Environmental Study Report

Wyecroft Road Improvements from Bronte Road to Kerr Street

Appendix J: Traffic Safety

Submitted to Town of Oakville
by IBI Group
January 2020

Road Safety Review

Wyecroft Road Improvements Environmental Assessment from Bronte Road to Kerr Street

Prepared for Town of Oakville
by IBI Group
June 28, 2019

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1 Introduction

The Town of Oakville has initiated a Municipal Class Environmental Assessment (EA) Study for improvements to Wyecroft Road that includes South Service Road West from Bronte Road to Kerr Street. The improvements are required to meet the needs of the town to 2041, including satisfying travel demand to and across the study area and supporting the town's vision.

As part of the EA, the Town provided collision data from the past 10 years (2007-2017). This report analyzes this data to gain an understanding of the existing trends and interactions between users along the study corridor and summarizes the findings of the traffic safety analysis.

A brief discussion of the available town-wide safety network screening is also provided.

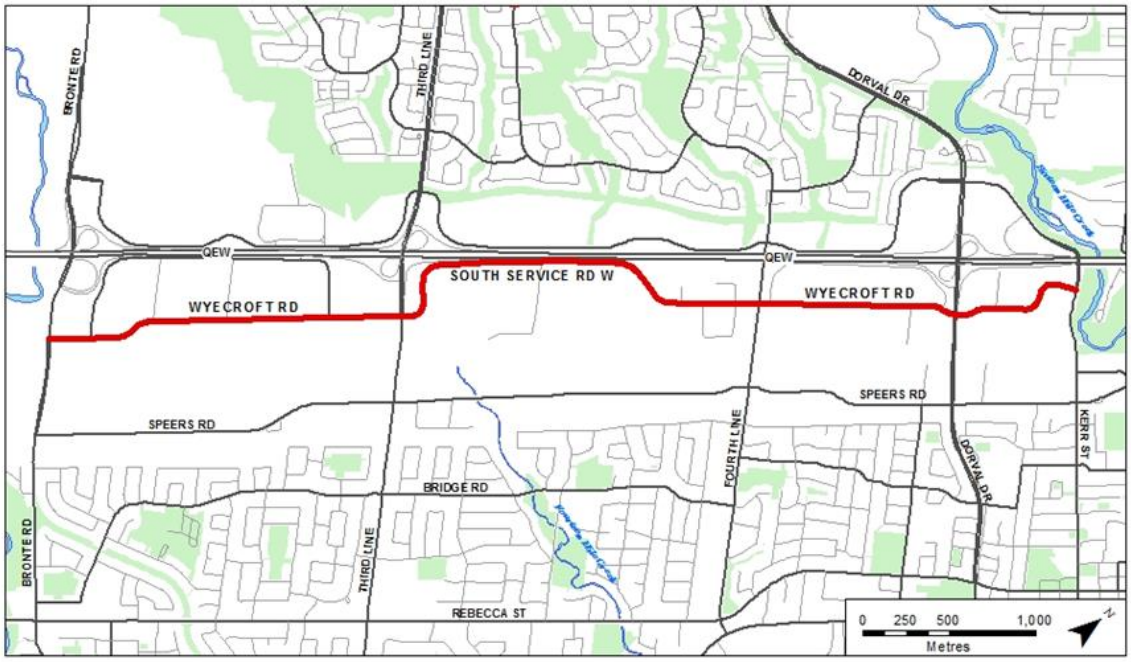
2 Site Context

An overview of the study area and the Town of Oakville's safety network screening are presented next.

2.1 Study Area

The study area (Exhibit 2-1) is bounded by Bronte Road to the west, and Kerr Street to the east. The corridor is approximately 6.4 kilometres long and has a total of 8 signalized intersections and 11 unsignalized intersections.

Exhibit 2-1: Map of Study Area



The Wyecroft Road corridor is a multi-purpose arterial with one-lane per direction with auxiliary lanes at signalized intersections. As illustrated in Exhibit 2-1, there are numerous reverse curves throughout the corridor. Horizontal curves add to driver workload which increases the likelihood of driver error and a resulting collision.

The corridor runs parallel to the Queen Elizabeth Way (QEW) and intersects one minor arterial (Third Line) and two major Regional arterials (Bronte Road and Dorval Drive) that have direct access to the QEW. Given the close proximity between the east-west corridors, Wyecroft Road is potentially used as an alternate route when the QEW is congested.

Drivers using Wyecroft Road as a cut-through route are likely commuters who are frustrated by the traffic conditions on the QEW, and are therefore more likely to display aggressive driving behaviour. This becomes more problematic as these potentially aggressive drivers are in conflict with those who use Wyecroft Road as a local access road.

The surrounding land use is predominantly business employment and industrial, with numerous driveways. These full-moves driveways create multiple conflict points between road users. More conflict points increases the likelihood of a collision occurring.

The Bronte GO station is located southwest of the intersection of Wyecroft Road at Third Line, and acts as a major generator for both automobile, transit and active transportation (e.g., pedestrian and cyclist) trips in the area.

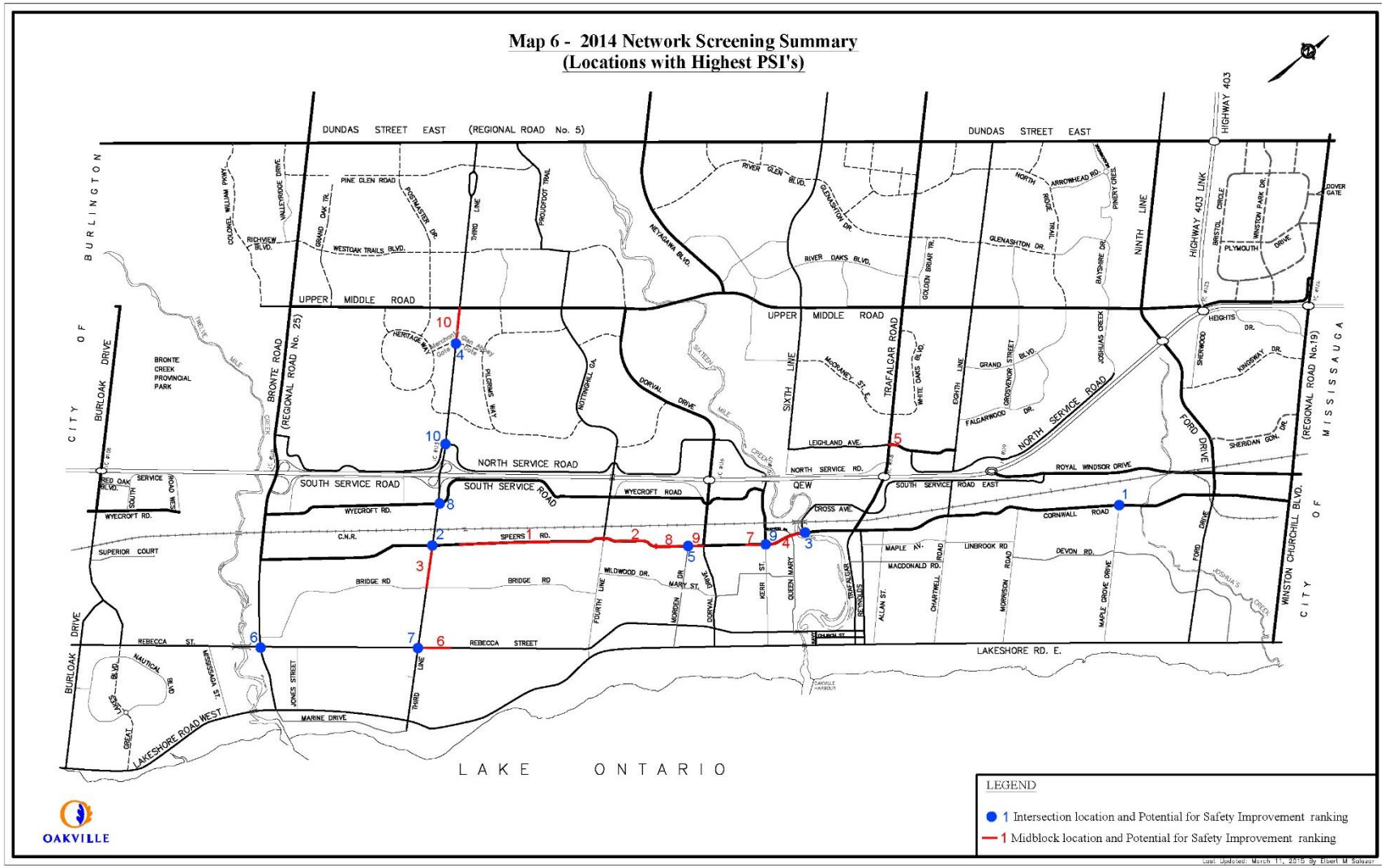
2.2 Town of Oakville Safety Network Screening

Exhibit 2-2 presents the Town of Oakville's 2014 Network Screening Summary. The study area is highlighted in red.

The Network Screening Summary shows the top 10 intersection and top 10 midblock locations identified as having the highest potential for safety improvement within the town. These locations were identified by the town based on a review of road safety at both an overall road network level and at a site-specific level.

The intersection of Wyecroft Road at Third Line is ranked 8th for potential safety improvements and is discussed in Section 3.3. None of the top 10 midblock segments identified are located along Wyecroft Road.

Exhibit 2-2: Town of Oakville 2014 Network Screening Summary



3 Preliminary Findings

Several overall corridor trends were identified based on the review of 10-years of collision data. To account for the different characteristics in the study area, the corridor was divided into three (3) segments for analysis:

1. West Segment: Bronte Road to Third Line/ Fourteen Mile Creek;
2. Middle Segment: Third Line / Fourteen Mile Creek to Cranberry Court; and
3. East Segment: Cranberry Court to Kerr Street.

