# Appendix E – Transportation Report

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# Memorandum

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| **To/Attention** | Andrew Doman (Region of Waterloo) | **Date** | January 16, 2020 |
| **From** | Matt Colwill (IBI Group) | **Project No** | 119697 |
| **cc** | Marc Tan (IBI Group), Alina Zhang (IBI Group), Jake Wang (IBI Group), Kelly Cobbe (IBI Group), Julianna Arcese (IBI Group) | | |
| **Subject** | **University Avenue Environmental Assessment between Albert Street and Weber Street North - Safety Analysis** | | |

## 1 Introduction

IBI Group was retained by Region of Waterloo (Region) to conduct a traffic safety analysis on University Avenue between Albert Street and Weber Street North. This safety analysis is in support of the Schedule C Class Environmental Assessment (EA) for the same study corridor with a planned implementation date for 2023. Most of the EA alternatives involve improvements to cycling and pedestrian facilities, relative to existing conditions. The objective of the safety analysis is to review the historical safety performance of the study corridor and the anticipated safety effect of the EA designs, then provide recommendations for inclusion in future detailed designs.

This memorandum provides an overview of the safety review and is broken down into the following sections:

- Section 2 Background: Discusses the project background and parallel projects in the study area;
- Section 3 Preliminary Findings and Field Investigations: Provides an overview of the findings from historical collision data analysis and field investigation;
- Section 4 List of Existing Issues and Potential Countermeasures: Lists the issues observed from collision data review and field investigation, and their potential countermeasures;
- Section 5 Design Concept Review: Provides a comparison of four design concepts, and review the four design concepts from a road user safety perspective; and
- Section 6 Recommendations for Future Detailed Design: Outlines some recommended countermeasures and their benefits for future detailed design of the study area.

# 2 Background

The following sections discuss the background information for the analysis including the study area, the proposed design concepts for the University Avenue EA, and other cycling infrastructure projects in the study area. This information was taken into account as part of the overall safety analysis.

## 2.1 Study Area

The study area consists of University Avenue between Albert Street and Weber Street North, including the following intersections along University Avenue, and the midblock segments between these intersections:

- Weber Street North at University Avenue East (signalized);
- Regina Street North at University Avenue East (signalized);
- King Street North at University Avenue (signalized);
- Hazel Street at University Avenue West (signalized);
- Midblock pedestrian signal (MPS)140 metres west of Hazel Street at University Avenue West (signalized)
- Hemlock Street at University Avenue West (unsignalized); and
- Albert Street at University Avenue West (signalized).

The locations of these intersections are shown in Exhibit 2-1.

**Exhibit 2-1: Study Area**

## 2.2 University Avenue Environmental Assessment Initial Design Concepts

As part of the University Avenue Environmental Assessment, the IBI Group Design Team has developed four design concepts for University Avenue. The goal of these design concepts is to incorporate improved pedestrian and cyclist facilities along University Avenue between Albert Street and Weber Street North, while preserving an acceptable vehicular level of service. These design concepts include a number of changes to pedestrian and cyclist facilities in the study

area, and are compared and reviewed more thoroughly in Section 5. Details of the design concepts are available in Appendix A.

### 2.3 Separated Cycling Network Pilot Project

To promote cycling and improve cyclist safety in the Region of Waterloo, the Region is undertaking a pilot project to provide separated bike lanes along some regional and local roads, including segments of University Avenue, King Street North, and Albert Street within the study area. As part of the design of this pilot project, a number of lane configuration changes are planned at the intersections of University Avenue at King Street North and University Avenue West at Albert Street.[1] The design drawings of these two intersections are shown in Appendix B.

## 3 Preliminary Findings and Field Investigations

The Region of Waterloo provided the historical collision data from January 2013 to December 2017 to support this study. Based on an office review of the data, several overall trends and dominant collision types were identified. The collision data provided by the Region are available in Appendix C. To provide a better understanding of the collision trends within the study area, the Region-wide collision trends from the Region of Waterloo 2017 Annual Collision Report were used as a "benchmark" for comparison.

In addition to the office review of the collision data, a field investigation of the study area was conducted on October 8, 2019 to observe and document the following:

- Existing traffic operations and road user behaviours;
- Field conditions (for comparison with plans and photographs); and
- Potential contributing factors linking observed conditions to the preliminary findings from the office review.

The field investigation was conducted under a range of operational conditions (e.g., AM peak period, off-peak period, and PM peak period) and environmental conditions (e.g., daytime and nighttime). Field observations validated some of the preliminary findings from the collision data analysis, and identified some potential issues along the corridor.

The following two subsections present the collision trends and observations for the overall study area and specific locations, respectively.

### 3.1 Study Area Trends and Observations

A total of 466 collisions were recorded within the study area during the five-year study period from January 2013 to December 2017. Of the 466 collisions, 359 (77%) collisions were property damage only (PDO) collisions, and 107 (23%) were non-fatal injury collisions. No fatal collisions were recorded during the analysis period.

As shown in Exhibit 3-1, in the study area, there is a slightly increasing trend in the annual collision frequencies after 2014. At the Regional level, annual collision frequency has been relatively constant in recent years, except for 2016, when the collision frequency was lower than all other years in the analysis period. This difference between the study area collision frequency and the Region's annual collision frequency could be a result of the student population growth

[1] These intersection lane configuration changes were implemented in fall of 2019.

and new high-density residential developments within the study area, which has resulted in increased exposure locally.

**Exhibit 3-1: Annual Collision Frequency and Severity**

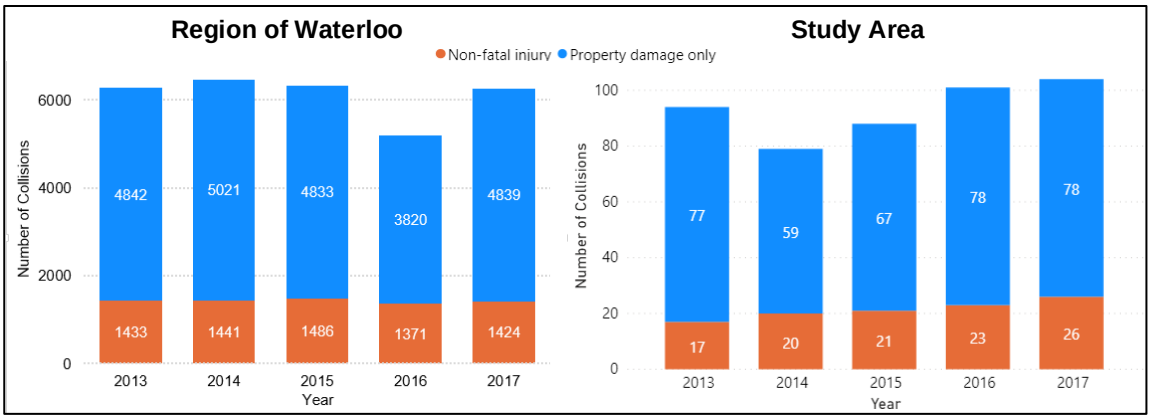



Exhibit 3-2 shows the monthly collision frequency during the 5-year analysis period. Higher numbers of collisions was observed during the period from November to February. This could be due to winter weather related conditions during those months. One exception is that the highest number of collisions was observed in September in the study area, likely due to the extra vehicular and pedestrian activity at the end of the summer season, coinciding with the beginning of the new school year.

**Exhibit 3-2: Number of Collisions by Month and Severity**

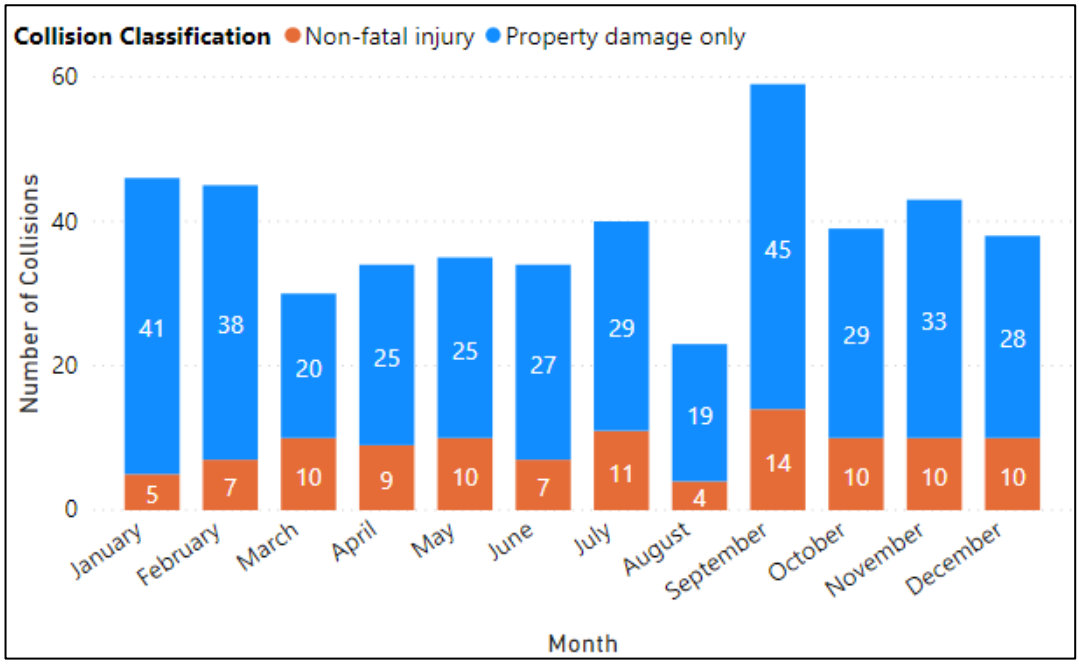



Exhibit 3-3 presents the hourly collision profile. Hourly collision frequencies start to increase at 7 AM, and gradually rise throughout the midday, coming to a peak in the 5 PM hour, which corresponds with the PM peak period. This pattern is consistent with commuter travel patterns coupled with midday activity that is likely attributable to the concentration of commercial and post-secondary land uses along the corridor.

**Exhibit 3-3: Number of Collisions by Time of Day and Severity**

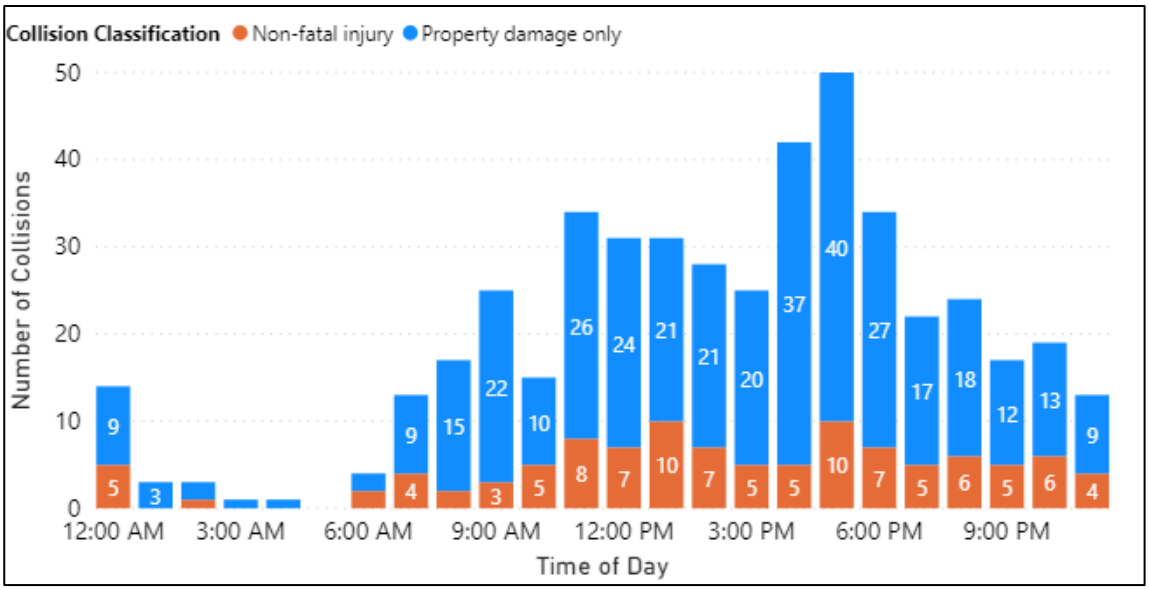



Exhibit 3-4 shows the Region-wide collisions impact type distribution, and the distribution within the study area. In general, the collision impact type distribution in the study area is similar to that for the rest of the Region of Waterloo. However, two exceptions were observed:

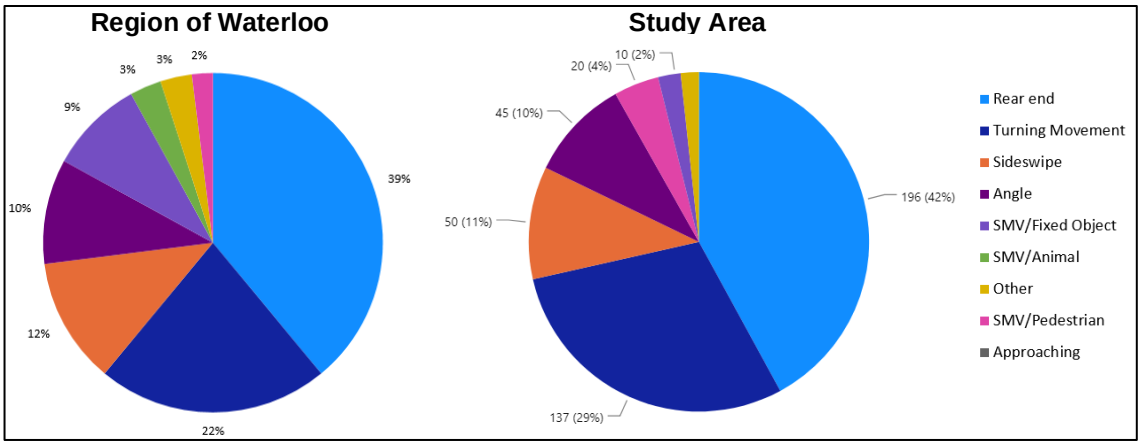
- The study area had higher percentage (29%) of turning movement collisions compared to the Region-wide collision data (22%); and
- The study area had higher percentage (4%) of pedestrian involved collisions compared to the Region-wide collision data (2%).

The possible contributing factors of these two exceptions are:

- High left-turn traffic at the intersections of major arterial roads, such as at the intersection of King Street North at University Avenue and the intersection of Weber Street North at University Avenue East;
- High pedestrian activity along University Avenue, as it connects many high-density residential, commercial, and post-secondary educational areas; and
- A combination of the two factors above, where drivers have less opportunities for permissive left-turn movement, as a result of high pedestrians volumes. This might encourages drivers to make aggressive turning movements, which might lead to collision with other vehicle or pedestrian.

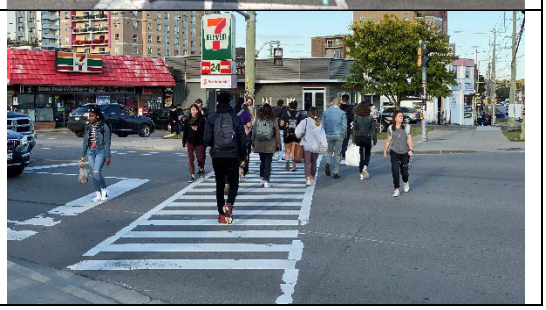
In the study area, rear-end collisions (196 collisions, 42%) and turning movement collisions (137 collisions, 29%) were the predominant collision impact types. There were 20 (4%) collisions involving pedestrians.

**Exhibit 3-4: Number of Collisions by Impact Type**




From the field investigations, some general observations which apply to the entire study area are listed in Exhibit 3-5.

**Exhibit 3-5: General Observations from Field Investigations**

| Road User | Observation | Description/Photo |
|---|---|---|
| Vehicle | Drivers generally appear to drive faster and more aggressively during PM peak period | N/A |
| | At skewed intersections, some left-turning vehicles encroach on opposing travel lanes when waiting for gaps | |
| Pedestrian | Many pedestrians start to cross close to the end of the "Flashing Don't Walk" phase | |
| | Many pedestrians walk outside of the marked pedestrian crosswalks |  |
| | Pedestrian crosswalks are generally too narrow for the amount of pedestrian volume | |

| Road User | Observation | Description/Photo |
|---|---|---|
| | The "Flashing Don't Walk" phases are relatively short compared to similar intersections in other municipalities | Based on Region of Waterloo Transportation Impact Studies (TIS) Requirements for Capacity Analysis, Roundabouts, Signal Warrants, the Region calculates "Flashing Don't Walk" (FDW) using the following formula:<br>FDW = clearance distance/1.25m/s – (amber + all-red), where amber and all-red times are included as parts of pedestrian clearance time.<br><br>While amber and all-red time are also intended for vehicular traffic to clear the intersection, this can increase conflicts between pedestrians and vehicles, especially between the pedestrians who are finishing crossing the road and the left-turn vehicles clearing the intersection during the amber and all-red time. |
| Cyclist | Cyclists ride in pedestrian crosswalks | |
| | Where bike lanes do not exist, cyclists ride in mixed traffic or ride on the sidewalk | |

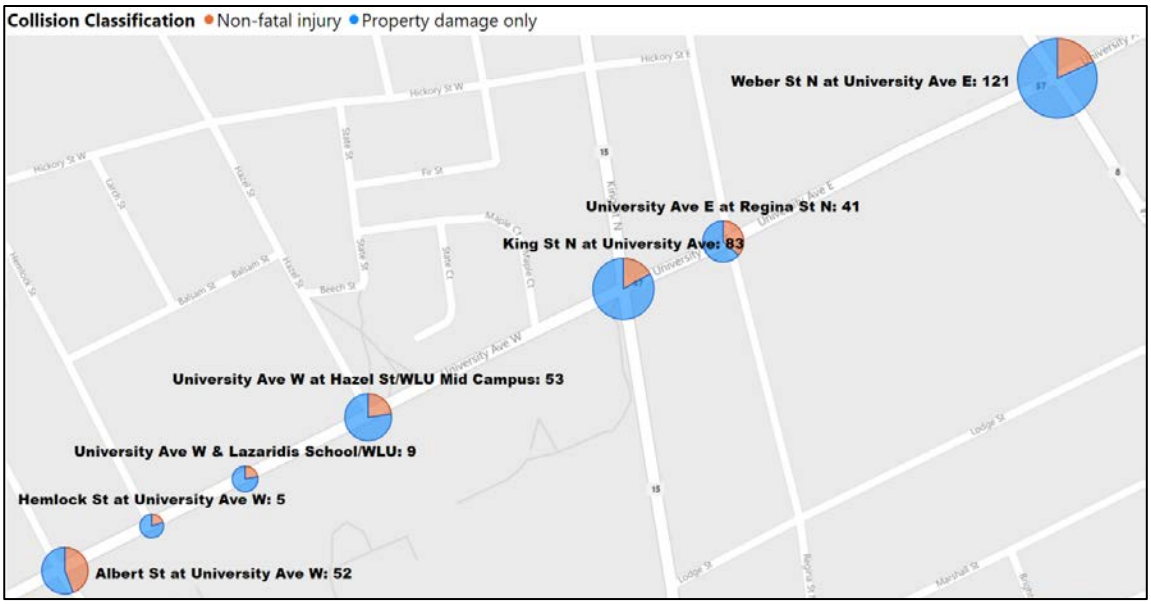
### 3.2 Location-Specific Trends and Observations

Exhibit 3-6 and Exhibit 3-7 show the number of collisions and their severity distributions at each intersection and midblock location, respectively. Collision impact type and severity of every collision were summarized and plotted in collision diagrams for every intersections and midblock segment, these collision diagrams are available in Appendix D.

As indicated in Exhibit 3-6, among all of the intersections analyzed, the intersection of Weber Street North at University Avenue East had the highest number of collisions (121), followed by the intersection of King Street North at University Avenue (83). In terms of severity, 44% (23 out of 52) of the collisions that occurred at the intersection of Albert Street at University Avenue West were collisions that resulted in injury, which is the highest proportion compared to the other intersections in the study area. A high proportion of collisions that resulted in injury were also observed at the intersection of Regina Street North at University Avenue East, where 15 out of

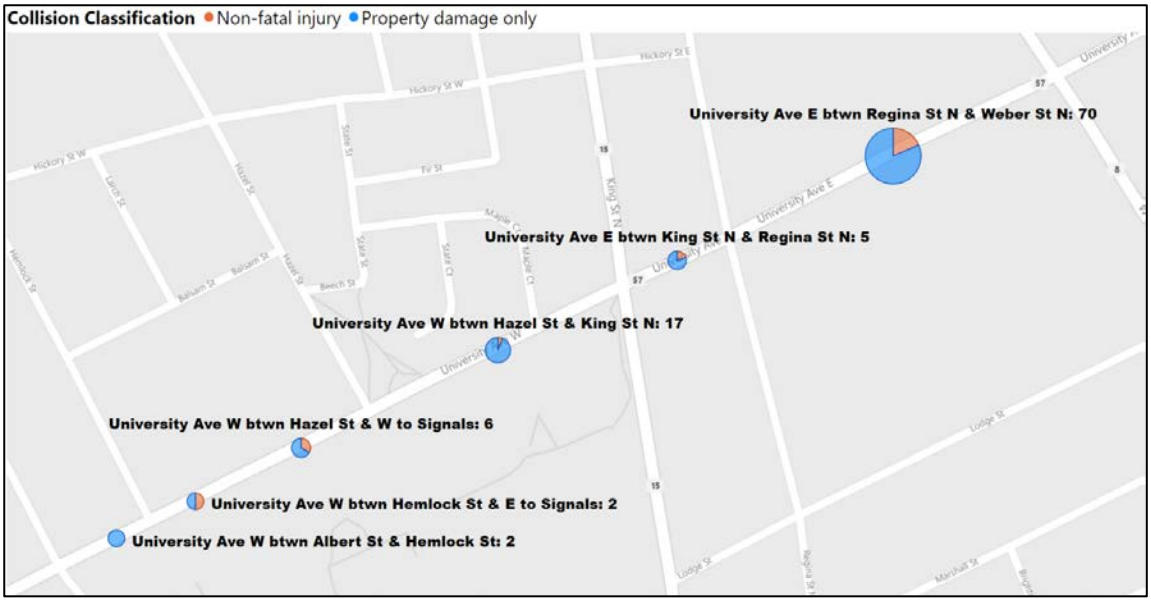
41 collisions (37%) resulted in injuries. Based on the data provided, no fatal collision occurred within the study area during the analysis period.

**Exhibit 3-6: Number of Collisions and Severity at each Intersection**




As indicated in Exhibit 3-7, among all midblock segments analyzed, the segment between Regina Street North and Weber Street North had the highest number of collisions (70), followed by the segment between Hazel Street and King Street North (17).

**Exhibit 3-7: Number of Collisions and Severity at each Midblock Location**




A summary of the findings from the collision data analysis and the field investigation for each intersection and midblock location within the study area are provided in Exhibit 3-8, where the key findings are bolded. Detailed findings for each intersection and midblock location are available in Appendix D.

**Exhibit 3-8: Collision Data Analysis and Field Observation Findings**

| Location Type | Location | Collision Data Analysis | Field Observations |
|---|---|---|---|
| Signalized Intersection | Albert Street at University Avenue West | • Number of collisions and severity: 23 out of 52 of collisions (44%) resulted in injuries<br>• High proportion of angle collisions (21%), 6 out of 11 collisions resulted in injuries<br>  o **Majority of angle collisions (8 out of 11) occurred with at-fault vehicles driving along University Avenue West**<br>• High proportion of pedestrian involved collisions (15%), 6 out 8 collisions resulted injuries<br>  o **Half of pedestrian involved collisions (4 out of 8) occurred during the evening (10 PM -12 AM) where pedestrians were hit by left-turning vehicles**<br>• 1 cyclist involved collision occurred, but the collision details are unknown | • The eastbound and westbound left-turn phase actuated without demand<br>• No issues with street lighting during evening<br>• Bike lane from Separated Cycling Network Project had been partially implemented, while the previous stop bar on the north approach was not yet removed |
| Midblock | Between Albert Street and Hemlock Street | • Number of collisions and severity: 2 Property Damage Only (PDO) collisions with no injury collisions<br>• No pedestrian/cyclist involved collision occurred at this location | • Uphill grade might affect driver's sightlines when approaching Albert Street |
| Unsignalized Intersection | Hemlock Street at University Avenue West | • Number of collisions and severity: 1 out of 5 (20%) collision resulted in injury<br>• Majority of collisions (80%) were rear end collisions<br>• No pedestrian/cyclist involved collisions occurred at this location | • Pedestrians crossing University Avenue West at this unsignalized intersection during the day time |
| Midblock | Between Hemlock Street and Midblock Pedestrian Signal | • Number of collisions and severity: 1 out of 2 collisions (50%) resulted in injury<br>• One rear end collision (injury) and 1 sideswipe collision (PDO)<br>• No pedestrian/cyclist involved collisions occurred at this location | • Uphill grade might affect driver's sightline and stopping distance when approaching the Midblock Pedestrian Signal west of Hazel Street |

| Location Type | Location | Collision Data Analysis | Field Observations |
|---|---|---|---|
| Midblock Pedestrian Signal | MPS West of Hazel Street | • Number of collisions and severity: 2 out of 9 collisions (22%) resulted in injury<br>• **All 9 collisions that occurred were rear end collisions**<br>• **Majority of collisions (78%) occurred with westbound traffic**<br>• No pedestrian/cyclist involved collisions occurred at this location | • High pedestrian activity<br>• Pedestrians walking outside of pedestrian crosswalks due to the location of Lazaridis Hall's entrance being offset from the crosswalk |
| Midblock | Between Midblock Pedestrian Signal and Hazel Street | • Number of collisions and severity: 2 out of 6 collisions (33%) resulted in injury<br>• Majority of collisions (50%) were rear end collisions<br>• No pedestrian/cyclist involved collisions occurred at this location | • Short distance (around 130 metres) between the MPS west of Hazel Street and the intersection of Hazel Street at University Avenue West<br>• Pedestrians crossing the road at midblock ("jaywalking") in the evening |
| Signalized Intersection | Hazel Street at University Avenue West | • Number of collisions and severity: 12 out of 53 collisions (23%) resulted in injuries<br>• Majority of collisions (57%) were rear end collisions<br>o All rear end collisions occurred along University Avenue West<br>• **2 pedestrian involved collisions occurred where pedestrians were hit by northbound and southbound left-turning vehicles**<br>• **1 cyclist involved collision occurred where cyclist was hit by a right-turning vehicle** | • No audible pedestrian push buttons at northeast and southeast corners of the intersection<br>• High pedestrian and cyclist activity |
| Midblock | Between Hazel Street and King Street North | • Number of collisions and severity: 1 out of 17 collisions (6%) resulted in injury<br>• Majority of collisions (65%) were rear end and sideswipe collisions<br>• High proportion of collisions (18%) involved southbound vehicles exiting from the driveways or parking lot on the north side of University Avenue West<br>• No pedestrian/cyclist involved collisions occurred at this location | • Two driveways (Maple Court and University Commons Plaza's parking lot access) next to each other on the north side of University Avenue West<br>• Small parking lot (6 parking spaces) on the north side of University Avenue West<br>• Lack of street lighting on the south side of University Avenue West in the evening<br>• Pedestrians crossing the road at midblock ("jaywalking") in the evening |
| Signalized Intersection | King Street North at University Avenue | • Number of collisions and severity: 14 out of 83 collisions (17%) resulted in injuries<br>• High proportion (34%) of turning movement collisions | • The westbound left-turn phase actuated without demand<br>• Optically programmable signals were used for both westbound left-turn and through movements, preventing |

| Location Type | Location | Collision Data Analysis | Field Observations |
|---|---|---|---|
| | | o Majority of turning movement collisions (21 out of 28) occurred with left-turning movements<br>o **High proportion of left-turn collisions (10 out of 28) occurred when making southbound left-turn movements**<br>• 5 out of 7 pedestrian involved collisions resulted in injuries<br>o **Majority of pedestrian involved collisions (4 out of 7) occurred where pedestrians were hit by left-turning vehicles** | drivers seeing the green light from distance because of the short distance (around 100 metres) between the intersection of King Street North at University Avenue and the intersection of Regina Street North at University Avenue East<br>• Narrow pedestrian crosswalks forcing pedestrians to walk outside of the pedestrian crosswalks<br>• The southbound left-turn lane is directly opposite northbound through lane<br>• No left-turn guide lines for tight northbound left-turn |
| Midblock | Between King Street North and Regina Street North | • Number of collisions and severity: 1 out of 5 collisions (20%) resulted in injuries<br>• **All collisions were rear end and sideswipe collisions**<br>• No pedestrian/cyclist involved collisions occurred at this location | • Short distance (around 100 metres) between the intersection of King Street North at University Avenue and the intersection of Regina Street North at University Avenue East<br>• A small reflective sign warns cyclists about exiting traffic from driveway when riding on sidewalk<br>• No bike lanes on this midblock segment |
| Signalized Intersection | Regina Street North at University Avenue East | • Number of collisions and severity: 15 out of 41 collisions (37%) resulted in injuries<br>• High proportion (34%) of angle collisions, resulted 4 injury collisions<br>o **Majority of angle collisions (10 out of 14) occurred in the eastbound direction;**<br>• High proportion (20%) of turning movement collisions, resulted in 4 injury collisions<br>o **Half of turning movement collisions (4 out of 8) occurred when making northbound left-turns**<br>• **3 pedestrian involved collisions, all resulted in injury, 2 out of 3 collisions occurred when vehicles were making left-turns**<br>• **2 cyclist involved collisions, resulted in 1 injury, for these collisions, cyclists were hit by 1 left-turning vehicle and 1 right-turning vehicle** | • A optically programmable eastbound through signal preventing drivers seeing the green light from distance because of the short distance (around 100 metres) between the intersection of King Street North at University Avenue and the intersection of Regina Street North at University Avenue East<br>• The pedestrian signal on the south side of the road (southeast corner) was not directly facing the pedestrian crosswalk |

| Location Type | Location | Collision Data Analysis | Field Observations |
|---|---|---|---|
| Midblock | Between Regina Street North and Weber Street North | • Number of collisions and severity: 13 out of 70 collisions (19%) resulted in injury<br>• High proportion (50%) of collisions were turning movement collisions<br>  o **Majority of turning movement collisions (22 out of 35) occurred while northbound traffic was exiting the driveways**<br>• **4 cyclist involved collisions occurred at this midblock location, resulting in 3 injuries**<br>  o **Majority of cyclist involved collisions (3 out of 4) occurred where cyclists were hit by vehicles entering or exiting the driveways** | • No bike lanes at this midblock location, cyclists ride with traffic or ride on sidewalks<br>• Some small reflective signs on both sides of the road, warning cyclists about exiting traffic from driveway when riding on the sidewalk<br>• Many wide driveways on both sides of the road, where some vehicles turned onto driveways at a high speed<br>• In the absence of two-way left-turn lane median, when a vehicle in the centre lane along University Avenue East indicating an intent to make a left-turn onto a driveway, vehicles behind the slowing/stopping vehicle occasionally make sudden lane change to the curb lane to avoid delay<br>• Some properties on the south side have two driveways<br>• Vehicles exiting from the driveways blocked by the heavy through movements during peak periods<br>• During peak periods, traffic on University Avenue East had to give “courtesy gaps” to vehicles wanting to enter or exit the driveways |
| Signalized Intersection | Weber Street North at University Avenue East | • Number of collisions and severity: 22 out of 121 collisions (18%) resulted in injury;<br>• High proportion of turning movement collisions (36%);<br>  o Majority of turning movement collisions (37 out of 43) occurred when vehicles were making left-turns;<br>  o High proportion of turning movement collisions (16 out of 43) occurred in the eastbound direction;<br>• Majority of rear end collisions (30 out of 50) occurred in the eastbound and westbound directions;<br>• No pedestrian/cyclist involved collisions occurred at this location; | • Pedestrians crossed the road without using the pedestrian refuge island<br>• Cyclists ride on the pedestrian crosswalks<br>• When buses service the westbound far side bus stop located approximately 60 metres west of the intersection, traffic in the curb lane was blocked by the stopped bus and queues spilled back into the intersection |

# 4 List of Existing Issues and Potential Countermeasures

Based on the review of the historical collision data and field investigations, some key issues were identified as shown below:

- High proportion of turning movement collisions at intersections of major arterial roads;
- High proportion of angle collisions at some intersections;
- High proportion of pedestrian and cyclist involved collisions;
- Drivers generally drive faster and more aggressively during the PM peak hours;
- Narrow pedestrian crosswalks, forcing pedestrians to walk outside of the pedestrian crosswalks;
- Short “Flashing Don’t Walk” time at crosswalks, creating potential conflicts between pedestrians and vehicles during the inter-green period (amber and all-red time);
- Limited street lighting at night at some locations along the corridor, particularly on the south side of University Avenue West;
- Absence of cycling facilities east of King Street North along University Avenue East; and
- Unusual northbound and southbound lane configurations at the intersection of University Avenue and King Street North, where southbound left-turn lane is directly facing northbound through lane.

