted, the adjacent Russell Road is a four-lane divided arterial road with no sidewalks. The development's proposed right-in/right-out driveway connection is located on the upgrade approximately 150 m south of the signalized Walkley Road intersection. If the development proceeds, the City will want a raised concrete sidewalk and raised bike track added to the west side of Russell Road along the full length of the site, and at the developer's cost.

The current design of the proposed site driveway connection includes an 11 m wide driveway to accommodate truck turns and no southbound right-turn lane. The By-Law requirement is for a maximum of 9m, but as this width does not accommodate simultaneous in and out movements involving trucks, a By-Law variance is being requested to allow 11 m. The recommendation that a southbound right-turn lane is not required is based on the combination of:

- The connection is a right-in/right-out only and on an upgrade (slower traffic flow). The average and 85 percentile southbound vehicle speeds are less than the posted speed and there is 93 % compliance with the posted speed. The speed surveys are included as **Appendix C**.
- The peak hour southbound right-turn volumes of 10 to 15 veh/h turning into the site are very low and do not meet the volume guidelines for requiring a right-turn lane. These guidelines are a right-turn volume of 60 veh/h or more, or the right-turn volume being 10 % or more of the curb lane traffic. As the peak hour right-turn volume is only 15 veh/h and as it is only 2.7 % of the southbound curb lane peak hour traffic volume, site-generated traffic volumes do not warrant a right-turn lane;
- Due to the unobstructed approaches to the Walkley/Russell intersection, there are no sight or stopping distance issues according to TAC guidelines (**see Appendix F**). This conclusion is based on the following:
 - The distance between the rear of a flat bed truck turning right into the site and the south limit of the Walkley intersection is approximately 135 m;
 - The stopping sight distance for an 80 km/h design speed is 130 m (Appendix E). The posted speed on Russell Road is 50 km/h north of Walkley Road and 70 km/h south of Walkley Road. As per the speed survey conducted 100 m south of the Walkley intersections, the average speed on Russell Road approaching the site driveway is 57 km/h and the 85th percentile speed is 68 km/h. As such, using an 80 km/h design speed to determine stopping site distance is very conservative in this instance; and
 - The slight vehicle curvature of Russell Road and planned guard rails located back of a future raised sidewalk and bike track do not visually impact the 135 m of available stopping sight distance.
- As previously described, there is no vehicle collision issue on the adjacent section of Russell Road; and
- Along the length of Hawthorne Road between Russell Road and Hunt Club Road, in both the northbound and southbound directions, there was no precedent for the City requiring/providing southbound right-turn lanes at private driveways, many of which accommodate higher traffic volumes than those projected for the subject site driveway.

11.0 SITE PERFORMANCE AND INTERSECTION DESIGN

11.1 Performance and MMLoS Analysis

Due to the extremely low volume of peak hour site-generated traffic using adjacent signalized intersections compared to the existing volumes of these intersections (0.4% to 0.6% of total), site-generated traffic will have no impact on the operation of adjacent intersections and there is no requirement for further review of these intersections.

Given the development's location in an "employment area" and the proposed 1.8 m raised concrete sidewalk and 1.8 m raised bike track adjacent to the site, the resulting MMLoS analysis for the adjacent section of Russell Road is summarized in Table 3, (Appendix G). As shown, all modes meet the target level of service, except pedestrians. Given the high volume of vehicles and the vehicle speeds along this segment of roadway, achieving a better PLoS at this location is difficult.

Table 3: MMLoS - Russell Road Segments

Road Segment	Level of Service							
	Pedestrian		Bicycle (BLoS)		Transit (TLoS)		Truck (TkLoS)	
	PLoS	Target	BLoS	Target	TLoS	Target	TkLoS	Target
Russell Road	E	C	A	C	D	No Target	A	B

11.2 Intersection Design Details

Based on a very thorough analysis of all factors/considerations, the proposed right-in/right-out site driveway connection, with no southbound right-turn lane and located approximately 150 m south of the Walkley/Russell intersection, is the recommended site access solution. Details of this intersection, and the other related road modification requirements, follow:

- With Russell Road being identified as a Spine Route in the City's Cycling Plan, a 1.8 m wide **raised bicycle track** is required along the site's Russell Road frontage. At both the north and south ends of the site, it will transition into the existing paved shoulder bike facility. A bicycle crossride will be provided at the driveway entrance;
- A 1.8 m raised concrete **sidewalk** will be required along the site's Russell Road frontage adjacent to and west of the raised bike track. At both the north and south ends of the site it will transition back into existing conditions. Across the proposed site driveway, the concrete sidewalk will be continuous but depressed to the level of the pavement;
- A **site driveway width** of 11 m is recommended to accommodate two-way delivery truck traffic simultaneously and thereby avoiding any vehicle delay entering the site. As the By-Law's maximum driveway width is 9 m, a variance is required;
- With the driveway radius matching the inbound truck turn template requirements, a **throat length** of 12.5 m can be achieved. This is slightly less than TAC's suggested 15 m requirement but is considered acceptable given the combination of the very low volume of site-generated traffic, truck delivery being only once a week and the entering vehicles having free flow, whereas site exiting vehicles are STOP sign controlled where the on-site circulation aisles intersect the entrance driveway;
- The total length of the site-driveway from the road's edge of pavement to its intersection with the on-site circulation aisle is approximately 21.5 m. With regard to **driveway grades**, from the edge of pavement to the back of proposed sidewalk, the distance is 3.6 m and the grade is - 2% (sloping towards the road). From the back of proposed sidewalk to the proposed exiting STOP bar, there is 3.0 m of 2% grade (sloping away from Russell Road). For the remaining 14.9 m of the driveway, the grade is slightly less than 6%. The City's Private Approach By-Law requires 9 m of 2% grade back from the property line, primarily for visibility purposes. As there are no adjacent buildings at the street edge blocking sight lines and as the required guard rails also do not block sight lines (to be elaborated later), the proposed driveway grades are considered acceptable and a variance will be required;

- With the urbanization of the adjacent southbound Russell Road (raised bike track and concrete sidewalk), **drainage** is a consideration. Catch basins will be required along the new curb and at the entrance to the site driveway to direct water to the existing ditch and to prevent any of the road runoff draining down the driveway into the site. The proposed culvert under the driveway will be at the appropriate depth and the appropriate length to be compatible with the existing ditch drainage and minimize the side slopes of the site driveways.
- Giving consideration to the driveway location, its grades and the location of the proposed bike track, sidewalk and guard rails, **appropriate sight lines** (equivalent to the minimum stopping sight distance requirements) will exist. Based on a graphical analysis of the Site Plan, the driver's eye height for passenger vehicles exiting the site will be an approximate elevation of 82.00 m when stopped behind the STOP bar. The driver must be able to see 145 m towards the Russell/Walkley intersection for appropriate decision sight distance to execute the outbound right turn (ref. TAC Fig. 9.95, Case B2, Design speed of 80 kph (conservative)). The guiderail will be located behind the sidewalk and bike track and will have an approximate top of rail elevation of 78.86 m at the point where the drivers sight line crosses it; and that point is 94 m away from the driver's eye. The surface elevation of the road in the curb lane at the 145 m DSD limit is approximately elevation 77.35 m and the minimum object height the driver would need to detect is approximately 0.6 m (approaching passenger vehicle headlight level), adding up to an object height elevation of 77.95 m. Based on the foregoing, the driver's line of sight to the headlights of an oncoming vehicle is above the guide rail by 0.5 m, and the elevations of guiderail and road/object in the intermediate distance also allow sightlines over the guiderail;
- Guardrail requirements were based on whether or not a recoverable road side slope of 4:1 or flatter could be achieved. A review of the road, ditch, driveway and on-site elevations provided by the site engineer, reveals the following:
 - A 4:1 side slope or flatter exists from Walkley Road south along Russell Road to a point approximately 45 m north of the centerline of the proposed site driveway, no guardrail is required along this section of road;
 - From the preceding limit to the site driveway (approximately 60 m), the side slope is in the 3:1 to 4:1 range, therefore a guiderail is required along this section and wrapping around on the north side of the site driveway, unless additional fill can be added to reduce the slope to be flatter than 4:1;
 - From the site driveway south to the bridge structure over the rail line, a guiderail is required and it should wrap around the south side of the site driveway and extend all the way to the west limit of the driveway to where it intersects the on-site circulation aisle. As the existing guardrail ties into the existing concrete barrier/railing of the bridge structure, the proposed bike track and sidewalk will need to transition into the exiting paved bicycle lane at this location; and
 - A guiderail height of 610 mm similar as exists beside the existing bicycle lane, is recommended. The guardrail height is less than 0.75 m so the minimum recommended horizontal off-set of 0.2 m is recommended.

12.0 TRANSIT

Study area bus routes and bus stops are summarized in Section 1.2.1 and are depicted in Figure 2 and Figure 6. As the proposed development is projected to generate between 0 and 3 transit riders per peak hour, it will have no impact on existing transit service serving to the site.

13.0 SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS

It is our understanding that with approval of the subject Site Plan the City will require that the proponent be responsible for the design and construction of both a raised bike track and sidewalk (each 1.8 m wide) along the full length of the site's Russell Road frontage. They will also be responsible for new guardrail installation, drainage requirements for the driveway and the adjacent section of Russell Road, and any required pole relocations and any raising of overhead wires to accommodate the new driveway. Our recommendation herein is that no other road modifications are required to accommodate the proposed right-in/right-out site driveway connection and the low projected site-generated volumes. Our recommended design solution is depicted in Figure 2.