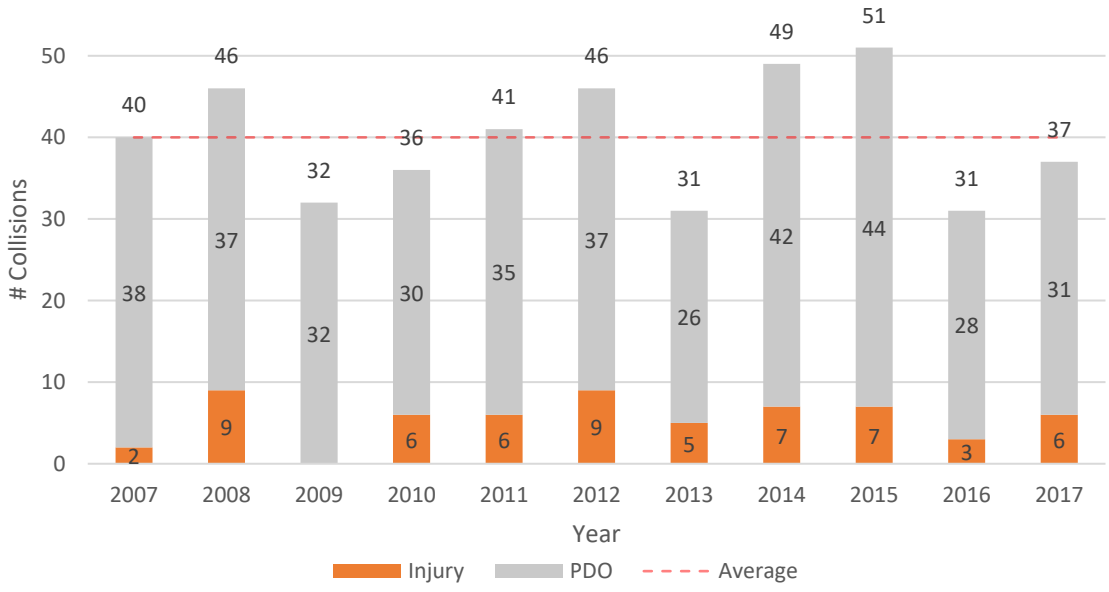
The findings of the overall corridor analysis and the individual segments are discussed next.

3.1 Overall Corridor Trends

Collision data over the last 10 years (2007-2017) was provided for all intersections and midblock segments within the study area. In total, 440 collisions were documented during this time period. Of those 440 collisions, 60 resulted in a non-fatal injury, and 380 resulted in property damage only (PDO). There were no collisions that resulted in a fatality.

The yearly collision frequency by severity is illustrated in Exhibit 3-1.

Exhibit 3-1: Yearly Collision Frequency by Severity (2007-2017)



Between 2007 and 2017, the total number of collisions occurring along Wyecroft Road ranged from 31 to 51 collisions per year. An average of 40 collisions occurred per year. Typically, collision frequency is expected to trend upwards over time, as traffic volumes generally increase over time. Collision frequency has remained relatively flat in the study area over the last 10 years, varying between 31 and 51 collisions per year.

The total number of collisions resulting in a non-fatal injury has also fluctuated slightly over the last 10 years, with between 0 and 9 injury collisions per year (0% to 20% of all collisions). Over the last 5 years (i.e., 2012-2017), the percentage of collisions resulting in an injury has remained comparatively consistent with an average rate of 14%. This is a low rate of injury collisions for an urban environment, which suggests that a high proportion of collisions along Wyecroft Road are occurring at low speeds, possibly under congested conditions.

The collision breakdown by initial impact type for both intersections and midblock segments are shown in Exhibit 3-2 and Exhibit 3-3, respectively.

Exhibit 3-2: Collision Breakdown by Initial Impact Type at Intersections

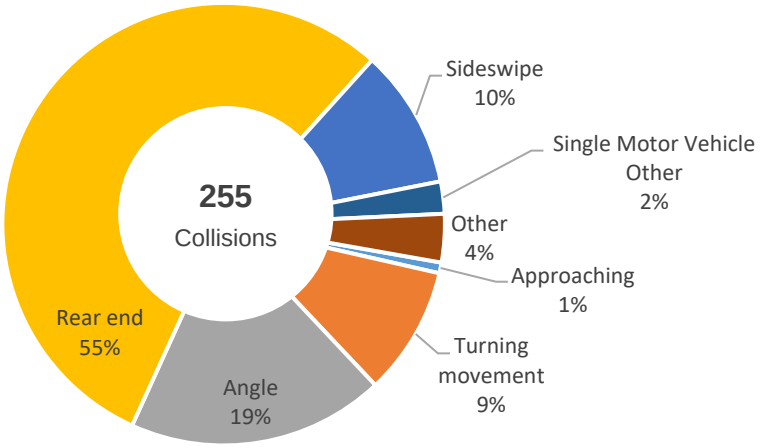
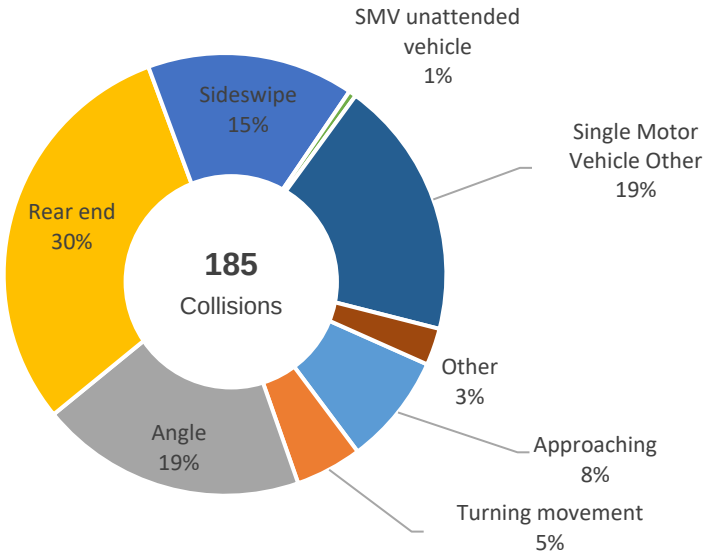


Exhibit 3-3: Collision Breakdown by Initial Impact Type for Midblock Segments



Rear-ends account for over half of all intersection related collisions, which is expected on an urban road. The proportion of angle collisions (19%), by comparison, is high, as angle collisions typically occur at intersections. A significant portion of angle collisions involve a driver making a turning movement, and could alternatively be classified as turning movement collisions. This re-classification would bring the associated percentages of angle and turning movement collisions into the typical range for intersection related collisions.

Collisions that occur in the midblock segments are predominantly rear-end (30%) with high proportions of angle (19%), Single Motor Vehicle (SMV) other (19%), and sideswipe (15%). Taking into account that some of the angle collisions involve turning vehicles, the distribution of rear end, angle, and sideswipe impact types is typical of midblock segments with high access density, where drivers turn or change lanes to go around turning vehicles without being aware of their surroundings.

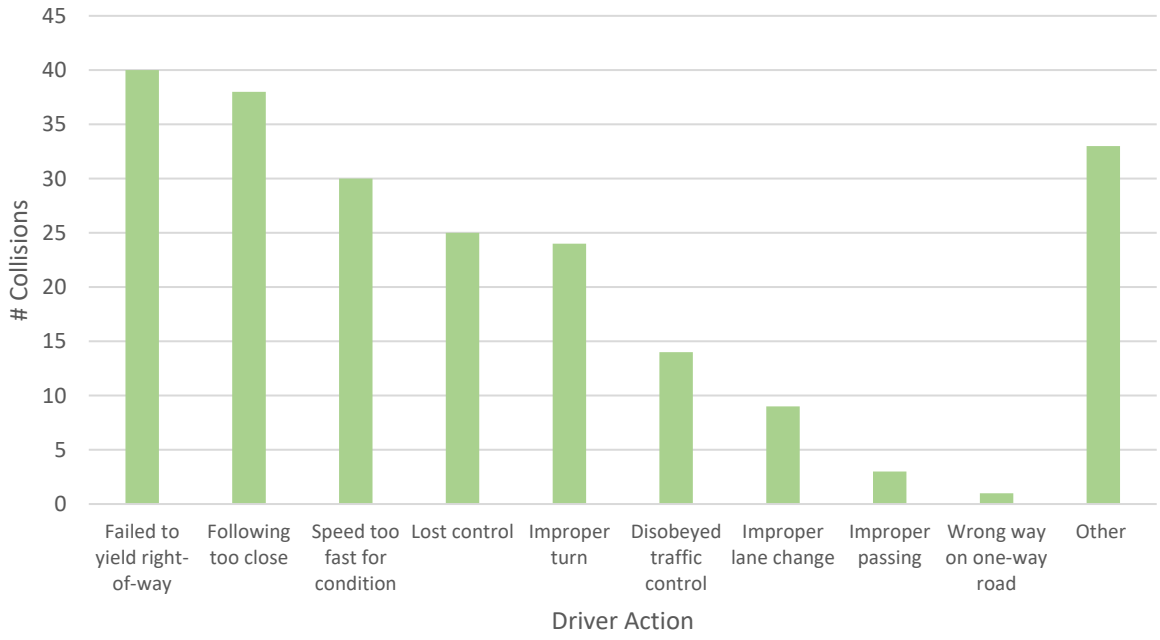
SMV other collisions occurring in the midblock segments are frequent (20%). Potential contributors to these collision types are the multiple reverse curves throughout the corridor, and higher operating speeds. These collisions are further discussed in later sections of the report.

A majority of property damage only (PDO) collisions may be attributed to the congestion that occurs due to high commuter volumes during the a.m. and p.m. peak periods. Prominent initial collision impact types such as rear-end and sideswipe collisions often occur when drivers are following too closely, or try and pass turning vehicles without being aware of their surroundings. This behaviour

is magnified during peak periods when there is high traffic demand and drivers may drive more aggressively.