A detailed list of issues and the potential countermeasures at specific locations are illustrated in Exhibit 4-1.

## Exhibit 4-1: List of Issues and Countermeasures

| Location | Issue | Countermeasures |
|---|---|---|
| **Intersection:**<br>• All signalized intersections | The "Flashing Don't Walk" times are too short | • Update the "Flashing Don't Walk" time, use slower walking speed and exclude the inter-green period from "Flashing Don't Walk" time. For example, City of Toronto currently implements 1.0m/s for "Walk" time, and 1.2m/s for "Flashing Don't Walk" time, and excludes inter-green from "Flashing Don't Walk" time.<br>• Reduce pedestrian crossing distances through intersection redesign incorporating "Protected Intersection" design. |
| **Intersections:**<br>• Albert Street at University Avenue West[2]<br>• Hazel Street at University Avenue West<br>• King Street North and University Avenue<br>• Regina Street North at University Avenue East | High proportion of pedestrian and cyclist involved collisions, where pedestrians and cyclists were hit by left-turn or right-turn traffic | • Implement leading pedestrian/cyclist interval<br>• Implement lagging fully protected left-turn phases<br>• Improve pedestrian level lighting<br>• Realign crosswalks to shorten crossing distances and create setback crossings<br>• Widen the crosswalks as needed at where high demand exists<br>• Extend the concrete median to the intersection<br>• Increase "Flashing Don't Walk" time at intersections<br>• Incorporate "protected intersection" geometric design features (more details provided following this table) |
| **Intersection:**<br>• Weber Street North at University Avenue East<br>**Midblock:**<br>• Between Regina Street North and Weber Street North | Drivers generally drive faster and more aggressively during the PM peak hours | • Reduce lane widths along the corridor<br>• Increase police speed enforcement<br>• Designate the corridor as a community safety zone and implement automated speed enforcement<br>• Install radar-linked speed display signs |
| **Intersection:**<br>• Albert Street at University Avenue West<br>• King Street North at University Avenue<br>• Regina Street North at University Avenue East<br>• Weber Street North at University Avenue East | High proportions of turning movement and angle collisions | • Provide protected left-turn phases<br>• Install red-light cameras |
| **Intersection:**<br>• King Street North at University Avenue<br>• Weber Street North at University Avenue East | Some left-turn vehicles encroach on opposing through traffic travel lanes when waiting for gap | • Install left-turn guide lines<br>• Realign the intersection |

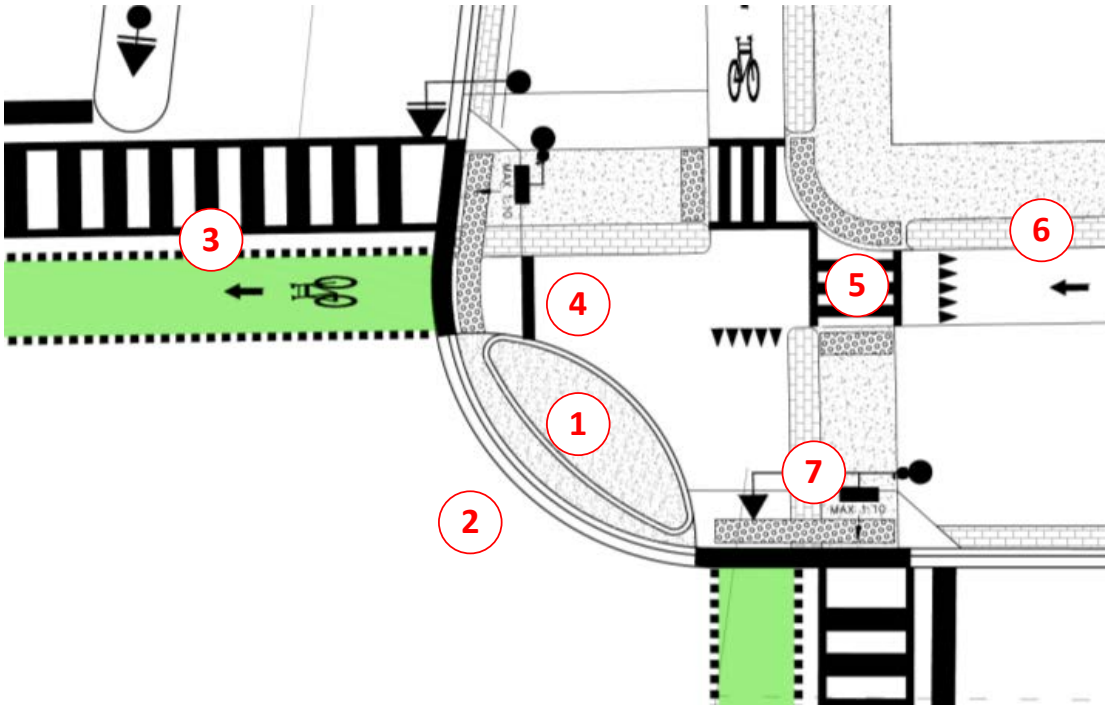
[2] Region of Waterloo is piloting no right turn on red restrictions at Albert Street at University Avenue West to reduce pedestrian collisions with right turning vehicles as of January 2020.

| Location | Issue | Countermeasures |
|---|---|---|
| **Intersection:**<br>• King Street North at University Avenue<br>• Weber Street North at University Avenue East<br>• Hazel Street at University Avenue West | Many pedestrians start to cross near the end of the "Flashing Don't Walk" phase | • Reduce pedestrian crossing distances |
| **Intersection:**<br>• King Street North at University Avenue<br>• Hazel Street at University Avenue West<br>• MPS west of Hazel Street | Pedestrian crosswalks are generally too narrow for the amount of pedestrian volume<br>Many pedestrians walk outside of the marked pedestrian crosswalks | • Widen the crosswalks |
| **Midblock:**<br>• Between Regina Street North and Weber Street North<br>• Between Hazel Street and King Street North | Pedestrians crossing University Avenue at midblock locations | • Narrow lane widths<br>• Install midblock refuge island<br>• Install midblock pedestrian crossings at appropriate midblock locations |
| **Intersection:**<br>• King Street North at University Avenue<br>• Weber Street North at University Avenue East<br>• Hazel Street at University Avenue West | Cyclists ride on pedestrian crosswalks | • Incorporate “protected intersection” geometric design features, and/or<br>• Provide cycling facilities such as crossrides, bike lanes, two-stage left-turns, bike boxes, and cycling signals. |
| **Midblock:**<br>• Between Regina Street North and Weber Street North | Where bike lanes do not exist, cyclists ride with traffic or ride on sidewalk | |
| **Midblock:**<br>• Between Regina Street North and Weber Street North<br>• Between Hazel Street and King Street North | Some midblock locations consist of many driveways, creating conflicts between road users when entering and exiting | • Consolidate driveways, limit the number of driveways for each property<br>• Install concrete median to limit left-turn movements or<br>• Install two-way left-turn lane at midblock locations |
| **Intersection:**<br>• Weber Street North at University Avenue East | When buses service the westbound far side bus stop located approximately 60 metres west of the intersection, traffic in the curb lane was blocked by the stopped bus and spilled back into the intersection | • Install farside bus bay, or<br>• Relocate the bus stop to near side of intersection |
| **Midblock:**<br>• Between Regina Street North and Weber Street North<br>• Between Hazel Street and King Street North | Absence of street lighting on the south side of the road | • Add street lighting and pedestrian level lighting to the south side of the road focusing lighting on the sidewalk to illuminate pedestrians |
| **Midblock:**<br>• Between Albert Street and MPS west of Hazel Street | Uphill grade might affect driver’s sightline and stopping distance when approaching intersections | • Install static warning signs before signals<br>• Improve sightline by moving the signal heads closer to the approaches<br>• Reduce the grade to improve sightlines |
| **Intersection:**<br>• King Street North at University Avenue | Unusual lane configurations, where the northbound left-turn lane is currently directly facing the southbound through lane | • Revise lane configurations and realign intersection approaches |

One of the countermeasures listed in Exhibit 4-1 is to incorporate “protected intersection” geometric design features. “Protected intersection” provides additional separation between vehicular traffic and other valuable road users (i.e., pedestrians and cyclists), increased driver visibility on cyclists/pedestrians when making right-turns, decreased right-turn turning speed, and shortened pedestrian/cyclist crossing distances. As shown in Exhibit 4-2, a typical “protected intersection” consist of a list of design elements, including:

1. Corner islands;
2. Reduced corner radii;
3. Set-back crossride and crosswalk;
4. Cyclist queuing area;
5. Bike lane crosswalk;
6. Visual/textured shoreline separation between cyclists and pedestrian; and
7. Dedicated pedestrian and cyclist signals.

**Exhibit 4-2: Design Elements of a "Protected Intersection"**



# 5 Concept Design Review

As part of the University Avenue Environmental Assessment, the IBI Group Design Team has developed four design concepts for University Avenue. The goal of these designs is to incorporate improved pedestrian and cyclist facilities along University Avenue between Albert Street and Weber Street North, while preserving an acceptable vehicular level of service. In this section, each of the design concepts were reviewed from a road user safety perspective to determine if the existing issues have been addressed. The four design concepts are as follows:

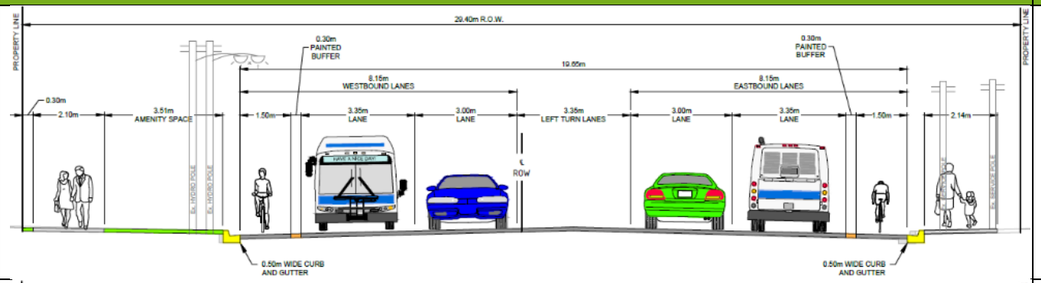
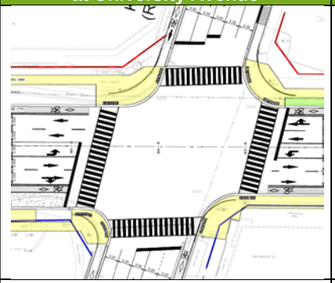
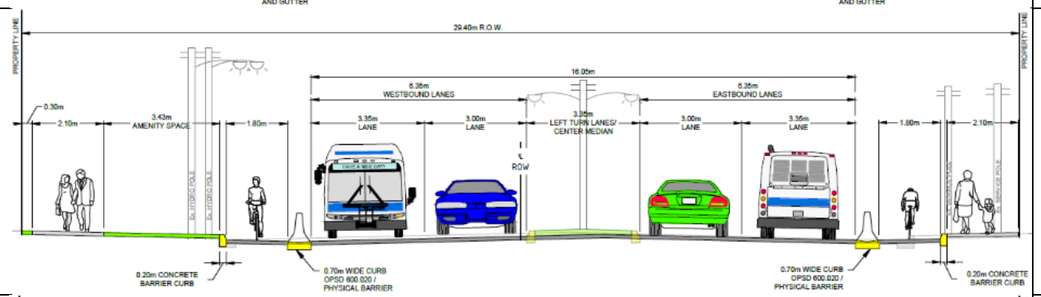
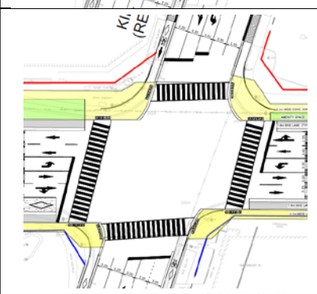
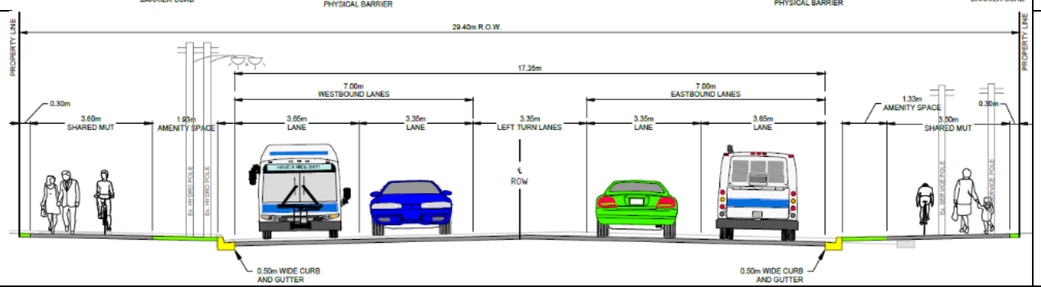
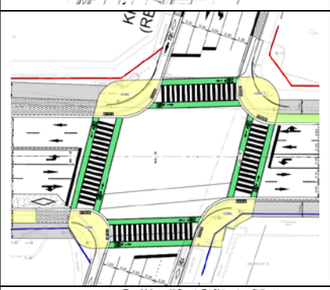
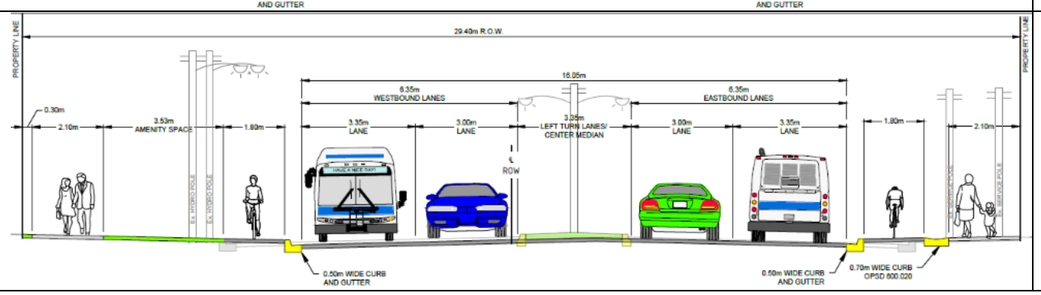
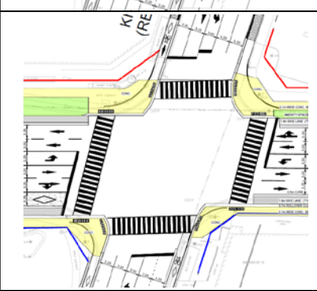
- Design Concept No.1: Separated Bike Lane with Painted Buffer;
- Design Concept No.2: Separated Bike Lane with Raised Physical Barrier;
- Design Concept No.3: Off-Roadway Shared Multi-use Pathways; and
- Design Concept No.4: Separated Bike Lane with Physical barrier.

Exhibit 5-1 provides a comparison between each design concept's cross-section design and intersection design features. This comparison includes the cross-section drawings of the midblock locations between Albert Street and King Street North, and intersection designs of King Street North at University Avenue. These two locations were selected for this comparison for the following reasons:

- These two locations have the highest combined traffic and pedestrian activity within the study area;
- The cross-section drawings of the segment between King Street North and Weber Street North are very similar to the drawings of the segment between Albert Street and King Street North in each design concept; and
- The intersection designs are very similar in terms of pedestrian and cyclist facilities in each design concept.

Full drawings of the four design concepts are available in Appendix A.

**Exhibit 5-1: Design Concept Comparisons**

| Design Concept | | | Separations between Road Users | | Use of Median |
|---|---|---|---|---|---|
| No. | Roadway Cross-section between Albert Street and King Street North | Intersection of King Street North at University Avenue | At Midblock | At Intersection | |
| No.1 |  |  | • Between vehicular traffic and cyclists: lane markings<br>• Between cyclists and pedestrians: concrete curb | • No separations between cyclists and pedestrians at intersections | • Midblock pedestrian crossing between Hazel Street and King Street North<br>• Two-way left-turn lane between Regina Street North and Weber Street North |
| No.2 |  |  | • Between vehicular traffic and cyclists: concrete barrier<br>• Between cyclists and pedestrians: concrete curb | • No separations between cyclists and pedestrians at intersections | • Midblock pedestrian crossing between Hazel Street and King Street North<br>• Street lighting at midblock pedestrian crossing between Hazel Street and King Street North<br>• Two-way left-turn lane between Regina Street North and Weber Street North |
| No.3 |  |  | • Between vehicular traffic and cyclists: amenity space<br>• Between cyclists and pedestrians: no separation, shared path | • Cross-rides for cyclists on both sides of the pedestrian crosswalk separating cyclists in both directions<br>• Crosswalks for pedestrians | • Midblock pedestrian crossing between Hazel Street and King Street North<br>• Concrete median with street lighting along the corridor<br>• Two-way left-turn lane between Regina Street North and Weber Street North |
| No.4 |  |  | • Between vehicular traffic and cyclists: concrete curb<br>• Between cyclists and pedestrians: concrete curb | • No separations between cyclists and pedestrians at intersections | • Midblock pedestrian crossing between Hazel Street and King Street North<br>• Street lighting at midblock pedestrian crossing between Hazel Street and King Street North<br>• Two-way left-turn lane between Regina Street North and Weber Street North |

Through the review of the design concepts and as shown in Exhibit 5-1, the main differences between the four design concepts are:

- The separations between different types of road users at midblock locations;
- The separations pedestrians and cyclists at intersections; and
- The use of road median.

In the design concepts, four types of separation between vehicular traffic and other vulnerable road users were proposed at midblock locations, which were lane markings, amenity space, concrete curbs and concrete barriers. The benefits of these four types of separation are listed in Exhibit 5-2.

**Exhibit 5-2: Proposed Separations between Road Users at Midblock Locations**

| Separation Type | Benefits |
|---|---|
| Lane markings | • Provides a visual separation between vehicular traffic and cyclists<br>• Maintains the good visibility of cyclists and pedestrians from driver's view when turning onto driveways, or turning at intersections |
| Concrete barriers | • Provides a physical separation between vehicular traffic and cyclists<br>• Provides extra protection to cyclists from vehicular traffic |
| Amenity space | • Provides a physical separation between vehicular traffic and other vulnerable road user<br>• Maintains the good visibility of cyclists and pedestrians from driver's view when turning onto driveways, or turning at intersections |
| Concrete curbs | |

Additionally, at each intersections, design concept No.3 proposed separated crosswalks for pedestrians and crossrides for cyclists, while other design concepts proposed crosswalks for pedestrians and no specific cycling facilities for cyclists. The benefits of these two intersection crossing facilities for pedestrians and cyclists are listed in Exhibit 5-3.

**Exhibit 5-3: Proposed Crossing Facilities for Pedestrians and Cyclists at Intersections**

| Separation Type | Benefits |
|---|---|
| Crosswalks and Crossrides | • Improves visibility of pedestrians and cyclists at the intersections<br>• Raises awareness for both cyclists and driver to potential conflict areas<br>• Reduces the conflicts between pedestrians and cyclists when crossing |
| Crosswalks only | • No additional benefits |

In terms of the use of road median, all four design concepts proposed a midblock pedestrian crossing between Hazel Street and King Street North, and a two-way left-turn lane between Regina Street North and Weber Street North. Additionally, design concepts No.2, No.3, and No.4 proposed median street lighting at midblock pedestrian crossings. Design concept No.3 also proposed concrete median with street lighting along University Avenue West between Albert Street and King Street North. The benefits of these proposed changes are outlined in Exhibit 5-4.

**Exhibit 5-4: Use of Medians and Benefits**

| Use of Median | Benefits |
|---|---|
| Midblock pedestrian crossing between Hazel Street and King Street North | • Reduces midblock crossing<br>• Provides a pedestrian refuge island for crossing pedestrians<br>• Warns the driver there might be crossing pedestrian ahead |
| Median street lighting at midblock pedestrian crossing | • Provides better visibility of the crossing pedestrians |
| Concrete median with median street lighting between Albert Street and King Street North | • Provides better visibility at night along the corridor<br>• Provides physical separation between two directions of traffic |
| Two-way left-turn lane between Regina Street North and Weber Street North | • Reduces potential conflicts between vehicles at midblock |

Based on the review of the four design concepts, the design concepts address some existing issues by implementing a subset of the potential countermeasures mentioned in Section 4. Exhibit 5-5 provides a summary of the countermeasures included in each design concept.

**Exhibit 5-5: Countermeasures Included in each Design Concept**

| Countermeasure | Concept Design | | | |
|---|---|---|---|---|
| | No. 1 | No. 2 | No. 3 | No. 4 |
| Widened crosswalks at intersections with high pedestrian activity | ● | ● | ● | ● |
| Midblock pedestrian crossing at midblock between Hazel Street and King Street North | ● | ● | ● | ● |
| Cross-rides at intersections | | | ● | |
| Dedicated bike lane | ● | ● | | ● |
| Physical barrier between vehicular traffic and vulnerable road users | | ● | ● | ● |
| Improved street lighting | ● | ● | ● | ● |
| Two-way left-turn lane at midblock location east of Regina Street North | ● | ● | ● | ● |
| Revised lane configurations at intersection of University Avenue at King Street North | ● | ● | ● | ● |

Once the preferred design concept is selected, it will be refined into a detailed design for the study area. The missing countermeasures such as traffic signal timing plans, additional illumination at intersections, and intersection-specific treatments will be taken into consideration when developing the detailed design.

# 6 Recommendations for Future Detailed Design

Through the historical collision data analysis and field investigation, a list of road user safety related issues and potential corresponding countermeasures were identified in Section 4. Based on the review of the four design concepts, some of the identified countermeasure have already been proposed in the design concepts to address the existing issues. However, additional countermeasures are recommended for the future detailed design. Exhibit 6-1 outlines the recommended countermeasures within the study area, and their anticipated benefits. These countermeasures should be considered during detailed design to mitigate the identified issues of the study area.

**Exhibit 6-1: Recommended Countermeasures for Future Detailed Design**

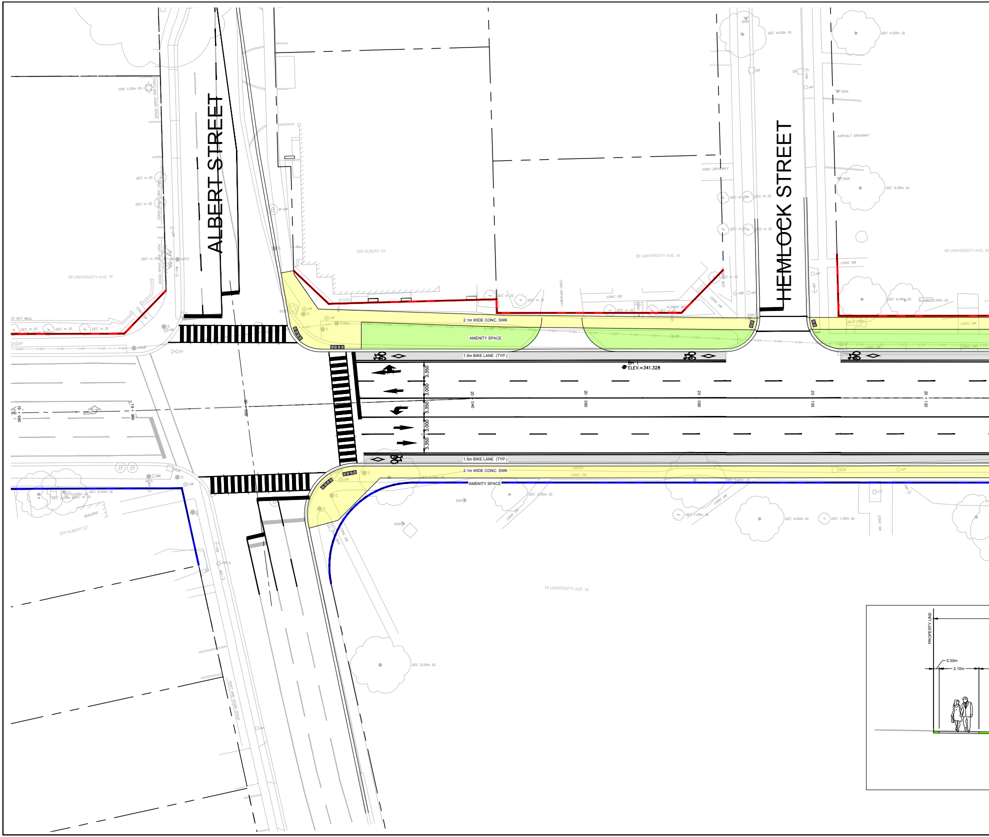
| Location | Countermeasures | Benefits |
|---|---|---|
| **All signalized intersections and midblock segments** | • Reduce lane width | • Reduce vehicular traffic speed |
| **All signalized intersections** | • Improve intersection lighting | • Provide better visibility of pedestrians and cyclists for drivers when driving through the intersection or marking turning movements. |
| | • Install left-turn guide lines for left-turn movements | • Reduce the potential conflicts between left-turning vehicles and opposing through and right-turning vehicles |
| | • Update the Flashing Don't Walk times | • Reduce the potential conflicts between pedestrians and vehicles |
| | • Implement leading pedestrian and cyclist intervals<br>• Implement lagging protected left-turn phases | • Provide longer crossing time for pedestrians and cyclists<br>• Reduce potential conflicts between pedestrians/cyclists and left-turning vehicles |
| **Intersection:**<br>• Albert Street at University Avenue West<br>• Hazel Street at University Avenue West<br>• King Street North and University Avenue<br>• Regina Street North at University Avenue East<br>• Weber Street North at University Avenue East | • Incorporate “protected intersection” geometric design features<br>• Extend the concrete median to the intersection | • Improve pedestrians’ and cyclists’ visibility to drivers<br>• Shorten pedestrian walking distances and crossing times<br>• Reduce turning vehicle speed<br>• Provide cyclists a two-stage left-turn |
| **Intersection:**<br>Weber Street North at University Avenue East | • Install farside bus bay; or<br>• Relocate the bus stop to nearside of the intersection | • Prevent traffic in the curb lane from being blocked by the stopped bus and spilled back into the intersection |
| **Midblock:**<br>• Between Albert Street and MPS west of Hazel Street | • Install static warning signs before signals<br>• Improve sightline by moving the signal heads closer to the approaches<br>• Reduce the grade | • Improve the sightline when approaching the downhill intersections<br>• Warn the drivers of the upcoming traffic signal |

| Location | Countermeasures | Benefits |
|---|---|---|
| **Midblock:**<br>• Between Regina Street North and Weber Street North<br>• Between Hazel Street and King Street North | • Consolidate driveways at midblock locations<br>• Install concrete median | • Reduce the potential conflicts between vehicles when entering and exiting the properties on the north and south sides of University Avenue |

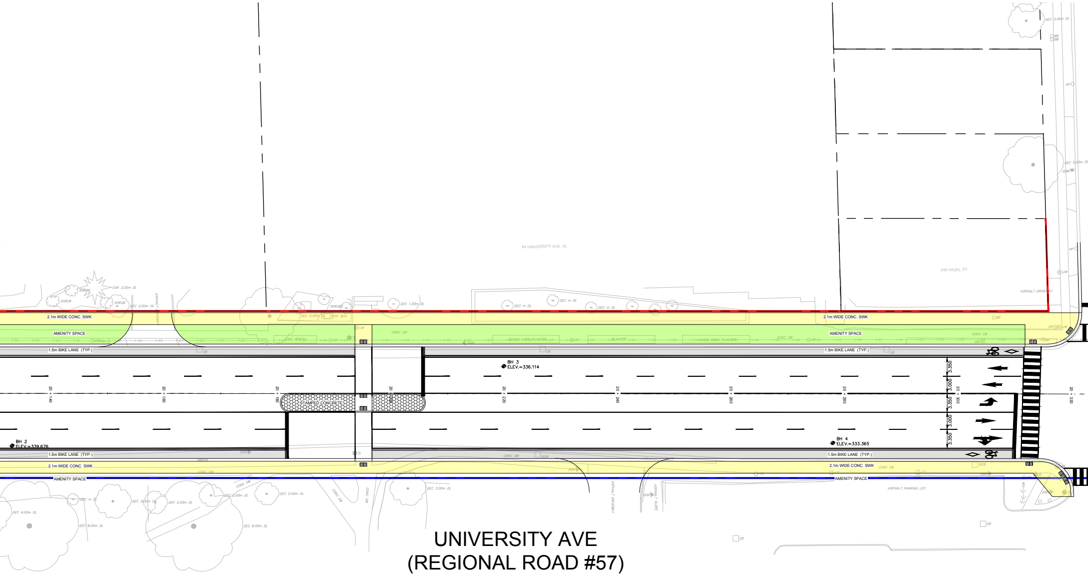
# Appendix A

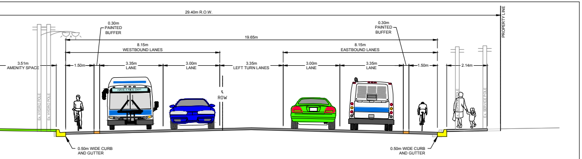
## University Avenue Environmental Assessment Initial Design Concepts

FILE: \\caneast.ibigroup.com\J\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C2 LAYOUT: OPTION 2 – BBL CTB: Rowpens-v2.ctb SAVED BY: Sergei.filippov, 2019–Aug–22 10:33 AM

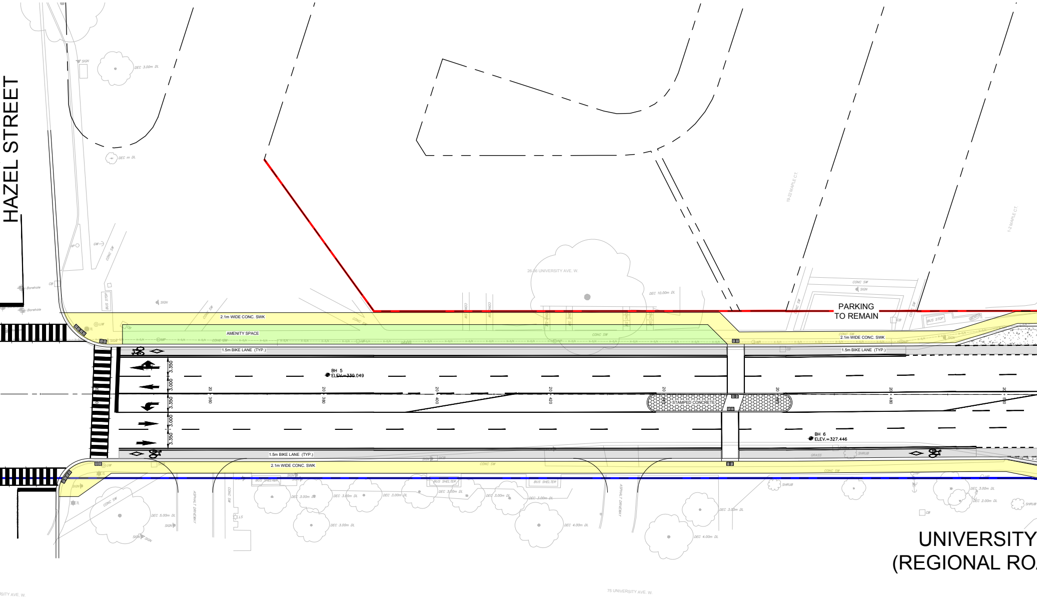


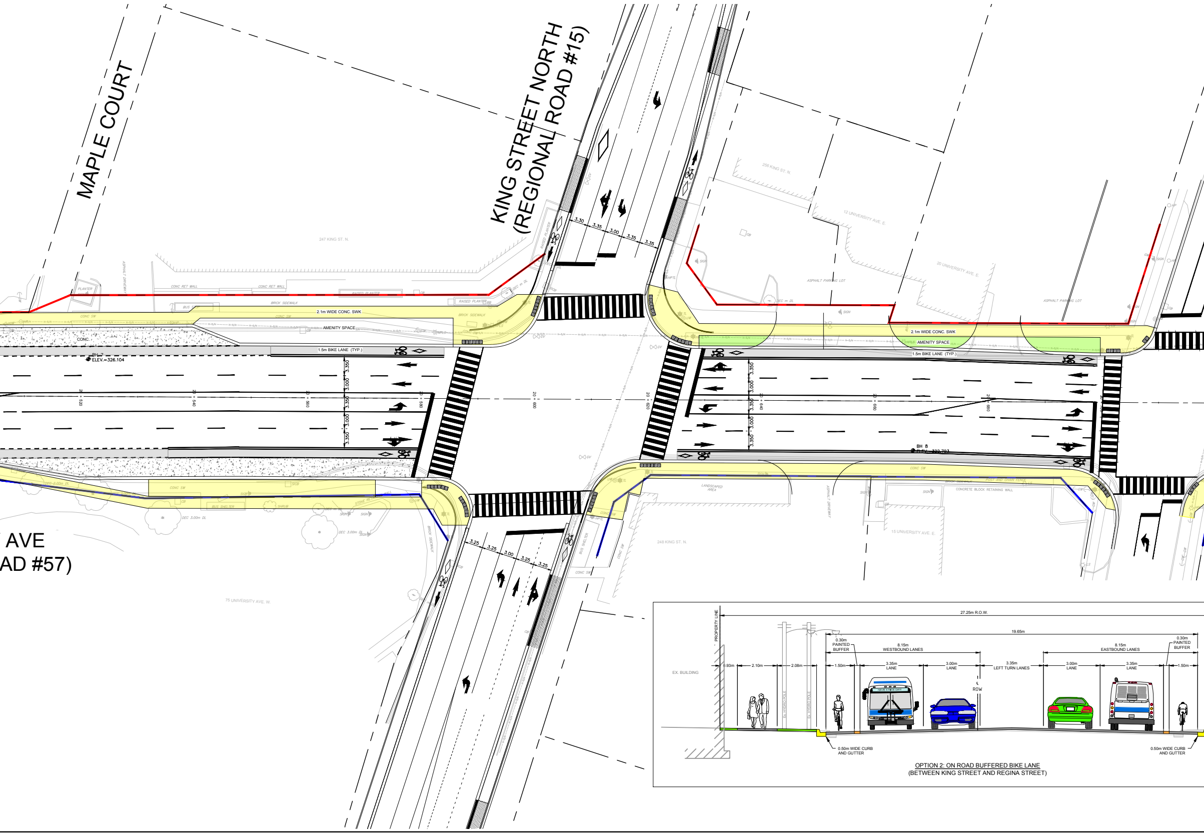
ALBERT STREET
HEMLOCK STREET
222 ALBERT ST.
86 UNIVERSITY AVE. W.
96 UNIVERSITY AVE. W.
80 UNIVERSITY AVE. W
205 ALBERT ST.
75 UNIVERSITY AVE. W.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
BH 1
ELEV.=341.328
3.350
3.000
3.350
3.000
3.350
20 + 040
20 + 060
20 + 080
20 + 100
20 + 120
19 + 960
19 + 980
20 + 000
CONC DRIVEWAY
ASPHALT DRIVEWAY
CONC SW
FLOWER BED
BUS STOP
GRASS
POST AND CHAIN FENCE
BUILDING
CON 1.00m DL
DEC 4.00m DL
DEC 5.00m DL
DEC 3.00m DL
DEC 1.00m DL
DEC m DL
SIGN
CB
HP
GV
UW
TL
HPLS
BB
PROPERTY LINE
0.30m
2.10m