The City, in initial discussions, had indicated that they may want either a southbound right-turn lane or a southbound taper only to be provided. At their request, Table 4 summarizes the pros and cons of the three options to assist the City in their review. In summary, as neither the right-turn lane nor a right-turn taper options meet either the traffic volume or sight line warrants, and as they would add significant costs to the project, neither is recommended.

Table 4: Pros and Cons of Providing a Southbound Right-Turn Facility, or not, at Proposed Site Driveway on Russell Road

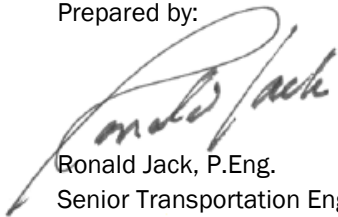
	Pros	Cons
Option 1: No Right-Turn Lane or Right-Turn Taper:	<ul style="list-style-type: none"> • Consistent with guidelines for volume and stopping sight distance; • Results in 3.5 m longer driveway; • Longer throat length allows for a 6 % driveway grade and a better road drainage solution at the driveway interface with Russell Road; • Longer throat length better accommodates truck turning requirements and reduces vehicle conflicts in driveway; • Does not require relocation of existing utility/hydro poles. However, the City requested sidewalk will require the relocation of two (2) street light poles and a utility pole guy wire; • Requires less fill material than Options 2 and 3. 	<ul style="list-style-type: none"> • 10 to 15 veh/h during peak hours are projected to turn right into site from curb-side through lane. Far fewer vehicles make this turn during all other hours of the day; • Slight increase in vehicle collision potential on section of Russell Road that has very low collision history.
Option 2: Right-Turn Lane and Taper:	<ul style="list-style-type: none"> • Removes low volume of inbound right turns from southbound traffic flow thereby reducing collision potential. 	<ul style="list-style-type: none"> • Combined with City requirement for a sidewalk, necessitates more fill material due to grade differential with site. Also requires relocation of two light poles and one utility pole; • Significant increased cost, estimated at approximately \$175,000 to \$200,000 more; • Reduces driveway length by 3.5 m and therefore increases driveway grade to well above 6 %; • Increases potential for vehicle conflicts in driveway zone due to reduced driveway length; • Adds complexity to drainage solution for driveway/roadway intersection.

	Pros	Cons
Option 3: Right-Turn Taper:	<ul style="list-style-type: none"> Removes low volume of inbound right turns from southbound traffic flow thereby reducing collision potential. 	<ul style="list-style-type: none"> Same “cons” as Option 2 with regard to fill and relocation, but to a lesser degree and therefore at a slightly lower cost increase; Reduces driveway length by 3.5 m and therefore increases driveway grade to well above 6 %; Increases potential for vehicle conflicts in driveway zone due to reduced driveway length; Adds complexity to drainage solution for driveway/roadway intersection.

14.0 RECOMMENDATIONS

Based on the combination of; the foregoing analysis, the proposed driveway design and the on-site circulation layout depicted in Figure 2, it is recommended that neither a southbound right-turn lane nor a right-turn taper is required for the site driveway intersection with Russell Road to operate acceptably and safely. With this design and the provision of a raised bike track and sidewalk and related new guardrails along site’s Russell Road frontage, the proposed Site Plan is recommended from a transportation perspective.

Prepared by:



Ronald Jack, P.Eng.
Senior Transportation Engineer

Attachments

Appendix A

Screening Form

City of Ottawa 2017 TIA Guidelines
TIA Screening Form

Date 4-Oct-17
Project 2510 Russell Road
Project Number 476409-01000

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

Module 1.1 - Description of Proposed Development	
Municipal Address	2510 Russell Road
Description of location	On the west side of Russell Road immediately south of Walkley Road
Land Use	Industrial/retail tile centre
Development Size	929 m ² showroom and 2,323 m ² warehouse
Number of Accesses and Locations	One
Development Phasing	None
Buildout Year	2018/2019
Sketch Plan / Site Plan	See attached

Module 1.2 - Trip Generation Trigger	
Land Use Type	Industrial/Retail
Development Size	3252 m ²
Trip Generation Trigger Met?	No

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

Module 1.4 - Safety Triggers	
Posted Speed Limit on any boundary road	>60 km/h
Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway	No
A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection;	Yes
A proposed driveway makes use of an existing median break that serves an existing site	No
There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development	Yes
The development includes a drive-thru facility	No
Safety Trigger Met?	Yes

Appendix B

Current Walkley/Russell Traffic Count

Turning Movement Count - Peak Hour Diagram

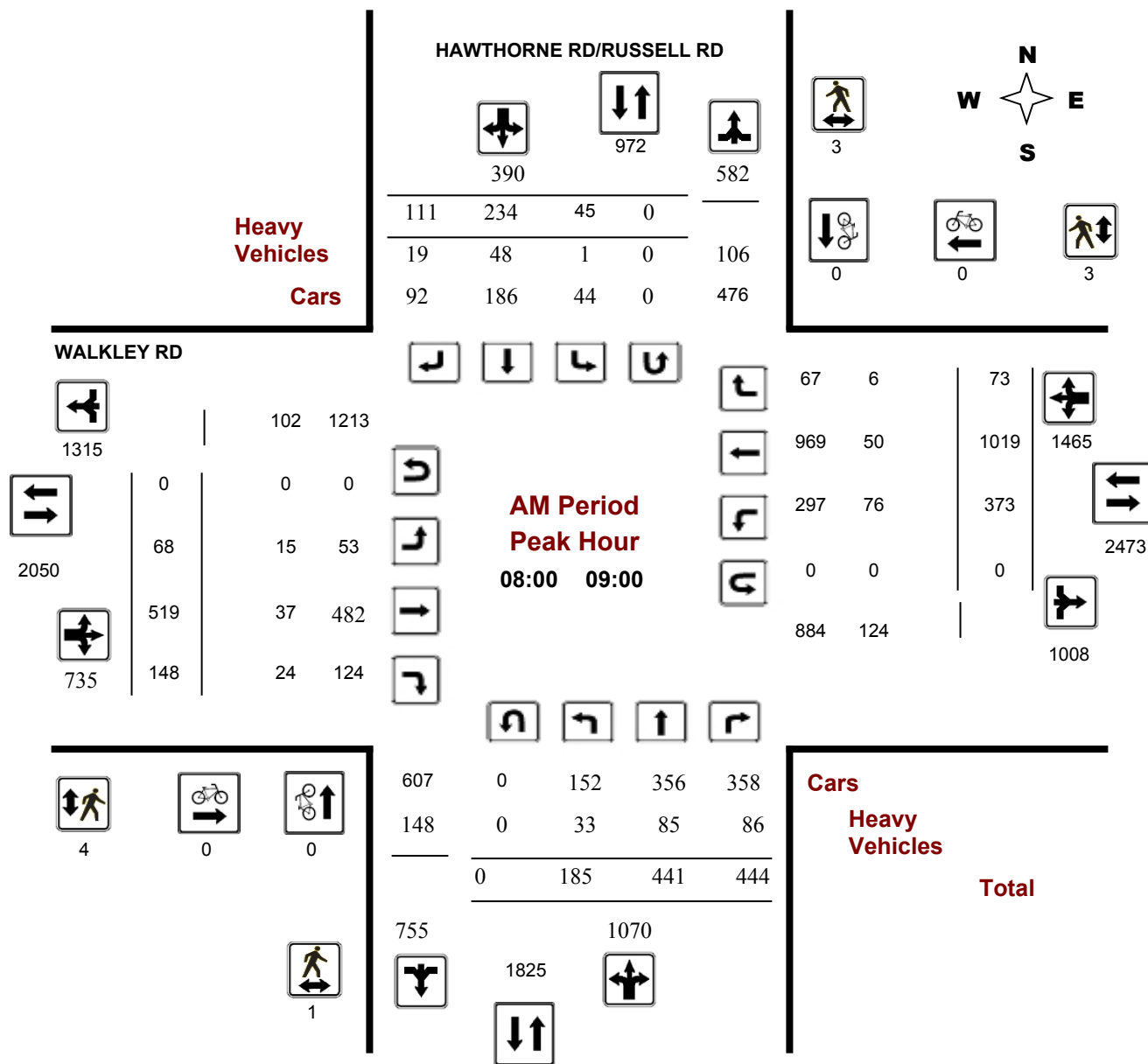
HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