The collision breakdown by driver action is illustrated in Exhibit 3.4. Dominant driver actions that resulted in a collision are drivers following too close, speed too fast for conditions, and failed to yield right-of-way. All three of these actions are associated with more aggressive driving behaviour.

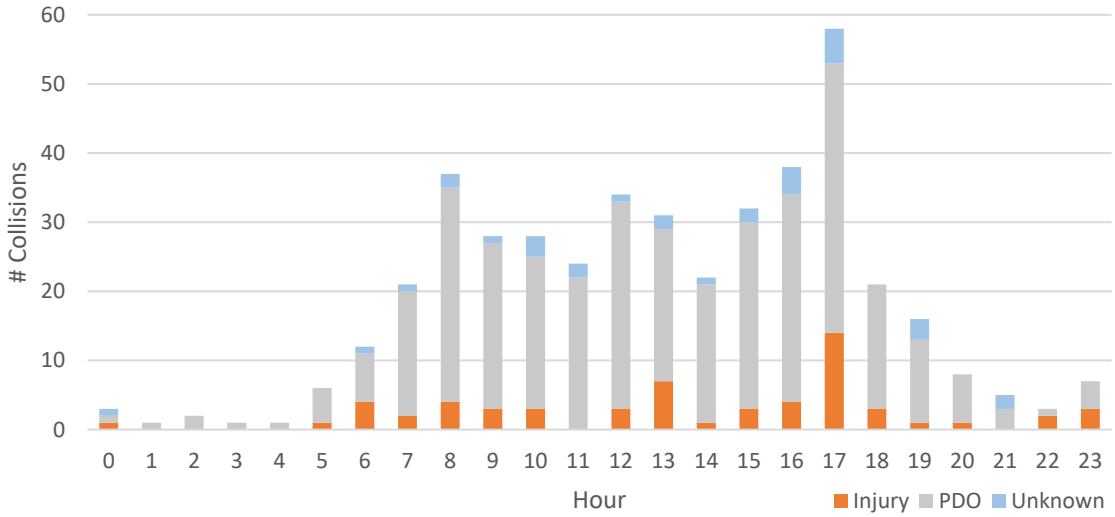
Exhibit 3-4: Collision Breakdown by Driver Action (Excluding Driving Properly)



**Note that 'Other' is a field in the received collision reports and cannot be broken down further*

The correlation between peak periods and frequency of collisions is illustrated in the distribution of collisions by time of day (Exhibit 3-5).

Exhibit 3-5: All Collisions by Hour and Severity (2007-2017)



The hourly distribution follows a typical commuter pattern, with noticeable peaks that correspond with the a.m. and p.m. rush hours, and a slight peak over the lunch hour. This is expected as higher traffic volumes generate higher collision frequency.

The number of injury collisions during peak periods are higher, with the majority consisting of angle collisions from drivers disobeying their traffic control, or failing to yield the right of way. These collisions were especially prominent in the midblock segments.

As discussed in Section 2, Wyecroft Road has generally one-lane per direction serving both through traffic and traffic accessing driveways. These volumes combined with long distances between signalized intersections may result in limited gap opportunities for drivers entering and exiting the numerous driveways along Wyecroft Road. During the rush hour, drivers are more likely to display aggressive driving behaviour and take greater risks, resulting in the higher number of injury collisions in the mid-block segments.

Exhibit 3-6 and Exhibit 3-7 show the geographical distribution of all collisions within the study area. There are five (5) areas where a significant proportion of collisions occurred between 2007 and 2017:

1. East of Bronte Road (35 collisions, 8% of total);
2. Around Third Line (199 collisions, 45% of total);
3. Around Fourth Line (53 collisions, 12% of total);
4. Around Dorval Drive (20 collisions, 5% of total); and
5. West of Kerr Street (20 collisions, 5% of total).

Exhibit 3-6: All Collisions by Location (2007-2017)

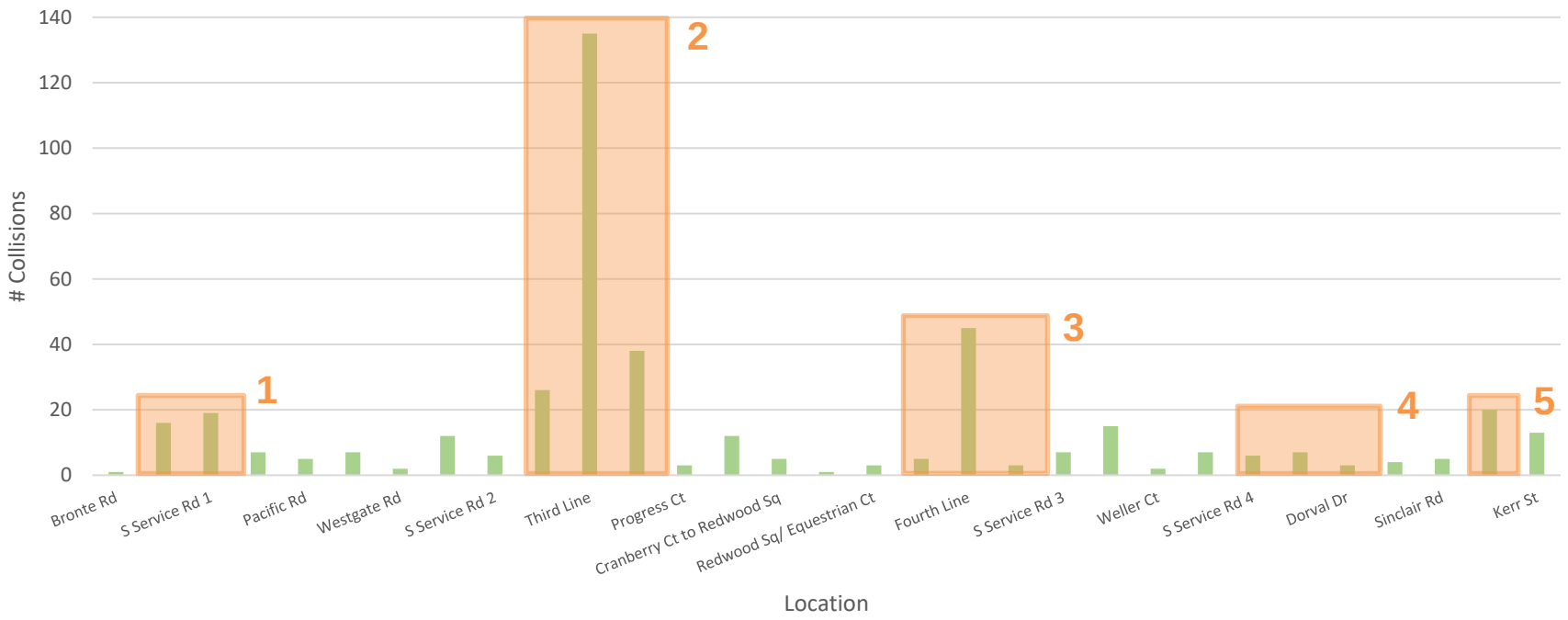


Exhibit 3-7: Map of All Collisions (2007-2017)

While Exhibit 3-6 illustrates which individual intersections or midblock segments have high collision frequency, some segments are longer than others, and those in close proximity to each other may have overlapping contributing factors. Exhibit 3-7 illustrates the prominent clusters of collisions along the Wyecroft Road corridor.

The intersection of Bronte Road has an unexpectedly low proportion of collisions (<1%), despite being a higher volume intersection. However, 35% of all collisions, and 57% of all collisions resulting in an injury occurred just east of Bronte Road. Potential contributors to these collisions are discussed in Section 3.2.

Exhibit 3-6 shows that a high proportion of all collisions (45%) occurred between South Service Road 2 and Progress Court. The intersection of Third Line accounts for 31% of all collisions that occurred within the entire 6.4 km study area over the last 10 years. No other intersection or midblock segment comprised of more than 10% of the total corridor collisions. As Third Line has such a high proportion of the total number of collisions, and the majority of them occurred along Third Line (i.e., in the north-south direction), this intersection will be discussed in Section 3.3.

Exhibit 3-6 also shows a peak in the number of collisions at Fourth Line, with 10% of all collisions. Aside from Third Line and Fourth Line, only the midblock segments on either side of Third Line averaged more than 6% of the yearly collisions (more than 3 collisions per year). The congestion at Third Line and the reverse curve just east of the intersection are likely significant contributors to the high midblock collision frequency.

Exhibit 3-7 shows a cluster of collisions in the segment approaching Dorval Drive. A disproportionately high number of collisions occurred in this segment, given the short segment length. Discussion regarding the segments' unique features and potential contributors to the high collision frequency is discussed in Section 3.5.

The relatively high number of collisions (5% of the total number of collisions) occurring west of Kerr Street is also highlighted in Exhibit 3-6. Similar to the portion of Wyecroft Road around Third Line, there is a reverse curve along this segment which is a potential contributing factor.

With the exception of the segments around Fourth Line and Bronte Road, all of these areas have reverse curves, which could be a contributing factor, as negotiating a curve increases driver workload compared to a straight segment of roadway. When a driver is navigating a curve, the workload is effectively doubled with both maintaining speed and lane-keeping. Sharp curves and reverse curves are especially difficult to navigate safely as sightlines may be reduced.