2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
BH 3
ELEV.=336.114
STAMPED CONCRETE
BH 2
ELEV.=339.676
BH 4
ELEV.=333.365
64 UNIVERSITY AVE. W.
245 HAZEL ST.
ASPHALT DRIVEWAY
ASPHALT PARKING LOT
20 + 140
20 + 160
20 + 180
20 + 200
20 + 220
20 + 240
20 + 260
20 + 280
20 + 300
20 + 320
3.350
3.000
3.350
3.000
3.350
UNIVERSITY AVE
(REGIONAL ROAD #57)


29.40m R.O.W.
PROPERTY LINE
0.30m PAINTED BUFFER
0.30m PAINTED BUFFER
19.65m
8.15m WESTBOUND LANES
8.15m EASTBOUND LANES
3.51m AMENITY SPACE
1.50m
3.35m LANE
3.00m LANE
3.35m LEFT TURN LANES
3.00m LANE
3.35m LANE
1.50m
2.14m
℄ ROW
HAVE A NICE DAY!
Ex. HYDRO POLE
Ex. HYDRO POLE
Ex. SERVICE POLE
0.50m WIDE CURB AND GUTTER
0.50m WIDE CURB AND GUTTER

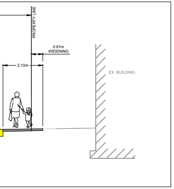
OPTION 2: ON ROAD BUFFERED BIKE LANE
(BETWEEN ALBERT STREET AND KING STREET)

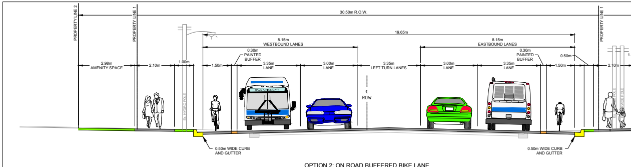

HAZEL STREET
UNIVERSITY
(REGIONAL RO
PARKING
TO REMAIN
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
1.5m BIKE LANE (TYP.)
1.5m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
BH 5
ELEV.=330.049
BH 6
ELEV.=327.446
STAMPED CONCRETE
3.350
3.000
3.350
3.000
3.350
20+360
20+380
20+400
20+420
20+480
26-36 UNIVERSITY AVE. W.
75 UNIVERSITY AVE. W.
19-32 MAPLE CT
1-2 MAPLE CT
BUS STOP
BUS SHELTER
BUS SHELTER
BUS SHELTER
ASPHALT DRIVEWAY
ASPHALT DRIVEWAY
DEC 3.00m DL
DEC 10.00m DL
DEC 5.00m DL
DEC 4.00m DL
CONC SW
Borehole
SIGN
SHRUB


MAPLE COURT
KING STREET NORTH
(REGIONAL ROAD #15)
AVE
AD #57)
247 KING ST. N.
256 KING ST. N.
12 UNIVERSITY AVE. E.
20 UNIVERSITY AVE. E.
15 UNIVERSITY AVE. E.
248 KING ST. N.
75 UNIVERSITY AVE. W.
ASPHALT PARKING LOT
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
CONC.
BH 7
ELEV.=326.104
BH 8
CONCRETE BLOCK RETAINING WALL
LANDSCAPED AREA
BUS SHELTER
3.30
3.35
3.00
3.35
3.35
3.25
3.25
3.00
3.25
3.25
3.350
3.000
3.350
3.000
3.350
27.25m R.O.W.
19.65m
PROPERTY LINE
EX. BUILDING
0.93m
2.10m
2.08m
EX. HYDRO POLE
EX. HYDRO POLE
0.30m PAINTED BUFFER
1.50m
8.15m WESTBOUND LANES
3.35m LANE
3.00m LANE
℄ ROW
3.35m LEFT TURN LANES
8.15m EASTBOUND LANES
3.00m LANE
3.35m LANE
0.30m PAINTED BUFFER
1.50m
HAVE A NICE DAY!
0.50m WIDE CURB AND GUTTER
0.50m WIDE CURB AND GUTTER

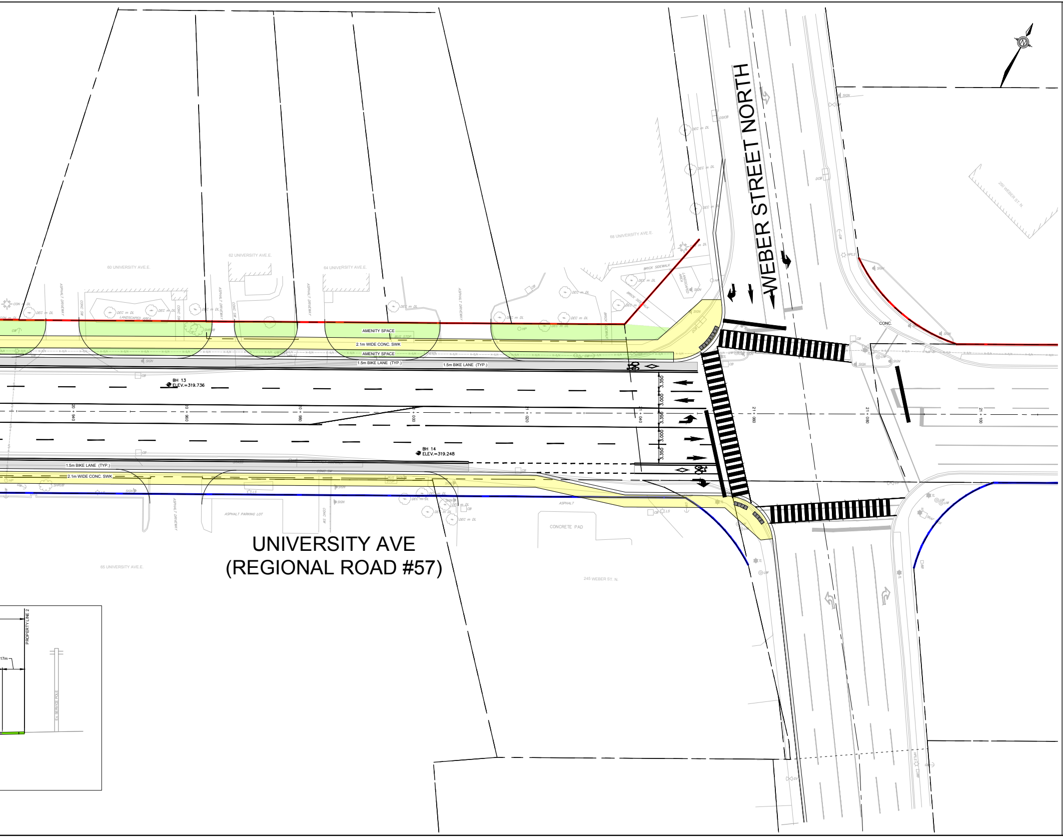
OPTION 2: ON ROAD BUFFERED BIKE LANE
(BETWEEN KING STREET AND REGINA STREET)

REGINA STREET
24 UNIVERSITY AVE. E.
28 UNIVERSITY AVE. E.
32 UNIVERSITY AVE. E.
36 UNIVERSITY AVE. E.
40 UNIVERSITY AVE. E.
50 UNIVERSITY AVE. E.
25 UNIVERSITY AVE. E.
27-31 UNIVERSITY AVE. E.
33 UNIVERSITY AVE. E.
ASPHALT PARKING LOT
CONC. WALKWAY
CONC RET WALL
CONC DRIVEWAY
ASPHALT DRIVEWAY
LANDSCAPED AREA
BRICK SW
BRICK SIDEWALK
CONC SW
GRASS
BUS STOP
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
BH 9 ELEV.=320.469
BH 10 ELEV.=320.222
BH 11 ELEV.=320.027
BH 12 ELEV.=319.831
3.350
3.000
3.350
3.000
3.350
20 + 720
20 + 740
20 + 760
20 + 780
20 + 800
20 + 820
20 + 840
20 + 860
20 + 880
20 + 900
20 + 920


PROPERTY LINE
0.61m WIDENING
2.10m
EX. BUILDING


PROPERTY LINE 2
PROPERTY LINE 1
PROPERTY LINE 1
30.50m R.O.W.
19.65m
8.15m WESTBOUND LANES
8.15m EASTBOUND LANES
2.98m AMENITY SPACE
2.10m
1.00m
1.50m
0.30m PAINTED BUFFER
3.35m LANE
3.00m LANE
3.35m LEFT TURN LANES
3.00m LANE
3.35m LANE
0.30m PAINTED BUFFER
0.50m
1.50m
2.10m
℄ ROW
EX. HYDRO POLE
HAVE A NICE DAY!
0.50m WIDE CURB AND GUTTER
0.50m WIDE CURB AND GUTTER

OPTION 2: ON ROAD BUFFERED BIKE LANE
(BETWEEN REGINA STREET AND WEBER STREET)


WEBER STREET NORTH
UNIVERSITY AVE
(REGIONAL ROAD #57)
60 UNIVERSITY AVE.E.
62 UNIVERSITY AVE.E.
64 UNIVERSITY AVE.E.
68 UNIVERSITY AVE.E.
65 UNIVERSITY AVE.E.
245 WEBER ST. N.
250 WEBER ST. N.
AMENITY SPACE
2.1m WIDE CONC. SWK
AMENITY SPACE
1.5m BIKE LANE (TYP.)
1.5m BIKE LANE (TYP.)
1.5m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
BH 13
ELEV.=319.736
BH 14
ELEV.=319.248
3.350
3.000
3.350
3.000
3.350
20+940
20+960
20+980
21+000
21+020
21+040
21+060
21+080
21+100
CONC.
CONCRETE PAD
ASPHALT PARKING LOT
ASPHALT
BRICK SIDEWALK
LANDSCAPED AREA
ASPHALT DRIVEWAY
PROPERTY LINE 2
17m

KEY PLAN

DISCLAIMER:
THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOTES:

1. FOR CATCHBASIN, AND CATCHBASIN MANHOLES, OFFSETS ARE GIVEN TO THE EDGE OF PAVEMENT. GRATE ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS. FOR MANHOLES, AND OTHER STRUCTURES, OFFSETS ARE GIVEN TO THE CENTER OF THE STRUCTURE AND ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS.
2. notes are mtext using pharagraphs.
3. this is the next note.

IBI

Region of Waterloo

No.	ISSUE/REVISION	BY	DATE
2			
1			

CONTROLLING B.M.
tbc

UNIVERSITY AVENUE
(REGIONAL ROAD 57)
CLASS EA - FUNCTIONAL
DESIGN ALTERNATIVES

OPTION 2
ON ROAD BUFFERED BIKE LANE

DRAWN BY: SVF	CONTRACT No. tbc
CHECKED BY: KC	FILE No. TBC
DATE: JUNE 2019	DRAWING No. OPTION 2 - BBL
SCALE	SHEET ___ OF -
CADD FILE: 119697 119697_C2.DWG	

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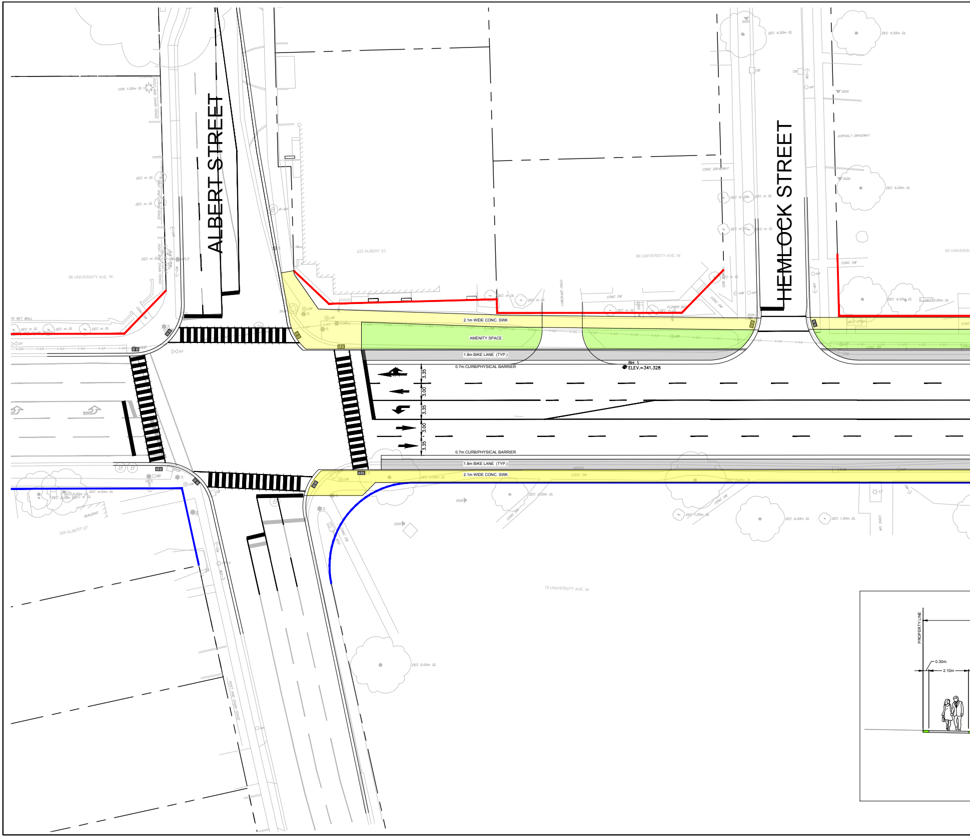
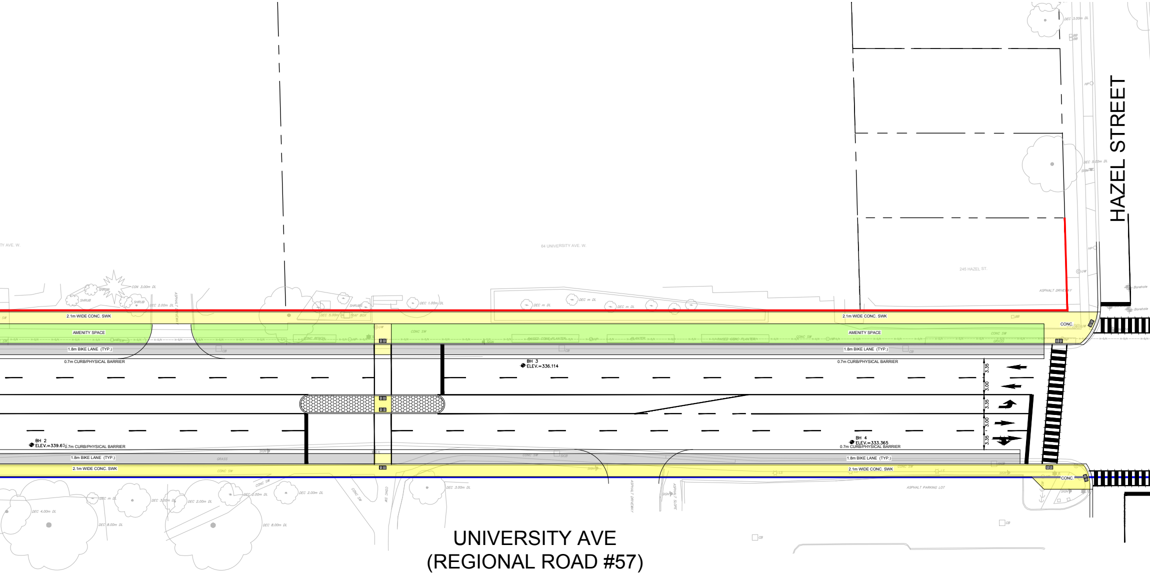
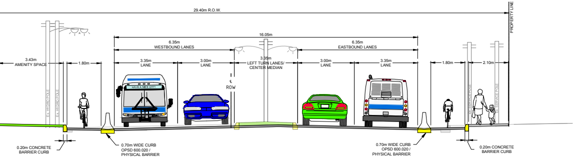

ALBERT STREET
HEMLOCK STREET
222 ALBERT ST.
86 UNIVERSITY AVE. W.
96 UNIVERSITY AVE. W.
80 UNIVERSI
205 ALBERT ST.
75 UNIVERSITY AVE. W.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
BH 1
ELEV.=341.328
3.35
3.00
3.35
3.00
3.35
0.7m CURB/PHYSICAL BARRIER
1.8m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
CONC DRIVEWAY
ASPHALT DRIVEWAY
CONC SW
BUS STOP
DEC 4.00m DL
DEC 5.00m DL
DEC 3.00m DL
DEC 1.00m DL
CON 1.00m DL
POST AND CHAIN FENCE
BUILDING
SIGN
PROPERTY LINE
0.30m
2.10m

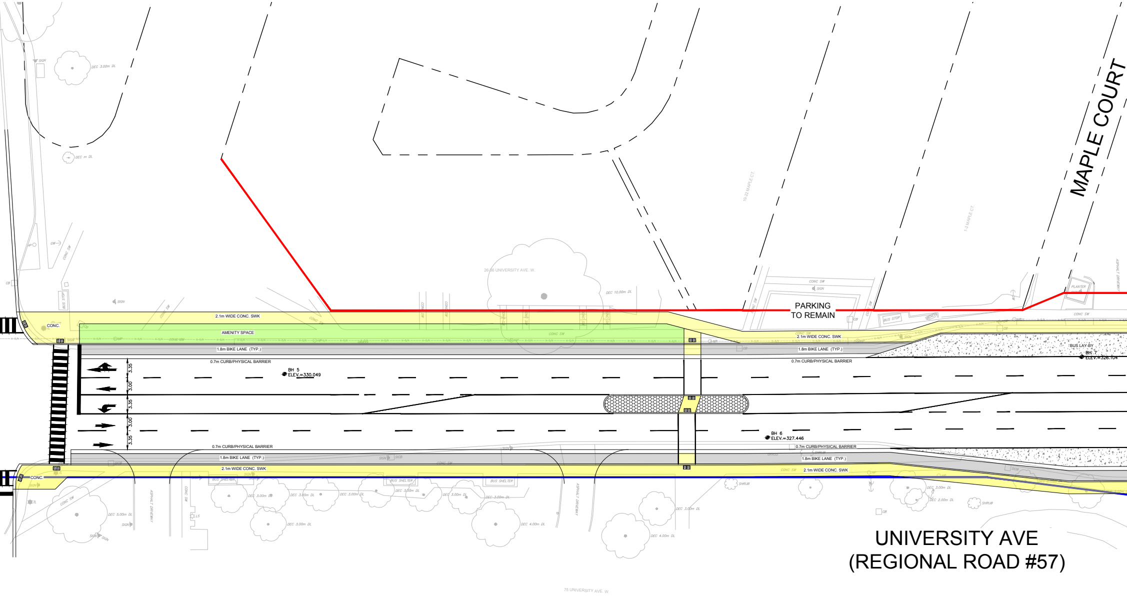


HAZEL STREET
64 UNIVERSITY AVE. W.
245 HAZEL ST.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
BH 3
ELEV.=336.114
BH 2
ELEV.=339.67
BH 4
ELEV.=333.365
CONC.
3.35
3.00
3.35
3.00
3.35
ASPHALT PARKING LOT
ASPHALT DRIVEWAY
UNIVERSITY AVE
(REGIONAL ROAD #57)
75 UNIVERSITY AVE. W.

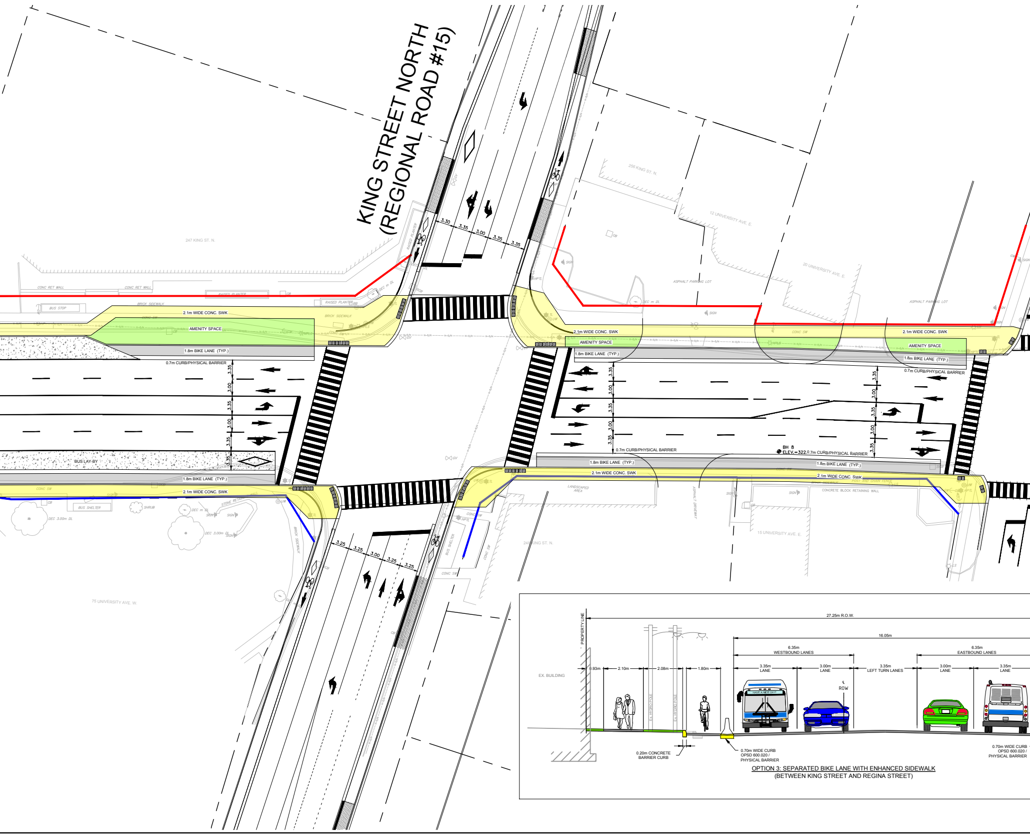


29.40m R.O.W.
PROPERTY LINE
16.05m
6.35m
WESTBOUND LANES
6.35m
EASTBOUND LANES
3.43m
AMENITY SPACE
1.80m
3.35m
LANE
3.00m
LANE
3.35m
LEFT TURN LANES/
CENTER MEDIAN
3.00m
LANE
3.35m
LANE
1.80m
2.10m
℄
ROW
Ex. HYDRO POLE
Ex. HYDRO POLE
Ex. SERVICE POLE
Ex. SERVICE POLE
HAVE A NICE DAY!
0.20m CONCRETE
BARRIER CURB
0.70m WIDE CURB
OPSD 600.020 /
PHYSICAL BARRIER
0.70m WIDE CURB
OPSD 600.020 /
PHYSICAL BARRIER
0.20m CONCRETE
BARRIER CURB

OPTION 3: SEPARATED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN ALBERT STREET AND KING STREET)

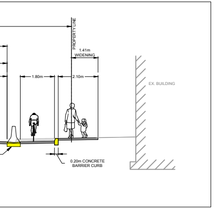


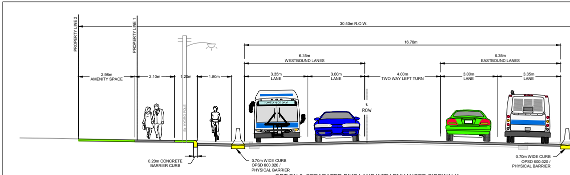
MAPLE COURT
PARKING
TO REMAIN
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
CONC.
BH 5
ELEV.=330.049
BH 6
ELEV.=327.446
BUS LAY-BY
BH 7
ELEV.=326.104
3.35
3.00
3.35
3.00
3.35
26-38 UNIVERSITY AVE. W.
75 UNIVERSITY AVE. W.
19-22 MAPLE CT.
1-2 MAPLE CT.
BUS STOP
BUS SHELTER
CONC SW
SIGN
CB
ASPHALT DRIVEWAY
DEC 3.00m DL
DEC 4.00m DL
DEC 5.00m DL
DEC 10.00m DL
SHRUB
PLANTER
UNIVERSITY AVE
(REGIONAL ROAD #57)


KING STREET NORTH
(REGIONAL ROAD #15)
247 KING ST. N.
256 KING ST. N.
12 UNIVERSITY AVE. E.
20 UNIVERSITY AVE. E.
24 KING ST. N.
15 UNIVERSITY AVE. E.
75 UNIVERSITY AVE. W.
CONC RET WALL
RAISED PLANTER
BRICK SIDEWALK
BUS STOP
CONC SW
ASPHALT PARKING LOT
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
BUS LAY-BY
BUS SHELTER
STONE RETAINING WALL
SHRUB
DEC 3.00m DL
SIGN
LANDSCAPED AREA
ASPHALT DRIVEWAY
CONCRETE BLOCK RETAINING WALL
BH 8
ELEV.=322
3.30
3.35
3.00
3.25
PROPERTY LINE
EX. BUILDING
27.25m R.O.W.
16.05m
6.35m
WESTBOUND LANES
EASTBOUND LANES
0.93m
2.10m
2.08m
1.80m
3.35m
LANE
3.00m
LEFT TURN LANES
℄
ROW
Ex. HYDRO POLE
HAVE A NICE DAY!
0.20m CONCRETE
BARRIER CURB
0.70m WIDE CURB
OPSD 600.020 /
PHYSICAL BARRIER

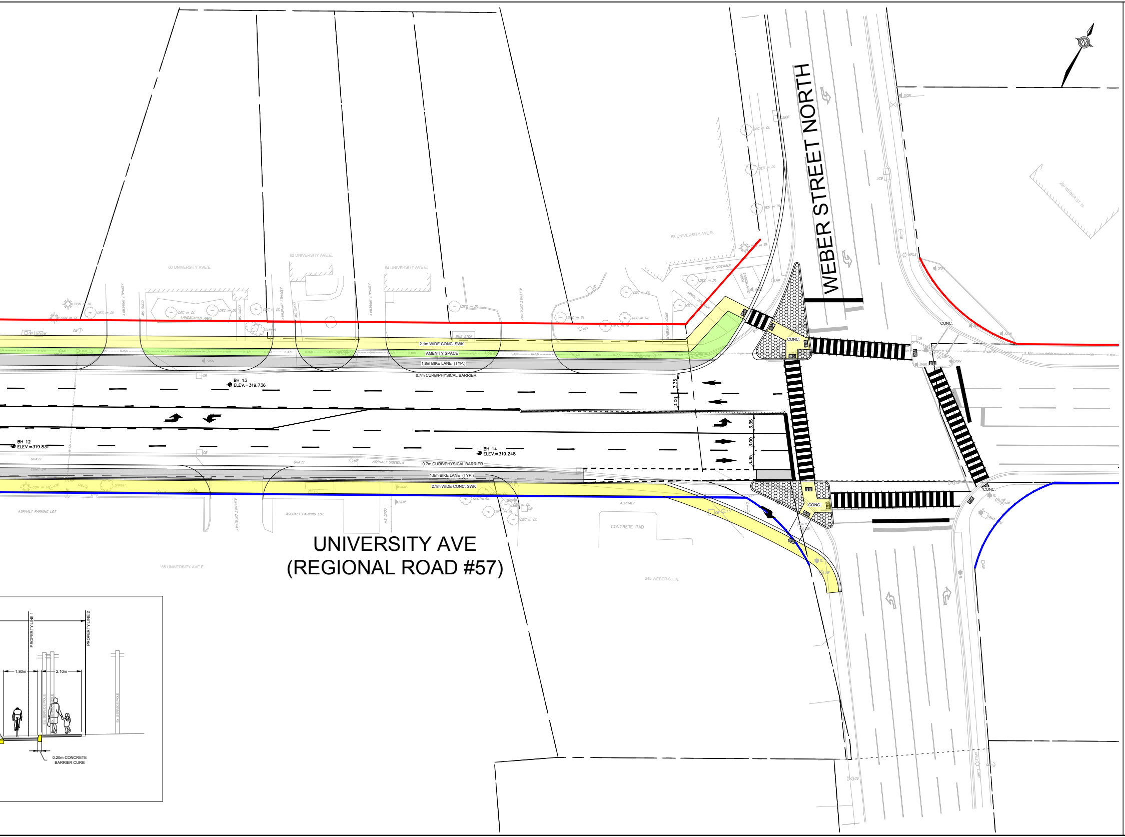
OPTION 3: SEPARATED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN KING STREET AND REGINA STREET)

REGINA STREET
24 UNIVERSITY AVE. E.
28 UNIVERSITY AVE. E.
32 UNIVERSITY AVE. E.
36 UNIVERSITY AVE. E.
40 UNIVERSITY AVE. E.
50 UNIVERSITY AVE. E.
ASPHALT PARKING LOT
CONC WALKWAY
CONC RET WALL
CONC DRIVEWAY
ASPHALT DRIVEWAY
LANDSCAPED AREA
DEC m DL
BRICK SW
CONC SW
SIGN
CB
HB
HP
HPLS
BUS STOP
GRASS
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
BH 9
ELEV.=320.469
BH 10
ELEV.=320.222
BH 11
ELEV.=320.097
3.35
3.00
4.00
3.00
3.35
4.00
0.7m CURB/PHYSICAL BARRIER
1.8m BIKE LANE (TYP.)
2.1m WIDE CONC. SWK
ASPHALT PARKING LOT
CONC SW
BRICK SIDEWALK
ASPHALT DRIVEWAY
CON m DL
25 UNIVERSITY AVE. E.
27-31 UNIVERSITY AVE. E.
33 UNIVERSITY AVE. E.


PROPERTY LINE
1.41m
WIDENING
1.80m
2.10m
EX. BUILDING
0.20m CONCRETE
BARRIER CURB


PROPERTY LINE 2
PROPERTY LINE 1
30.50m R.O.W.
16.70m
6.35m
WESTBOUND LANES
6.35m
EASTBOUND LANES
2.98m
AMENITY SPACE
2.10m
1.20m
1.80m
3.35m
LANE
3.00m
LANE
4.00m
TWO WAY LEFT TURN
3.00m
LANE
3.35m
LANE
℄
ROW
Ex. HYDRO POLE
HAVE A NICE DAY!
0.20m CONCRETE
BARRIER CURB
0.70m WIDE CURB
OPSD 600.020 /
PHYSICAL BARRIER
0.70m WIDE CURB
OPSD 600.020 /
PHYSICAL BARRIER

OPTION 3: SEPARATED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN REGINA STREET AND WEBER STREET)


WEBER STREET NORTH
UNIVERSITY AVE
(REGIONAL ROAD #57)
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.7m CURB/PHYSICAL BARRIER
BH 13
ELEV.=319.736
BH 12
ELEV.=319.831
BH 14
ELEV.=319.248
3.35
3.00
3.35
3.00
3.35
CONC.
CONC.
CONC.
CONC.
CONCRETE PAD
60 UNIVERSITY AVE.E.
62 UNIVERSITY AVE.E.
64 UNIVERSITY AVE.E.
68 UNIVERSITY AVE.E.
65 UNIVERSITY AVE.E.
245 WEBER ST. N.
250 WEBER ST. N.
ASPHALT DRIVEWAY
ASPHALT PARKING LOT
ASPHALT SIDEWALK
BRICK SIDEWALK
LANDSCAPED AREA
BUS STOP
GRASS
ASPHALT
DEC m DL
PROPERTY LINE 1
PROPERTY LINE 2
1.80m
2.10m
Ex. SERVICE POLE
0.20m CONCRETE
BARRIER CURB

KEY PLAN

DISCLAIMER:
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NOTES:

1. FOR CATCHBASIN, AND CATCHBASIN MANHOLES, OFFSETS ARE GIVEN TO THE EDGE OF PAVEMENT. GRATE ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS. FOR MANHOLES, AND OTHER STRUCTURES, OFFSETS ARE GIVEN TO THE CENTER OF THE STRUCTURE AND ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS.
2. notes are mtext using pharagraphs.
3. this is the next note.