Start Time: 07:00

WO No: 35412

Device: Miovision



Turning Movement Count - Peak Hour Diagram

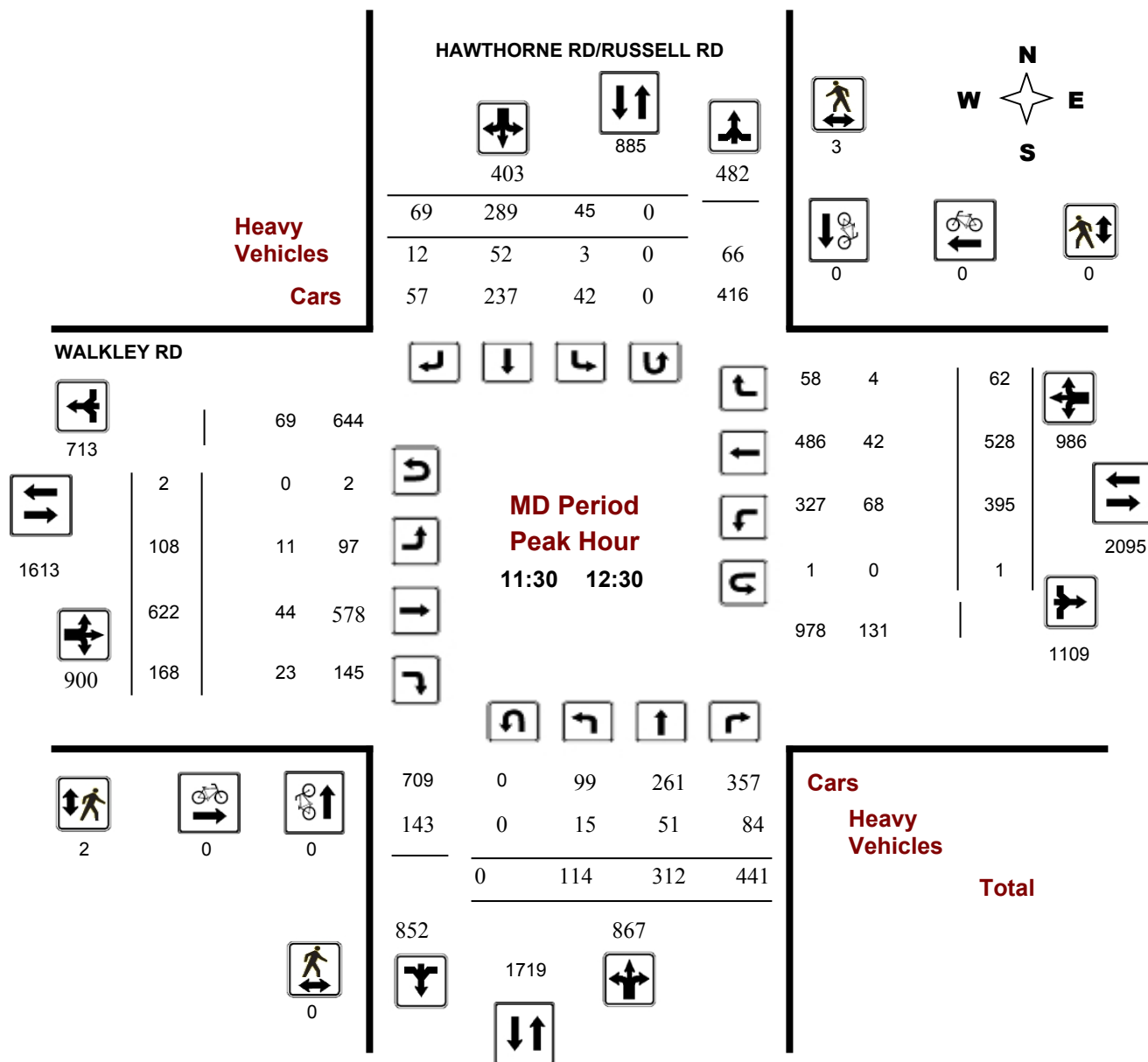
HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

Start Time: 07:00

WO No: 35412

Device: Miovision



Turning Movement Count - Peak Hour Diagram

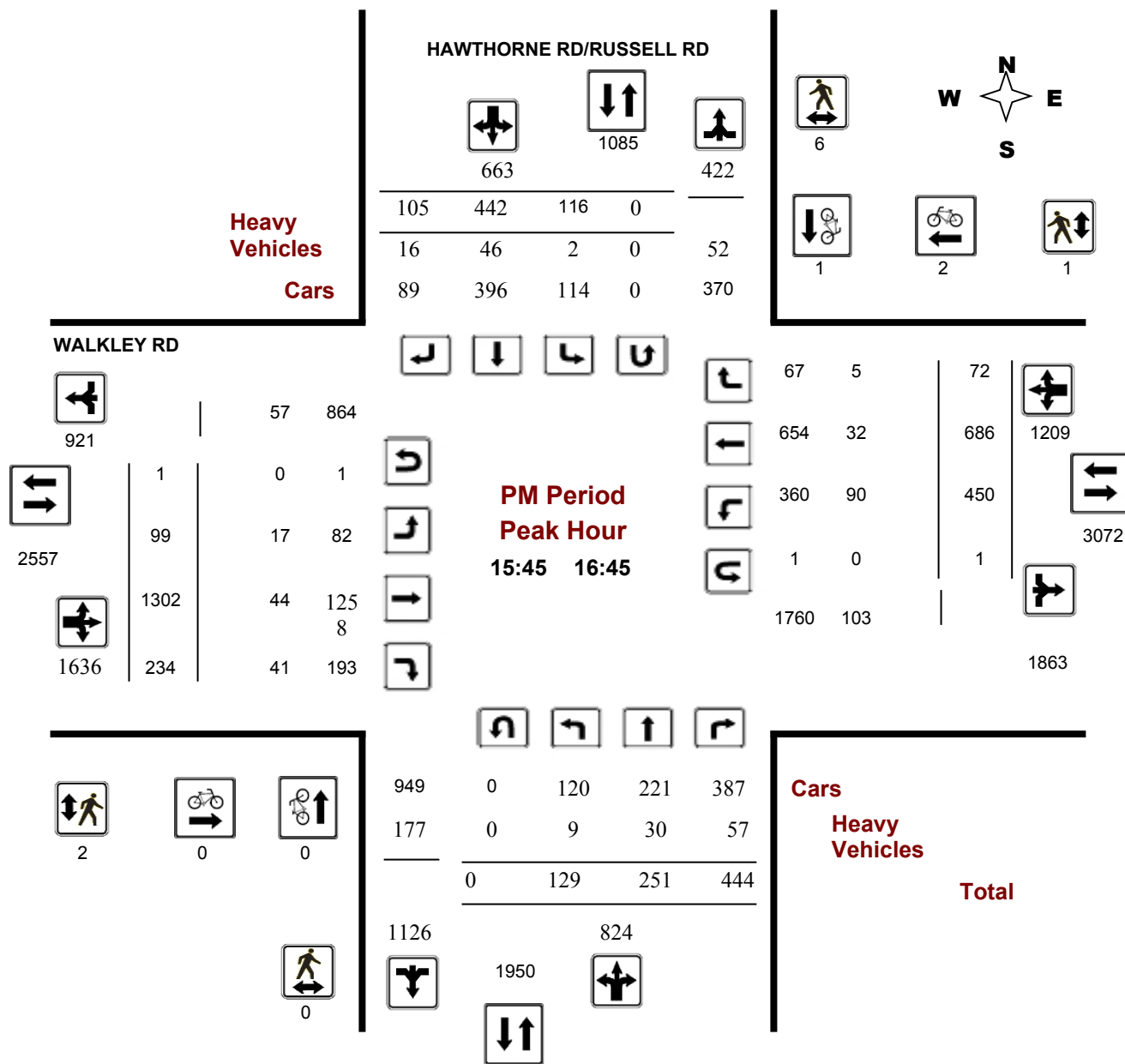
HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

Start Time: 07:00

WO No: 35412

Device: Miovision



Transportation Services - Traffic Services

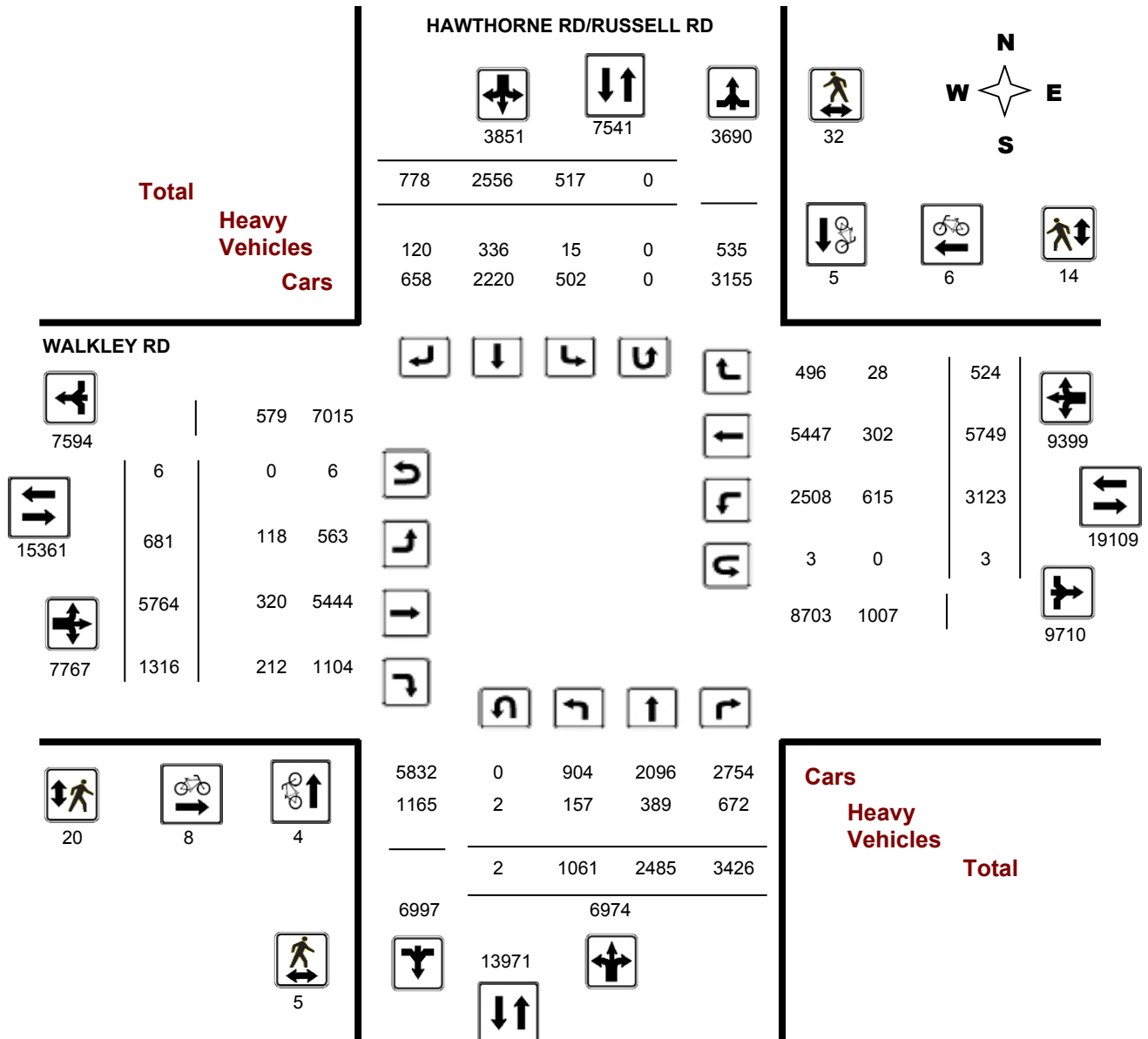
Turning Movement Count - Full Study Diagram

HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

WO#: 35412

Device: Miovision



Turning Movement Count - Full Study Summary Report

HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

Total Observed U-Turns

AADT Factor

Northbound: 2 Southbound: 0
Eastbound: 6 Westbound: 3
1.00

Full Study

HAWTHORNE RD/RUSSELL RD										WALKLEY RD									
Northbound					Southbound					Eastbound					Westbound				
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	162	408	368	938	42	215	91	348	1286	48	459	89	596	403	1109	59	1571	2167	3453
08:00 09:00	185	441	444	1070	45	234	111	390	1460	68	519	148	735	373	1019	73	1465	2200	3660
09:00 10:00	109	306	511	926	50	213	89	352	1278	69	439	155	663	341	657	56	1054	1717	2995
11:30 12:30	114	312	441	867	45	289	69	403	1270	108	622	168	898	395	528	62	985	1883	3153
12:30 13:30	100	287	339	726	45	345	99	489	1215	90	518	162	770	420	547	66	1033	1803	3018
15:00 16:00	136	277	502	915	90	450	112	652	1567	105	1062	203	1370	379	599	53	1031	2401	3968
16:00 17:00	130	234	448	812	114	426	109	649	1461	99	1278	212	1589	472	687	80	1239	2828	4289
17:00 18:00	125	220	373	718	86	384	98	568	1286	94	867	179	1140	340	603	75	1018	2158	3444
Sub Total	1061	2485	3426	6972	517	2556	778	3851	10823	681	5764	1316	7761	3123	5749	524	9396	17157	27980
U Turns				2				0	2				6				3	9	11
Total	1061	2485	3426	6974	517	2556	778	3851	10825	681	5764	1316	7767	3123	5749	524	9399	17166	27991
EQ 12Hr	1475	3454	4762	9694	719	3553	1081	5353	15047	947	8012	1829	10796	4341	7991	728	13065	23861	38908
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.										1.39									
AVG 12Hr	1475	3454	4762	9694	719	3553	1081	5353	15047	947	8012	1829	10796	4341	7991	728	13065	23861	38908
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.										1.00									
AVG 24Hr	1932	4525	6238	12699	941	4654	1417	7012	19711	1240	10496	2396	14143	5687	10468	954	17115	31258	50969
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.										1.31									

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Turning Movement Count - 15 Minute Summary Report

HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Survey Date: Thursday, September 17, 2015

Total Observed U-Turns

Northbound: 2 Southbound: 0
Eastbound: 6 Westbound: 3

HAWTHORNE RD/RUSSELL RD										WALKLEY RD										Grand Total
Northbound					Southbound					Eastbound					Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT		
07:00 07:15	35	82	76	193	14	54	13	81	274	8	98	21	127	103	229	9	341	468	742	
07:15 07:30	46	109	100	256	7	50	29	86	342	13	109	20	142	107	296	17	420	562	904	
07:30 07:45	30	110	110	251	11	65	28	104	355	13	132	20	165	87	275	21	383	548	903	
07:45 08:00	51	107	82	240	10	46	21	77	317	14	120	28	162	106	309	12	427	589	906	
08:00 08:15	49	84	115	248	12	75	19	106	354	19	125	30	174	97	240	20	357	531	885	
08:15 08:30	57	124	101	282	7	51	28	86	368	16	122	39	177	87	276	21	384	561	929	
08:30 08:45	35	133	109	277	14	49	33	96	373	17	147	34	198	91	234	13	338	536	909	
08:45 09:00	44	100	119	263	12	59	31	102	365	16	125	45	186	98	269	19	386	572	937	
09:00 09:15	39	92	145	276	14	64	32	110	386	25	115	34	174	79	186	18	283	457	843	
09:15 09:30	23	80	131	234	7	48	21	76	310	19	114	46	179	93	147	15	255	434	744	
09:30 09:45	27	63	127	217	16	40	14	70	287	13	111	35	162	71	162	8	241	403	690	
09:45 10:00	20	71	108	199	13	61	22	96	295	12	99	40	151	98	162	15	276	427	722	
11:30 11:45	30	73	109	212	10	66	22	98	310	24	147	40	212	86	117	25	228	440	750	
11:45 12:00	21	86	122	229	8	72	16	96	325	36	145	32	213	101	145	5	251	464	789	
12:00 12:15	31	61	100	192	13	88	17	118	310	18	169	57	244	117	127	15	260	504	814	
12:15 12:30	32	92	110	234	14	63	14	91	325	30	161	39	231	91	139	17	247	478	803	
12:30 12:45	12	69	84	165	12	98	23	133	298	18	153	35	206	101	118	23	242	448	746	
12:45 13:00	25	71	100	196	9	80	21	110	306	28	121	41	190	110	151	14	275	465	771	
13:00 13:15	37	68	76	181	7	89	23	119	300	23	141	38	202	94	139	14	247	449	749	
13:15 13:30	26	79	79	184	17	78	32	127	311	21	103	48	172	115	139	15	269	441	752	
15:00 15:15	37	77	145	259	22	93	34	149	408	20	238	41	299	106	143	15	264	563	971	
15:15 15:30	34	71	123	228	26	114	31	171	399	25	248	43	316	88	123	17	228	544	943	
15:30 15:45	37	52	130	219	15	139	16	170	389	33	282	59	374	87	171	10	268	642	1031	
15:45 16:00	28	77	104	209	27	104	31	162	371	27	294	60	381	98	162	11	272	653	1024	
16:00 16:15	37	65	131	233	31	94	22	147	380	16	340	59	416	124	172	20	316	732	1112	
16:15 16:30	33	44	104	181	37	135	29	201	382	30	337	63	430	102	168	19	289	719	1101	
16:30 16:45	31	65	105	201	21	109	23	153	354	26	331	52	409	126	184	22	332	741	1095	
16:45 17:00	29	60	108	197	25	88	35	148	345	27	270	38	335	120	163	19	302	637	982	
17:00 17:15	47	66	117	230	37	103	16	156	386	29	296	66	391	93	213	25	331	722	1108	
17:15 17:30	28	60	106	194	21	105	28	154	348	23	225	44	292	86	172	21	279	571	919	
17:30 17:45	23	44	71	138	13	102	26	141	279	17	186	43	246	90	121	17	228	474	753	
17:45 18:00	27	50	79	156	15	74	28	117	273	25	160	26	211	71	97	12	180	391	664	
TOTAL:	1061	2485	3426	6974	517	2556	778	3851	10825	681	5764	1316	7767	3123	5749	524	9399	17166	27991	

Note: U-Turns are included in Totals.