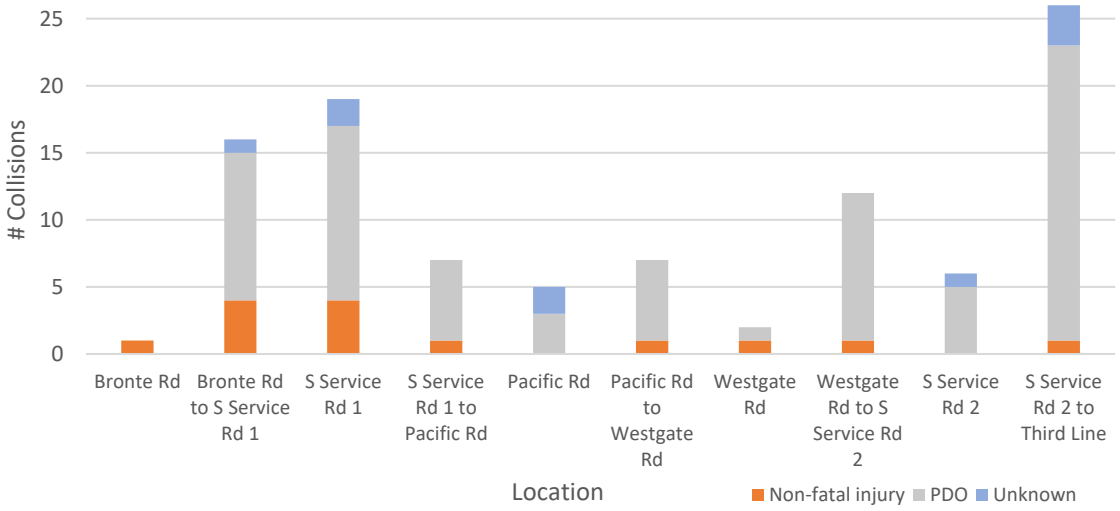
These five areas are also near north-west corridors that either connect with or cross the QEW, suggesting that higher traffic volumes may also be contributing factors to the higher collision frequency.

The following sections analyse the collision history of the study area by segment.

3.2 West Segment: Bronte Street to Third Line

Exhibit 3-8 shows the breakdown of collisions in the west segment by location and severity.

Exhibit 3-8: All Collisions in the West Segment by Location and Severity



The midblock segment between South Service Road 2 and Third Line has the highest proportion (26%) of collisions in the west segment. The majority of these collisions are rear-ends (35%) and sideswipe (23%), suggesting that the lane configuration change and congestion from the nearby intersection of Third Line may be contributing factors. The low injury rate (one (1) injury collision between 2007 and 2017) also suggests that these collisions are occurring under congested conditions, as low injury rates are typically associated with lower vehicle speeds.

The intersection of Wyecroft Road and Third Line is discussed in the next section.

The portion of Wyecroft Road between Bronte Road and South Service Road 1 – containing the midblock segment between Bronte Road and South Service Road 1 and the intersection of South Service Road 1 – also has a high frequency of collisions. Over the analysis period, 35% of all collisions, and 57%

of all collisions resulting in an injury, occurred in this short 240 metre segment. This is disproportionately high as this segment is comprised of only 11% of the length of the entire west segment. This indicates that there may be issues with drivers entering/exiting the driveways on the north side of Wyecroft Road. Consideration to improving sightlines could be investigated in the road re-design.

The hotel driveway is about 100 metres east of the signalized intersection of Wyecroft Road at Bronte Street, and a high number of these collisions occurred during the p.m. peak period. Longer peak period queues from the intersection may be restricting sightlines and limiting gap opportunities, leading to more aggressive driving and higher collision rates.

The intersection of Bronte Road has an unexpectedly low proportion of collisions. Higher volume intersections are generally expected to have a higher frequency of collisions.

Exhibit 3-9 and Exhibit 3-10 show the breakdown of all collisions in the west segment by initial impact type and collision location (i.e., intersection related vs midblock).

Exhibit 3-9: Breakdown of All Intersection Related Collisions in the West Segment by Initial Impact Type

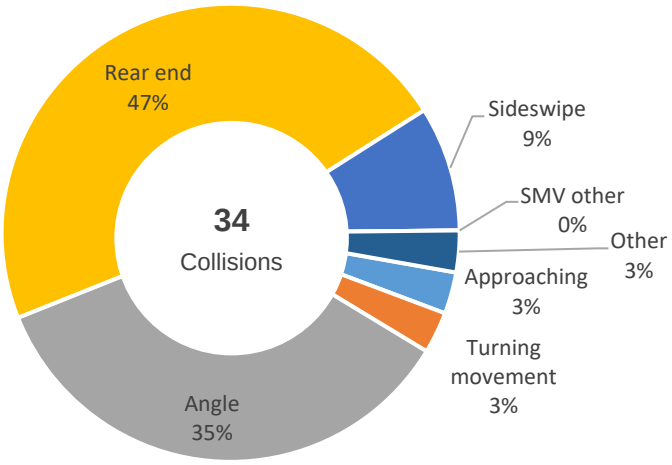
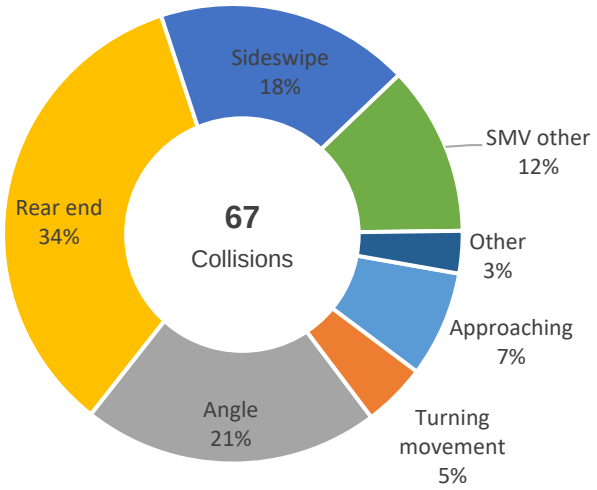


Exhibit 3-10: Breakdown of All Midblock Collisions in the West Segment by Initial Impact Type



Rear-end and angle collisions account for the majority of all intersection related collisions within this segment. As discussed earlier in the report, collisions that involve a turning movement appear to be coded as angle collisions, though they may be more appropriately coded as turning movement collisions. Five of the six intersections in this segment are T-intersections, where turning movement collisions are expected to be higher as drivers are tasked with identifying gaps in the conflicting traffic flow without the aid of signals.

In the midblock segments, rear-ends, angles, and sideswipes are the most prominent collision types. These collisions are likely a result of drivers displaying more unpredictable behaviour as they attempt to access the numerous uncontrolled driveways along both sides of Wyecroft Road. A portion of the rear-end collisions occurring in the midblock segments may also be attributed to queueing from the downstream intersections. In particular, queuing during peak periods at the intersections of Bronte Road, South Service Road 2, and Third Line may be contributing to higher collision rates in the midblock segments, as illustrated by the higher number of collisions in these segments (Exhibit 3-8).

Sideswipe collisions predominantly occur in the segments approaching Bronte Road, and approaching Third Line. Both of these segments have lane configuration changes (from one lane on Wyecroft Road to two-lanes approaching the intersections) which could be a contributing factor.

Exhibit 3-11 shows the breakdown of all collisions in the west segment by driver action.

Exhibit 3-11: Breakdown of All Collisions in the West Segment by Driver Action

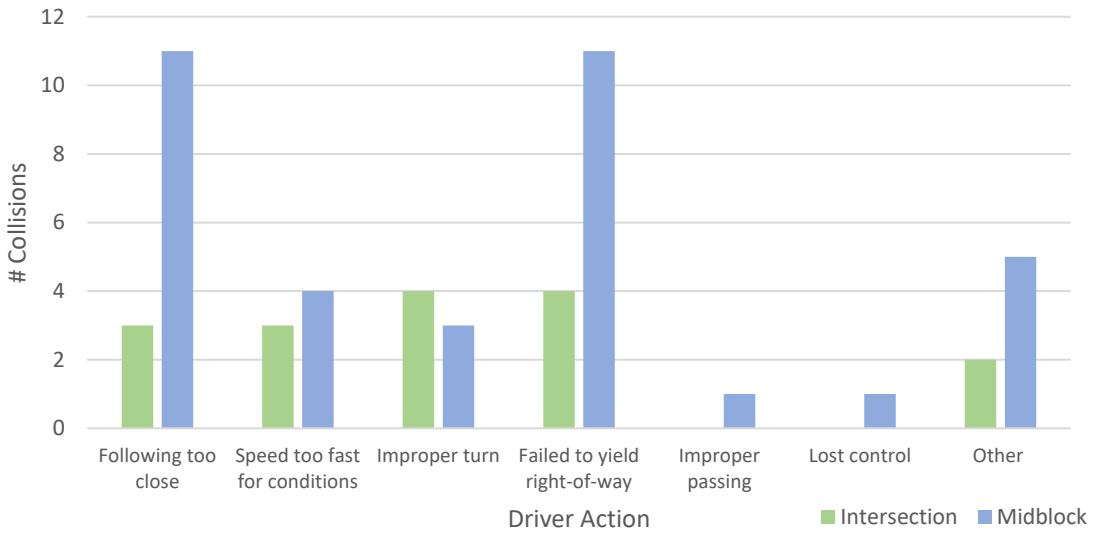


Exhibit 3-11 supports the earlier discussion that collisions result from the conflict between drivers travelling through the corridor (following too close, speed too fast for conditions) and drivers accessing the surrounding land use (improper turn, failed to yield right-of-way).

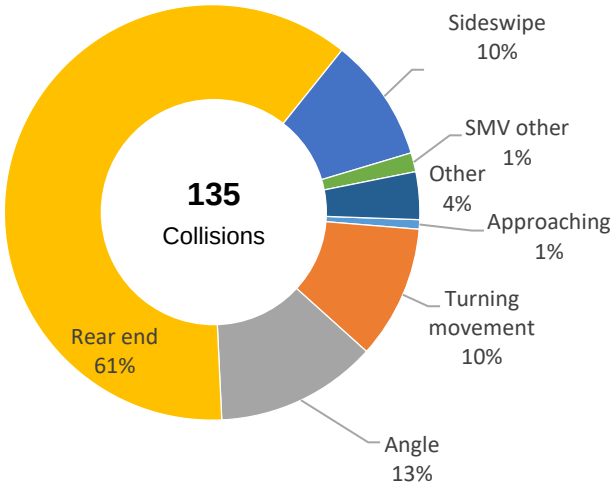
3.3 Third Line

As discussed in Section 3.1, 31% of all collisions within the study area occurred at the intersection of Wyecroft Road at Third Line. The large concentration of collisions could be a result of the combination of:

1. High volumes on Third Line and the proximity of the QEW interchange; and/or
2. Horizontal curvature just east of the intersection, impacting sightlines and vehicle handling.