IBI

Region of Waterloo

No.	ISSUE/REVISION	BY	DATE
2			
1			

CONTROLLING B.M.
tbc

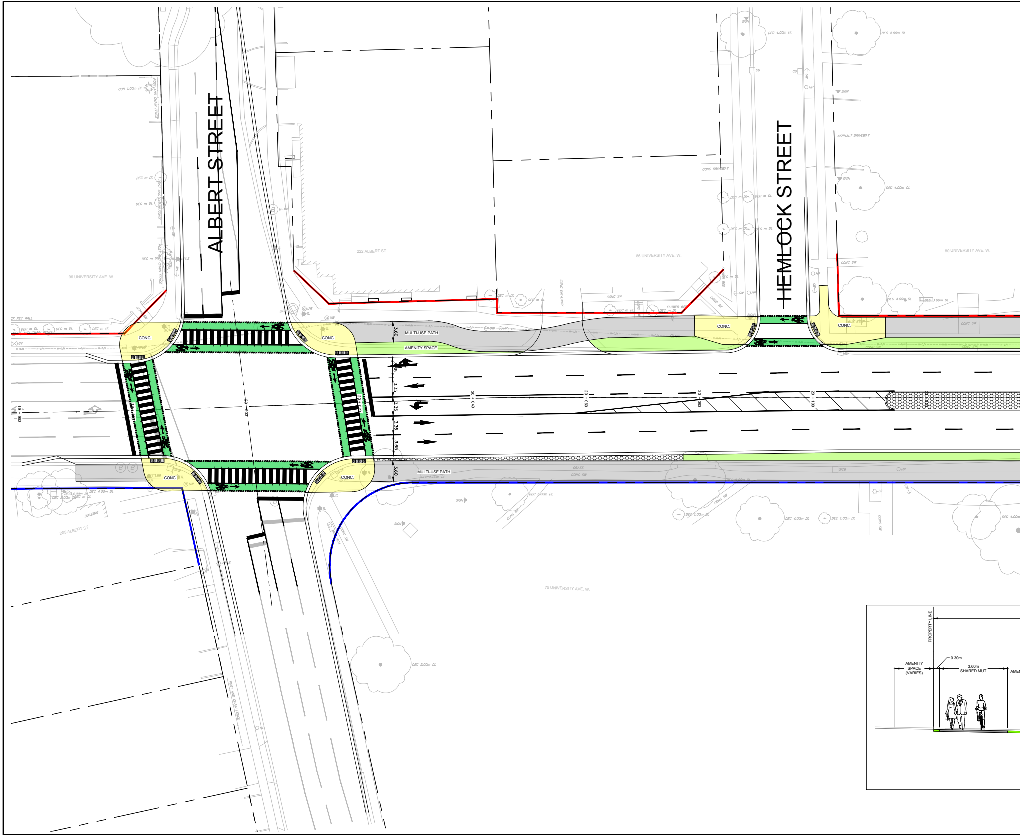
UNIVERSITY AVENUE
(REGIONAL ROAD 57)
CLASS EA - FUNCTIONAL
DESIGN ALTERNATIVES

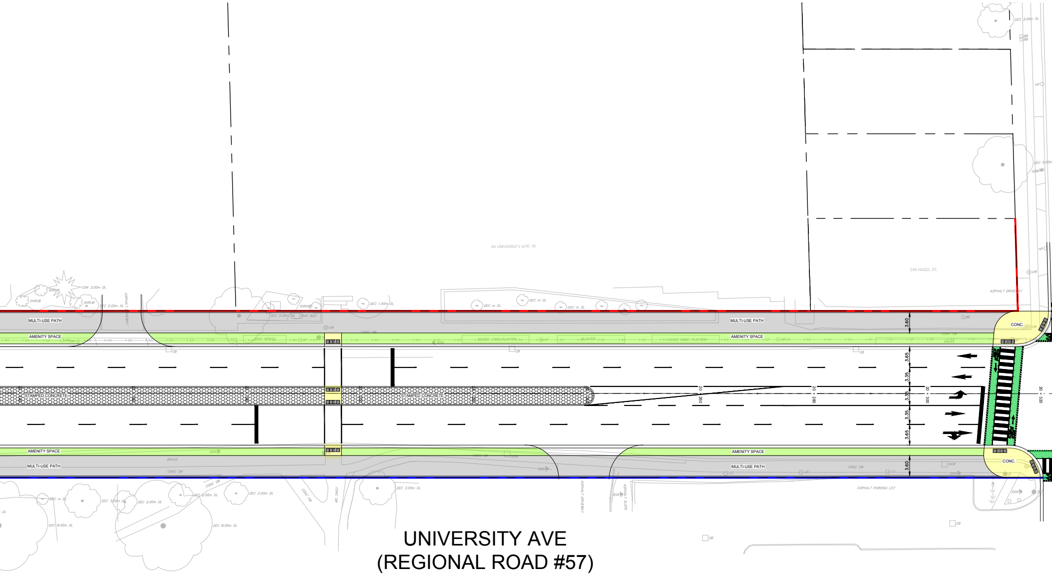
OPTION 3
SEPARATED BIKE LANE WITH
ENHANCED SIDEWALK

DRAWN BY: SVF	CONTRACT No. tbc
CHECKED BY: KC	FILE No. TBC
DATE: JUNE 2019	DRAWING No. OPTION 3 - SBL
SCALE 1:250	SHEET ___ OF -
CADD FILE: 119697 119697_C3.DWG	

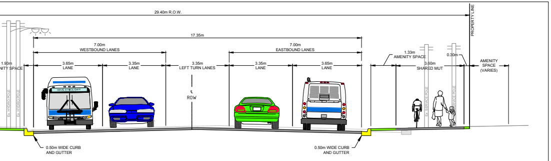
FILE: \\caneast.ibigroup.com\J\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C3 LAYOUT: OPTION 3 - SBL CTB: Rowpens-v2.ctb SAVED BY: Sergei.filippov, 2019-Aug-22 10:45 AM

FILE: \\conaest.ibigroup.com\u\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C3   LAYOUT:Concept 3 - MUT   CTB: Rowpens-v2.ctb   SAVED BY:Sergei.filippov, 2019-Jun-26 4:04 PM

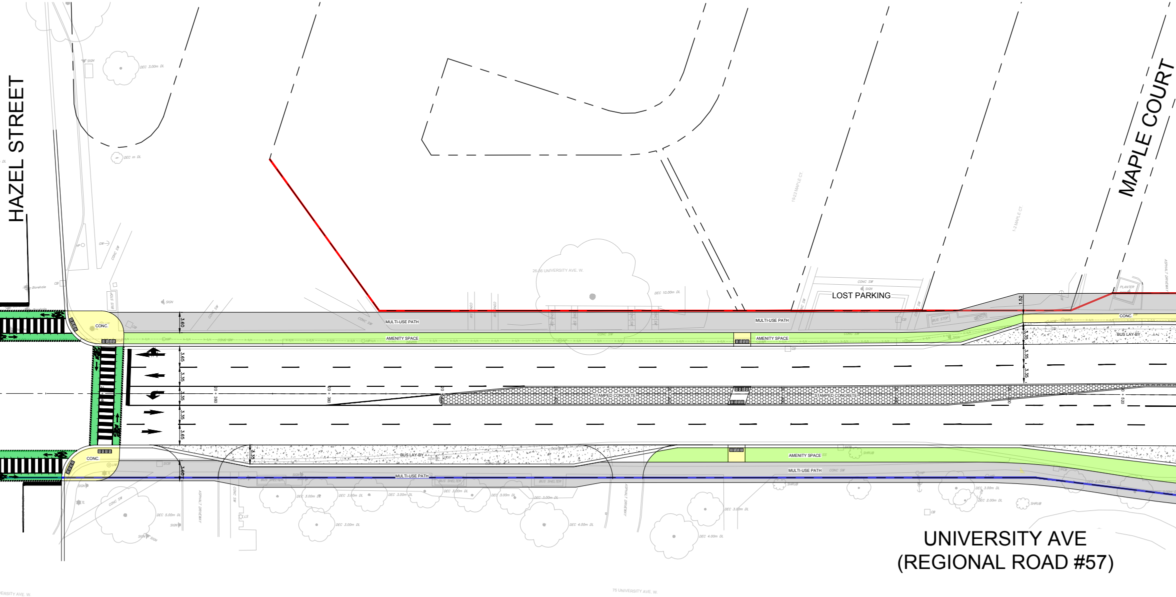

ALBERT STREET
HEMLOCK STREET
222 ALBERT ST.
86 UNIVERSITY AVE. W.
96 UNIVERSITY AVE. W.
80 UNIVERSITY AVE. W.
75 UNIVERSITY AVE. W.
205 ALBERT ST.
CONC.
MULTI-USE PATH
AMENITY SPACE
3.60
3.65
3.35
3.35
3.35
3.65
3.60
19 + 960
20 + 000
20 + 020
20 + 040
20 + 060
20 + 080
20 + 100
CONC DRIVEWAY
ASPHALT DRIVEWAY
CONC SW
POST AND CHAIN FENCE
FLOWER BED
GRASS
BUILDING
DEC 4.00m DL
DEC 5.00m DL
DEC 1.00m DL
CON 1.00m DL
SIGN
PROPERTY LINE
AMENITY SPACE (VARIES)
0.30m
3.60m SHARED MUT

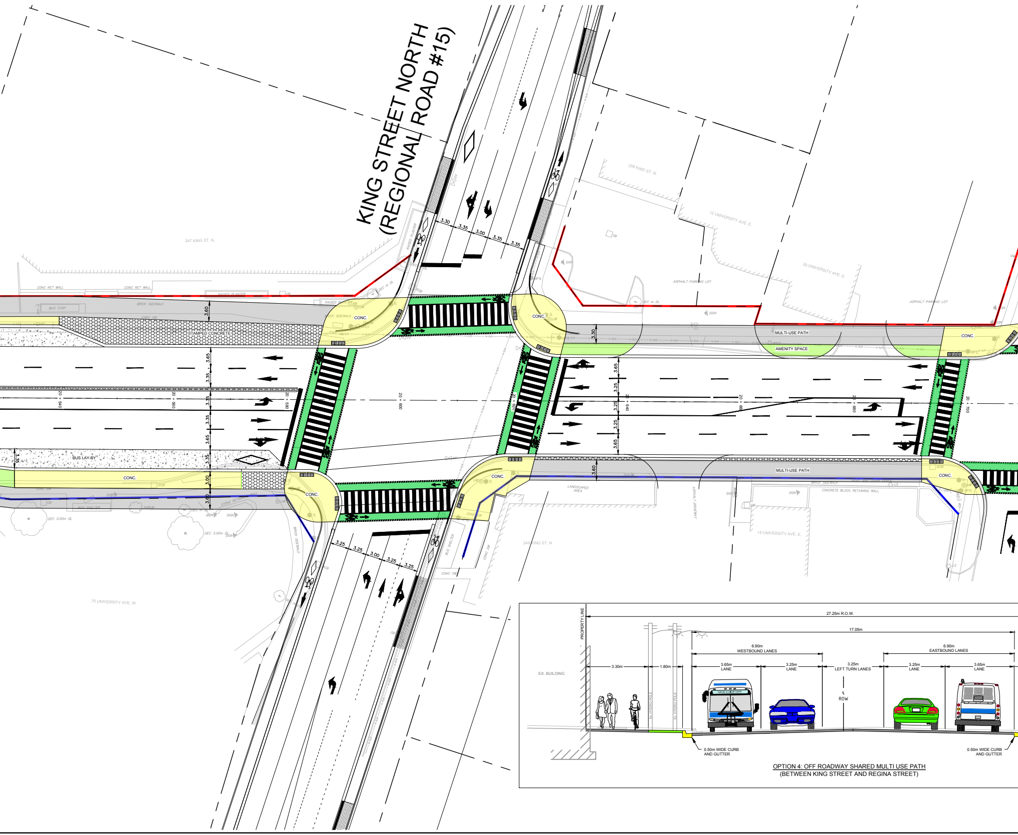

64 UNIVERSITY AVE. W.
245 HAZEL ST.
ASPHALT DRIVEWAY
MULTI-USE PATH
AMENITY SPACE
STAMPED CONCRETE
AMENITY SPACE
MULTI-USE PATH
MULTI-USE PATH
AMENITY SPACE
AMENITY SPACE
MULTI-USE PATH
CONC.
CONC.
3.60
3.65
3.35
3.35
3.35
3.65
3.60
20 + 280
20 + 280
20 + 300
20 + 320
ASPHALT PARKING LOT
ASPHALT DRIVEWAY
GRASS
CONC SW
DEC 2.00m DL
DEC 3.00m DL
DEC 8.00m DL
SHRUB
CB
75 UNIV

UNIVERSITY AVE
(REGIONAL ROAD #57)

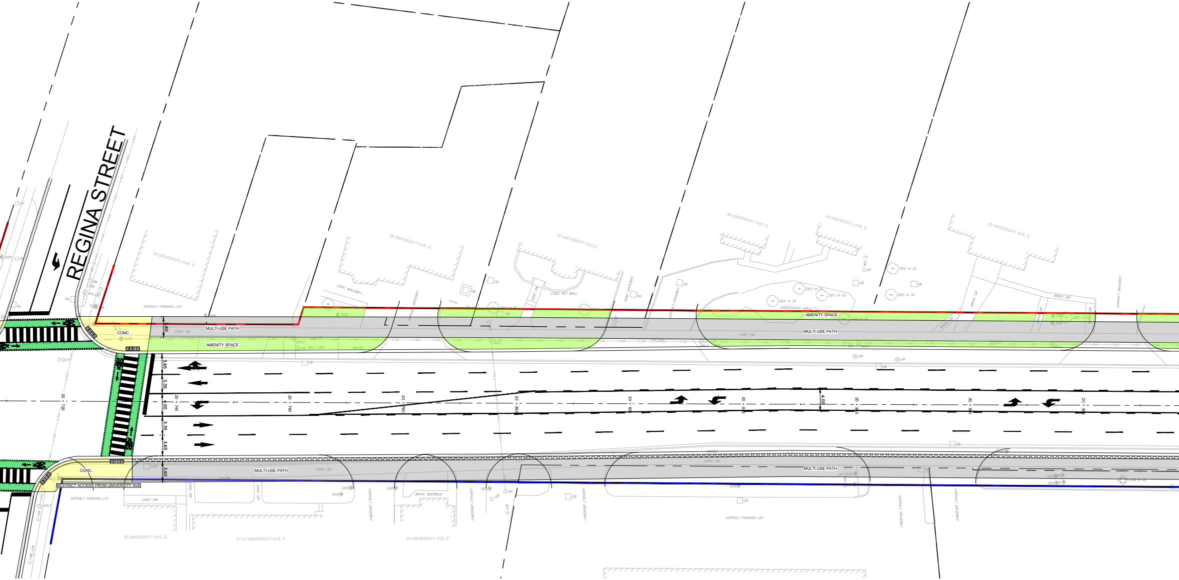

29.40m R.O.W.
PROPERTY LINE
17.35m
7.00m
WESTBOUND LANES
7.00m
EASTBOUND LANES
1.93m
NITY SPACE
3.65m
LANE
3.35m
LANE
3.35m
LEFT TURN LANES
3.35m
LANE
3.65m
LANE
1.33m
AMENITY SPACE
3.60m
SHARED MUT
0.30m
AMENITY
SPACE
(VARIES)
℄
ROW
HAVE A NICE DAY!
EX. HYDRO POLE
EX. HYDRO POLE
0.50m WIDE CURB
AND GUTTER
0.50m WIDE CURB
AND GUTTER

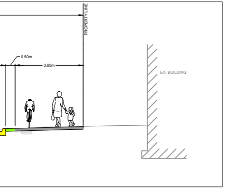
OPTION 4: OFF ROADWAY SHARED MULTI USE PATH
(BETWEEN ALBERT STREET AND KING STREET)

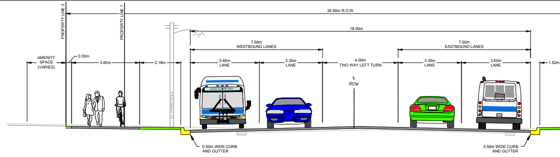

HAZEL STREET
MAPLE COURT
LOST PARKING
MULTI-USE PATH
AMENITY SPACE
CONC.
BUS LAY-BY
STAMPED CONCRETE
MULTI-USE PATH
AMENITY SPACE
BUS LAY-BY
3.60
3.65
3.35
3.35
3.35
3.65
3.35
3.60
1.52
20-26 UNIVERSITY AVE. W.
75 UNIVERSITY AVE. W.
UNIVERSITY AVE
(REGIONAL ROAD #57)


KING STREET NORTH
(REGIONAL ROAD #15)
247 KING ST. N.
256 KING ST. N.
12 UNIVERSITY AVE. E.
20 UNIVERSITY AVE. E.
248 KING ST. N.
15 UNIVERSITY AVE. E.
75 UNIVERSITY AVE. W.
CONC RET WALL
CONC RET WALL
RAISED PLANTER
RAISED PLANTER
BUS STOP
BRICK SIDEWALK
CONC SW
STAMPED CONCRETE
BUS LAY-BY
CONC.
BUS SHELTER
STONE RETAINING WALL
DEC 3.00m DL
DEC m DL
SIGN
SHRUB
BRICK SIDEWALK
ASPHALT PARKING LOT
ASPHALT PARKING LOT
MULTI-USE PATH
AMENITY SPACE
MULTI-USE PATH
LANDSCAPED AREA
ASPHALT DRIVEWAY
BRICK SIDEWALK
CONCRETE BLOCK RETAINING WALL
CONC SW
3.30
3.35
3.00
3.35
3.35
3.60
3.65
3.35
3.35
3.35
3.65
3.35
3.00
3.60
3.25
3.25
3.00
3.25
3.25
3.30
3.65
3.25
3.25
3.25
3.65
3.60
20 + 540
20 + 560
20 + 580
20 + 600
20 + 620
20 + 640
20 + 660
20 + 680
20 + 700
PROPERTY LINE
27.25m R.O.W.
17.05m
6.90m
WESTBOUND LANES
6.90m
EASTBOUND LANES
EX. BUILDING
3.30m
1.80m
3.65m
LANE
3.25m
LANE
3.25m
LEFT TURN LANES
3.25m
LANE
3.65m
LANE
Ex. HYDRO POLE
Ex. HYDRO POLE
HAVE A NICE DAY!
℄
ROW
0.50m WIDE CURB
AND GUTTER
0.50m WIDE CURB
AND GUTTER

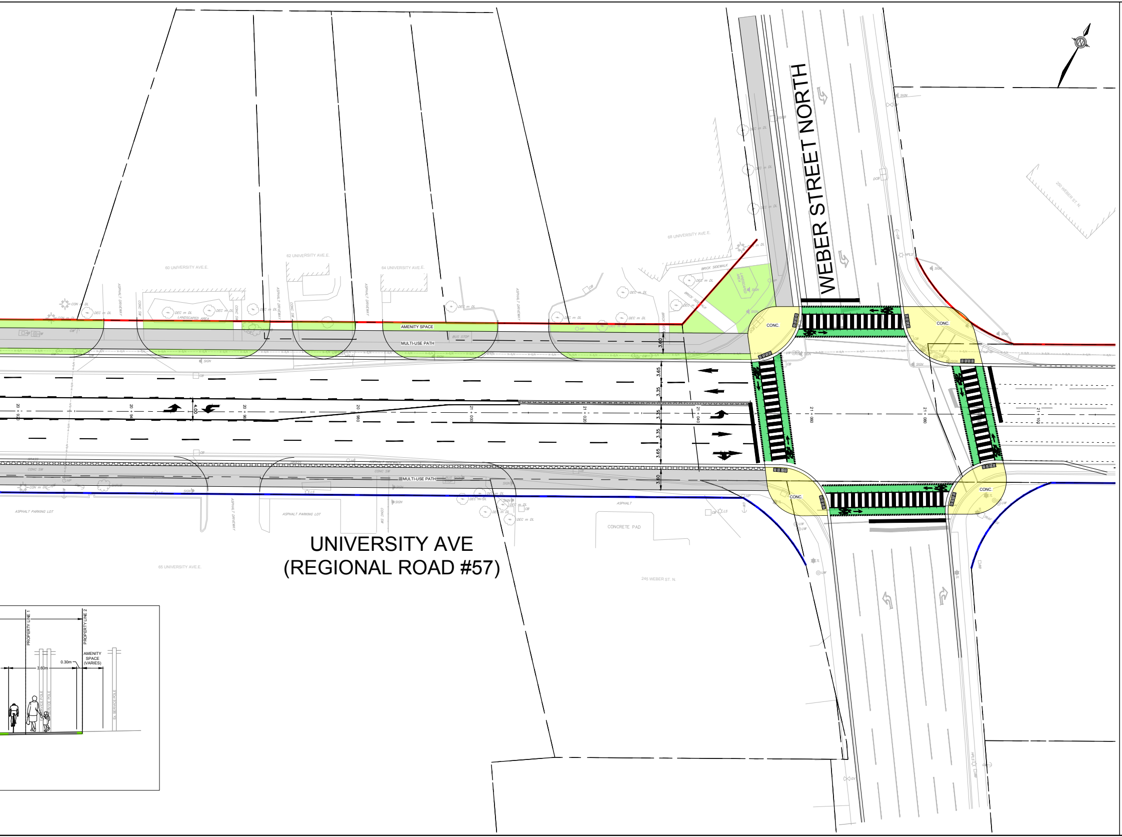
OPTION 4: OFF ROADWAY SHARED MULTI USE PATH
(BETWEEN KING STREET AND REGINA STREET)


REGINA STREET
CONC.
MULTI-USE PATH
AMENITY SPACE
ASPHALT PARKING LOT
24 UNIVERSITY AVE. E.
28 UNIVERSITY AVE. E.
32 UNIVERSITY AVE. E.
36 UNIVERSITY AVE. E.
40 UNIVERSITY AVE. E.
50 UNIVERSITY AVE. E.
CONC WALKWAY
CONC RET WALL
CONC DRIVEWAY
ASPHALT DRIVEWAY
LANDSCAPED AREA
BRICK SW
CONC SW
BUS STOP
GRASS
3.60
3.65
3.35
4.00
3.35
3.65
20 + 720
20 + 740
20 + 760
20 + 780
20 + 800
20 + 820
20 + 840
20 + 860
20 + 880
20 + 900
4.00
CONC.
MULTI-USE PATH
RESTRICT ACCESS FROM UNIVERSITY AVE
ASPHALT PARKING LOT
CONC SW
BRICK SIDEWALK
25 UNIVERSITY AVE. E.
27-31 UNIVERSITY AVE. E.
33 UNIVERSITY AVE. E.
ASPHALT PARKING LOT


PROPERTY LINE
0.50m
3.60m
EX. BUILDING


PROPERTY LINE 2
PROPERTY LINE 1
30.50m R.O.W.
18.00m
7.00m
WESTBOUND LANES
7.00m
EASTBOUND LANES
AMENITY SPACE (VARIES)
0.30m
3.60m
2.18m
3.65m LANE
3.35m LANE
4.00m TWO WAY LEFT TURN
3.35m LANE
3.65m LANE
1.52m
℄ ROW
HAVE A NICE DAY!
0.50m WIDE CURB AND GUTTER
0.50m WIDE CURB AND GUTTER

OPTION 4: OFF ROADWAY SHARED MULTI USE PATH
(BETWEEN REGINA STREET AND WEBER STREET)


WEBER STREET NORTH
UNIVERSITY AVE
(REGIONAL ROAD #57)
MULTI-USE PATH
AMENITY SPACE
CONC.
60 UNIVERSITY AVE.E.
62 UNIVERSITY AVE.E.
64 UNIVERSITY AVE.E.
68 UNIVERSITY AVE.E.
65 UNIVERSITY AVE.E.
245 WEBER ST. N.
250 WEBER ST. N.
ASPHALT PARKING LOT
CONCRETE PAD
BUS STOP
LANDSCAPED AREA
BRICK SIDEWALK
3.60
3.65
3.35
3.35
3.35
3.65
3.60
4.00
PROPERTY LINE 1
PROPERTY LINE 2
AMENITY SPACE (VARIES)
0.30m
3.60m

KEY PLAN

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NOTES:

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2. notes are mtext using pharagraphs.
3. this is the next note.

IBI

Region of Waterloo

No.	ISSUE/REVISION	BY	DATE
2			
1			

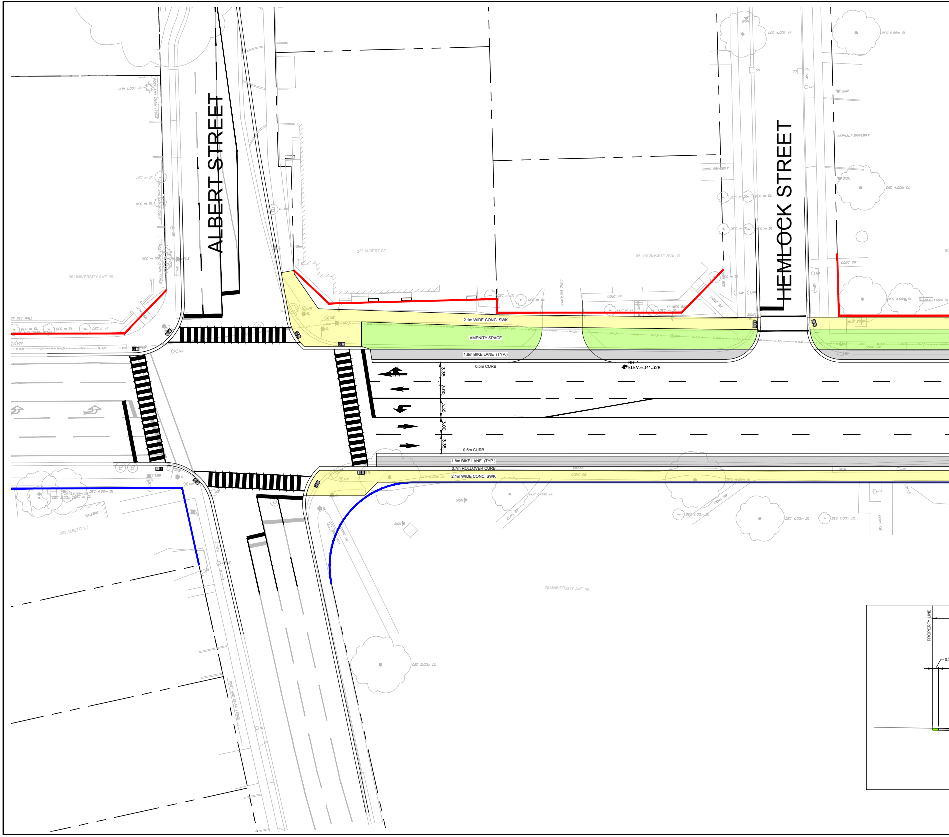
CONTROLLING B.M.
tbc

UNIVERSITY AVENUE
(REGIONAL ROAD 57)
CLASS EA - FUNCTIONAL
DESIGN ALTERNATIVES

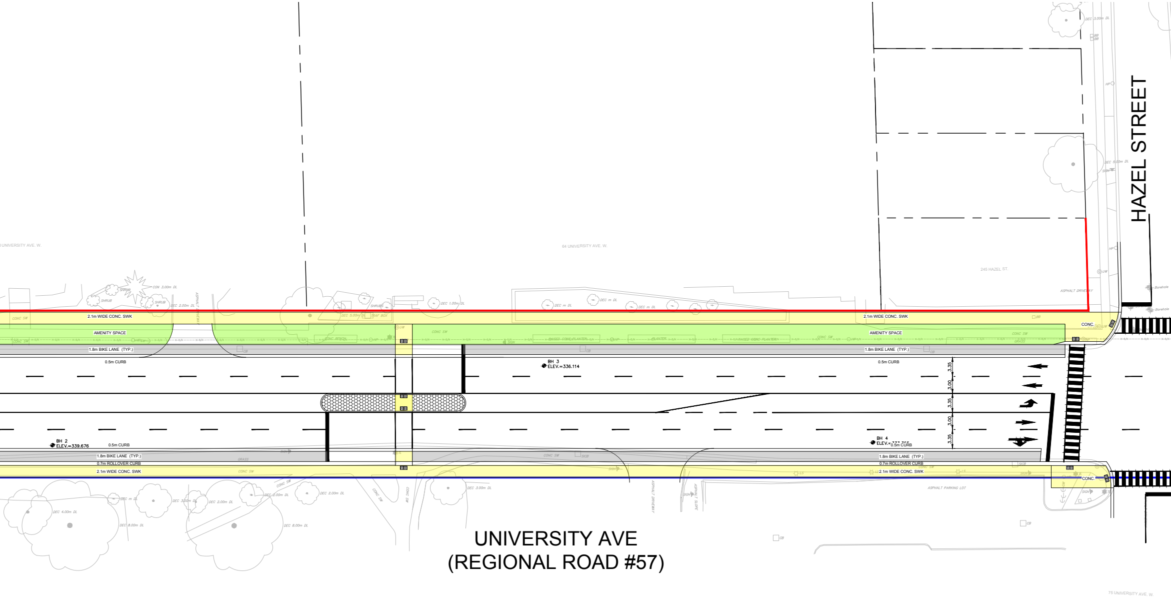
CONCEPT 3
OFF ROADWAY SHARED
MULTI USE PATH

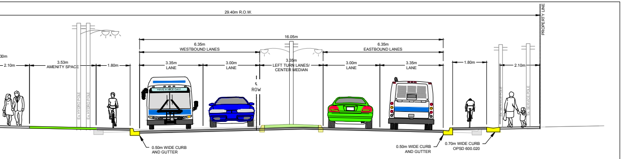
DRAWN BY: SVF	CONTRACT No. tbc
CHECKED BY: KC	FILE No. TBC
DATE: JUNE 2019	DRAWING No. CONCEPT 3 - MUT
SCALE 1:250	SHEET ____ OF -
CADD FILE: 119697 119697_C3.DWG	

FILE: \\caneast.ibigroup.com\J\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C3 LAYOUT: Concept 3 – MUT CTB: Rowpens-v2.ctb SAVED BY: Sergei.filippov, 2019-Jun-26 4:04 PM

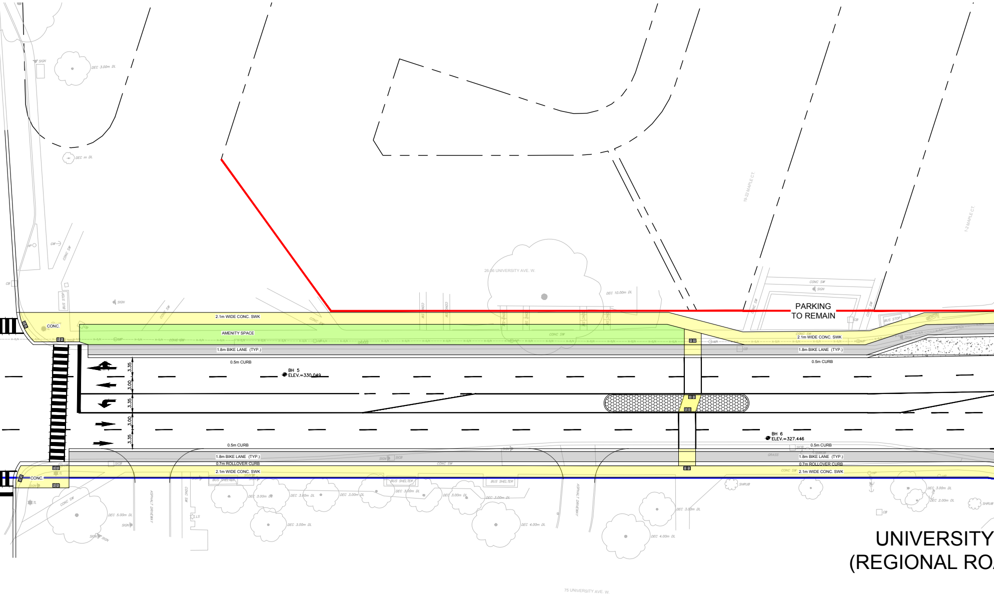

ALBERT STREET
HEMLOCK STREET
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.5m CURB
BH 1
ELEV.=341.328
3.35
3.00
3.35
3.00
3.35
0.5m CURB
1.8m BIKE LANE (TYP.)
0.7m ROLLOVER CURB
2.1m WIDE CONC. SWK
222 ALBERT ST.
86 UNIVERSITY AVE. W.
96 UNIVERSITY AVE. W.
205 ALBERT ST.
75 UNIVERSITY AVE. W.
PROPERTY LINE
POST AND CHAIN FENCE
CONC SW
CONC DRIVEWAY
ASPHALT DRIVEWAY
FLOWER BED
BUILDING
DEC 4.00m DL
DEC 5.00m DL
DEC 1.00m DL
CON 1.00m DL
SIGN