Comment:

Appendix C

Speed Survey on Southbound Russell Road 100 m South of Walkley/Russell Intersection



Spot Speed Survey Histogram

Glossary of Relevant Spot Speed Survey Terms



Russell Road between Hawthorne Road and Walkley Road

A point 100 m south of Walkley Road

Hawthorne Meadows

Ward: 10

Ottawa, ON

Monday 10 July 2017

Road Surface: Asphalt

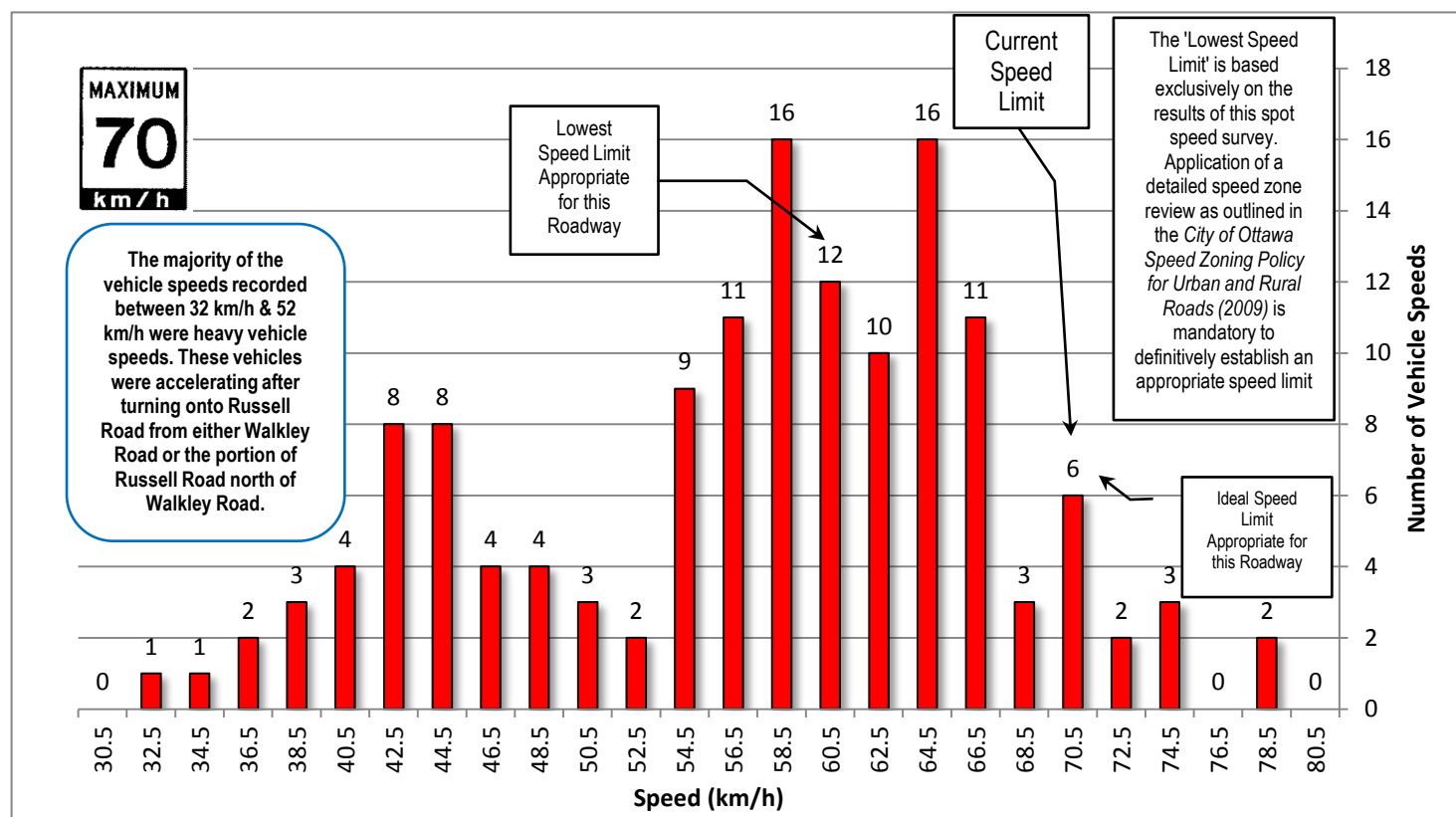
Road Condition: Dry

Weather: Cloudy

Survey Hours: 0945 - 1045

Notes: All southbound vehicles accelerating up hill including E/B right turns & W/B left turns from Walkley Road & S/B straight through vehicles.

Spot Speed Survey Histogram - All Vehicles - Combined Directions



Glossary of Relevant Spot Speed Survey Terms

Mean Speed:	The average speed, calculated as the sum of all speeds divided by the number of speed observations.
Median Speed	The speed that equally divides the distribution of spot speeds; 50 % of observed speeds are higher than the median; 50 % of the observed speeds are lower than the median.
Mode:	The number that occurs most frequently in a series of numbers.
Pace Speed:	The 16 km/h (typically, 15 km/h) increment in speeds that encompass the highest portion of observed speeds; often, the pace speed range is the mean speed plus/minus 8 km/h.
85th percentile Speed:	The speed at or below which 85 % of a sample of free-flowing vehicles is travelling (based on the results of a spot speed survey). The 85th percentile speed is typically used as a baseline for establishing the speed limit.

DISCLAIMER

The data contained in this data summary are for information purposes only, and may not apply to your situation. Every effort is made to ensure the traffic count or speed survey information is accurate for the survey date provided on the summary, flow chart and/or histogram forms. The author, publisher, and distributor provide no warranty about the content or accuracy of either the summary, flow charts, or histogram. Information provided is subjective. The publisher, author, and distributor shall not be liable for any loss of profit or any other commercial damages resulting from the use of the data.



Spot Speed Survey Summary



Russell Road between Hawthorne Road and Walkley Road

A point 100 m south of Walkley Road

Hawthorne Meadows

Ward: 10

Ottawa, ON

Monday 10 July 2017

Road Surface: Asphalt

Road Condition:

Dry

Weather: Cloudy

Survey Hours: 0945 - 1045

Notes: All southbound vehicles accelerating up hill including E/B right turns & W/B left turns from Walkley Road & S/B straight through vehicles.

Spot Speed Survey Summaries for All Vehicle Types

Northbound		Speed Limit 70 km/h	Southbound	
Total Number of All Vehicles	<div>N/B vehicle speeds NOT recorded.</div>		Total Number of All Vehicles	141
Average (Mean) Speed			Average (Mean) Speed	57 km/h
85th Percentile Speed			85th Percentile Speed	68 km/h
95th Percentile Speed			95th Percentile Speed	74 km/h
Upper Limit Pace Speed Range			Upper Limit Pace Speed Range	70 km/h
Driver Compliance with Speed Limit			Driver Compliance with Speed Limit	93 %

Spot Speed Summary - Combined Both Directions	
Total Number of All Vehicles	141
Average (Mean) Speed	57 km/h
85th Percentile Speed	68 km/h
95th Percentile Speed	74 km/h
Upper Limit Pace Speed Range	70 km/h
Driver Compliance with Speed Limit	93%

Additional Survey Details	
Highest vehicle speed in summary	78 km/h
Slowest vehicle speed in summary	32 km/h
Speed Differential	46 km/h
Fastest Speed Observed *	78 km/h
* The FASTEST speed observed is NOT included in the summary if it is > than the HIGHEST vehicle speed in the summary. It is included for information only.	

Arterial Roadway

Heavy Vehicle Spot Speed Survey Summary

Total Number of Heavy Vehicles *	48
Average (Mean) Speed	47 km/h
85th Percentile Speed	54 km/h
Driver Compliance with Speed Limit	100%

Trucks

46



Buses

2



School Buses

0

* N/A if the total number of heavy vehicles <6.

* If the total number of heavy vehicles <30, this value is insufficient for a valid statistical sample.

Estimated Driver Compliance

with an increase or decrease in the posted speed limit.

Speed Limit	Compliance
30 km/h	0%
40 km/h	6%
50 km/h	26%
60 km/h	58%
70 km/h	93%
80 km/h	100%
90 km/h	100%
100 km/h	100%

Current
Speed
Limit



City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)

Based **exclusively** on the results of this spot speed survey and using the criteria set forth in the *City of Ottawa Speed Zoning Policy for Urban and Rural Roads (2009)*, the ideal speed limit for this roadway is:

70 km/h

The lowest speed limit appropriate for this roadway shall not differ from the 85th percentile speed by more than 13 km/h. In this case, the lowest speed limit must not be lower than:

60 km/h

Appendix D

Collision Data on Russell Road between the Walkley and Hawthorne Intersections



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2016

Location: RUSSELL RD btwn RUSSELL RD & WALKLEY RD

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Apr-19, Tue,07:44	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Truck - tractor	Other motor vehicle	
					South	Stopped	Truck and trailer	Other motor vehicle	

HAWTHORNE RD, RUSSELL RD S to WALKLEY RD

Former Municipality: Ottawa

Traffic Control: No control

Number of Collisions: 2

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
9	2012-05-15	Tue	14:55	Clear	Daylight	Sideswipe	P.D. only	V1 S V2 S	Dry Dry	Changing lanes Going ahead	Passenger van Automobile, station	Other motor vehicle Other motor vehicle	0
10	2012-05-29	Tue	17:26	Rain	Daylight	Rear end	P.D. only	V1 N V2 N	Wet Wet	Slowing or Stopped	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 To: December 31, 2015

Location: RUSSELL RD btwn RUSSELL RD & WALKLEY RD

Traffic Control: No control

Total Collisions: 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-03, Fri,07:04	Clear	SMV other	P.D. only	Ice	South	Going ahead	Pick-up truck	Steel guide rail	
2014-Apr-09, Wed,08:41	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Apr-30, Wed,15:37	Rain	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Passenger van	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2014-Aug-12, Tue,08:10	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2015-Feb-13, Fri,07:09	Drifting Snow	SMV other	Non-fatal injury	Ice	South	Going ahead	Automobile, station wagon	Skidding/sliding	
2015-Jan-14, Wed,10:35	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Delivery van	Other motor vehicle	

2015-Sep-02, Wed,09:01	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle
					South	Stopped	Truck - closed	Other motor vehicle

Summary:

- 2 collisions related to icy road conditions
- 1 related to lane changing
- 1 related to in-lane rear-end collision