Exhibit 3-12 shows the breakdown of the collisions at the intersection of Third Line by initial impact type.

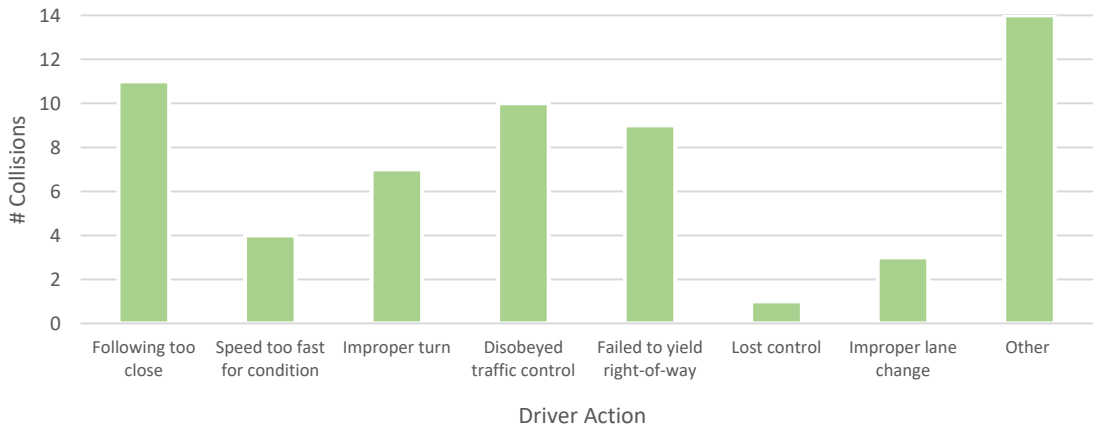
Exhibit 3-12: Breakdown of Collisions at Third Line by Initial Impact Type



Rear end collisions account for the majority of all collisions at the intersection (61%), followed by angle (13%), sideswipe (10%), and turning movement (10%). The high proportion of rear-end collisions is likely contributed to by high levels of peak period congestion and queueing. However, previously discussed issues with approach geometry may also be a contributing factor. Most of the rear-end collisions are in the north-south direction, which is consistent with the distribution of traffic volumes, as Third Line has consistently high volumes throughout the day. Along Wyecroft Road, most of the collisions involve vehicles travelling eastbound, which is also consistent with the traffic volume distributions.

Exhibit 3-13 shows the breakdown of collisions at Third Line by driver action.

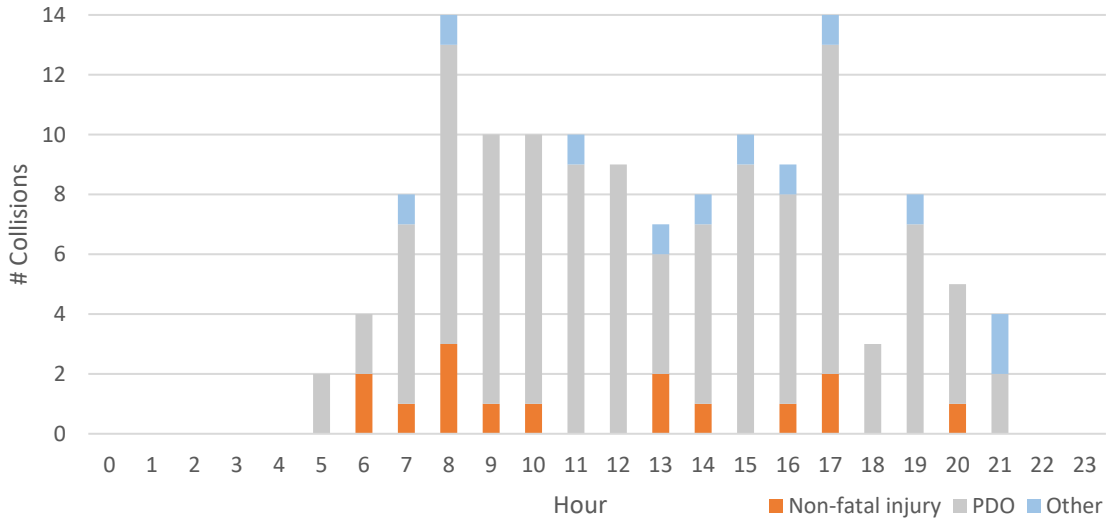
Exhibit 3-13: Breakdown of Collisions at Third Line by Driver Action



The majority of collisions are a result of drivers either following too close, disobeying the traffic control, or failing to yield the right-of-way. This is consistent with typical congested signalized intersection operations.

Exhibit 3-14 shows the hourly distribution of collisions by severity.

Exhibit 3-14: Hourly Distribution of Collisions at Third Line by Severity



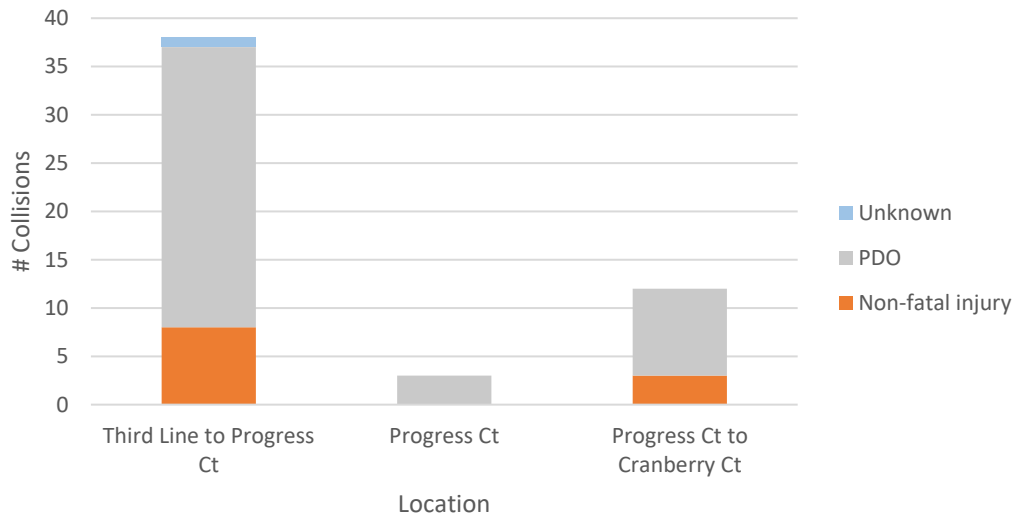
Similar to the overall corridor trend, there are clear spikes during the a.m. and p.m. peak periods. However, the percentage of injury collisions remains low during the peak periods. This is typical as rear-end collisions under congested conditions are often accompanied by low injury rates due to the associated low operating speeds.

3.4 Middle Segment: Third Line to Cranberry Court

With the exclusion of Third Line, the portion of Wyecroft Road between Third Line and Cranberry Court accounts for 24% of all collisions that resulted in an injury. This is proportional to the relative size of the segment. However, the vast majority of the collisions occur along the 500 metre long reverse curve just east of Third Line, which is only 7% of the total corridor length. The concentration of collisions along the reverse curve is more clearly illustrated in the map in Exhibit 3-7 (Section 3.1).

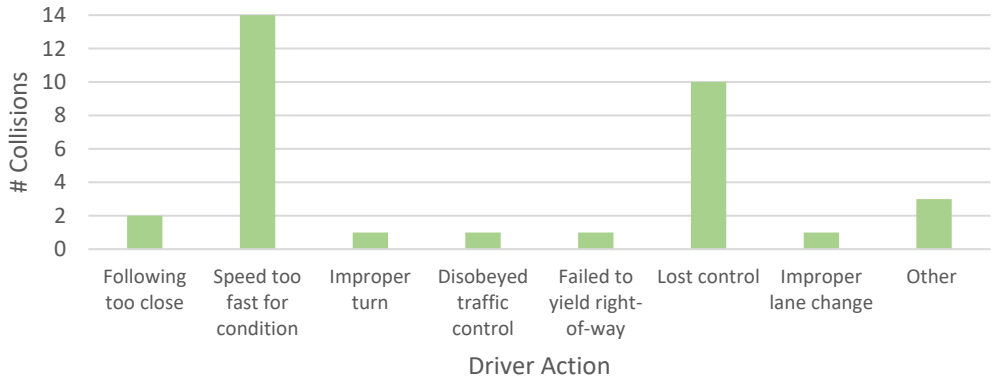
Exhibit 3-15 shows the breakdown of all collisions in the middle segment by location and severity.

Exhibit 3-15: All Collisions in the Middle Segment by Location and Severity



For the analysis period, 72% of all collisions in the middle segment occurred immediately east of Third Line. 21% of those collisions resulted in an injury. A high percentage of the injury collisions had an initial impact type of Single Motor Vehicle (SMV) other, with an associated driver action of either the driver's speed is too fast for the conditions, or the driver lost control (Exhibit 3-16).

Exhibit 3-16: Breakdown of Collisions in the Middle Segment by Driver Action



Furthermore, the majority of collisions with an initial impact type of SMV other occurred during adverse weather conditions (i.e., rain, snow, or fog). This supports the supposition that the sharp reverse curve east of Third Line is a significant contributing factor to safety concerns in this section. Design alternatives could explore alternative horizontal alignments for this reverse curve.

The reverse curve is illustrated in Exhibit 3-17.