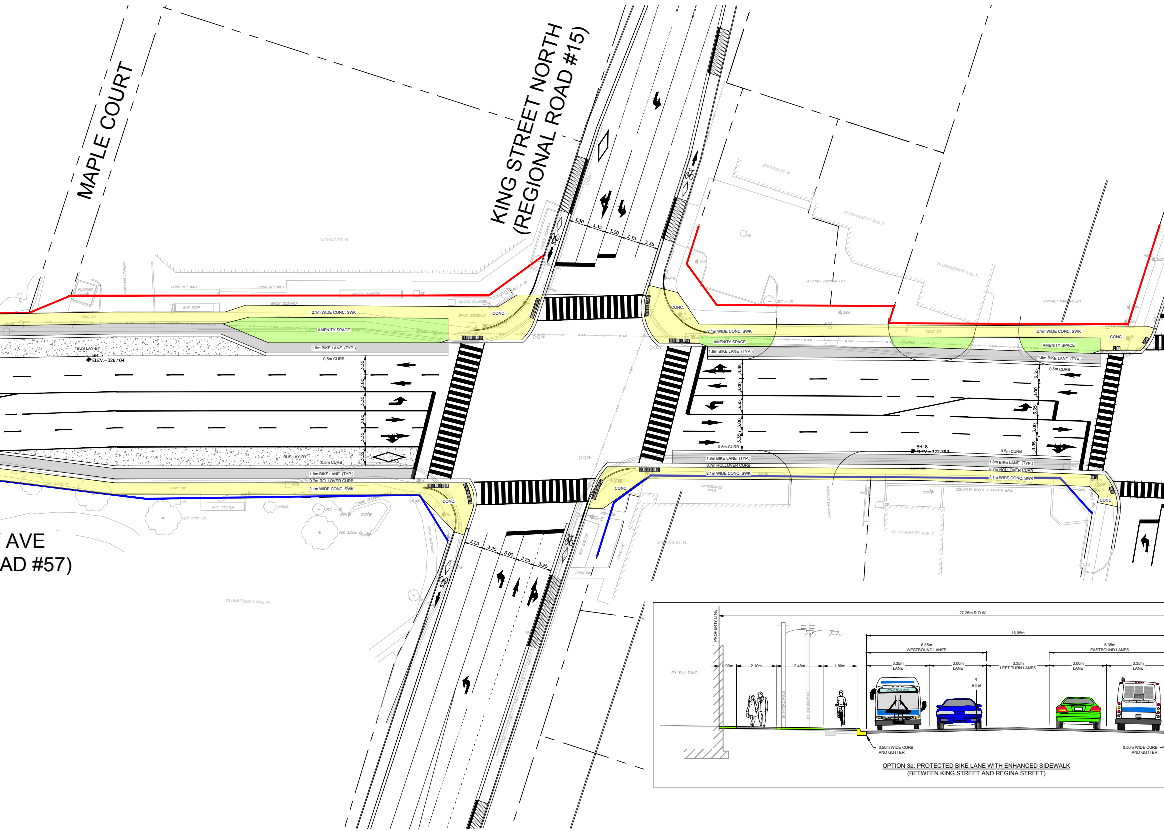
FILE: \\coneast.ibigroup.com\J\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C3a LAYOUT:OPTION 3a - SBL CTB: Rowpens-v2.ctb SAVED BY:Sergei.filippov, 2019-Aug-16 12:47 PM


HAZEL STREET
UNIVERSITY AVE. W.
64 UNIVERSITY AVE. W.
245 HAZEL ST.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.5m CURB
CONC.
BH 3
ELEV.=336.114
BH 2
ELEV.=339.676
BH 4
0.5m CURB
1.8m BIKE LANE (TYP.)
0.7m ROLLOVER CURB
2.1m WIDE CONC. SWK
3.35
3.00
3.35
3.00
3.35
ASPHALT DRIVEWAY
ASPHALT PARKING LOT
75 UNIVERSITY AVE. W.
UNIVERSITY AVE
(REGIONAL ROAD #57)

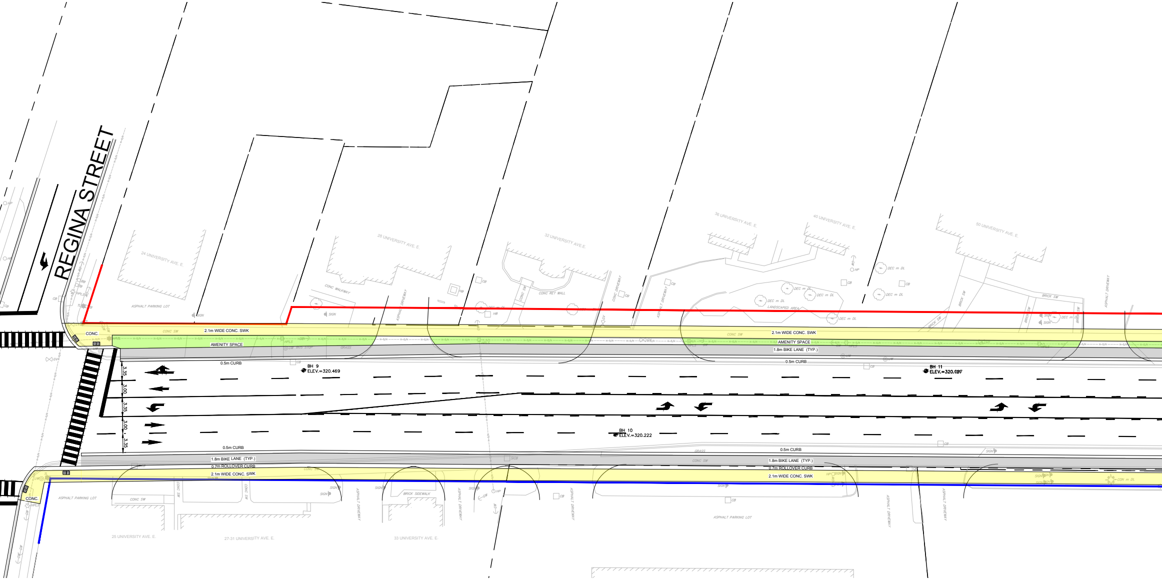

29.40m R.O.W.
PROPERTY LINE
16.05m
6.35m
WESTBOUND LANES
6.35m
EASTBOUND LANES
2.10m
3.53m
AMENITY SPACE
1.80m
3.35m
LANE
3.00m
LANE
3.35m
LEFT TURN LANES/
CENTER MEDIAN
3.00m
LANE
3.35m
LANE
1.80m
2.10m
℄
ROW
HAVE A NICE DAY!
Ex HYDRO POLE
Ex HYDRO POLE
Ex SERVICE POLE
0.50m WIDE CURB
AND GUTTER
0.50m WIDE CURB
AND GUTTER
0.70m WIDE CURB
OPSD 600.020

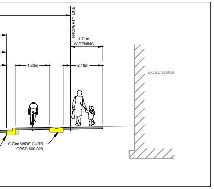
OPTION 3a: PROTECTED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN ALBERT STREET AND KING STREET)

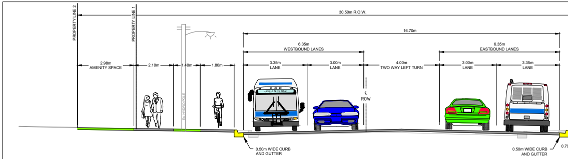

PARKING
TO REMAIN
2.1m WIDE CONC. SWK
AMENITY SPACE
CONC.
1.8m BIKE LANE (TYP.)
0.5m CURB
BH 5
ELEV.=330.049
3.35
3.00
3.35
3.00
3.35
BH 6
ELEV.=327.446
0.5m CURB
1.8m BIKE LANE (TYP.)
0.7m ROLLOVER CURB
2.1m WIDE CONC. SWK
CONC.
26-36 UNIVERSITY AVE. W.
19-32 MAPLE CT.
1-2 MAPLE CT.
75 UNIVERSITY AVE. W.
BUS STOP
BUS SHELTER
ASPHALT DRIVEWAY
CONC SW
SIGN
CB
DEC 3.00m DL
DEC 4.00m DL
DEC 5.00m DL
DEC 10.00m DL
SHRUB
GRASS
UNIVERSITY
(REGIONAL RO


MAPLE COURT
KING STREET NORTH
(REGIONAL ROAD #15)
AVE
AD #57)
247 KING ST. N.
256 KING ST. N.
12 UNIVERSITY AVE. E.
20 UNIVERSITY AVE. E.
15 UNIVERSITY AVE. E.
75 UNIVERSITY AVE. W.
ASPHALT PARKING LOT
CONC RET WALL
RAISED PLANTER
BRICK SIDEWALK
BUS STOP
BUS SHELTER
BUS LAY-BY
BH 7
ELEV.=326.104
BH 8
ELEV.=322.793
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.5m CURB
0.7m ROLLOVER CURB
CONC.
LANDSCAPED AREA
CONCRETE BLOCK RETAINING WALL
3.30
3.35
3.00
3.35
3.35
3.25
3.25
3.00
3.25
3.25
27.25m R.O.W.
16.05m
PROPERTY LINE
EX. BUILDING
0.93m
2.10m
2.48m
1.80m
Ex. HYDRO POLE
Ex. HYDRO POLE
6.35m
WESTBOUND LANES
6.35m
EASTBOUND LANES
3.35m
LANE
3.00m
LANE
3.35m
LEFT TURN LANES
3.00m
LANE
3.35m
LANE
℄
ROW
HAVE A NICE DAY!
0.50m WIDE CURB AND GUTTER
0.50m WIDE CURB AND GUTTER

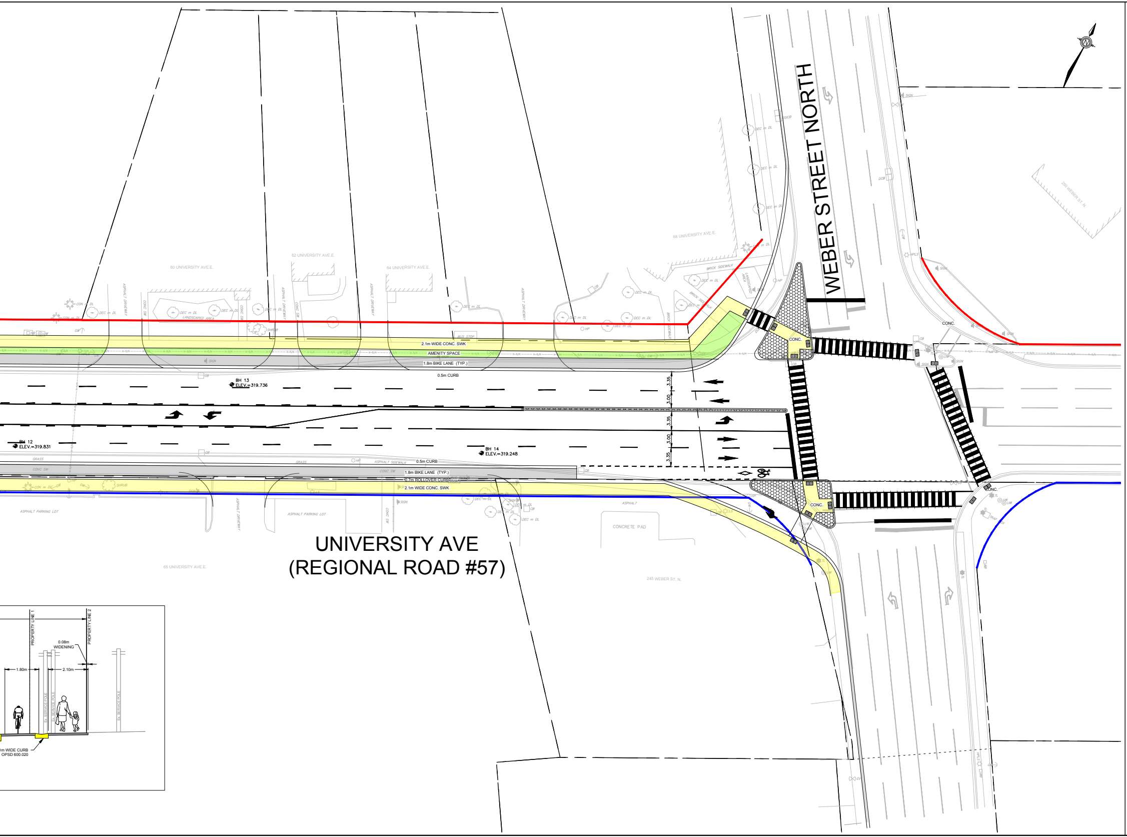
OPTION 3a: PROTECTED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN KING STREET AND REGINA STREET)


REGINA STREET
24 UNIVERSITY AVE. E.
28 UNIVERSITY AVE. E.
32 UNIVERSITY AVE. E.
36 UNIVERSITY AVE. E.
40 UNIVERSITY AVE. E.
50 UNIVERSITY AVE. E.
25 UNIVERSITY AVE. E.
27-31 UNIVERSITY AVE. E.
33 UNIVERSITY AVE. E.
ASPHALT PARKING LOT
CONC WALKWAY
CONC RET WALL
CONC DRIVEWAY
ASPHALT DRIVEWAY
LANDSCAPED AREA
DEC m DL
BRICK SW
BRICK SIDEWALK
CONC SW
GRASS
BUS STOP
SIGN
CB
HP
CONC.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.5m CURB
0.7m ROLLOVER CURB
3.35
3.00
3.35
3.00
3.35
BH 9
ELEV.=320.469
BH 10
ELEV.=320.222
BH 11
ELEV.=320.097
CON m DL


PROPERTY LINE
1.71m
WIDENING
1.80m
2.10m
EX. BUILDING
0.70m WIDE CURB
OPSD 600.020


PROPERTY LINE 2
PROPERTY LINE 1
30.50m R.O.W.
16.70m
6.35m
WESTBOUND LANES
6.35m
EASTBOUND LANES
2.98m
AMENITY SPACE
2.10m
1.40m
1.80m
3.35m
LANE
3.00m
LANE
4.00m
TWO WAY LEFT TURN
3.00m
LANE
3.35m
LANE
℄
ROW
EX. HYDRO POLE
HAVE A NICE DAY!
0.50m WIDE CURB
AND GUTTER
0.50m WIDE CURB
AND GUTTER
0.70

OPTION 3a: PROTECTED BIKE LANE WITH ENHANCED SIDEWALK
(BETWEEN REGINA STREET AND WEBER STREET)


WEBER STREET NORTH
UNIVERSITY AVE
(REGIONAL ROAD #57)
60 UNIVERSITY AVE.E.
62 UNIVERSITY AVE.E.
64 UNIVERSITY AVE.E.
68 UNIVERSITY AVE.E.
65 UNIVERSITY AVE.E.
245 WEBER ST. N.
220 WEBER ST. N.
2.1m WIDE CONC. SWK
AMENITY SPACE
1.8m BIKE LANE (TYP.)
0.5m CURB
0.7m ROLLOVER CURB
BH 13
ELEV.=319.736
BH 12
ELEV.=319.831
BH 14
ELEV.=319.248
3.35
3.00
3.35
3.00
3.35
CONC.
BUS STOP
ASPHALT DRIVEWAY
ASPHALT SIDEWALK
ASPHALT PARKING LOT
CONCRETE PAD
LANDSCAPED AREA
BRICK SIDEWALK
DEC m DL
CON m DL
CONC SW
GRASS
SHRUB
SIGN
CB
HP
PROPERTY LINE 1
PROPERTY LINE 2
0.08m
WIDENING
1.80m
2.10m
Ex. SERVICE POLE
m WIDE CURB
OPSD 600.020

KEY PLAN

DISCLAIMER:
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NOTES:

1. FOR CATCHBASIN, AND CATCHBASIN MANHOLES, OFFSETS ARE GIVEN TO THE EDGE OF PAVEMENT. GRATE ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS. FOR MANHOLES, AND OTHER STRUCTURES, OFFSETS ARE GIVEN TO THE CENTER OF THE STRUCTURE AND ELEVATIONS ARE THE FINISHED PAVEMENT ELEVATIONS.
2. notes are mtext using pharagraphs.
3. this is the next note.

IBI

Region of Waterloo

No.	ISSUE/REVISION	BY	DATE
2			
1			

CONTROLLING B.M.
tbc

UNIVERSITY AVENUE
(REGIONAL ROAD 57)
CLASS EA - FUNCTIONAL
DESIGN ALTERNATIVES

OPTION 3a
PROTECTED BIKE LANE WITH
ENHANCED SIDEWALK

DRAWN BY: SVF	CONTRACT No. tbc
CHECKED BY: KC	FILE No. TBC
DATE: JUNE 2019	DRAWING No. OPTION 3A - SBL
SCALE 1:250	SHEET ____ OF -
CADD FILE: 119697 119697_C3A.DWG	

FILE: \\caneast.ibigroup.com\J\WT\119697_RoW_UnivAve\7.0_Production\7.2_Conceptual_Design\04_Civil\119697_C3a LAYOUT: OPTION 3a – SBL CTB: Rowpens-v2.ctb SAVED BY: Sergei.filippov, 2019-Aug-16 12:47 PM

# Appendix B

## Separated Cycling Network Pilot Project

REMOVALS:
EXISTING PAVEMENT MARKING TO BE REMOVED, EXCEPT FOR YELLOW CENTRE LINE, STOP BARS AND TURN ARROWS, OR AS DIRECTED BY JOB SUPERVISOR

| PAVEMENT MARKING LEGEND | |
|---|---|
| 1 | SOLID YELLOW, 10cm |
| 2 | SOLID DOUBLE YELLOW, 10cm |
| 3 | 363 BROKEN YELLOW, 10cm |
| 4 | SOLID YELLOW, 20cm |
| 5 | SOLID WHITE, 10cm |
| 6 | 333 BROKEN WHITE, 10cm |
| 7 | 363 BROKEN WHITE, 10cm |
| 9 | SOLID WHITE, 20cm |
| 10 | 111 BROKEN WHITE, 10cm |
| 11 | 333 BROKEN WHITE, 20cm |
| 13 | 333 BROKEN WHITE, 30cm |
| 14 | SOLID WHITE, 30cm |
| 15 | SOLID WHITE, 60cm |
| 16 | 111 BROKEN WHITE, 45m |
| 17 | SOLID WHITE, 15cm |
| 18 | SOLID WHITE, 45cm |
| 19 | 111 BROKEN YELLOW, 10cm |
| 20 | SOLID WHITE, SYMBOLS AND ARROWS |
| 21 | 121 BROKEN WHITE 10cm |
| 22 | 1.8 BROKEN WHITE 10cm |
| 23 | WHITE DOT 10cmØ AT 1.8m SPACING |
| 24 | ELEPHANTS FEET WHITE 20cm SQUARES AT 20cm SPACING OR 40cm SQUARES AT 40cm SPACING |
| 25 | SHARKS TEETH WHITE TRIANGLE 60x90cm AT 30cm SPACING |
| 26 | SOLID GREEN |

COLUMBIA STREET WEST

REGIONAL ROAD No. 15
(KING STREET NORTH)

HYCKORY STREET EAST

REGIONAL ROAD No. 15
(KING STREET NORTH)

MAINTAIN EXISTING LANE CONFIGURATION

BUS STOP

BUILDING ENTRANCE

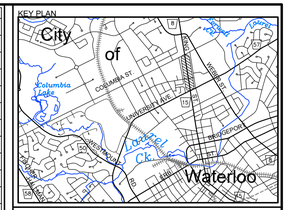
WILFRED LAURIER UNIVERSITY No. 224

MAINTENANCE ENTRANCE

LIMIT OF CONTRACT
2019-156 PART `B'

UNIVERSITY AVENUE WEST

KEY PLAN

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| Item | Sign | Code | Sign Name | Description |
|---|---|---|---|---|
| 1 | | RB-84A (OTM) | Reserved Bicycle Lane | The buffer is a painted space that ensures the bicycle lane remains clear of motor vehicles. (MMP Ecore and Price Lane) |
| 2 | ENDS | RB-85T (OTM) | Reserved Lane Ends | Placed where curbs are removed and the roadway surface can continue. Motorists are to merge into the bicycle lane once safe to do so. Provide a minimum of 30m of reserved bicycle lane before for safer visibility and awareness. (Price Lane) |
| 3 | | RB-37 (TAC) | Turning Vehicles Yield to Bicycles Sign | |
| 4 | | WC-43 (TAC) | Contraflow Bicycle Lane Crossing Sign | |
| 5 | | WA-33A (TAC) | Object Marker Sign | Markers are used to create a physical separation between the bicycle lane and the auto lane. They're a combination of white and green in color, plastic in construction and come as a continuous strip. (Columbia Lake Road West, MUP) |
| 6 | BEGINS | RB-84T (OTM) | Reserved Lane Begins | The Concrete Low Mid Separator measures 150mm in height and 600mm in width. It is placed in the centre line and has auto lane on one side and bicycle lane on the other. Reflectors are placed on the top of the curb. (Columbia Lake Road West) |
| 7 | | RB-42 (OTM) | Right Turn Only Sign | |
| 8 | | (Custom Yellow Sign) | "Caution Oncoming Vehicles Turning" Sign | Rubber extrusions provide physical separation between the vehicle travel lane and the bike lane. Rubber extrusions are 100mm in height and length of 150mm, and shaped to aid in the deflection of vehicles. Designed compared to road together with a white reflective tape. (Laurel Creek Road, May 2021) |
| 9 | | RB-73 (OTM) | Yield to Pedestrians Sign | |
| 10 | | RB-78 (OTM) | Stop Here On Red Sign | |
| 11 | | RB-79R (OTM) | No Right Turn on Red Sign | Traffic bollards provide physical separation between the vehicle travel lane and the bike lane. The bollards are placed on a concrete base and secured to concrete curbs or directly into the road surface. (Hazelwood Drive, 2018) |
| 12 | | WC-19 (OTM) | Shared Use Lane Sign | |
| 13 | | RB-93 (TAC) | Shared Pathway Sign | The bike box is high visibility, designated area for cyclists to travel ahead of motor vehicles during a red light without being hit or a signalized intersection. The bike box allows cyclists to be well ahead of queuing traffic and to be seen by motorists. (Erb St. and Phillip/Shirley Ave, 2019) |
| 14 | | WC-46 (TAC) | Pedestrian and Bicycle Crossing Ahead Sign | |
| 15 | | WC-75 (TAC) | Crossing Tab Sign | The term "Dutch" connotes the use of a short set for low speeding and a physical separation between the crossing the flow space to add additional advantages. (Fairview Creek Trail, 2021) |
| 16 | | WC-30L | Distance Tab Sign* | |
| 17 | | WC-07 (OTM) | Share the Road Sign | The raised edge will not cause bikes to be categorized as within the regulations. Motorists are encouraged to stay within their white reading if they edge the road. (Columbia Lake Road West, 2021) |
| 18 | | Rb-27T (OTM) | Bicycles Excepted Tab Sign | |

NOTES

1. 333, 363, 393, DENOTES PAVEMENT MARKING SPACING (IE., 3m LINE, 3m GAP, 3m LINE)
2. THIS ⊙ TO DENOTE PAVEMENT MARKING
3. THIS ⊙ TO DENOTE PAVEMENT MARKING, DURABLE
4. THIS △ TO DENOTE PAVEMENT MARKING, TEMPORARY-REMOVABLE
5. THIS ⊡ TO DENOTE PAVEMENT MARKING, TEMPORARY

Region of Waterloo

CONTROLLING B.M.

FIELD BOOK No.

| No. | ISSUE/REVISION | BY | DATE |
|---|---|---|---|
| 1 | ISSUED FOR TENDER | IY | MAY 2019 |

REGIONAL ROAD No. 15
(KING STREET NORTH)
CYCLE TRACK

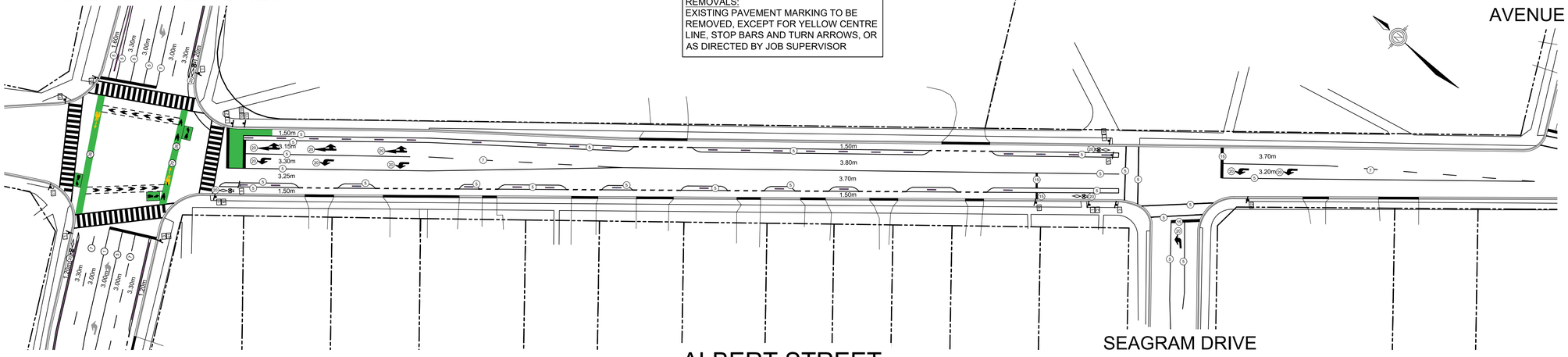
PAVEMENT MARKINGS

| | |
|---|---|
| DRAWN BY: SFP | CONTRACT No. 2019-156 |
| CHECKED BY: IY | FILE No. 07477 |
| DATE: MAR 2019 | DRAWING No. - |
| SCALE HOR. 1:500 VERT. N/A | SHEET No. 3 OF 10 |

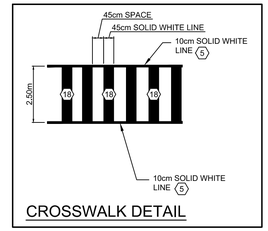
LAYOUT NAME:
3 - PM - KING NORTH

I:\DCCADD\DES-7000\CD07477\03 - PAVEMENT MARKINGS\07477 - KING NORTH PAVEMENT MARKINGS.DWG

ROW-2018

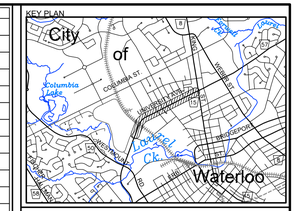



REMOVALS:
EXISTING PAVEMENT MARKING TO BE REMOVED, EXCEPT FOR YELLOW CENTRE LINE, STOP BARS AND TURN ARROWS, OR AS DIRECTED BY JOB SUPERVISOR




| | PAVEMENT MARKING LEGEND |
|---|---|
| 1 | SOLID YELLOW, 10cm |
| 2 | SOLID DOUBLE YELLOW, 10cm |
| 3 | 363 BROKEN YELLOW, 10cm |
| 4 | SOLID YELLOW, 20cm |
| 5 | SOLID WHITE, 10cm |
| 6 | 333 BROKEN WHITE, 10cm |
| 7 | 363 BROKEN WHITE, 10cm |
| 9 | SOLID WHITE, 20cm |
| 10 | 111 BROKEN WHITE, 10cm |
| 11 | 333 BROKEN WHITE, 20cm |
| 13 | 333 BROKEN WHITE, 30cm |
| 14 | SOLID WHITE, 30cm |
| 15 | SOLID WHITE, 60cm |
| 16 | 111 BROKEN WHITE, 45cm |
| 17 | SOLID WHITE, 15cm |
| 18 | SOLID WHITE, 45cm |
| 19 | 111 BROKEN YELLOW, 10cm |
| 20 | SOLID WHITE, SYMBOLS AND ARROWS |
| 21 | 121 BROKEN WHITE 10cm |
| 22 | 1.8 BROKEN WHITE 10cm |
| 23 | WHITE DOT 10cmØ AT 1.8m SPACING |
| 24 | ELEPHANTS FEET WHITE 20cm SQUARES AT 20cm SPACING OR 40cm SQUARES AT 40cm SPACING |
| 25 | SHARKS TEETH WHITE TRIANGLE 60x90cm AT 30cm SPACING |
| 26 | SOLID GREEN |

KEY PLAN

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NOTES

1. 333, 363, 393, DENOTES PAVEMENT MARKING SPACING (IE., 3m LINE, 3m GAP, 3m LINE)
2. THIS ⊙ TO DENOTE PAVEMENT MARKING
3. THIS ⊙ TO DENOTE PAVEMENT MARKING, DURABLE
4. THIS △ TO DENOTE PAVEMENT MARKING, TEMPORARY-REMOVABLE
5. THIS ⊡ TO DENOTE PAVEMENT MARKING, TEMPORARY

Region of Waterloo

CONTROLLING B.M.