Appendix E

Collision Data at Walkley/Russell Intersection



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** January 1, 2017

Location: HAWTHORNE RD/RUSSELL RD @ WALKLEY RD

Traffic Control: Traffic signal

Total Collisions: 72

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Feb-17, Mon,19:29	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Feb-16, Sun,15:50	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Feb-04, Tue,15:32	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Truck and trailer	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Mar-05, Wed,18:40	Clear	Rear end	P.D. only	Ice	West	Changing lanes	Pick-up truck	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2014-Mar-27, Thu,11:19	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Pick-up truck	Other motor vehicle	
2014-Feb-11, Tue,08:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	

					West	Stopped	Passenger van	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2014-Mar-30, Sun,15:01	Snow	SMV other	P.D. only	Packed snow	South	Turning right	Automobile, station wagon	Skidding/sliding
2014-Apr-12, Sat,09:29	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Truck - dump	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2014-May-02, Fri,02:34	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Apr-14, Mon,15:52	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Slowing or stopping	Pick-up truck	Other motor vehicle
2014-Jun-02, Mon,16:48	Clear	Turning movement	Non-fatal injury	Dry	North	Turning right	Truck and trailer	Cyclist
					North	Going ahead	Bicycle	Other motor vehicle
2014-May-29, Thu,18:00	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2014-Jun-05, Thu,18:20	Clear	Sideswipe	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle

					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Jun-23, Mon,17:39	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle
					North	Turning left	Truck - dump	Other motor vehicle
2014-Apr-30, Wed,17:33	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2014-Jun-15, Sun,15:00	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2014-May-26, Mon,09:11	Clear	Other	P.D. only	Dry	East	Reversing	Truck - open	Other motor vehicle
					West	Turning left	Passenger van	Other motor vehicle
2014-Aug-12, Tue,17:23	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jul-12, Sat,15:12	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2014-Apr-26, Sat,09:35	Clear	Rear end	P.D. only	Dry	North	Turning right	Unknown	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle

2014-Aug-08, Fri,13:00	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Sep-26, Fri,15:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Aug-26, Tue,07:24	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Truck - closed	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2014-Dec-16, Tue,13:17	Rain	Rear end	P.D. only	Wet	South	Going ahead	Construction equipment	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Dec-16, Tue,17:15	Freezing Rain	Sideswipe	P.D. only	Wet	South	Changing lanes	Automobile, station wagon	Other motor vehicle
					South	Turning left	Pick-up truck	Other motor vehicle
2014-Oct-16, Thu,09:45	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Delivery van	Other motor vehicle
2014-Aug-12, Tue,17:05	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Turning left	Pick-up truck	Other motor vehicle

2014-Oct-01, Wed,18:05	Clear	Rear end	P.D. only	Dry	East	Unknown	Automobile, station wagon	Other motor vehicle
					East	Unknown	Truck - closed	Other motor vehicle
2014-Oct-17, Fri,15:58	Rain	Sideswipe	Non-fatal injury	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Jul-22, Wed,09:29	Clear	Rear end	Non-fatal injury	Dry	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2014-Dec-26, Fri,14:01	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2015-Feb-07, Sat,11:40	Clear	Angle	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning left	Truck - closed	Other motor vehicle
2015-Feb-14, Sat,12:45	Snow	Sideswipe	P.D. only	Loose snow	West	Unknown	Pick-up truck	Other motor vehicle
					West	Unknown	Automobile, station wagon	Other motor vehicle
2015-Jan-12, Mon,16:16	Clear	Rear end	P.D. only	Packed snow	North	Going ahead	Unknown	Other motor vehicle
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2014-Dec-31, Wed,08:00	Clear	Rear end	P.D. only	Dry	North	Turning right	Truck - closed	Other motor vehicle

					North	Turning right	Pick-up truck	Other motor vehicle
2014-Dec-17, Wed,13:15	Rain	Rear end	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2015-Jan-12, Mon,15:37	Snow	Rear end	P.D. only	Loose snow	South	Turning right	Truck - closed	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2015-Mar-25, Wed,10:20	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2015-Apr-04, Sat,22:27	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Pick-up truck	Other motor vehicle
2015-May-07, Thu,13:13	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Stopped	Truck and trailer	Other motor vehicle
2015-Jun-04, Thu,09:56	Clear	Angle	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2015-Jun-18, Thu,10:54	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle

2015-Sep-08, Tue,07:27	Clear	Rear end	P.D. only	Dry	East	Going ahead	Truck and trailer	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Passenger van	Other motor vehicle
2015-May-23, Sat,13:27	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Police vehicle	Other motor vehicle
2016-May-13, Fri,08:01	Rain	Rear end	P.D. only	Wet	North	Turning right	Delivery van	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2016-Feb-16, Tue,06:50	Snow	Rear end	P.D. only	Slush	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Nov-03, Tue,15:57	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2015-Nov-09, Mon,14:10	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2015-Jul-21, Tue,10:29	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Truck and trailer	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle

2015-Nov-27, Fri,16:20	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2016-Mar-11, Fri,15:40	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Delivery van	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2016-Apr-12, Tue,06:21	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2016-May-03, Tue,08:02	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Pick-up truck	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2015-Dec-22, Tue,16:13	Rain	Rear end	Non-fatal injury	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Nov-13, Fri,14:04	Rain	Rear end	P.D. only	Wet	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2015-Nov-24, Tue,12:25	Snow	Rear end	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2016-Mar-01, Tue,18:56	Snow	Turning movement	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Truck - tractor	Other motor vehicle
2016-May-06, Fri,10:22	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Pick-up truck	Other motor vehicle
2016-Sep-11, Sun,20:10	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Pick-up truck	Other motor vehicle
2016-Sep-14, Wed,17:30	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle
2016-Jul-22, Fri,14:43	Clear	Other	P.D. only	Dry	West	Reversing	Truck - tractor	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jun-20, Mon,07:44	Clear	Other	P.D. only	Dry	East	Reversing	Truck - tractor	Other motor vehicle
					West	Stopped	Truck - tractor	Other motor vehicle
2016-Nov-07, Mon,16:24	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2016-Oct-19, Wed,17:46	Clear	Approaching	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-05, Wed,18:45	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Sep-28, Wed,10:57	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Truck and trailer	Other motor vehicle
					West	Going ahead	Truck - open	Other motor vehicle
2016-Sep-30, Fri,15:53	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Sep-27, Tue,15:45	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Motorcycle	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2016-Dec-17, Sat,13:33	Snow	SMV other	P.D. only	Packed snow	North	Going ahead	Automobile, station wagon	Animal - wild
2016-Dec-16, Fri,06:52	Clear	Rear end	P.D. only	Wet	South	Turning right	Truck - closed	Other motor vehicle
					South	Turning right	Truck - closed	Other motor vehicle
					South	Turning right	Truck - closed	Other motor vehicle

2016-Dec-05, Mon,05:55	Snow	Other	P.D. only	Packed snow	North	Turning right	Pick-up truck	Skidding/sliding
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Dec-05, Mon,06:10	Snow	Rear end	P.D. only	Packed snow	North	Turning right	Pick-up truck	Skidding/sliding
					North	Turning right	Truck - closed	Other motor vehicle

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

RUSSELL RD & WALKLEY RD

Former Municipality: Ottawa

Traffic Control: Traffic signal

Number of Collisions: 61

	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
1	2012-01-13	Fri	22:52	Clear	Dark	Rear end	P.D. only	V1 N	Ice	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Ice	Turning right	Truck - dump	Other motor vehicle	
2	2012-01-16	Mo	16:00	Clear	Daylight	Sideswipe	P.D. only	V2 W	Dry	Turning left	Pick-up truck	Other motor vehicle	0
								V1 W	Dry	Changing lanes	Automobile, station	Other motor vehicle	
3	2012-01-18	We	09:29	Clear	Daylight	Rear end	P.D. only	V1 N	Slush	Turning right	Pick-up truck	Other motor vehicle	0
								V2 N	Slush	Turning right	Automobile, station	Other motor vehicle	
4	2012-01-27	Fri	17:34	Snow	Dusk	Rear end	P.D. only	V1 N	Slush	Turning right	Automobile, station	Skidding/Sliding	0
								V2 N	Slush	Turning right	Pick-up truck	Other motor vehicle	
5	2012-02-02	Thu	12:00	Clear	Daylight	Rear end	Non-fatal	V1 S	Wet	Turning right	Pick-up truck	Other motor vehicle	0
								V2 S	Wet	Turning right	Automobile, station	Other motor vehicle	
6	2012-02-17	Fri	07:59	Clear	Daylight	Rear end	P.D. only	V1 S	Ice	Turning right	Automobile, station	Skidding/Sliding	0
								V2 S	Ice	Turning right	Municipal transit bus	Other motor vehicle	
7	2012-02-24	Fri	14:10	Snow	Daylight	Rear end	P.D. only	V1 W	Loose snow	Slowing or	Pick-up truck	Other motor vehicle	0
								V2 W	Loose snow	Stopped	Pick-up truck	Other motor vehicle	
8	2012-02-29	We	10:53	Clear	Daylight	Sideswipe	P.D. only	V1 W	Dry	Changing lanes	Passenger van	Other motor vehicle	0
								V2 W	Dry	Turning left	Truck - dump	Other motor vehicle	
9	2012-03-05	Mo	15:07	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Turning right	Delivery van	Other motor vehicle	0
								V2 N	Dry	Turning right	Automobile, station	Other motor vehicle	
10	2012-03-10	Sat	11:39	Clear	Daylight	Rear end	P.D. only	V1 N	Wet	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Wet	Turning right	Pick-up truck	Other motor vehicle	
11	2012-03-17	Sat	11:50	Clear	Daylight	Rear end	P.D. only	V1 W	Dry	Going ahead	Pick-up truck	Other motor vehicle	0
								V2 W	Dry	Stopped	Automobile, station	Other motor vehicle	
12	2012-03-22	Thu	09:05	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Dry	Turning right	Pick-up truck	Other motor vehicle	
13	2012-03-24	Sat	23:00	Clear	Dark	Rear end	P.D. only	V1 S	Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 S	Dry	Turning right	Automobile, station	Other motor vehicle	
14	2012-03-25	Sun	20:00	Clear	Dark	Angle	Non-fatal	V1 N	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Going ahead	Automobile, station	Other motor vehicle	