Exhibit 3-17: Reverse Curve on South Service Road

Speed surveys conducted at the beginning of July 2018 between Third Line and Progress Court further corroborate the collision data. The 85th percentile speeds are 77 km/hr eastbound, and 79 km/hr westbound, both of which are in excess of the posted speed limit of 60 km/hr. The 24 hour speed and volume profiles for the segment between Third Line and Progress Court, in both the eastbound and westbound directions, are presented in Exhibit 3-18 and Exhibit 3-19, respectively.

Exhibit 3-18: 24 Hour Speed and Volume Profile - Eastbound (between Third Line & Progress Court)

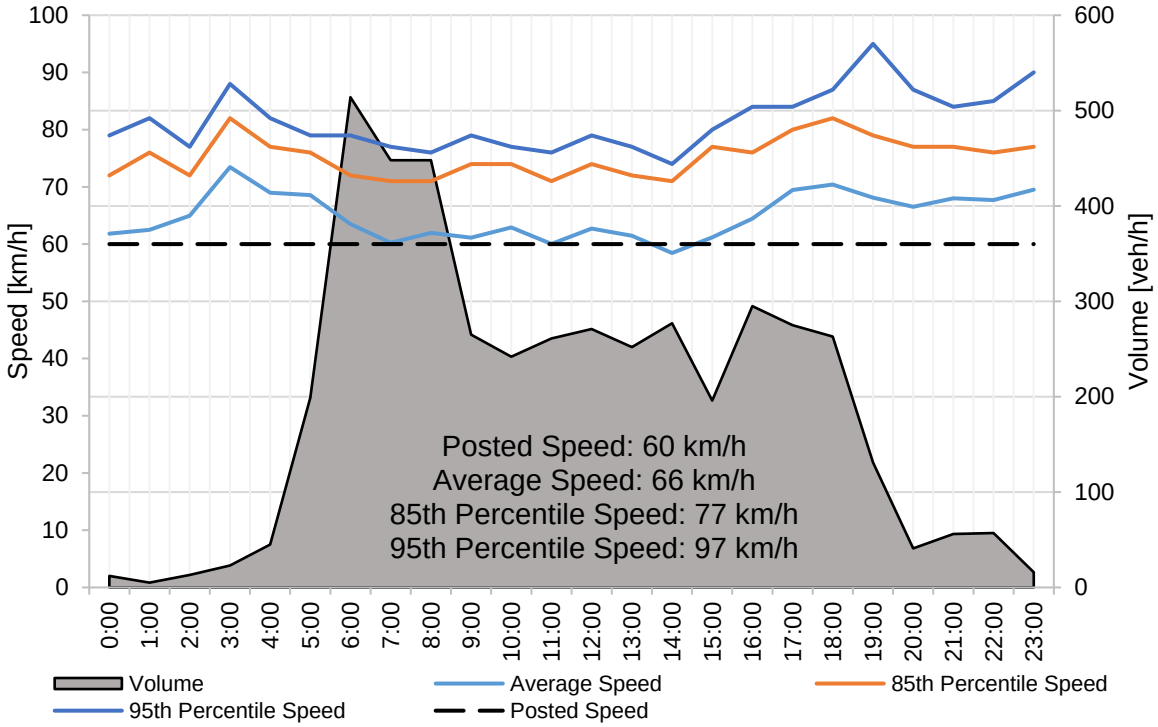
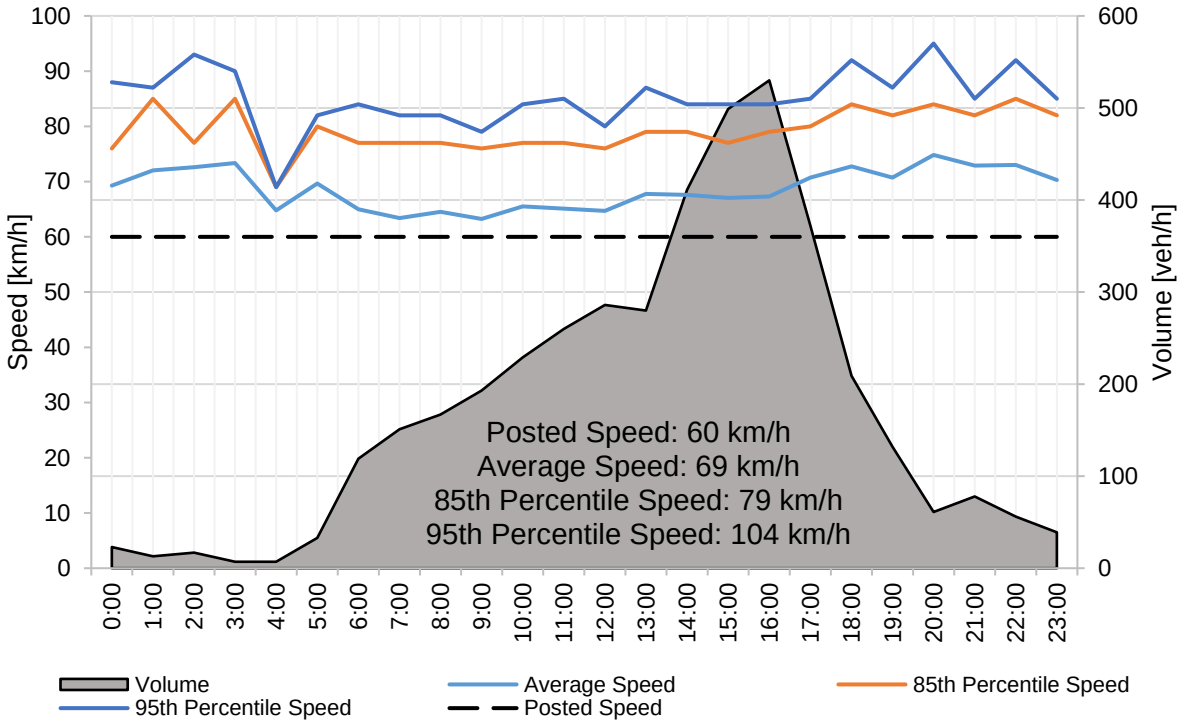


Exhibit 3-19: 24 Hour Speed and Volume Profile - Westbound (between Third Line & Progress Court)



3.5 Progress Court

There is an existing westbound transit stop on the northwest corner of South Service Road West and Progress Court (stop ID 3319) served by bus route 10. There is another westbound transit stop approximately 200 m to the west (stop ID 3321), which could be consolidated with stop 3319 at the discretion of Oakville Transit.

Signalizing the intersection of Progress Court is recommended as part of this environmental assessment to improve pedestrian access to transit, influence driver speed choice, and manage conflicts with turning traffic. It is understood that the signal warrant analysis completed for the traffic analysis found a signal is not justified based on traffic volumes (OTM Book 12, see separate appendix to the Environmental Study Report).

Pedestrian safety and transit access would be improved at this intersection by allowing transit riders to activate the signal and cross the road without waiting for gaps in traffic. Improving pedestrian safety is especially important on arterials with high operating speeds. As illustrated in **Section 3.4**, the 85th percentile operating speeds along South Service Road West are 77 km/h, and 79 km/h, in the eastbound and westbound direction, respectively. If a vehicle-pedestrian collision occurs at these speeds, the risk of fatality for the pedestrian is greater than 80%.

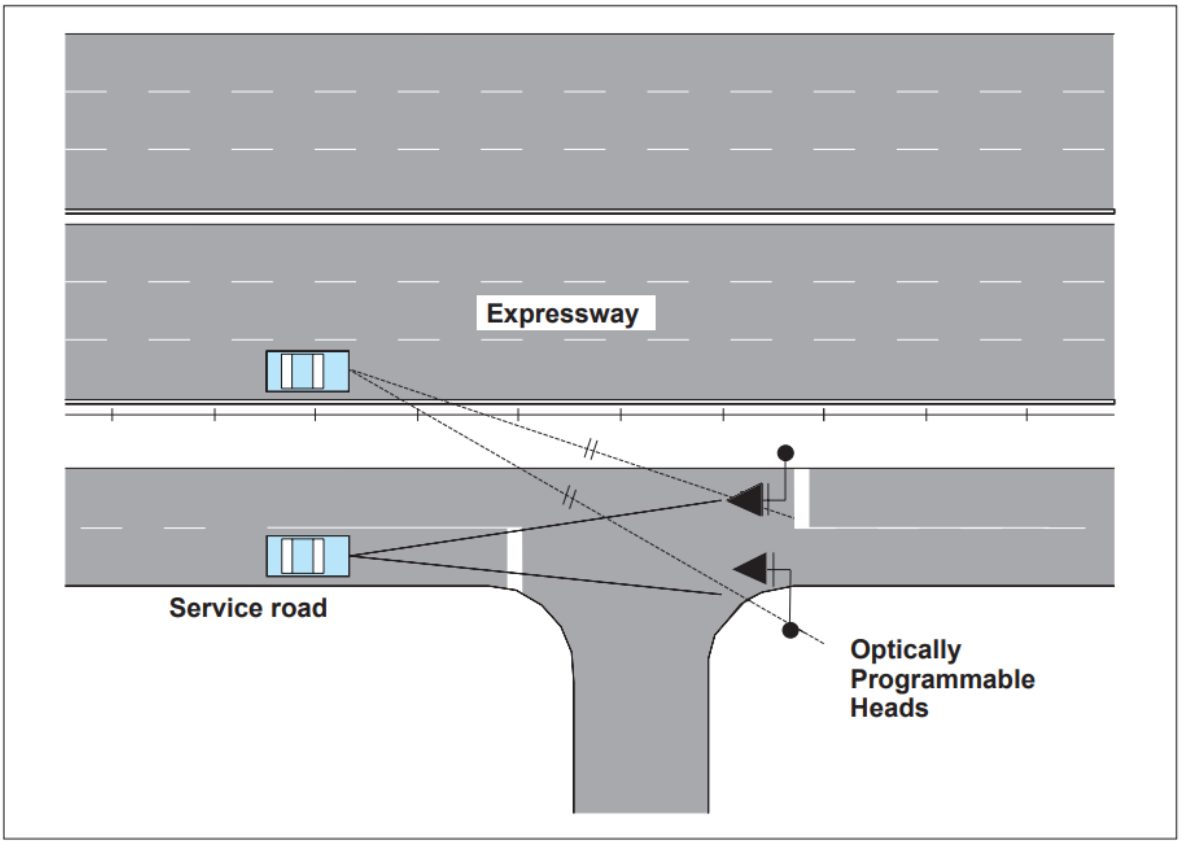
Drivers on South Service Road West may be influenced to drive at a lower speed due to the presence of a signalized intersection. The signal heads and crosswalk markings will serve as a cue to drivers that they are not on the Queen Elizabeth Way. With reduced operating speeds, should a vehicle-pedestrian collision occur, the risk of fatality can be reduced.