FIELD BOOK No.

| No. | ISSUE/REVISION | BY | DATE |
|---|---|---|---|
| 1 | ISSUED FOR TENDER | IY | MAY 2019 |

# ALBERT STREET CYCLE TRACK

## PAVEMENT MARKINGS

| | |
|---|---|
| DRAWN BY: SFP | CONTRACT No. 2019-156 |
| CHECKED BY: IY | FILE No. 07477 |
| DATE: MAR 2019 | DRAWING No. - |
| SCALE HOR. 1:500 VERT. N/A | SHEET No. 7 OF 10 |
| LAYOUT NAME: 7 - PM - ALBERT ST | |

I:\DCCADD\DES-7000\CD07477\03 - PAVEMENT MARKINGS\7477 - ALBERT ST PAVEMENT MARKINGS.DWG

ROW 2018

# Appendix C

## Region of Waterloo Collision Data (2013 – 2017)

Region of Waterloo

# 5 Year Collision Summary
# January 1, 2013 to December 31, 2017

NS **WEBER ST** **AT** EW **UNIVERSITY AVE**

**Total Collisions for Location = 121 collisions** **GEO ID** ***7533***

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2013-01-21 | 11 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 01 | 01 | 03 | 03 |
| 2013-02-19 | 22 | 03 | 03 | 01 | 01 | 04 | 01 | 02 | 02 | 02 | | 01 | 01 | 99 | 03 |
| 2013-03-06 | 15 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2013-03-10 | 22 | 01 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 02 | 02 | 03 |
| 2013-04-03 | 12 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2013-04-24 | 18 | 03 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 01 | 01 | 03 | 03 |
| 2013-04-27 | 7 | 01 | 01 | 01 | 01 | 08 | 01 | 08 | 01 | 02 | | 01 | 01 | 04 | 03 |
| 2013-05-02 | 23 | 01 | 01 | 04 | 01 | 06 | 01 | 05 | 01 | 03 | | 02 | 02 | 05 | 03 |
| 2013-05-07 | 9 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 04 | 03 | | 03 | 01 | 05 | 03 |
| 2013-05-17 | 8 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 03 | | 02 | 02 | 03 | 04 |
| 2013-05-31 | 11 | 01 | 01 | 06 | 01 | 08 | 01 | 04 | 01 | 02 | | 03 | 04 | 05 | 03 |
| 2013-06-30 | 14 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 03 | | 02 | 02 | 03 | 03 |
| 2013-07-30 | 11 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 10 | 02 | | 02 | 02 | 04 | 02 |
| 2013-07-31 | 19 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 02 | | 03 | 04 | 05 | 03 |
| 2013-09-09 | 13 | 01 | 01 | 01 | 01 | 99 | 01 | 02 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2013-09-16 | 11 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 03 | | 04 | 04 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2013-09-25 | 17 | 01 | 01 | 05 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2013-09-27 | 7 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 01 | 03 | 02 | 03 |
| 2013-10-08 | 13 | 01 | 01 | 01 | 04 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 04 |
| 2013-10-09 | 20 | 01 | 01 | 01 | 04 | 12 | 01 | 07 | 01 | 02 | | 01 | 01 | 04 | 03 |
| 2013-10-31 | 18 | 02 | 02 | 01 | 04 | 12 | 01 | 07 | 01 | 02 | | 01 | 01 | 04 | 03 |
| 2013-11-06 | 17 | 02 | 02 | 01 | 04 | 02 | 02 | 01 | 01 | 02 | | 03 | 03 | 03 | 03 |
| 2013-11-10 | 0 | 01 | 02 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 02 |
| 2013-12-11 | 8 | 03 | 03 | 14 | 01 | 04 | 01 | 01 | 10 | 02 | | 03 | 03 | 04 | 03 |
| 2014-02-24 | 8 | 01 | 01 | 01 | 04 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2014-02-27 | 9 | 03 | 04 | 05 | 01 | 04 | 01 | 02 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2014-04-06 | 9 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 02 | 02 | 03 |
| 2014-05-07 | 1 | 01 | 01 | 04 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2014-06-21 | 17 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2014-06-21 | 17 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2014-07-02 | 11 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2014-07-23 | 16 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 02 | 05 | 02 |
| 2014-07-29 | 9 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2014-08-09 | 1 | 01 | 08 | 02 | | 10 | | 05 | | 03 | | 04 | | 07 | 03 |
| 2014-08-29 | 7 | 01 | 01 | 01 | | 10 | | 04 | | 02 | | 02 | | 07 | 03 |
| 2014-09-30 | 16 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2014-10-14 | 7 | 01 | 01 | 01 | 14 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2014-11-24 | 12 | 02 | 02 | 01 | 01 | 12 | 01 | 07 | 10 | 03 | | 01 | 01 | 04 | 03 |
| 2014-12-10 | 16 | 01 | 01 | 06 | 01 | 02 | 01 | 01 | 10 | 03 | | 02 | 02 | 03 | 03 |
| 2015-01-18 | 00:33 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2015-01-22 | 19:15 | 01 | 01 | 04 | 04 | 12 | 01 | 07 | 01 | 03 | | 01 | 01 | 04 | 03 |
| 2015-01-23 | 16:45 | 01 | 01 | 01 | 01 | 99 | 01 | 99 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2015-02-11 | 19:47 | 03 | 03 | 01 | 14 | 04 | 01 | 02 | 10 | 02 | | 01 | 01 | 03 | 03 |
| 2015-02-20 | 17:45 | 01 | 02 | 01 | 01 | 12 | 01 | 07 | 02 | 02 | | 01 | 01 | 04 | 03 |
| 2015-03-31 | 23:19 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 02 |
| 2015-04-19 | 18:45 | 01 | 01 | 01 | 01 | 10 | 01 | 01 | 10 | 02 | MVD | 03 | 03 | 03 | 02 |
| 2015-05-26 | 16:50 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-05-31 | 15:00 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-06-06 | 13:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2015-06-08 | 16:15 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-06-17 | 13:35 | 01 | 01 | 04 | 05 | 99 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2015-06-23 | 12:50 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2015-06-23 | 18:00 | 01 | 01 | 05 | 05 | 99 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2015-07-19 | 00:30 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2015-07-20 | 10:30 | 01 | 01 | 01 | 05 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |
| 2015-09-09 | 18:00 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-09-13 | 17:15 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-09-18 | 22:54 | 01 | 01 | 01 | 05 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2015-09-25 | 17:00 | 01 | 01 | 04 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-10-21 | 17:55 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2015-11-06 | 07:30 | 02 | 02 | 01 | 01 | 99 | 01 | 09 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-11-13 | 15:30 | 99 | 02 | 01 | 01 | 99 | 01 | 05 | 04 | 02 | | 03 | 04 | 04 | 03 |
| 2015-11-30 | 16:27 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 02 |
| 2015-12-12 | 08:50 | 01 | 01 | 01 | 04 | 02 | 01 | 05 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2015-12-21 | 07:22 | 02 | 02 | 01 | 04 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 02 |
| 2016-02-03 | 20:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2016-02-18 | 10:59 | 01 | 01 | 04 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2016-02-29 | 20:28 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2016-03-06 | 21:37 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2016-03-11 | 11:15 | 01 | 01 | 01 | 06 | 08 | 01 | 05 | 01 | 02 | | 04 | 01 | 05 | 03 |
| 2016-03-23 | 19:15 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 02 |
| 2016-04-05 | 16:20 | 01 | 01 | 04 | 01 | 99 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 04 |
| 2016-04-09 | 13:30 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 04 |
| 2016-05-01 | 22:35 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 02 |
| 2016-06-02 | 14:40 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2016-07-03 | 21:30 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2016-07-04 | 15:26 | 01 | 01 | 05 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |
| 2016-07-10 | 20:51 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 02 | 02 | | 01 | 01 | 04 | 03 |
| 2016-07-12 | 20:40 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2016-07-14 | 22:15 | 02 | 02 | 01 | 01 | 04 | 01 | 04 | 01 | 02 | | 02 | 04 | 05 | 03 |
| 2016-07-14 | 16:45 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-07-25 | 17:30 | 01 | 01 | 05 | 01 | 02 | 01 | 02 | 10 | 03 | | 02 | 02 | 03 | 02 |
| 2016-08-05 | 12:54 | 01 | 01 | 01 | | 10 | | 01 | | 03 | | 01 | | 07 | 03 |
| 2016-08-21 | 08:58 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 04 |
| 2016-08-31 | 11:43 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-09-06 | 11:12 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2016-09-06 | 12:00 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 03 |
| 2016-09-23 | 09:30 | 01 | 01 | 01 | 05 | 06 | 01 | 04 | 04 | 03 | | 04 | 03 | 05 | 03 |
| 2016-10-10 | 17:20 | 01 | 01 | 01 | 01 | 08 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 03 |
| 2016-11-22 | 18:32 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 02 |
| 2016-11-26 | 14:15 | 01 | 01 | 01 | 05 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 04 |
| 2016-12-04 | 14:18 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 02 | | 04 | 04 | 04 | 03 |
| 2016-12-15 | 23:18 | 03 | 05 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2016-12-16 | 08:55 | 01 | 02 | 01 | 04 | 10 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2016-12-21 | 09:45 | 01 | 01 | 01 | 01 | 02 | 01 | 05 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2017-01-08 | 09:00 | 03 | 05 | 05 | 01 | 09 | 01 | 07 | 10 | 02 | | 04 | 04 | 03 | 04 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2017-01-09 | 11:00 | 01 | 05 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2017-01-12 | 13:03 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |
| 2017-02-07 | 16:30 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2017-03-02 | 14:40 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 01 | 01 | 03 | 02 |
| 2017-03-03 | 16:00 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-03-27 | 18:20 | 01 | 02 | | 01 | | 01 | | 10 | 02 | | | 04 | 05 | 03 |
| 2017-04-03 | 17:45 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 02 | 02 | 03 | 02 |
| 2017-04-13 | 11:40 | 01 | 01 | | 04 | | 02 | | 02 | 02 | | | 04 | 03 | 02 |
| 2017-04-25 | 16:45 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2017-04-26 | 21:00 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2017-05-17 | 14:30 | 01 | 01 | 01 | 17 | 06 | 01 | 05 | 01 | 02 | | 01 | 03 | 05 | 03 |
| 2017-06-27 | 17:04 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 03 |
| 2017-06-27 | 13:51 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 02 |
| 2017-07-16 | 17:57 | 01 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2017-07-30 | 00:45 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 03 | | 03 | 03 | 04 | 03 |
| 2017-08-29 | 17:27 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 02 |
| 2017-09-07 | 18:20 | 01 | 01 | 01 | 04 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2017-10-05 | 22:05 | 01 | 01 | | 01 | | 01 | | 01 | 02 | | | 04 | 04 | 03 |
| 2017-11-04 | 13:48 | 01 | 01 | 01 | 01 | 09 | 01 | 07 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-11-07 | 20:50 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2017-11-14 | 11:48 | 01 | 01 | | 01 | | 01 | | 10 | 02 | | | 02 | 03 | 03 |
| 2017-11-15 | 19:19 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 02 |
| 2017-11-24 | 00:04 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2017-12-18 | 20:21 | 02 | 02 | 05 | 01 | 06 | 01 | 05 | 01 | 03 | | 04 | 04 | 05 | 03 |
| 2017-12-21 | 17:10 | 03 | 02 | 05 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |

NS **KING ST** **AT** EW **UNIVERSITY AVE**

**Total Collisions for Location = 83 collisions** **GEO ID** ***373***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-01-30 | 14 | 01 | 01 | 04 | 04 | 99 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 04 |
| 2013-01-31 | 0 | 02 | 02 | 01 | | 01 | | 01 | | 03 | | 04 | | 08 | 03 |
| 2013-01-31 | 9 | 03 | 05 | 05 | 04 | 04 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2013-02-05 | 9 | 01 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |
| 2013-02-16 | 18 | 01 | 02 | 05 | 04 | 02 | 01 | 01 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2013-03-13 | 11 | 01 | 01 | 01 | 14 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 04 |
| 2013-03-23 | 0 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 02 | | 02 | 01 | 05 | 02 |
| 2013-04-22 | 20 | 01 | 01 | 01 | 04 | 06 | 01 | 06 | 01 | 02 | | 02 | 02 | 99 | 03 |
| 2013-05-06 | 11 | 01 | 01 | 01 | 06 | 06 | 01 | 05 | 02 | 03 | | 02 | 03 | 05 | 03 |
| 2013-05-27 | 14 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2013-06-15 | 15 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 02 | | 03 | 04 | 05 | 02 |
| 2013-06-25 | 16 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2013-07-11 | 18 | 01 | 01 | 01 | 01 | 09 | 01 | 01 | 10 | 03 | | 01 | 01 | 04 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2013-09-02 | 15 | 01 | 01 | 01 | 04 | 99 | 01 | 01 | 01 | 03 | | 04 | 04 | 03 | 03 |
| 2013-09-08 | 16 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 03 | | 02 | 02 | 04 | 03 |
| 2013-09-28 | 22 | 01 | 01 | 01 | | 08 | | 05 | | 02 | | 02 | | 08 | 02 |
| 2013-09-29 | 13 | 01 | 01 | 01 | 04 | 99 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2013-10-17 | 21 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 03 |
| 2013-10-21 | 12 | 01 | 01 | 06 | 16 | 99 | 01 | 01 | 10 | 03 | | 03 | 03 | 04 | 03 |
| 2013-11-13 | 17 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2013-11-19 | 20 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2013-11-30 | 9 | 01 | 01 | 01 | | 06 | | 04 | | 03 | | 03 | | 07 | 03 |
| 2013-12-04 | 23 | 02 | 02 | 01 | 01 | 99 | 99 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2014-01-05 | 17 | 03 | 03 | 01 | 04 | 04 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2014-01-06 | 19 | 03 | 03 | 01 | 01 | 04 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2014-01-30 | 22 | 03 | 05 | 01 | 01 | 07 | 01 | 01 | 04 | 02 | | 01 | 03 | 05 | 03 |
| 2014-03-09 | 15 | 01 | 01 | 01 | 01 | 99 | 07 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2014-03-20 | 13 | 01 | 02 | 04 | 04 | 02 | 01 | 02 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2014-04-12 | 13 | 01 | 01 | 09 | 01 | 99 | 01 | 09 | 10 | 03 | | 03 | 03 | 03 | 03 |
| 2014-05-06 | 13 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2014-06-26 | 12 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2014-07-12 | 22 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 03 | | 02 | 02 | 03 | 03 |
| 2014-07-17 | 10 | 01 | 01 | 01 | | 13 | | 01 | | 02 | | 01 | | 07 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2014-08-16 | 18 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2014-09-25 | 13 | 01 | 01 | 01 | 04 | 06 | 01 | 05 | 04 | 03 | | 01 | 02 | 04 | 03 |
| 2014-09-26 | 0 | 01 | 01 | 01 | | 08 | | 04 | | 03 | | 04 | | 08 | 02 |
| 2014-10-10 | 19 | 01 | 01 | 05 | 04 | 12 | 01 | 07 | 01 | 02 | | 03 | 03 | 04 | 03 |
| 2014-10-12 | 20 | 01 | 01 | 01 | | 08 | | 04 | | 03 | | 01 | | 08 | 02 |
| 2014-10-18 | 3 | 01 | 02 | 01 | 01 | 99 | 01 | 04 | 01 | 02 | | 02 | 03 | 05 | 03 |
| 2014-12-23 | 18 | 07 | 02 | 05 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2014-12-23 | 14 | 99 | 02 | 01 | 01 | 02 | 01 | 02 | 10 | 03 | | 02 | 02 | 03 | 02 |
| 2015-01-03 | 14:50 | 03 | 04 | 04 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-02-20 | 20:02 | 01 | 01 | 04 | | 08 | | 04 | | 03 | | 03 | | 08 | 02 |
| 2015-02-24 | 16:27 | 03 | 03 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2015-04-19 | 00:12 | 01 | 01 | 01 | | | | 01 | | 03 | | 01 | | 08 | 02 |
| 2015-05-06 | 23:20 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 02 | | 01 | 01 | 04 | 03 |
| 2015-07-02 | 07:10 | 01 | 01 | 05 | 01 | 99 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2015-07-21 | 14:00 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2015-08-31 | 18:04 | 01 | 01 | 01 | 05 | 08 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2015-09-17 | 22:18 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2015-10-18 | 19:00 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2015-10-26 | 11:00 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 02 | | 04 | 04 | 04 | 03 |
| 2015-10-29 | 16:30 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-10-30 | 17:41 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2015-11-09 | 09:15 | 01 | 01 | | 01 | | 01 | 99 | 10 | 02 | | 02 | 02 | 04 | 03 |
| 2015-11-21 | 15:30 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2016-01-08 | 19:00 | 01 | 99 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2016-01-08 | 12:45 | 01 | 02 | 05 | 05 | 02 | 01 | 01 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2016-01-09 | 12:30 | 01 | 02 | 05 | 01 | 04 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-01-24 | 13:17 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 02 |
| 2016-03-05 | 21:04 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2016-05-09 | 21:45 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2016-08-16 | 10:15 | 02 | 02 | 04 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2016-09-10 | 12:25 | 01 | 01 | 01 | 01 | 10 | 01 | 01 | 10 | 02 | | 01 | 01 | 03 | 02 |
| 2016-09-17 | 15:30 | 02 | 02 | 01 | 01 | 04 | 01 | 02 | 10 | 03 | | 03 | 03 | 03 | 04 |
| 2016-09-24 | 16:30 | 01 | 01 | 04 | 04 | 99 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 04 |
| 2016-09-26 | 21:43 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 03 | | 03 | 03 | 04 | 03 |
| 2016-10-22 | 22:15 | 01 | 01 | 34 | 01 | 99 | 01 | 09 | 10 | 02 | | 01 | 01 | 99 | 03 |
| 2016-12-13 | 13:00 | 01 | 02 | 01 | 01 | 12 | 01 | 07 | 04 | 02 | | 03 | 03 | 05 | 03 |
| 2017-01-18 | 20:31 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2017-01-24 | 18:48 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2017-01-25 | 22:48 | 02 | 02 | 01 | | 06 | | 04 | | 03 | | 02 | | 08 | 03 |
| 2017-02-10 | 18:00 | 03 | 03 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | Impact Type | Classification of Accident |
| 2017-03-22 | 10:15 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 02 | | 02 | 02 | 04 | 03 |
| 2017-04-13 | 19:39 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 03 | | 01 | 01 | 04 | 03 |
| 2017-04-28 | 22:47 | 01 | 01 | 09 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2017-05-25 | 10:05 | 02 | 02 | 01 | 01 | 99 | 01 | 05 | 04 | 02 | | 04 | 03 | 05 | 04 |
| 2017-06-13 | 15:20 | 01 | 01 | 01 | 01 | 08 | 01 | 05 | 01 | 03 | | 01 | 03 | 05 | 03 |
| 2017-08-29 | 06:34 | 01 | 01 | 05 | 01 | 02 | 01 | 01 | 02 | 02 | | 04 | 04 | 03 | 03 |
| 2017-09-07 | 20:27 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 04 | 03 | | 04 | 03 | 05 | 03 |
| 2017-09-24 | 20:25 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 04 | 03 | | 03 | 04 | 05 | 03 |
| 2017-09-28 | 13:01 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2017-12-26 | 12:00 | 01 | 03 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 03 |

EW **UNIVERSITY AVE** **AT** NS **Albert St**

**Total Collisions for Location = 52 collisions** **GEO ID** ***270***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-02-01 | 21 | 03 | 03 | 04 | 01 | 01 | 06 | 02 | 04 | 03 | | 03 | 04 | 05 | 04 |
| 2013-04-04 | 17 | 01 | 01 | 04 | 01 | 06 | 07 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2013-04-08 | 10 | 01 | 01 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 02 |
| 2013-07-31 | 12 | 01 | 01 | 01 | 01 | 07 | 01 | 04 | 01 | 03 | | 02 | 03 | 05 | 02 |
| 2013-09-17 | 16 | 01 | 01 | 01 | 05 | 07 | 01 | 01 | 04 | 03 | | 03 | 01 | 05 | 03 |
| 2013-09-17 | 14 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 03 |
| 2013-09-25 | 16 | 01 | 01 | 04 | 01 | 10 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2013-10-21 | 10 | 02 | 02 | 01 | 01 | 04 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2013-11-02 | 11 | 02 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2013-11-08 | 11 | 01 | 01 | 01 | 05 | 12 | 01 | 07 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2013-11-13 | 2 | 01 | 05 | 01 | 34 | 99 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2013-12-15 | 14 | 03 | 03 | 01 | 04 | 04 | 01 | 02 | 01 | 03 | | 02 | 04 | 02 | 02 |
| 2013-12-22 | 13 | 01 | 02 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2014-02-26 | 18 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 02 |
| 2014-03-08 | 12 | 01 | 01 | 04 | 01 | 12 | 01 | 07 | 01 | 02 | | 02 | 02 | 04 | 02 |
| 2014-03-12 | 8 | 03 | 04 | 01 | 01 | 10 | 01 | 01 | 10 | 03 | | 02 | 02 | 03 | 03 |
| 2014-05-30 | 7 | 01 | 01 | 01 | 01 | 08 | 01 | 01 | 01 | 02 | | 03 | 02 | 02 | 02 |
| 2015-01-08 | 10:41 | 01 | 03 | 01 | 14 | 08 | 01 | 01 | 01 | 03 | | 01 | 03 | 02 | 03 |
| 2015-03-11 | 11:22 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 04 | 03 | | 03 | 01 | 05 | 02 |
| 2015-03-15 | 01:46 | 01 | 01 | 01 | | | | 05 | | 03 | | 04 | | 08 | 04 |
| 2015-04-01 | 18:41 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 02 |
| 2015-05-25 | 17:00 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-07-22 | 17:30 | 01 | 01 | 05 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-08-13 | 00:15 | 01 | 01 | 01 | | | | 04 | | 03 | | 04 | | 08 | 02 |
| 2015-09-02 | 17:18 | 01 | 01 | 05 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-09-14 | 11:24 | 01 | 01 | 14 | 04 | 10 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 02 |
| 2015-11-02 | 15:30 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2015-11-10 | 22:00 | 02 | 02 | 05 | | 06 | | 04 | | 03 | | 01 | | 08 | 02 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-12-18 | 20:00 | 03 | 06 | 01 | 01 | 99 | 01 | 05 | 05 | 03 | | 04 | 04 | 05 | 03 |
| 2016-01-11 | 15:54 | 01 | 02 | 01 | 01 | 99 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2016-01-28 | 18:30 | 03 | 06 | 01 | 01 | 10 | 01 | 02 | 10 | 02 | | 02 | 02 | 03 | 03 |
| 2016-04-21 | 23:18 | 02 | 02 | 01 | | 08 | | 04 | | 03 | | 01 | | 08 | 02 |
| 2016-05-18 | 07:47 | 01 | 01 | 01 | | 08 | | 05 | | 03 | | 02 | | 08 | 02 |
| 2016-05-21 | 11:55 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2016-07-06 | 08:20 | 01 | 01 | 05 | 01 | 10 | 01 | 02 | 10 | 01 | | 03 | 03 | 03 | 02 |
| 2016-08-23 | 09:13 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2016-09-16 | 06:39 | 01 | 01 | 01 | 05 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 02 |
| 2016-11-10 | 16:50 | 01 | 01 | 05 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-01-08 | 16:50 | 01 | 05 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 01 | 04 | 02 | 03 |
| 2017-02-03 | 17:46 | 01 | 01 | | | | | | | 03 | | | | 08 | 03 |
| 2017-02-24 | 23:47 | 02 | 02 | 05 | 01 | 02 | 01 | 01 | 01 | 02 | | 03 | 03 | 03 | 03 |
| 2017-02-28 | 23:22 | 02 | 02 | 01 | | 08 | | 04 | | 03 | | 04 | | 08 | 02 |
| 2017-04-20 | 17:05 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-06-03 | 18:11 | 01 | 01 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 02 | 02 | 02 |
| 2017-06-03 | 10:00 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 04 |
| 2017-06-20 | 22:00 | 02 | 02 | 01 | 01 | 06 | 01 | 05 | 05 | 03 | | 03 | 03 | 05 | 03 |
| 2017-07-30 | 01:40 | 01 | 01 | 01 | | 10 | | 05 | | 02 | | 02 | | 07 | 03 |
| 2017-09-08 | 16:10 | 01 | 01 | 01 | 14 | 08 | 01 | 05 | 01 | 03 | | 02 | 04 | 05 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | Impact Type | Classification of Accident |
| 2017-09-09 | 09:39 | 01 | 01 | 01 | 05 | 08 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2017-09-26 | 09:00 | 01 | 01 | 36 | 01 | | 01 | | 10 | 02 | | 04 | 01 | 02 | 03 |
| 2017-10-18 | 11:19 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 01 | 01 | 03 | 03 |
| 2017-11-15 | 21:35 | 02 | 02 | 01 | | 08 | | 05 | | 03 | | 03 | | 08 | 02 |

EW **UNIVERSITY AVE W** **BTWN** **Albert & Hemlock**

**Total Collisions for Location = 2 collisions** GEO ID ***9073***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-09-17 | 12 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2013-11-23 | 12 | 03 | 05 | 01 | 34 | 99 | 99 | 01 | 99 | 01 | | 03 | 03 | 99 | 03 |

EW **UNIVERSITY AVE** **AT** N **Hemlock St**

**Total Collisions for Location = 5 collisions** GEO ID ***258***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-11-23 | 11 | 03 | 06 | 01 | 14 | 04 | 01 | 01 | 10 | 03 | | 03 | 03 | 03 | 03 |
| 2013-12-02 | 9 | 01 | 02 | 04 | 14 | 09 | 01 | 03 | 10 | 02 | | 04 | 04 | 04 | 03 |
| 2014-02-05 | 12 | 03 | 03 | 05 | 14 | 99 | 01 | 02 | 10 | 03 | | 03 | 03 | 03 | 03 |
| 2015-09-29 | 09:20 | 01 | 02 | 01 | 01 | 10 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-07-13 | 12:15 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |

EW **UNIVERSITY AVE W** **BTWN** **Hemlock & E to Signals (Lazaridis School/WLU)**

**Total Collisions for Location = 2 collisions** GEO ID ***35157***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016-01-08 | 18:29 | 02 | 02 | 01 | 05 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2016-10-06 | 22:00 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 02 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| EW **UNIVERSITY AVE** | | | | **AT** | | N **Lazaridis School/WLU** | | | | | | | | | |
| **Total Collisions for Location = 9 collisions** | | | | | | | | | | | | | | **GEO ID** | ***28356*** |
| 2014-01-21 | 10 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 02 |
| 2014-10-28 | 11 | 01 | 01 | 01 | 05 | 02 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 03 |
| 2015-01-07 | 02:15 | 03 | 06 | 01 | 01 | 04 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-02-14 | 12:51 | 03 | 03 | 01 | 31 | 04 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-06-08 | 17:16 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2016-08-03 | 07:41 | 01 | 01 | 02 | 01 | 02 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2016-09-25 | 01:00 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-12-06 | 17:20 | 03 | 02 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | REF 64 | 03 | 03 | 03 | 03 |
| 2017-01-10 | 14:30 | 03 | 03 | 17 | 01 | 04 | 01 | 02 | 10 | 02 | 70 | 03 | 03 | 03 | 03 |
| EW **UNIVERSITY AVE W** | | | | **BTWN** | | **Hazel & W to Signals (Lazaridis School/WLU)** | | | | | | | | | |
| **Total Collisions for Location = 6 collisions** | | | | | | | | | | | | | | **GEO ID** | ***9078*** |
| 2016-05-13 | 11:30 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 04 | 75 | 04 | 04 | 03 | 03 |
| 2016-06-11 | 21:08 | 01 | 01 | 02 | 01 | 09 | 01 | 03 | 01 | 01 | UK | 04 | 04 | 99 | 03 |
| 2016-10-28 | 20:46 | 01 | 01 | 04 | 01 | 02 | 01 | 02 | 02 | 02 | | 04 | 04 | 03 | 02 |
| 2016-11-06 | 02:25 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 04 | 03 |
| 2016-12-14 | 17:52 | 03 | 03 | 34 | 01 | 06 | 01 | 04 | 01 | 04 | 75 | 04 | 03 | 05 | 02 |
| 2017-07-18 | 17:30 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 01 | | 04 | 04 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| EW **UNIVERSITY AVE** | | | | **AT** | | | | | | NS **Hazel St/WLU Mid Campus (75 University Ave)** | | | | | |
| **Total Collisions for Location = 53 collisions** | | | | | | | | | | | | | | **GEO ID** | ***358*** |
| 2013-02-11 | 20 | 04 | 06 | 01 | 01 | 04 | 01 | 02 | 04 | 03 | | 03 | 01 | 05 | 03 |
| 2013-04-03 | 9 | 03 | 03 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2013-06-19 | 17 | 01 | 01 | 05 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2013-07-17 | 21 | 01 | 01 | 01 | | 08 | | 04 | | 03 | | 02 | | 08 | 02 |
| 2013-10-04 | 17 | 02 | 02 | 01 | 04 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2013-10-21 | 19 | 02 | 02 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 02 |
| 2013-11-13 | 8 | 01 | 06 | 01 | 01 | 04 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2014-02-05 | 10 | 03 | 03 | 01 | 14 | 12 | 01 | 07 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2014-02-11 | 23 | 01 | 02 | 04 | | 10 | | 01 | | 02 | | 02 | | 07 | 03 |
| 2014-02-13 | 17 | 01 | 02 | 05 | 01 | 04 | 01 | 01 | 01 | 02 | | 04 | 04 | 03 | 03 |
| 2014-04-16 | 12 | 01 | 01 | 01 | 04 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2014-07-02 | 19 | 01 | 01 | 36 | 01 | 99 | 01 | 01 | 05 | 03 | | 02 | 04 | 05 | 02 |
| 2014-10-08 | 8 | 01 | 01 | 06 | 14 | 99 | 01 | 03 | 10 | 02 | | 04 | 04 | 04 | 03 |
| 2014-10-28 | 14 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2014-11-03 | 18 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 02 | 02 | | 04 | 04 | 03 | 03 |
| 2014-11-05 | 16 | 01 | 01 | 05 | 01 | 02 | 01 | 02 | 02 | 02 | | 04 | 04 | 03 | 03 |
| 2015-02-10 | 17:02 | 01 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 03 |
| 2015-02-11 | 13:10 | 03 | 03 | 01 | 05 | 10 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-03-12 | 13:28 | 01 | 01 | 06 | 14 | 09 | 01 | 01 | 10 | 02 | | 04 | 04 | 04 | 03 |
| 2015-04-10 | 00:43 | 01 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 03 |
| 2015-06-25 | 12:05 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 02 | | 03 | 03 | 04 | 03 |
| 2015-07-23 | 13:17 | 01 | 01 | 08 | 14 | 09 | 01 | 07 | 10 | 02 | | 04 | 04 | 04 | 04 |
| 2015-10-31 | 23:15 | 02 | 02 | 01 | 01 | 04 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2015-12-18 | 22:09 | 03 | 06 | 01 | 01 | 04 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-01-10 | 16:00 | 03 | 04 | 01 | 01 | 04 | 01 | 02 | 10 | 03 | | 03 | 03 | 03 | 03 |
| 2016-01-10 | 16:50 | 03 | 05 | 01 | 04 | 04 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-01-18 | 09:58 | 03 | 05 | 01 | 04 | 10 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-02-02 | 12:11 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2016-02-11 | 16:52 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-02-17 | 19:30 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-05-07 | 20:10 | 01 | 01 | 01 | 01 | | 01 | 09 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2016-06-03 | 19:58 | 01 | 01 | 01 | 05 | 12 | 01 | 07 | 01 | 02 | | 04 | 04 | 04 | 03 |
| 2016-07-15 | 12:25 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2016-08-17 | 17:15 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-09-02 | 21:20 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 10 | 03 | | 01 | 02 | 05 | 03 |
| 2016-09-04 | 20:50 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | UK | 04 | 04 | 03 | 03 |
| 2016-11-21 | 15:52 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2017-01-09 | 11:33 | 03 | 06 | 14 | 01 | 10 | 01 | 01 | 02 | 02 | | 03 | 03 | 03 | 02 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2017-01-25 | 18:18 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 03 |
| 2017-01-26 | 21:00 | 03 | 03 | 01 | 05 | 04 | 01 | 02 | 02 | 03 | | 03 | 03 | 03 | 03 |
| 2017-03-14 | 18:15 | 01 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2017-03-16 | 21:34 | 01 | 01 | 01 | | 06 | | 04 | | 03 | REF 75 | 01 | | 08 | 02 |
| 2017-04-15 | 13:06 | 01 | 02 | 01 | | 04 | | 04 | | 02 | | 02 | | 07 | 03 |
| 2017-06-16 | 08:15 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-06-26 | 14:42 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 04 | 03 | | 04 | 02 | 05 | 02 |
| 2017-07-19 | 12:26 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2017-08-20 | 13:32 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 02 | 02 | | 04 | 04 | 03 | 02 |
| 2017-09-24 | 13:59 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2017-09-29 | 23:37 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 02 |
| 2017-10-21 | 13:36 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2017-11-05 | 19:00 | 01 | 02 | 01 | 01 | 06 | 01 | 05 | 01 | 02 | | 04 | 04 | 05 | 04 |
| 2017-11-15 | 18:57 | 02 | 02 | 01 | 01 | 04 | 01 | 02 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2017-12-21 | 11:00 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |

EW **UNIVERSITY AVE W** **BTWN** **Hazel & Maple**

**Total Collisions for Location = 8 collisions** **GEO ID** ***9076***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-09-18 | 20 | 01 | 01 | 05 | 14 | 09 | 01 | 01 | 10 | 01 | | 04 | 04 | 04 | 04 |
| 2013-11-29 | 12 | 01 | 01 | 04 | 01 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2014-02-27 | 11 | 01 | 02 | 06 | 04 | 02 | 01 | 01 | 10 | 01 | | 04 | 04 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-02-27 | 17:30 | 01 | 02 | 05 | 14 | 09 | 01 | 03 | 10 | 01 | | 03 | 03 | 04 | 03 |
| 2015-06-28 | 11:05 | 02 | 02 | 01 | 01 | 04 | 01 | 02 | 10 | 04 | REF 34 | 03 | 03 | 03 | 03 |
| 2015-12-02 | 08:56 | 01 | 01 | | 14 | | 01 | | 10 | 01 | | 04 | 04 | 04 | 04 |
| 2017-01-31 | 14:30 | 01 | 01 | 01 | 04 | 06 | 01 | 04 | 10 | 04 | 28 | 02 | 01 | 05 | 03 |
| 2017-07-15 | 14:00 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 06 | 04 | 34 | 04 | 04 | 99 | 03 |

EW **UNIVERSITY AVE W** **BTWN** **KING & Maple**

**Total Collisions for Location = 9 collisions** **GEO ID** ***8996***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-01-22 | 19 | 03 | 03 | 01 | 04 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 04 | 03 |
| 2014-01-12 | 14 | 01 | 02 | 14 | 01 | 99 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 02 |
| 2015-02-09 | 16:33 | 01 | 04 | 01 | 01 | 02 | 01 | 02 | 10 | 01 | | 03 | 03 | 03 | 03 |
| 2015-05-29 | 21:50 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 247 KING | 02 | 04 | 05 | 03 |
| 2015-09-08 | 21:34 | 01 | 01 | 01 | 02 | 08 | 01 | 01 | 01 | 04 | | 02 | 04 | 02 | 03 |
| 2016-01-31 | 18:05 | 02 | 02 | 01 | 01 | 04 | 01 | 01 | 02 | 01 | | 04 | 04 | 03 | 03 |
| 2016-05-24 | 19:30 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | 247 KING | 03 | 04 | 05 | 03 |
| 2017-03-03 | 20:39 | 01 | 01 | 01 | 01 | 08 | 01 | 13 | 01 | 04 | 247 KING | 03 | 02 | 02 | 04 |
| 2017-06-29 | 13:15 | 02 | 02 | 01 | 01 | 02 | 01 | 02 | 10 | 01 | | 03 | 03 | 03 | 03 |

EW **UNIVERSITY AVE E** **BTWN** **KING & Regina**

**Total Collisions for Location = 5 collisions** **GEO ID** ***221***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-10-21 | 16 | 02 | 02 | 04 | 01 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2015-09-16 | 14:45 | 01 | 01 | 01 | 01 | 12 | 99 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2016-05-15 | 12:40 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 01 | | 04 | 04 | 03 | 03 |
| 2016-09-07 | 17:00 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 03 |
| 2016-12-15 | 12:00 | 03 | 03 | 01 | 01 | 04 | 01 | 01 | 10 | 04 | | 03 | 03 | 03 | 02 |