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

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Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

15	2012-03-27	Tue	13:19	Clear	Daylight	Sideswipe	P.D. only	V1 W Dry	Turning left	Pick-up truck	Other motor vehicle	0
								V2 W Dry	Turning left	School bus	Other motor vehicle	
16	2012-03-27	Tue	15:19	Clear	Daylight	Rear end	P.D. only	V1 E Dry	Going ahead	Truck - other	Other motor vehicle	0
								V2 E Dry	Stopped	Automobile, station	Other motor vehicle	
17	2012-04-25	We	07:46	Clear	Daylight	Rear end	Non-fatal	V1 N Dry	Turning right	Police vehicle	Other motor vehicle	0
								V2 N Dry	Turning right	Automobile, station	Other motor vehicle	
18	2012-05-02	We	21:30	Rain	Dark	Rear end	P.D. only	V1 N Wet	Turning right	Pick-up truck	Other motor vehicle	0
								V2 N Wet	Turning right	Pick-up truck	Other motor vehicle	
19	2012-05-02	We	15:03	Clear	Daylight	Rear end	P.D. only	V1 E Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 E Dry	Turning right	Automobile, station	Other motor vehicle	
20	2012-05-10	Thu	06:45	Clear	Daylight	Rear end	P.D. only	V1 N Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 N Dry	Turning right	Pick-up truck	Other motor vehicle	
21	2012-05-11	Fri	09:29	Clear	Daylight	Rear end	P.D. only	V1 W Dry	Turning left	Passenger van	Other motor vehicle	0
								V2 W Dry	Turning left	Automobile, station	Other motor vehicle	
22	2012-05-24	Thu	08:54	Clear	Daylight	Rear end	Non-fatal	V1 N Dry	Turning right	Pick-up truck	Other motor vehicle	0
								V2 N Dry	Turning right	Pick-up truck	Other motor vehicle	
23	2012-05-25	Fri	08:40	Clear	Daylight	Rear end	P.D. only	V1 N Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 N Dry	Turning right	Automobile, station	Other motor vehicle	
24	2012-06-19	Tue	09:46	Clear	Daylight	Sideswipe	P.D. only	V1 N Dry	Changing lanes	Automobile, station	Other motor vehicle	0
								V2 N Dry	Turning right	Truck and trailer	Other motor vehicle	
25	2012-07-08	Sun	14:42	Clear	Daylight	Sideswipe	P.D. only	V1 W Dry	Changing lanes	Automobile, station	Other motor vehicle	0
								V2 W Dry	Going ahead	Automobile, station	Other motor vehicle	
26	2012-07-11	We	08:45	Clear	Daylight	Sideswipe	P.D. only	V1 W Dry	Turning left	Automobile, station	Other motor vehicle	0
								V2 W Dry	Turning left	Automobile, station	Other motor vehicle	
27	2012-08-08	We	18:22	Rain	Daylight	Rear end	P.D. only	V1 E Wet	Turning right	Automobile, station	Other motor vehicle	0
								V2 E Wet	Turning right	Automobile, station	Other motor vehicle	
28	2012-08-23	Thu	17:00	Clear	Daylight	Sideswipe	P.D. only	V1 W Dry	Changing lanes	Automobile, station	Other motor vehicle	0
								V2 W Dry	Going ahead	Automobile, station	Other motor vehicle	
29	2012-09-04	Tue	13:15	Clear	Daylight	Rear end	P.D. only	V1 S Dry	Slowing or	Truck - closed	Other motor vehicle	0
								V2 S Dry	Stopped	Delivery van	Other motor vehicle	
30	2012-11-06	Tue	12:36	Clear	Daylight	Rear end	P.D. only	V1 W Dry	Turning left	Automobile, station	Other motor vehicle	0
								V2 W Dry	Turning left	Truck - dump	Other motor vehicle	

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FROM: 2012-01-01 TO: 2014-01-01

31	2012-11-26	Mo	04:02	Snow	Dark	Single vehicle	P.D. only	V1 N	Loose snow	Turning right	Pick-up truck	Skidding/Sliding	0
32	2012-12-05	We	17:41	Snow	Dark	Sideswipe	P.D. only	V1 N	Dry	Changing lanes	Pick-up truck	Other motor vehicle	0
33	2012-12-13	Thu	14:30	Clear	Daylight	Single vehicle	Non-fatal	V2 N	Dry	Turning right	Passenger van	Other motor vehicle	0
34	2012-12-21	Fri	19:53	Snow	Dark	Sideswipe	P.D. only	V1 S	Wet	Slowing or	Motorcycle	Other Events	0
								V1 N	Loose snow	Turning left	Snow plow	Other motor vehicle	0
								V2 N	Loose snow	Stopped	Automobile, station	Other motor vehicle	0
35	2013-01-07	Mo	13:59	Clear	Daylight	Angle	Non-fatal	V1 W	Dry	Going ahead	Passenger van	Other motor vehicle	0
								V2 S	Dry	Turning left	Tow truck	Other motor vehicle	0
								V3 S	Dry	Turning left	Automobile, station	Other motor vehicle	0
36	2013-01-09	We	11:19	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Turning right	Delivery van	Other motor vehicle	0
								V2 N	Dry	Turning right	Automobile, station	Other motor vehicle	0
37	2013-01-10	Thu	08:25	Freezin	Daylight	Rear end	P.D. only	V1 N	Ice	Turning left	Automobile, station	Other motor vehicle	0
								V2 N	Wet	Turning left	Automobile, station	Other motor vehicle	0
								V3 N	Ice	Turning left	Passenger van	Other motor vehicle	0
38	2013-01-14	Mo	14:14	Clear	Daylight	Rear end	Non-fatal	V1 N	Wet	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Wet	Turning right	Automobile, station	Other motor vehicle	0
39	2013-01-24	Thu	19:25	Clear	Dark	Rear end	P.D. only	V1 N	Ice	Turning right	Automobile, station	Skidding/Sliding	0
								V2 N	Wet	Turning right	Automobile, station	Other motor vehicle	0
40	2013-01-25	Fri	08:10	Snow	Daylight	Rear end	P.D. only	V1 N	Packed snow	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Packed snow	Turning right	Automobile, station	Other motor vehicle	0
41	2013-01-25	Fri	09:15	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 N	Dry	Slowing or	Automobile, station	Other motor vehicle	0
42	2013-01-31	Thu	06:15	Rain	Dark	Sideswipe	P.D. only	V1 W	Wet	Changing lanes	Automobile, station	Other motor vehicle	0
								V2 W	Wet	Going ahead	Automobile, station	Other motor vehicle	0
43	2013-02-05	Tue	09:20	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Going ahead	Pick-up truck	Other motor vehicle	0
								V2 N	Dry	Stopped	Pick-up truck	Other motor vehicle	0
44	2013-02-25	Mo	13:11	Clear	Daylight	Rear end	P.D. only	V1 W	Wet	Turning left	Automobile, station	Other motor vehicle	0
								V2 W	Wet	Turning left	Automobile, station	Other motor vehicle	0

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OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