Vehicular safety can also be improved by the installation of a signal. In general, it is expected that converting an intersection to full signal control will result in a reduced number of angle and turning movement collisions, which tend to result more often in injury or fatality. Volume counts indicate that left-turning drivers from Progress Court may experience difficulties finding acceptable gaps in through traffic. This is based on the proportion of left-turning vehicles from Progress Court onto South Service Road West, compared to east and west through volumes throughout the day. Drivers on Progress Court who are unable to find acceptable gaps can become frustrated and may make more aggressive turns, increasing the potential for a collision to occur. Signal control would manage this conflict by separating the east-west and northbound vehicles in time.

The proximity of this intersection to the Queen Elizabeth Way is a potential issue. Specifically, the concern is that drivers on the freeway may see and react to the traffic signal. A potential mitigation measure is to install optically programmable signal heads, which restrict the visibility of the indication to a specific area. In other words, the signal indication would only be visible to

drivers along South Service Road West, and not visible to drivers on the Queen Elizabeth Way. This is illustrated in **Exhibit 3-20**.

Exhibit 3-20: Example of Optically Programmable Heads Restricting Visibility to Service Road Drivers (source: Ontario Traffic Manual Book 12)



Other potential mitigation measures to restrict the visibility of the signal heads from the freeway include:

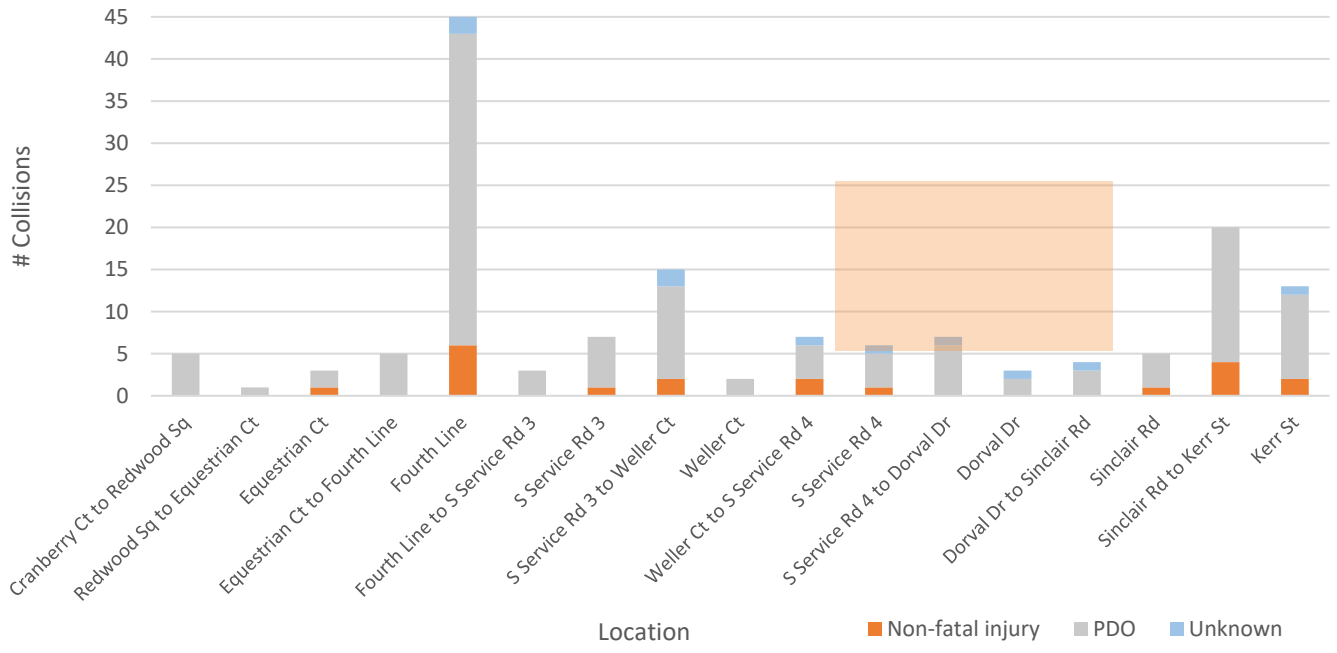
- Angle the signal heads to make the displays less visible to freeway drivers;
- Use display filters or louvres to limit their visibility from the freeway; and
- Install a higher barrier along the QEW to block visibility to South Service Road West.

The feasibility of converting this intersection to full signal control, and the advantages of the various mitigation measures, should be reviewed by the Town in consultation with the MTO during detail design.

3.6 East Segment: Cranberry Court to Kerr Street

Exhibit 3-21 shows the breakdown of all collisions in the east segment by location and severity.

Exhibit 3-21: Breakdown of All Collisions in the East Segment by Location and Severity



Fourth Line has the highest concentration of collisions in this segment. The majority of collisions at this signalized intersection are rear-ends (53%) and angle (22%), which is expected for this type of intersection control. The majority of the rear-end collisions occurred in the eastbound or southbound directions. Collisions that resulted in an injury involved vehicles travelling westbound, indicating that operating speeds east of the intersection may be higher.

Speed surveys conducted at the beginning of April 2018 indicate that drivers are speeding east of Fourth Line. Between South Service Road West and Weller Court, drivers had an 85th percentile speed of 64 km/hr eastbound, and 66 km/hr westbound. Speeds in both directions are higher than the posted speed limit of 50 km/hr. 24 hour speed and volume profiles are illustrated in Exhibit 3 20 and Exhibit 3 21 for the eastbound and westbound directions, respectively.

Exhibit 3-22: 24 Hour Speed and Volume Profile - Eastbound (between South Service Road & Weller Court)

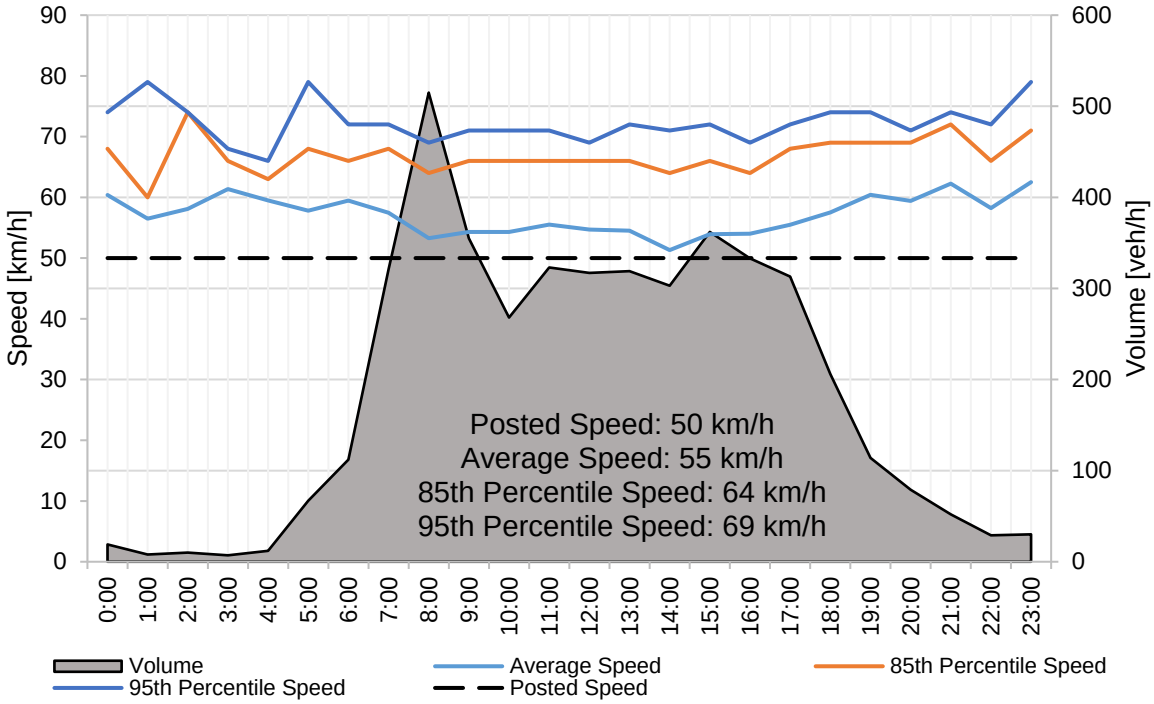
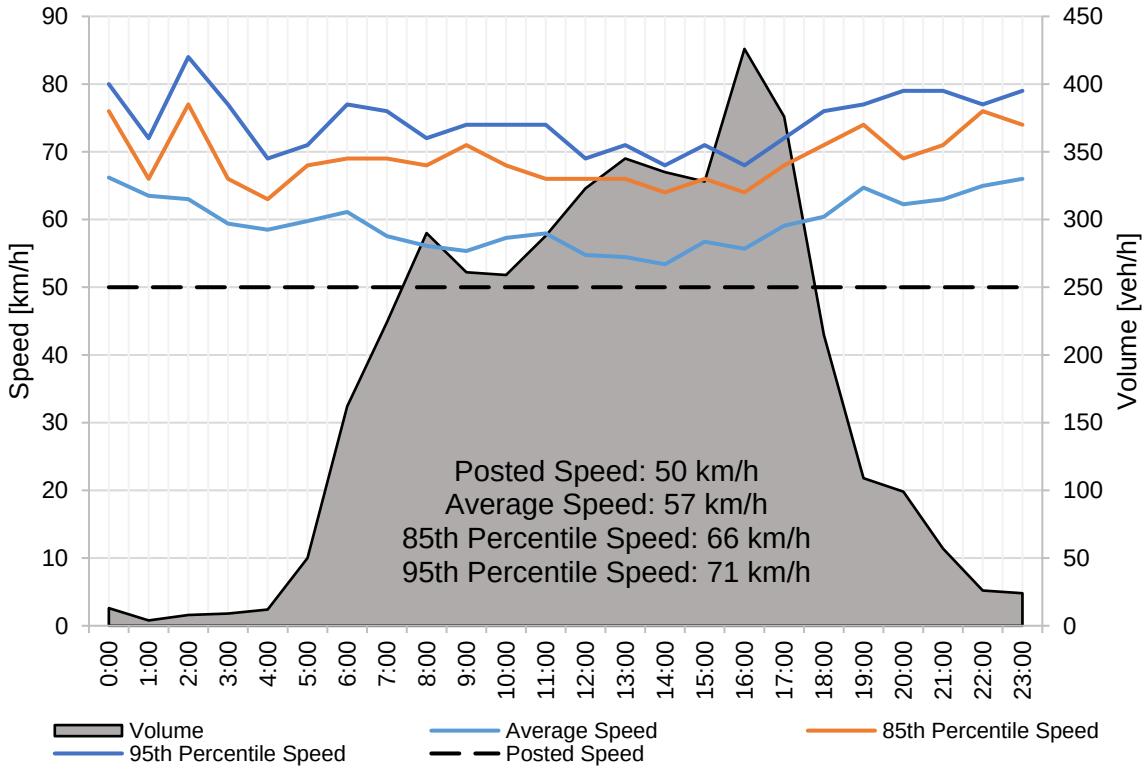