EW **UNIVERSITY AVE** **AT** NS **Regina St**

**Total Collisions for Location = 41 collisions** **GEO ID** ***374***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-05-30 | 12 | 01 | 01 | 01 | 01 | 99 | 01 | 02 | 10 | 02 | | 01 | 01 | 03 | 02 |
| 2013-07-14 | 17 | 01 | 01 | 05 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2013-09-08 | 23 | 01 | 01 | 01 | 36 | 08 | 99 | 04 | 01 | 03 | | 01 | 02 | 05 | 03 |
| 2013-12-07 | 15 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2013-12-15 | 16 | 03 | 05 | 01 | 01 | 12 | 01 | 04 | 04 | 03 | | 03 | 03 | 03 | 03 |
| 2014-02-12 | 9 | 01 | 01 | 01 | 01 | 07 | 01 | 04 | 01 | 03 | | 01 | 03 | 05 | 02 |
| 2014-03-12 | 22 | 03 | 06 | 01 | 01 | 07 | 01 | 02 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2014-04-04 | 11 | 02 | 02 | 01 | 01 | 07 | 01 | 02 | 02 | 03 | | 03 | 01 | 02 | 03 |
| 2014-04-25 | 16 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 01 | 01 | 03 | 03 |
| 2014-05-17 | 7 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 02 | 03 | 02 | 02 |
| 2014-06-05 | 17 | 01 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 03 |
| 2014-06-12 | 13 | 01 | 01 | 05 | 01 | 08 | 01 | 04 | 01 | 03 | | 03 | 04 | 05 | 03 |
| 2014-07-19 | 13 | 01 | 01 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 01 | 02 | 02 |
| 2014-09-02 | 11 | 01 | 02 | 01 | 04 | 99 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 02 |
| 2014-09-09 | 17 | 01 | 01 | 36 | 01 | 08 | 08 | 01 | 05 | 03 | | 03 | 03 | 05 | 02 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2014-10-21 | 14 | 01 | 02 | 01 | 07 | 07 | 01 | 01 | 01 | 03 | | 03 | 01 | 02 | 02 |
| 2014-11-21 | 7 | 01 | 04 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2015-01-20 | 16:56 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 02 | 02 | | 04 | 04 | 03 | 03 |
| 2015-06-25 | 15:45 | 01 | 01 | 01 | | 01 | | 01 | | 02 | | 04 | | 08 | 02 |
| 2015-08-23 | 15:30 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 03 |
| 2015-10-03 | 16:55 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 04 | 03 | 05 | 02 |
| 2015-11-13 | 20:40 | 02 | 02 | 01 | | 06 | | 04 | | 03 | | 04 | | 08 | 02 |
| 2016-01-18 | 10:21 | 03 | 03 | 01 | 01 | 02 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-02-09 | 15:00 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 03 | | 04 | 04 | 03 | 03 |
| 2016-02-16 | 16:17 | 01 | 02 | 05 | 14 | 12 | 01 | 07 | 10 | 02 | | 04 | 04 | 04 | 03 |
| 2016-04-15 | 14:30 | 01 | 01 | 01 | 01 | 07 | 01 | 02 | 01 | 02 | | 04 | 01 | 02 | 03 |
| 2016-05-15 | 11:25 | 03 | 02 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 02 |
| 2016-07-12 | 15:45 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 02 | 01 | 05 | 03 |
| 2016-12-29 | 19:37 | 03 | 03 | 01 | 01 | 04 | 01 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2016-12-30 | 16:00 | 03 | 03 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2017-01-05 | 17:55 | 01 | 03 | 01 | 01 | 07 | 01 | 02 | 01 | 03 | | 03 | 01 | 02 | 03 |
| 2017-02-03 | 18:49 | 01 | 01 | 01 | | 08 | | 04 | | 03 | | 03 | | 08 | 02 |
| 2017-05-05 | 20:20 | 02 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 03 | | 01 | 01 | 05 | 02 |
| 2017-05-31 | 18:20 | 01 | 01 | 05 | 01 | 06 | 01 | 05 | 01 | 02 | | 01 | 01 | 05 | 03 |
| 2017-07-05 | 19:30 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 01 | 02 | | 04 | 04 | 03 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2017-07-28 | 09:11 | 01 | 01 | 04 | 01 | 07 | 01 | 01 | 01 | 03 | | 03 | 02 | 02 | 03 |
| 2017-08-04 | 04:55 | 01 | 02 | 01 | 01 | 07 | 01 | 01 | 01 | 03 | | 04 | 02 | 02 | 03 |
| 2017-10-01 | 17:24 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 02 | | 04 | 04 | 03 | 02 |
| 2017-10-04 | 18:01 | 01 | 01 | 05 | 01 | 02 | 01 | 01 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-10-23 | 16:15 | 02 | 02 | 01 | 01 | 02 | 12 | 02 | 10 | 02 | | 03 | 03 | 03 | 03 |
| 2017-12-14 | 11:22 | 01 | 02 | | 01 | | 01 | | 10 | 02 | | | 03 | 03 | 02 |

EW **UNIVERSITY AVE E** **BTWN** **Regina & WEBER**

**Total Collisions for Location = 70 collisions** **GEO ID** ***8991***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2013-02-08 | 14 | 03 | 05 | 01 | 01 | 02 | 01 | 01 | 04 | 04 | | 03 | 03 | 03 | 03 |
| 2013-02-14 | 15 | 03 | 02 | 01 | 05 | 06 | 01 | 04 | 01 | 04 | 65 | 01 | 03 | 05 | 03 |
| 2013-02-15 | 18 | 03 | 03 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 04 | 03 |
| 2013-03-21 | 6 | 01 | 99 | 01 | | 10 | | 01 | | 01 | | 04 | | 07 | 03 |
| 2013-03-21 | 8 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 04 | | 03 | 03 | 03 | 02 |
| 2013-04-19 | 14 | 01 | 01 | 01 | 05 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 03 | 03 |
| 2013-05-31 | 14 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 04 | | 03 | 03 | 03 | 03 |
| 2013-07-04 | 16 | 01 | 01 | 01 | 01 | 99 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 03 |
| 2013-08-02 | 17 | 01 | 01 | 01 | 01 | 08 | 01 | 01 | 01 | 04 | 245 Webe | 01 | 03 | 02 | 03 |
| 2013-09-23 | 18 | 01 | 01 | 01 | 01 | 08 | 01 | 01 | 01 | 04 | | 01 | 03 | 02 | 03 |
| 2013-10-29 | 17 | 01 | 01 | 05 | 36 | 08 | 99 | 05 | 01 | 04 | | 03 | 03 | 05 | 02 |
| 2013-11-25 | 17 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | | 01 | 03 | 05 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2013-12-01 | 9 | 03 | 02 | 01 | 01 | 01 | 08 | 01 | 01 | 04 | 68 | 03 | 02 | 02 | 02 |
| 2013-12-18 | 23 | 01 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | | 01 | 03 | 05 | 03 |
| 2014-01-07 | 16 | 01 | 05 | 01 | 01 | 04 | 01 | 02 | 10 | 04 | | 04 | 04 | 03 | 03 |
| 2014-02-03 | 10 | 01 | 02 | 01 | 01 | 02 | 01 | 01 | 10 | 04 | | 04 | 04 | 03 | 03 |
| 2014-02-06 | 12 | 01 | 01 | 04 | 01 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 04 | 03 |
| 2014-02-18 | 15 | 01 | 02 | 06 | 04 | 08 | 01 | 05 | 01 | 04 | 35 | 01 | 03 | 05 | 03 |
| 2014-03-11 | 16 | 01 | 01 | 01 | 01 | 08 | 01 | 05 | 01 | 04 | 245 | 01 | 03 | 05 | 03 |
| 2014-04-04 | 16 | 02 | 02 | 01 | 01 | 02 | 01 | 01 | 02 | 01 | | 03 | 03 | 03 | 03 |
| 2014-04-08 | 12 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 35 | 01 | 03 | 05 | 03 |
| 2014-05-06 | 19 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | | 04 | 04 | 05 | 03 |
| 2014-05-14 | 10 | 99 | 99 | 01 | 05 | 02 | 01 | 01 | 10 | 04 | 60 | 04 | 04 | 03 | 02 |
| 2014-06-10 | 18 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 50 | 01 | 04 | 05 | 03 |
| 2014-06-28 | 8 | 01 | 01 | 01 | 01 | 99 | 99 | 04 | 01 | 04 | | 04 | 04 | 05 | 03 |
| 2014-08-25 | 7 | 01 | 01 | 01 | 06 | 08 | 01 | 05 | 01 | 04 | | 01 | 03 | 05 | 03 |
| 2014-09-22 | 16 | 01 | 01 | 01 | 14 | 09 | 01 | 07 | 10 | 01 | | 03 | 03 | 03 | 03 |
| 2014-10-07 | 9 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 04 | 65 | 04 | 04 | 04 | 03 |
| 2014-10-18 | 22 | 01 | 01 | 01 | 01 | 10 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 02 |
| 2014-12-05 | 15 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 01 | | 04 | 04 | 03 | 03 |
| 2015-04-20 | 17:54 | 01 | 01 | 36 | 01 | 12 | 01 | 07 | 01 | 01 | REF 60 | 04 | 04 | 04 | 02 |
| 2015-04-23 | 11:15 | 01 | 01 | 05 | 01 | 99 | 01 | 09 | 01 | 04 | 25 | 03 | 01 | 99 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2015-06-30 | 13:30 | 02 | 02 | 05 | 01 | 08 | 01 | 04 | 01 | 04 | | 01 | 04 | 05 | 03 |
| 2015-08-18 | 09:00 | 01 | 01 | 01 | 36 | 06 | 99 | 05 | 01 | 04 | 33 | 01 | 04 | 05 | 02 |
| 2015-09-15 | 06:03 | 01 | 01 | 01 | 04 | 08 | 01 | 05 | 01 | 04 | 65 | 01 | 03 | 05 | 02 |
| 2015-09-18 | 15:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2015-09-18 | 13:55 | 01 | 01 | 01 | 01 | 08 | 01 | 05 | 01 | 04 | 65 | 01 | 03 | 05 | 03 |
| 2015-10-02 | 13:15 | 01 | 01 | 01 | 04 | 06 | 01 | 05 | 01 | 04 | | 01 | 03 | 05 | 03 |
| 2015-11-08 | 20:50 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 02 | 01 | | 03 | 03 | 03 | 03 |
| 2015-11-14 | 14:30 | 01 | 01 | 01 | 05 | 06 | 01 | 05 | 01 | 04 | 245 WEB | 01 | 03 | 05 | 03 |
| 2015-12-01 | 17:59 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2016-01-03 | 15:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2016-01-29 | 18:00 | 01 | 01 | 01 | 01 | 02 | 01 | 02 | 10 | 04 | 35 | 03 | 03 | 03 | 04 |
| 2016-02-02 | 16:30 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2016-03-02 | 10:43 | 01 | 02 | 01 | 01 | 10 | 01 | 01 | 10 | 01 | | 04 | 04 | 03 | 02 |
| 2016-03-18 | 14:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2016-04-06 | 08:02 | 03 | 05 | 08 | 01 | 02 | 01 | 02 | 02 | 04 | 35 | 03 | 03 | 03 | 03 |
| 2016-05-17 | 12:45 | 01 | 01 | 01 | 05 | 06 | 01 | 04 | 01 | 04 | | 03 | 03 | 05 | 03 |
| 2016-06-23 | 08:20 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 04 | 04 | 65 | 01 | 04 | 05 | 03 |
| 2016-09-06 | 15:00 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | REF 65 | 01 | 03 | 05 | 03 |
| 2016-09-17 | 09:50 | 01 | 02 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | 65 | 04 | 03 | 05 | 03 |
| 2016-11-03 | 14:30 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 04 | 04 | 04 | 03 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |
| 2016-12-01 | 17:42 | 02 | 02 | 36 | 05 | 08 | 01 | 01 | 05 | 04 | 60 | 03 | 04 | 05 | 03 |
| 2016-12-08 | 21:09 | 03 | 03 | 01 | 01 | 12 | 01 | 01 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2017-01-17 | 11:49 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 68 | 02 | 03 | 05 | 03 |
| 2017-02-01 | 15:28 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 01 | 66 | 04 | 04 | 03 | 03 |
| 2017-03-14 | 17:30 | 01 | 01 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 65 | 01 | 03 | 05 | 03 |
| 2017-05-16 | 18:14 | 01 | 01 | 05 | 01 | 06 | 01 | 04 | 01 | 01 | | 04 | 04 | 05 | 03 |
| 2017-05-31 | 08:27 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | 65 | 04 | 03 | 05 | 03 |
| 2017-07-10 | 19:30 | 01 | 01 | 01 | 02 | 08 | 01 | 05 | 01 | 01 | 68 | 04 | 04 | 07 | 02 |
| 2017-08-18 | 17:48 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 04 | 65 | 04 | 04 | 03 | 03 |
| 2017-08-22 | 09:55 | 01 | 01 | 01 | 01 | 08 | 01 | 01 | 01 | 04 | 65 | 01 | 03 | 02 | 03 |
| 2017-08-25 | 16:30 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 04 | 65 | 03 | 03 | 03 | 03 |
| 2017-09-11 | 13:20 | 01 | 01 | 01 | 01 | 02 | 01 | 01 | 10 | 01 | | 03 | 03 | 03 | 02 |
| 2017-09-24 | 19:40 | 01 | 01 | 01 | 01 | 12 | 01 | 07 | 01 | 01 | | 03 | 03 | 04 | 03 |
| 2017-10-10 | 17:47 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | 65 | 04 | 03 | 05 | 03 |
| 2017-11-02 | 11:00 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 33 | 02 | 04 | 05 | 03 |
| 2017-11-16 | 12:53 | 02 | 02 | 01 | 01 | 08 | 01 | 04 | 01 | 04 | 245 WEB | 04 | 04 | 05 | 03 |
| 2017-12-21 | 18:00 | 01 | 01 | 01 | 01 | 06 | 01 | 06 | 02 | 01 | 62 | 04 | 04 | 99 | 02 |
| 2017-12-29 | 17:29 | 01 | 01 | 01 | 01 | 06 | 01 | 04 | 01 | 04 | 68 | 02 | 04 | 05 | 02 |

| Date | Time | Environment Condition | Road Surface Condition | Vehicle Type | | Driver Action | | Vehicle Manoeuver | | Accident | | Direction of Travel | | Impact Type | Classification of Accident |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *Vehicle One* | *Vehicle Two* | *Driver One* | *Driver Two* | *Vehicle One* | *Vehicle Two* | *Location* | *Address No.* | *Vehicle One* | *Vehicle Two* | | |

## *LEGEND*

***Environment Condition*** *1-clear, 2-rain, 3-snow, 4-freezing rain, 5-drifting snow, 6-strong wind, 7-fog, mist, smoke, dust, 99-other*

***Road Surface Condition:*** *1-dry, 2-wet, 3-loose snow, 4-slush, 5-packed snow, 6-ice, 7-mud, 8-loose sand or gravel, 9-spilled liquid, 99-other*

***Vehicle Type:*** *1-automobile, 2-motorcycle, 3-moped, 4-passenger van (SUV), 5-pickup truck, 6-delivery van, 7-tow truck, 8-truck(open), 9-truck(closed), 10-truck(tank), 11-truck(dump), 12-truck(car carrier), 13-truck(tractor), 14-municipal transit bus, 15-intercity bus, 16-bus(other), 17-school bus, 18-school van, 19-other school vehicle/bus, 20-motor home, 21-off-road(2 wheels), 22-off-road(3 wheels), 23-off-road(4 wheels), 24-off-road(other), 25-motorized snow vehicle, 26-farm tractor, 27-other farm vehicle, 28-construction equipment, 29-railway train, 30-street car, 31-snow plow, 32-ambulance, 33-fire vehicle, 34-police vehicle, 35-other emergency vehicle, 36-bicycle, 37-buggy(horse), 00-unknown, 98-truck(other), 99-other*

***Driver Action:*** *1-driving properly, 2-following too close, 3-exceeding speed limit, 4-speed too fast for condition, 5-speed too slow, 6-improper turn, 7-disobeyed traffic control 8-failed to yield right-of-way, 9-improper passing, 10-lost control, 11-wrong way on one-way road, 12-improper lane change, 13-evasive action 99-other*

***Vehicle Manoeuver:*** *1-going ahead, 2-slowing or stopping, 3-overtaking, 4-turning left, 5-turning right, 6-making "U" turn, 7-changing lanes, 8-merging, 9-reversing, 10-stopped, 11-parked 12-disabled, 13-pulling away from shoulder or curb, 14-pulling onto shoulder or toward curb, 00-unknown, 99-other*

***Accident Location:*** *1-non-intersection, 2-intersection related, 3-at intersection, 4-at/near private drive, 5-at railway crossing, 6-underpass or tunnel, 7-overpass or bridge, 98-other*

***Accident Address No.:*** *Municipal Address - Only used if Accident Location is equal to 4-at private drive (if known)*

***Direction of Travel:*** *1-North, 2-South, 3-East, 4-West*

***Impact Type:*** *1-approaching, 2-angle, 3-rear end, 4-sideswipe, 5-turning movement, 6-SMV*/animal, 7-SMV*/fixed object, 8-SMV*pedestrian, 99-other*

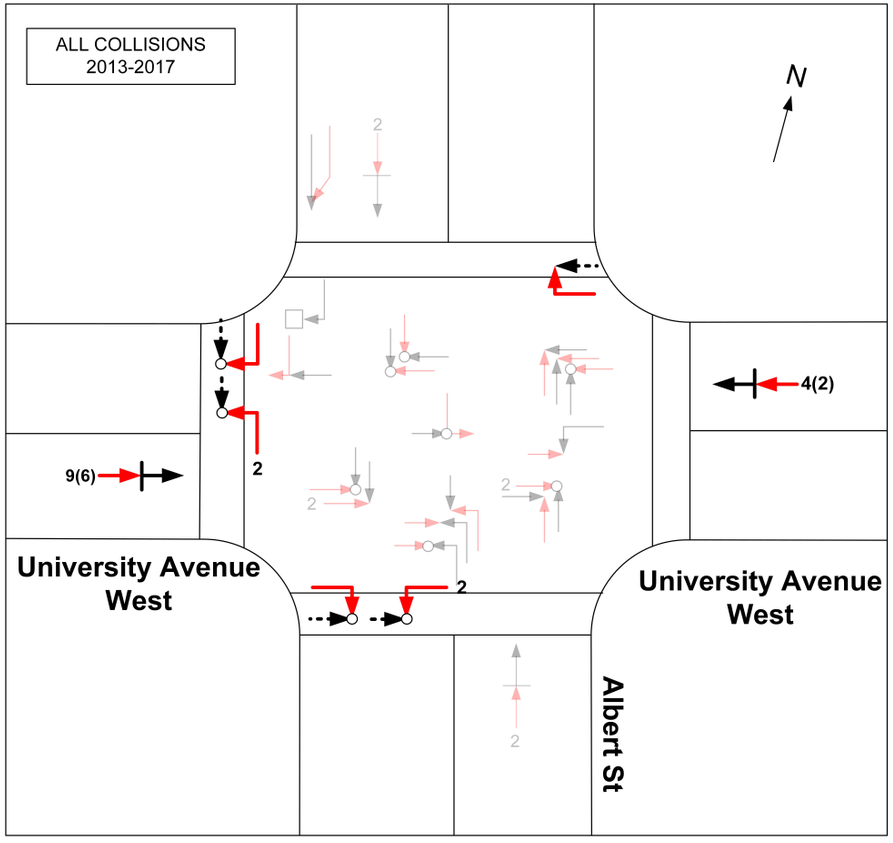
***Classification of Accident:*** *1-fatal injury, 2-non-fatal injury, 3-property damage only, 4-non-reportable, 99-other*

**SMV = Single Motor Vehicle*

# Appendix D

## Collision Diagrams & Detailed Findings from Collision Data Review and Field Investigations

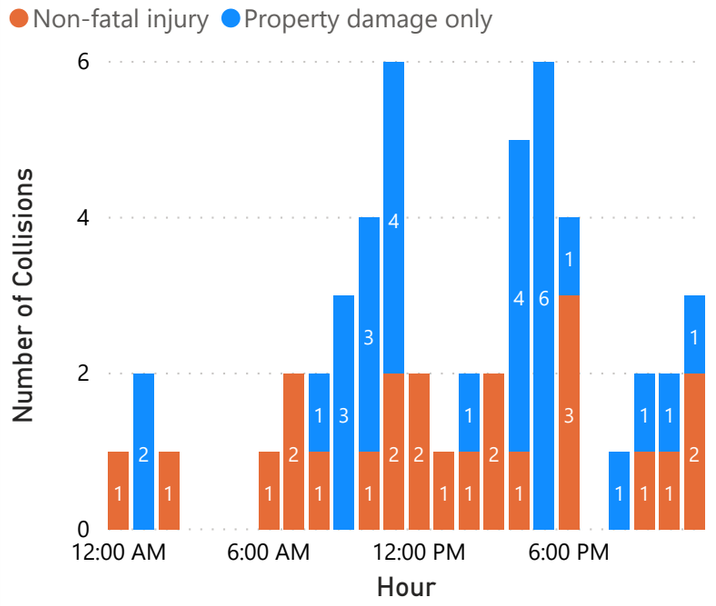
# Albert St at University Ave



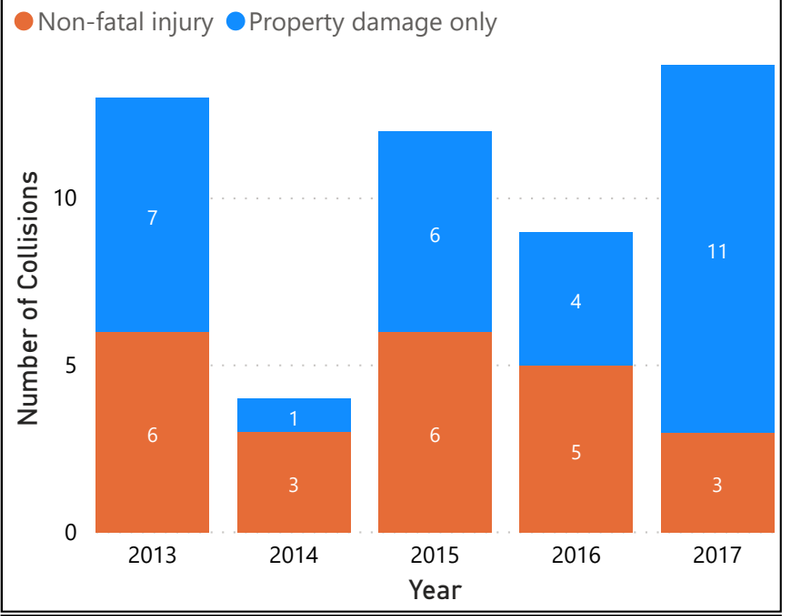

## Legend

Approaching
Angle
Rear End
Sideswipe
Turning
Pedestrian
Fixed Object
Cyclist
Injury
Fatal
At Fault
xx (xx): PDO (Injury)

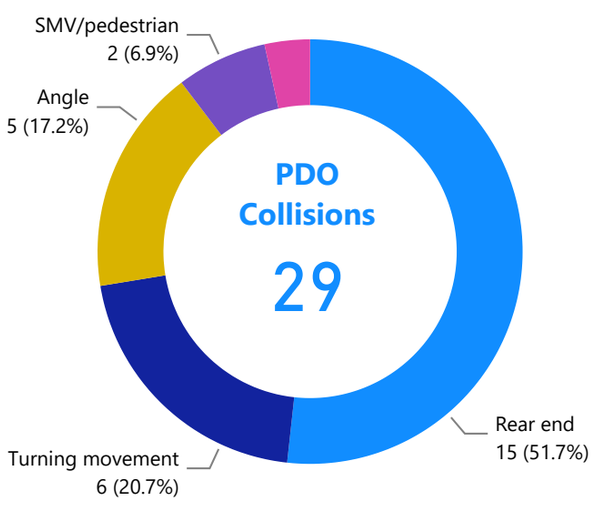
## Number of Collisions by Time of Day



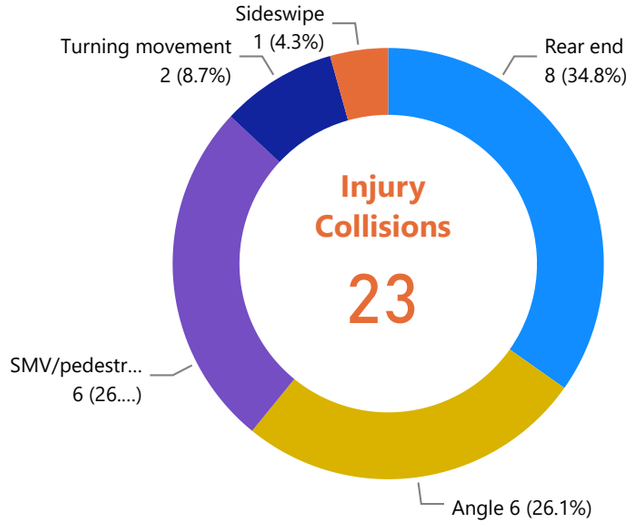

## Number of Collisions by Year



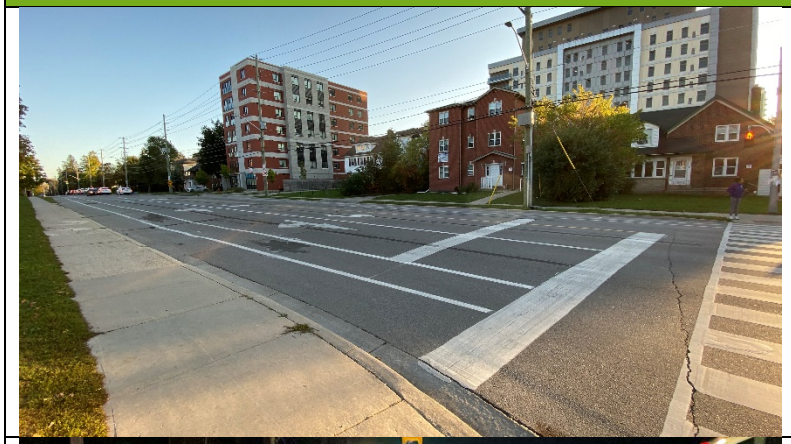

## Number of PDO Collisions by Collision Impact Type



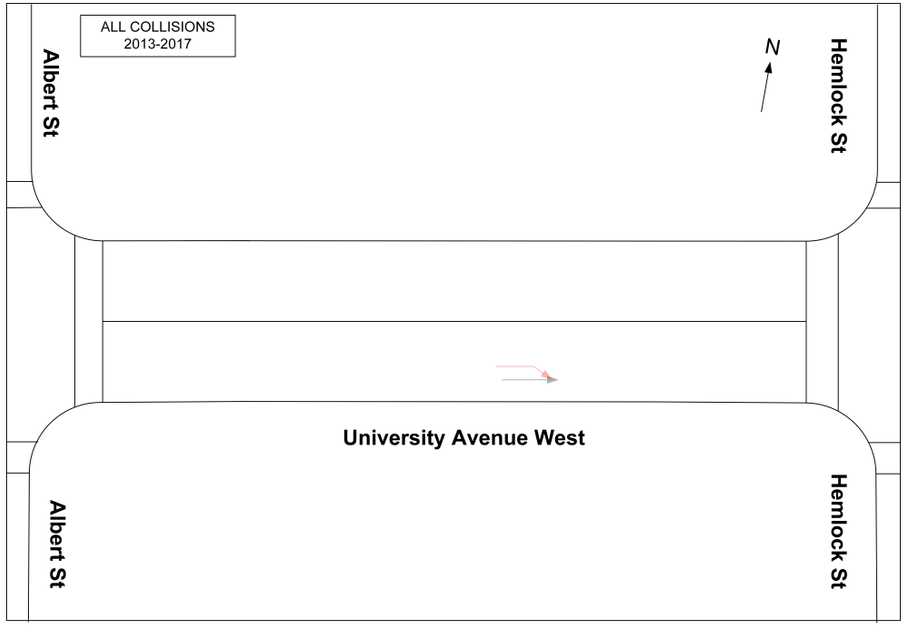

## Number of Injury Collisions by Collision Impact Type



## Field Investigation – Albert Street at University Avenue West

| Photo | Description |
|---|---|
|  | Bike lane from Separated Cycling Network Project had been partially implemented, while the previous stop bar on the north approach was not yet removed |
| | E-bike rides with pedestrian |

# University Ave btwn Albert & Hemlock

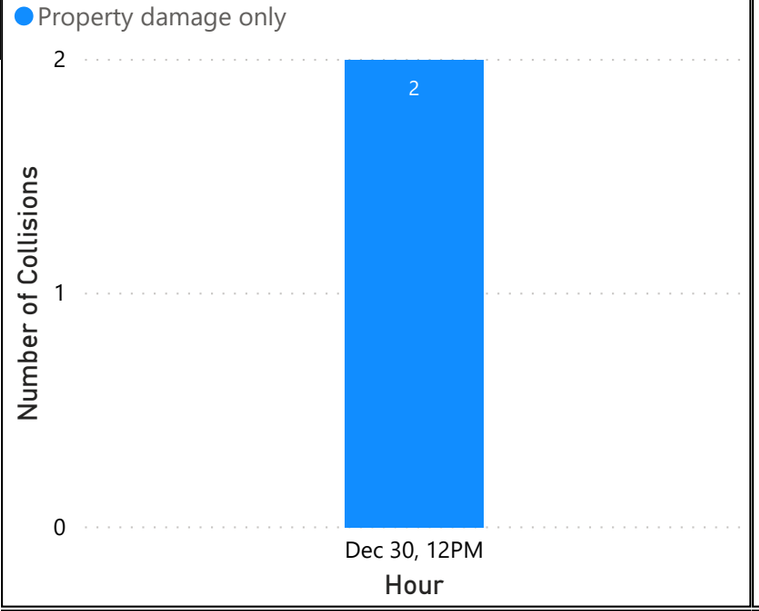



**Legend**

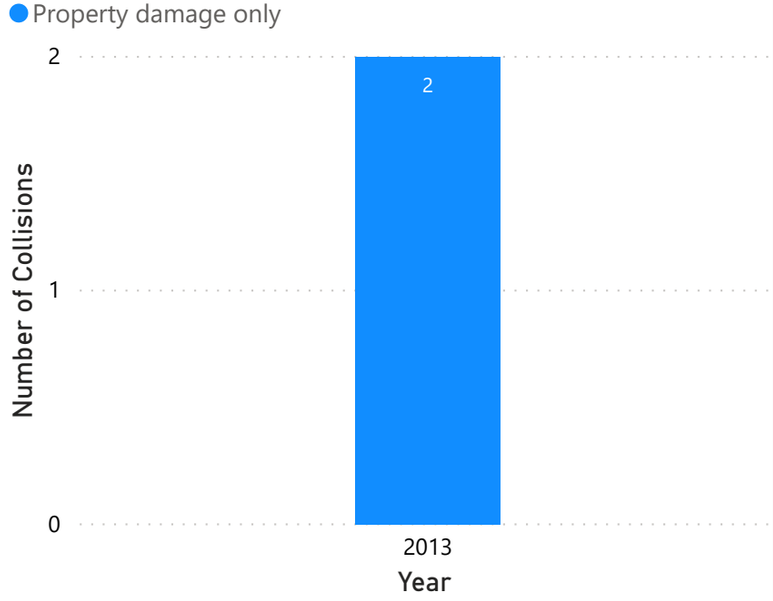
| | | | | | |
|---|---|---|---|---|---|
| Approaching | Turning | Sideswipe | Injury | | |
| Angle | Pedestrian | Cyclist | Fatal | | |
| Rear End | Fixed Object | Unknown Movement | Assumed At Fault | | |

xx (xx): PDO (Injury)