45	2013-03-16	Sat	14:08	Clear	Daylight	Rear end	Non-fatal	V1 S	Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 S	Dry	Turning right	Automobile, station	Other motor vehicle	
46	2013-03-21	Thu	12:17	Clear	Daylight	Rear end	Non-fatal	V1 E	Ice	Turning right	Delivery van	Other motor vehicle	0
								V2 E	Ice	Turning right	Pick-up truck	Other motor vehicle	
47	2013-05-15	We	21:42	Clear	Dark	Rear end	Non-fatal	V1 N	Dry	Going ahead	Pick-up truck	Other motor vehicle	0
								V2 N	Dry	Stopped	Pick-up truck	Other motor vehicle	
48	2013-05-24	Fri	13:32	Clear	Daylight	Other	P.D. only	V1 N	Dry	Turning right	Pick-up truck	Curb	0
								V2 W	Dry	Turning left	Pick-up truck	Other motor vehicle	
								V3 W	Dry	Turning left	Pick-up truck	Other motor vehicle	
								V4 W	Dry	Going ahead	Automobile, station	Other motor vehicle	
49	2013-06-04	Tue	07:50	Clear	Daylight	Rear end	Non-fatal	V1 W	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 W	Dry	Stopped	Automobile, station	Other motor vehicle	
50	2013-06-13	Thu	14:30	Clear	Daylight	Rear end	P.D. only	V1 E	Dry	Turning right	Passenger van	Other motor vehicle	0
								V2 E	Dry	Turning right	Automobile, station	Other motor vehicle	
51	2013-06-13	Thu	11:16	Clear	Daylight	Other	P.D. only	V1 E	Dry	Reversing	Truck - dump	Other motor vehicle	0
								V2 W	Dry	Turning left	Truck - open	Other motor vehicle	
52	2013-06-15	Sat	10:59	Clear	Daylight	Rear end	Non-fatal	V1 E	Dry	Slowing or	Automobile, station	Other motor vehicle	0
								V2 E	Dry	Stopped	Passenger van	Other motor vehicle	
53	2013-06-19	We	14:47	Clear	Daylight	Angle	P.D. only	V1 S	Dry	Turning right	Automobile, station	Cyclist	0
								V2 E	Dry	Going ahead	Bicycle	Other motor vehicle	
54	2013-07-25	Thu	12:27	Clear	Daylight	Rear end	Non-fatal	V1 N	Dry	Turning right	Automobile, station	Other motor vehicle	0
								V2 N	Dry	Turning right	Automobile, station	Other motor vehicle	
55	2013-07-30	Tue	12:22	Clear	Daylight	Rear end	Non	V1 N	Dry	Going ahead	Automobile, station	Other motor vehicle	0
								V2 N	Dry	Going ahead	Passenger van	Other motor vehicle	
56	2013-08-09	Fri	08:04	Clear	Daylight	Angle	P.D. only	V1 W	Dry	Going ahead	Truck and trailer	Other motor vehicle	0
								V2 S	Dry	Turning left	Automobile, station	Other motor vehicle	
57	2013-08-30	Fri	10:00	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Turning left	Truck - dump	Other motor vehicle	0
								V2 N	Dry	Turning left	Automobile, station	Other motor vehicle	

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

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Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2012-01-01 TO: 2014-01-01

58	2013-10-16	We	13:34	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Going ahead	Pick-up truck	Other motor vehicle	0
								V2 N	Dry	Stopped	Automobile, station	Other motor vehicle	
59	2013-12-05	Thu	09:40	Rain	Daylight	Rear end	P.D. only	V1 W	Wet	Slowing or	Automobile, station	Other motor vehicle	0
								V2 W	Wet	Stopped	Pick-up truck	Other motor vehicle	
60	2013-12-11	We	07:08	Clear	Dawn	Rear end	Non-fatal	V1 N	Dry	Turning right	Passenger van	Other motor vehicle	0
								V2 N	Dry	Turning right	Automobile, station	Other motor vehicle	
61	2013-12-24	Tue	09:59	Clear	Daylight	Rear end	P.D. only	V1 S	Wet	Going ahead	Pick-up truck	Other motor vehicle	0
								V2 S	Wet	Stopped	Automobile, station	Other motor vehicle	

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

Thursday, November 23, 2017

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Appendix F

Sight/Stopping Distance Analysis

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039 \frac{V^2}{a} \quad (2.5.2)$$

Where:

- SSD = Stopping sight distance (m)
- t = Brake reaction time, 2.5 s
- V = Design speed (km/h)
- a = Deceleration rate (m/s²)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in Table 2.5.2 may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles⁵⁴

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

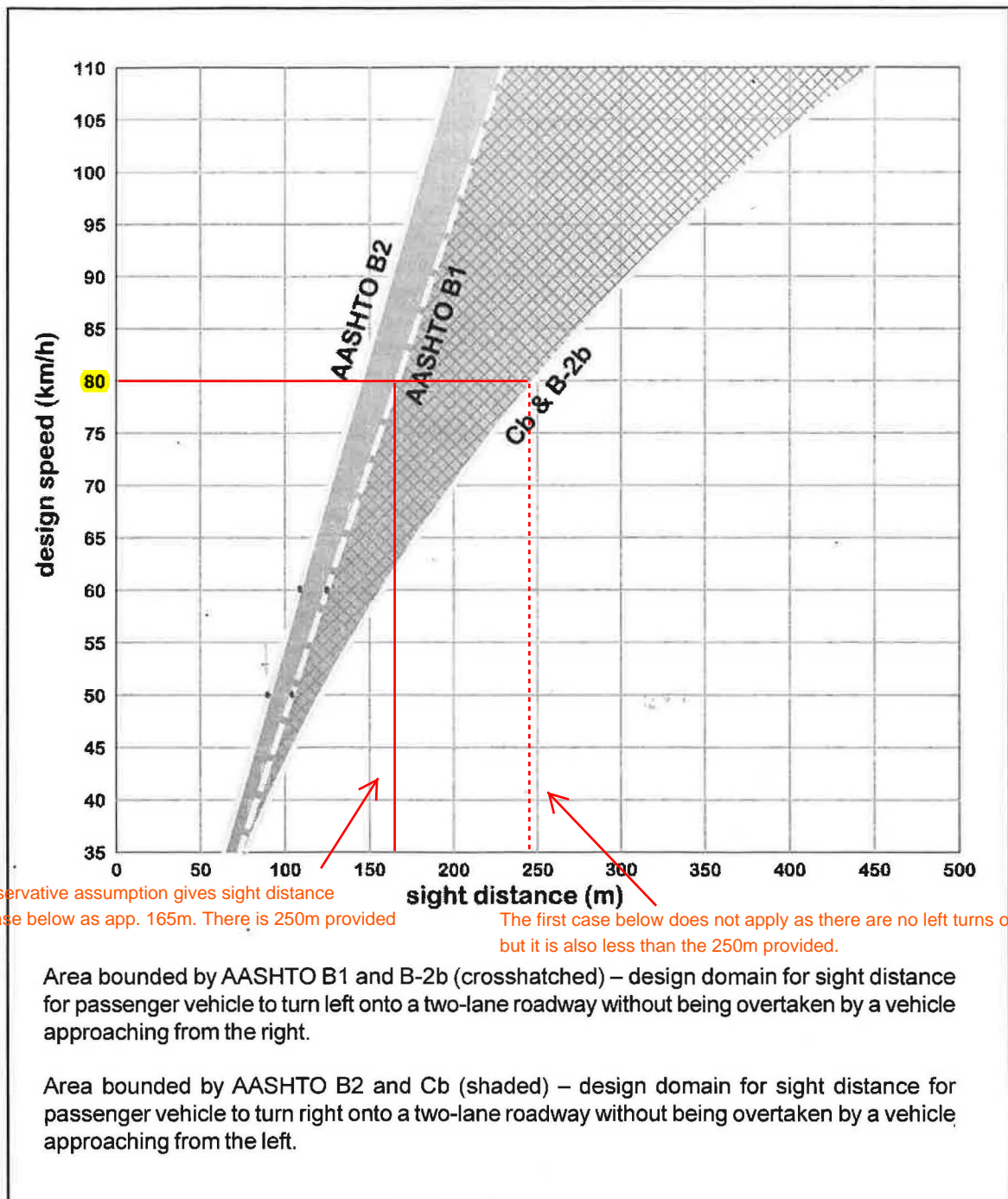
Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s² used to determine calculated sight distance.

North of Walkley Road - posted speed = 50kph

South of Walkley Road - posted speed = 70kph (begins)

Conservative operating speed of 80kph used for Design Speed; result is 130m SSD needed and there is 150m provided

Figure 2.3.3.4b Sight Distance for Turning Movements with Vehicles approaching in the Intended Direction of Travel



Appendix G

MMLOS for Adjacent Section of Russell Road

Multi-Modal Level of Service - Segments Form

Consultant	Parsons
Scenario	Future Condition
Comments	Assume 1.8 m sidewalk and 1.8 m cycle track fronting site

Project	2510 Russell
Date	Jan-18

SEGMENTS		Street A	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	Section 9
Pedestrian	Sidewalk Width	-	1.8 m								
	Boulevard Width		0.5 - 2 m								
	Avg Daily Curb Lane Traffic Volume		> 3000								
	Operating Speed		> 50 to 60 km/h								
	On-Street Parking		no								
	Exposure to Traffic PLoS		E	-	-	-	-	-	-	-	-
	Effective Sidewalk Width										
	Pedestrian Volume										
Bicycle	Crowding PLoS	A	-	-	-	-	-	-	-	-	-
	Level of Service		-	-	-	-	-	-	-	-	-
	Type of Cycling Facility		Physically Separated								
	Number of Travel Lanes										
	Operating Speed										
	# of Lanes & Operating Speed LoS		-	-	-	-	-	-	-	-	-
	Bike Lane (+ Parking Lane) Width										
	Bike Lane Width LoS		-	-	-	-	-	-	-	-	-
	Bike Lane Blockages										
	Blockage LoS		-	-	-	-	-	-	-	-	-
	Median Refuge Width (no median = < 1.8 m)										
	No. of Lanes at Unsignalized Crossing										
Transit	Sidestreet Operating Speed	D									
	Unsignalized Crossing - Lowest LoS		A	-	-	-	-	-	-	-	-
	Level of Service		A	-	-	-	-	-	-	-	-
Truck	Facility Type	D	Mixed Traffic								
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8								
	Level of Service		D	-	-	-	-	-	-	-	-
Truck	Truck Lane Width	A	≤ 3.5 m								
	Travel Lanes per Direction		> 1								
	Level of Service		A	-	-	-	-	-	-	-	-