Exhibit 3-23: 24 Hour Speed and Volume Profile - Westbound (between South Service Road & Weller Court)



This portion of Wyecroft Road has one travel lane per direction with a two-way centre left-turn lane. The centre left-turn lane effectively separates turning vehicles from through vehicles, allowing the through vehicles to travel at higher speeds. The generally straight alignment provide clear sightlines to driveways, though this may lead to higher operating speeds. However, the higher operating speed increases the risk of collisions between turning vehicles and through vehicles, which may have contributed to the spike in collisions between South Service Road 3 and Weller Court (Exhibit 3-21).

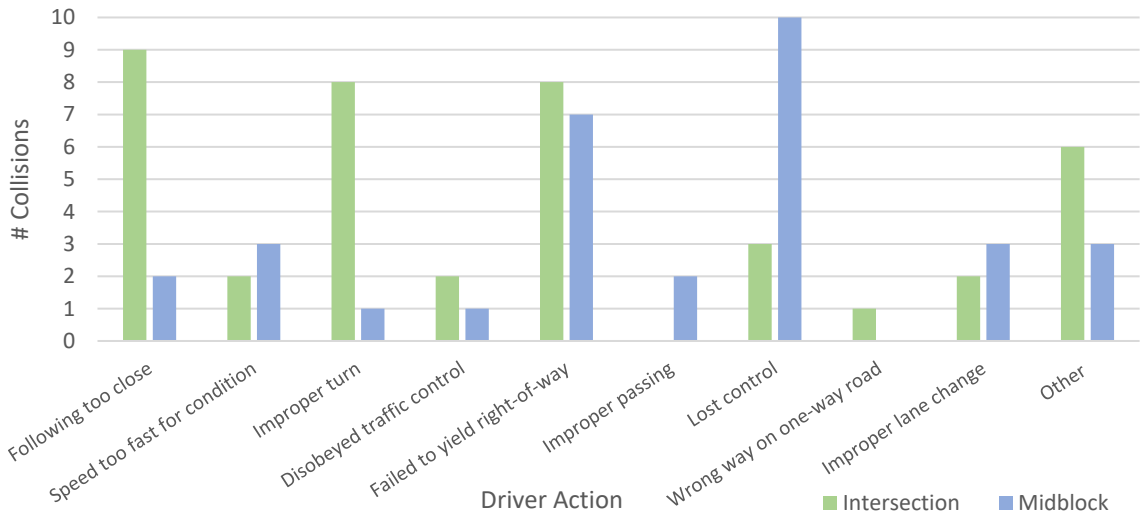
Exhibit 3-21 also shows a higher concentration of collisions on the eastern portion of the corridor (between Sinclair Road and Kerr Street). Similar to the section just east of Third Line, there is a reverse curve between Sinclair Road and Kerr Street. The curve in this segment is not as extreme; however, there are multiple uncontrolled full-move driveways along the curve. Driveways located along a curve may have inadequate sightlines for the high operating speeds along Wyecroft Road. Factors affecting sightlines, such as daylight triangles, could be considered during roadway design.

The signalized intersection of Dorval Drive is complex, with reverse curves and dual left-turns on multiple approaches. Adding to the complexity is a two-way stop controlled intersection located on the north side of Wyecroft Road, approximately 60 metres to the west of Dorval Drive. While the intersection of Dorval Drive itself appears to have fewer collisions, it is likely that collisions on the approaches are intersection-related. Factors affecting sightlines, such as daylight triangles, could be considered during roadway design.

These nearby segments include the nearby intersection of South Service Road 4 and the midblock segments around Dorval Drive. The segment between South Service Road 4 and Sinclair Road (represented by the red rectangle in Exhibit 3-21), is less than 100 metres in length and comprises of 13% of all collisions in the east segment. This is comparable to the other areas of concern highlighted in this section.

Exhibit 3-24 illustrates the breakdown of collisions in the east segment by driver action and severity.

Exhibit 3-24: Breakdown of All Collisions in the East Segment by Driver Action and Severity



Similar to the west segment, failure to yield the right-of-way and following too close are dominant driver actions that resulted in a collision. This indicates that a prominent contributing factor may be the number of uncontrolled driveways (e.g. in the event a driver brakes unexpectedly to access a driveway, a collision is more likely to occur if the driver behind is following too closely). A high proportion (25%) of collisions are also a result of drivers losing control of their vehicles, and these collisions have a higher likelihood of resulting in an injury.

Approximately half of the injury collisions where drivers lost control occurred between South Service Road West and Weller Court. Higher operating speeds (85th percentile speeds of 64-66 km/hr) may be a contributing factor to collisions in this segment. The other half of the injury collisions occurred between Sinclair Road and Kerr Street, where the reverse curve with uncontrolled driveways may be the dominant contributing factor.

4 Conclusions

A review of the 10-year historical collision data from 2007-2017 revealed four main safety concerns that are prevalent along the entire Wyecroft Road corridor:

1. Conflict points at driveways;
2. Traffic congestion and queuing;
3. Reverse horizontal curves; and
4. High operating speeds.

While these concerns occur throughout the study area, there are five locations that have a higher frequency of collisions. The following locations would benefit from operational or infrastructure improvements to improve safety performance. The development of design alternatives in Phase 3 of the EA process should consider safety performance as an evaluation criteria.

East of Bronte Road

A high proportion of all collisions in the west segment occurred within the 240 metre segment between Bronte Rod and South Service Road 1. Potential contributing factors are peak period queuing from the intersection of Wyecroft Road at Bronte road, and vehicles entering/exiting the driveways between the intersections.

Around Third Line

A significant number of collisions where the driver lost control occurred along the short segment between Third Line and Cranberry Court. This part of the corridor has a sharp reverse curve, which increases drivers workload compared to a straight section of roadway. When a driver is navigating a curve, the workload is effectively doubled with both maintaining speed and lane-keeping. Design alternatives could explore alternative horizontal alignments for this reverse curve.

At Progress Court

To improve pedestrian access to transit, signalizing the intersection of South Service Road West and Progress Court is recommended. Key safety benefits include: influencing driver speed choice on South Service Road West, managing conflicts for turning traffic, and reducing potential for aggressive driving by drivers making northbound left-turns. During detail design, mitigation measures should be put in place to reduce sightlines for freeway drivers to the signals.

Around Fourth Line

Fourth Line has the highest concentration of collisions in the east segment. The majority of collisions that resulted in an injury involved vehicles travelling

westbound. Speed surveys showed speeding occurring east of Fourth Line, which indicates that higher operating speeds may be a contributing factor to collisions around Fourth Line.

Around Dorval Drive

The short 100 m section between South Service Road 4 and Sinclair Road is complex. There are reverse curves, dual left-turns on multiple approaches at Dorval Drive, and a two-way stop controlled intersection 60 m away from a signalized intersection. The combination of these features and higher traffic volumes may contribute to the higher frequency of collisions around Dorval Drive. Factors affecting sightlines, such as daylight triangles, could be considered during roadway design. Other design options that could be considered, in consultation with Halton Region, are modifying adjacent intersections to right-in/right-out, closing adjacent intersections, or reconfiguring accesses on the intersection approaches.

West of Kerr Street

Similar to the middle segment (between Third Line and Progress Court), there is a reverse curve between Sinclair Road and Kerr Street, which may be a contributing factor to the higher frequency of collisions in this segment. The reverse curve west of Kerr Street also has multiple uncontrolled driveways located along the curve, further increasing driver workload as drivers must be aware of vehicles entering/exiting the driveways. Factors affecting sightlines, such as daylight triangles, could be considered during roadway design.