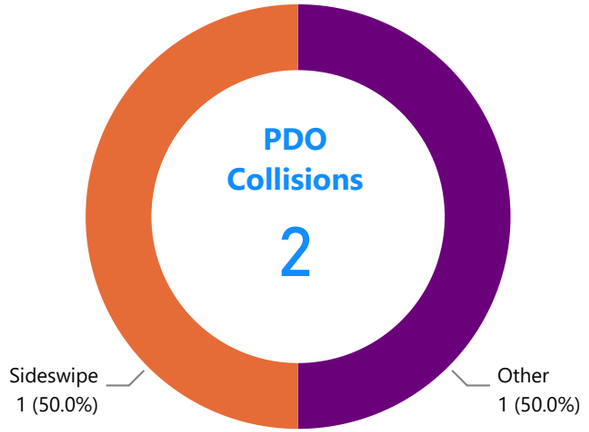
## Number of Collisions by Time of Day




## Number of Collisions by Year




## Number of PDO Collisions by Collision Impact Type

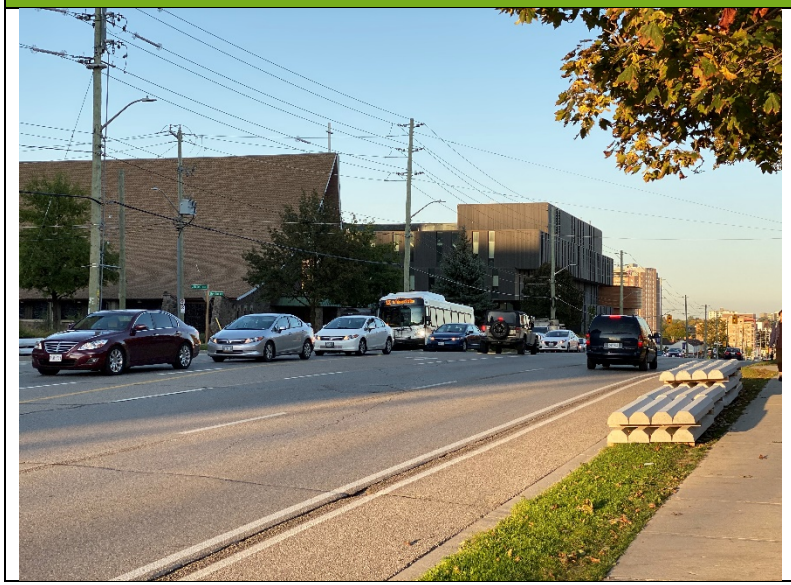



## Number of Injury Collisions by Collision Impact Type

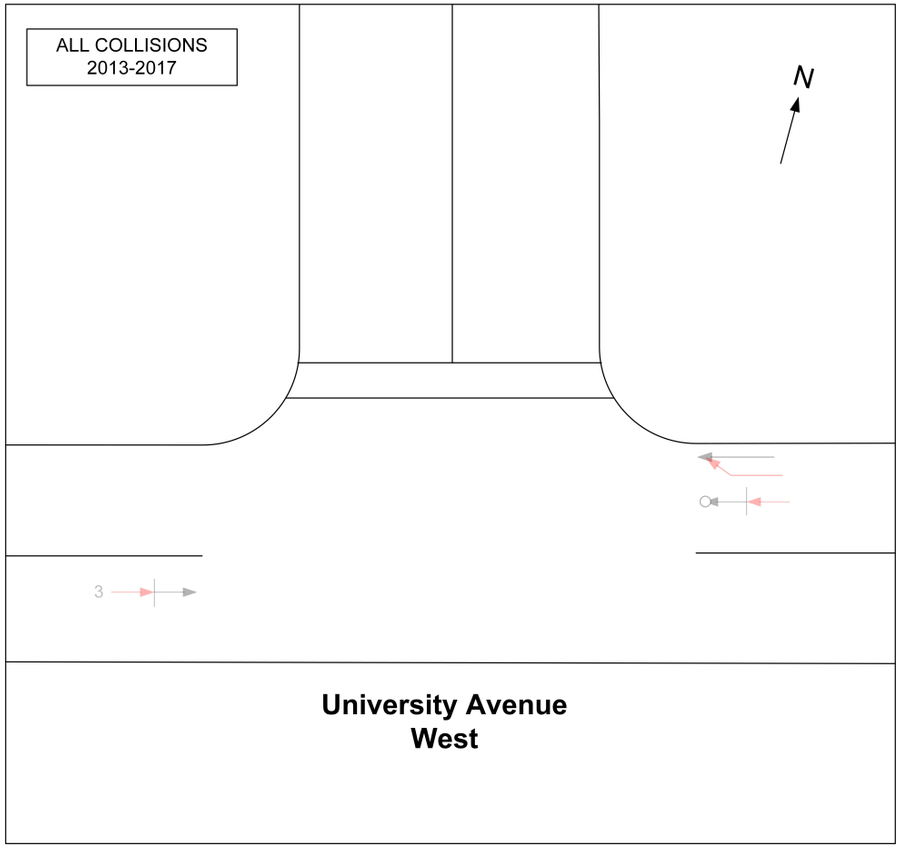
Injury Collisions

(Blank)

## Field Investigation – University Avenue West between Albert Street and Hemlock Street

| Photo | Description |
| --- | --- |
|  | Uphill grade might affect driver's sightline and stopping distance when approaching Albert Street |

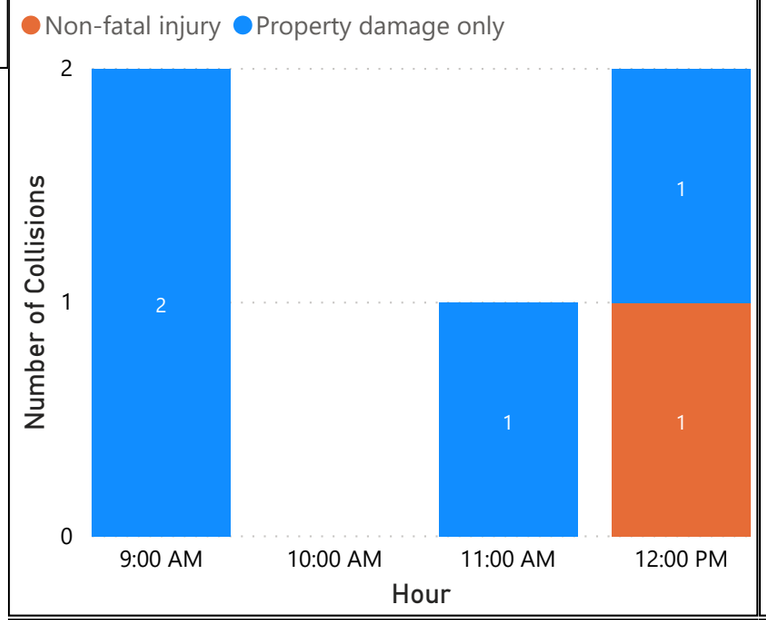
# Hemlock St at University Ave



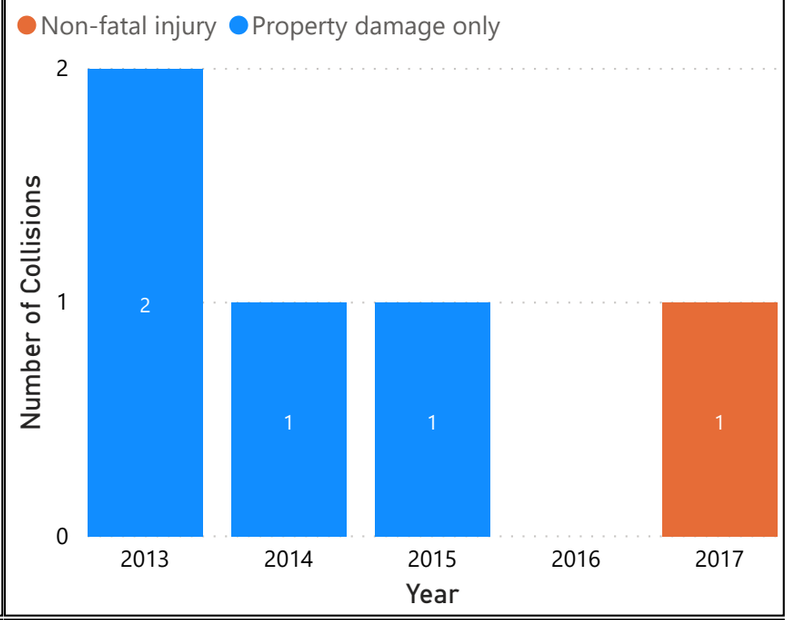

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

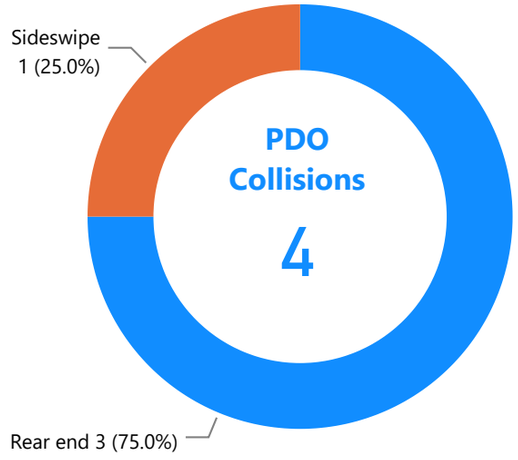
## Number of Collisions by Time of Day




## Number of Collisions by Year

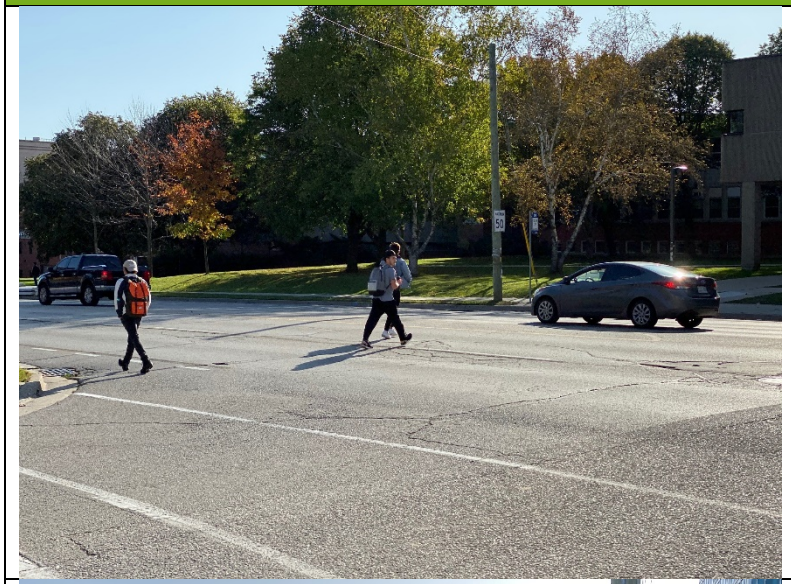
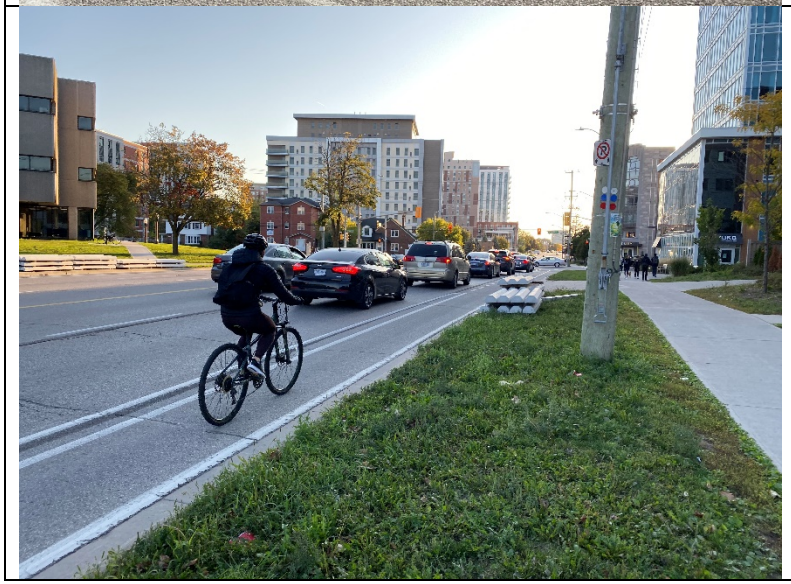



## Number of PDO Collisions by Collision Impact Type

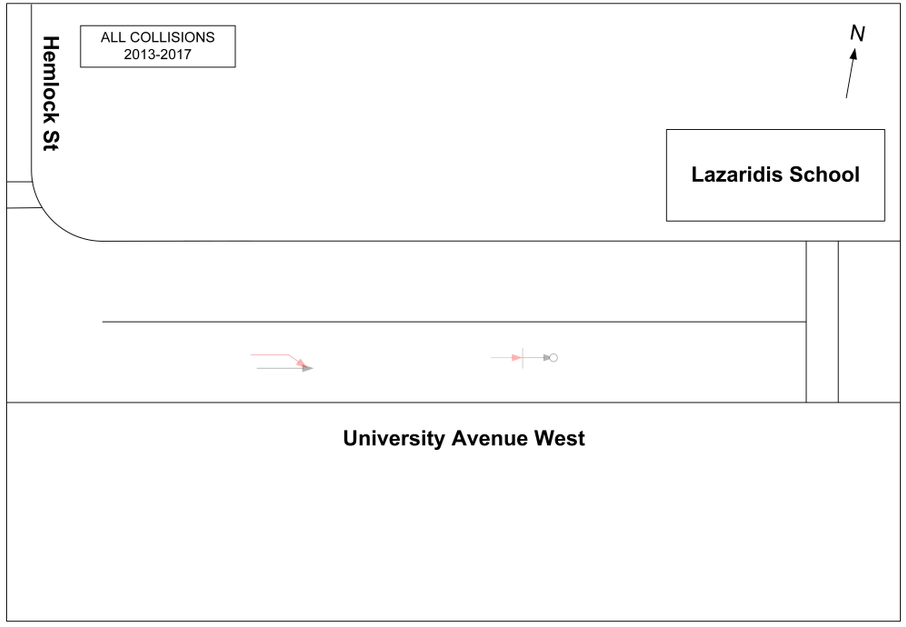


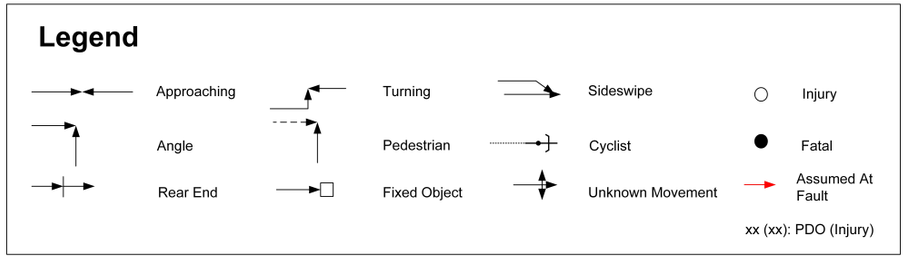

## Number of Injury Collisions by Collision Impact Type

## Field Investigation – Hemlock Street at University Avenue West

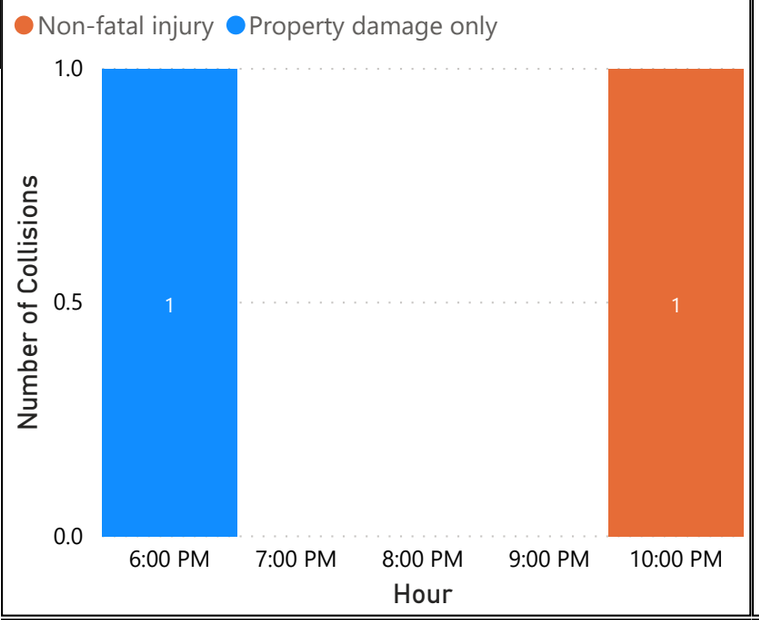
| Photo | Description |
|---|---|
|  | Pedestrians crossing University Avenue West at this unsignalized intersection during the day time |
|  | Cyclist was riding with the traffic using the bike lane |

# University Ave btwn Hemlock & E to Signals

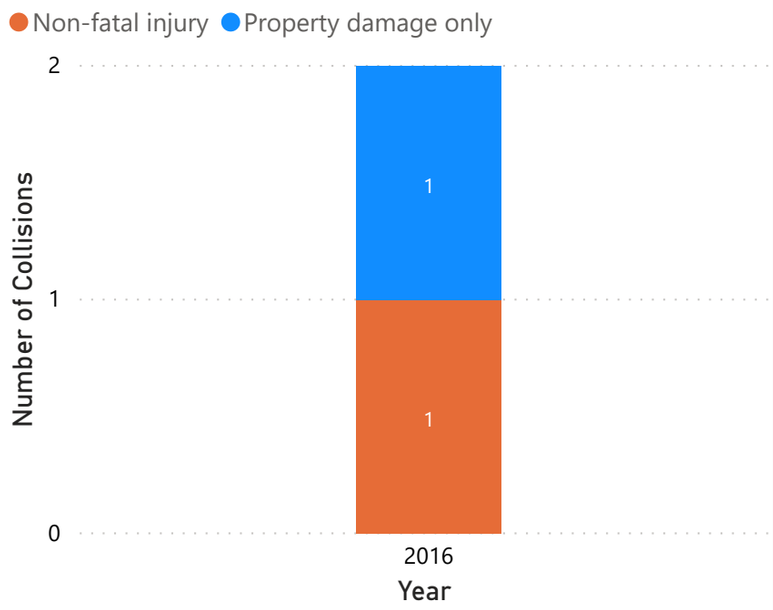


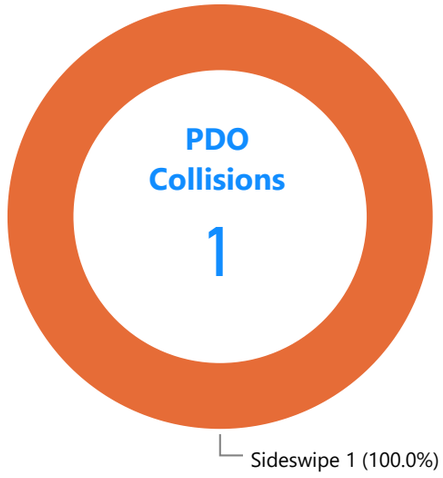

## Number of Collisions by Time of Day




## Number of Collisions by Year




## Number of PDO Collisions by Collision Impact Type

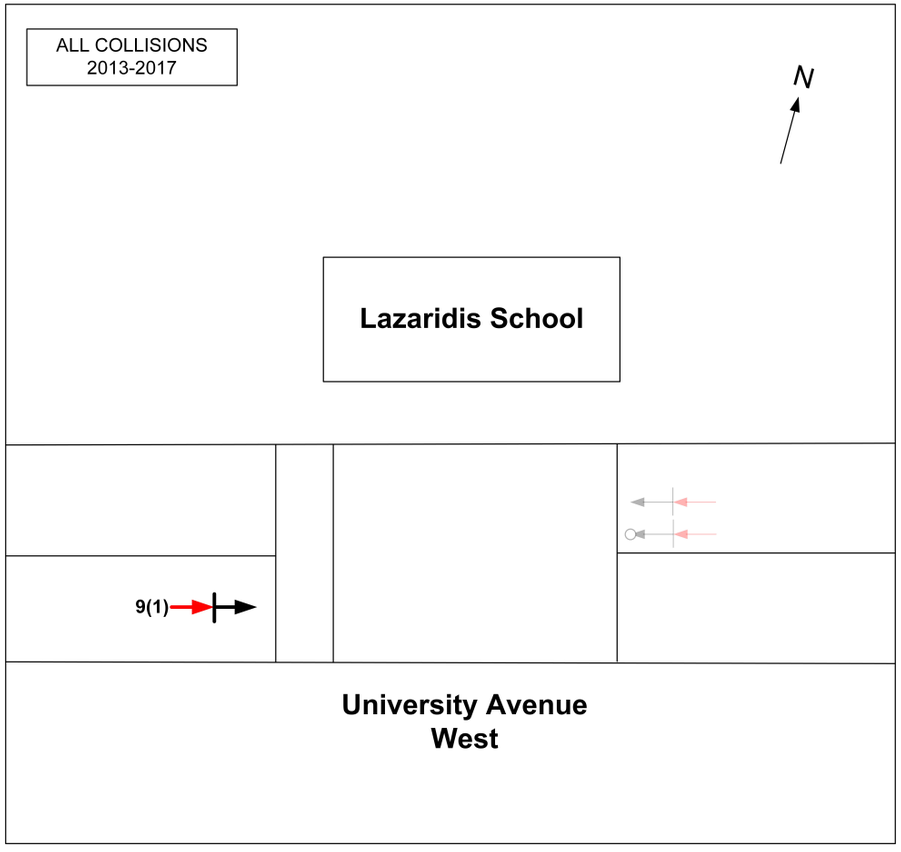



## Number of Injury Collisions by Collision Impact Type

## Field Investigation – University Avenue West between Hemlock Street and Midblock Pedestrian Signal (MPS)

| Photo | Description |
|---|---|
| | Uphill grade might affect driver's sightline and stopping distance when approaching the Midblock Pedestrian Signal west of Hazel Street |

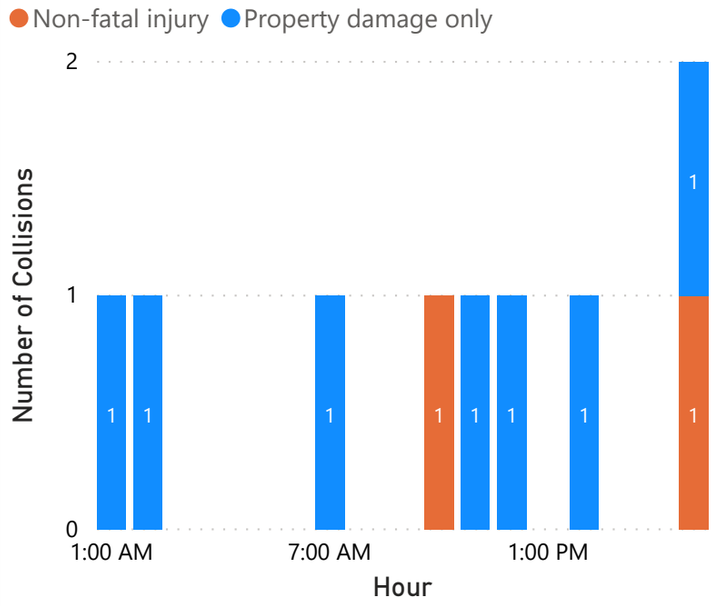
# University Ave & Lazaridis School/WLU



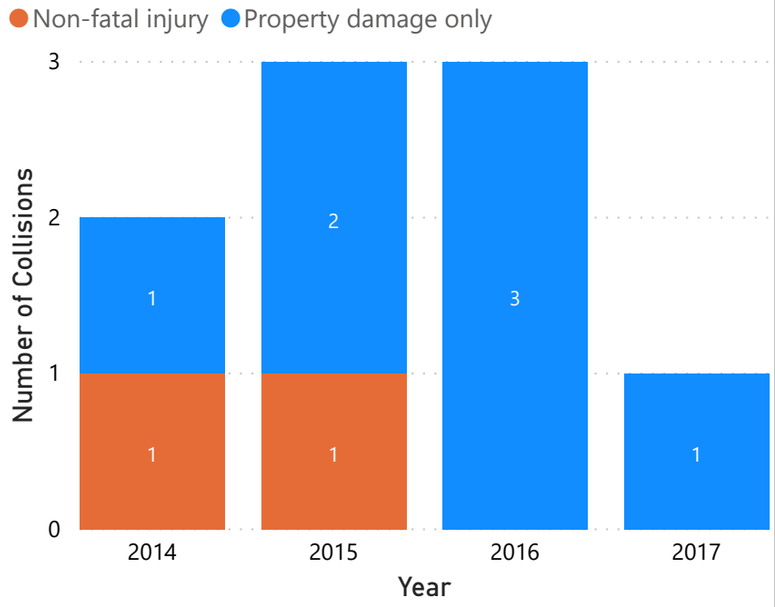

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

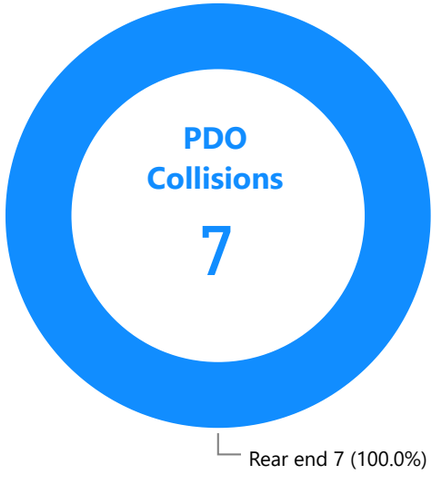
## Number of Collisions by Time of Day




## Number of Collisions by Year

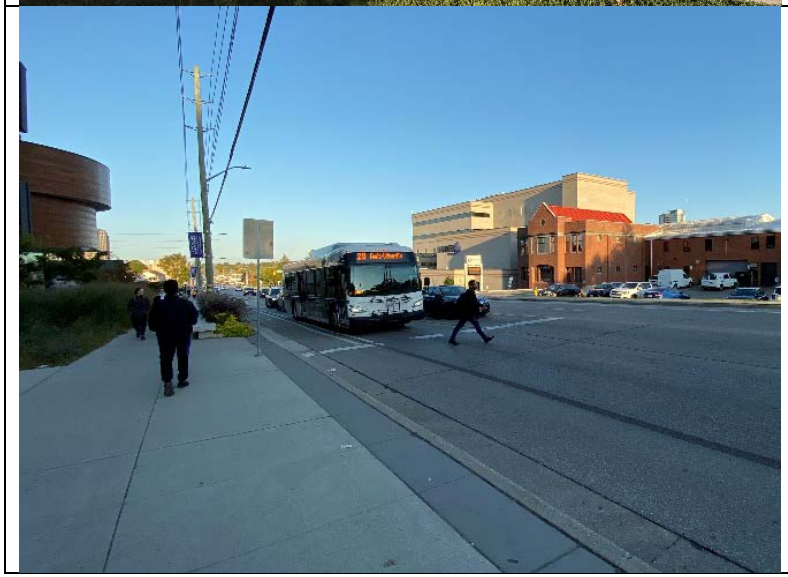



## Number of PDO Collisions by Collision Impact Type

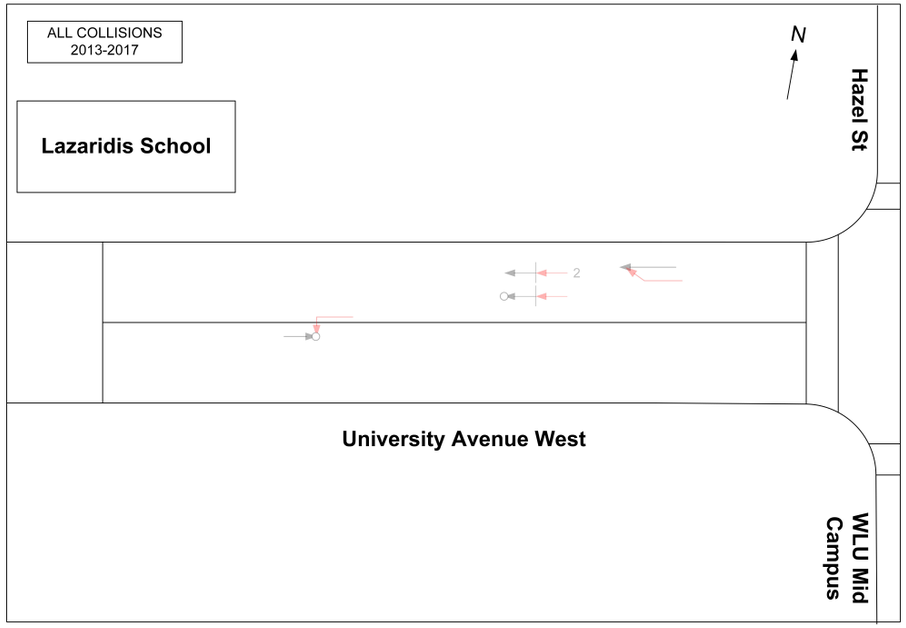



## Number of Injury Collisions by Collision Impact Type

## Field Investigation – MPS West of Hazel Street at University Avenue West

| Photo | Description |
|---|---|
| <br>  | High pedestrian activity, and some pedestrians walking outside of pedestrian crosswalks due to the location of Lazaridis Hall's entrance being offset from the crosswalk |

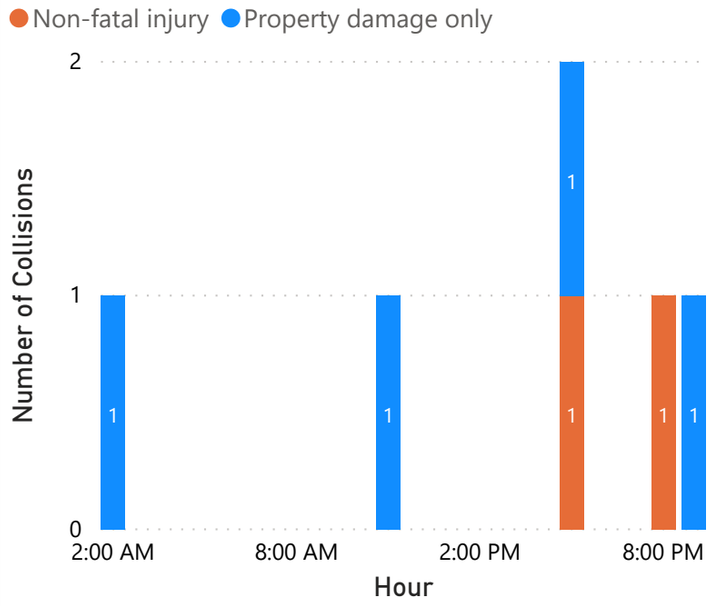
# University Ave btwn Hazel & W to Signals



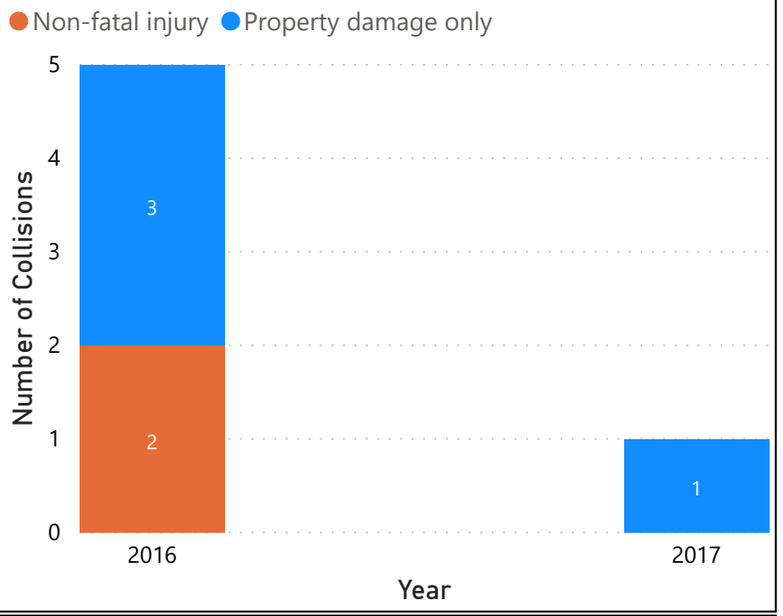

**Legend**

Approaching, Turning, Sideswipe, Injury
Angle, Pedestrian, Cyclist, Fatal
Rear End, Fixed Object, Unknown Movement, Assumed At Fault
xx (xx): PDO (Injury)

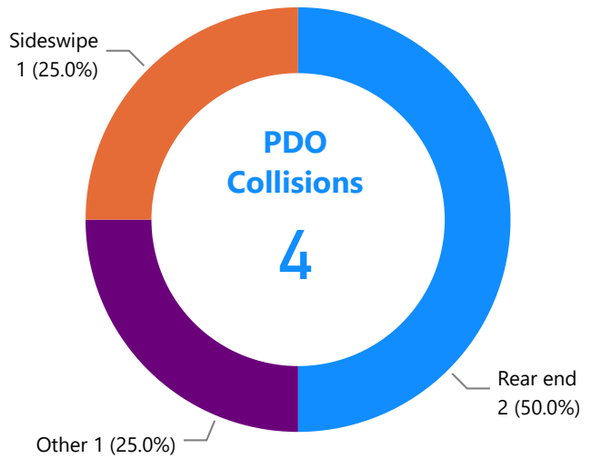
## Number of Collisions by Time of Day



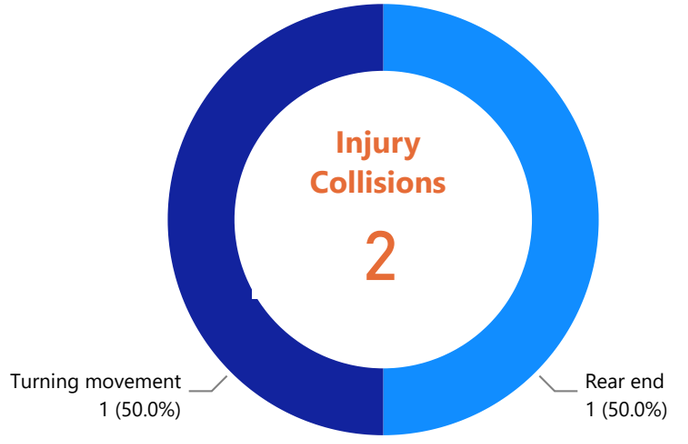

## Number of Collisions by Year




## Number of PDO Collisions by Collision Impact Type



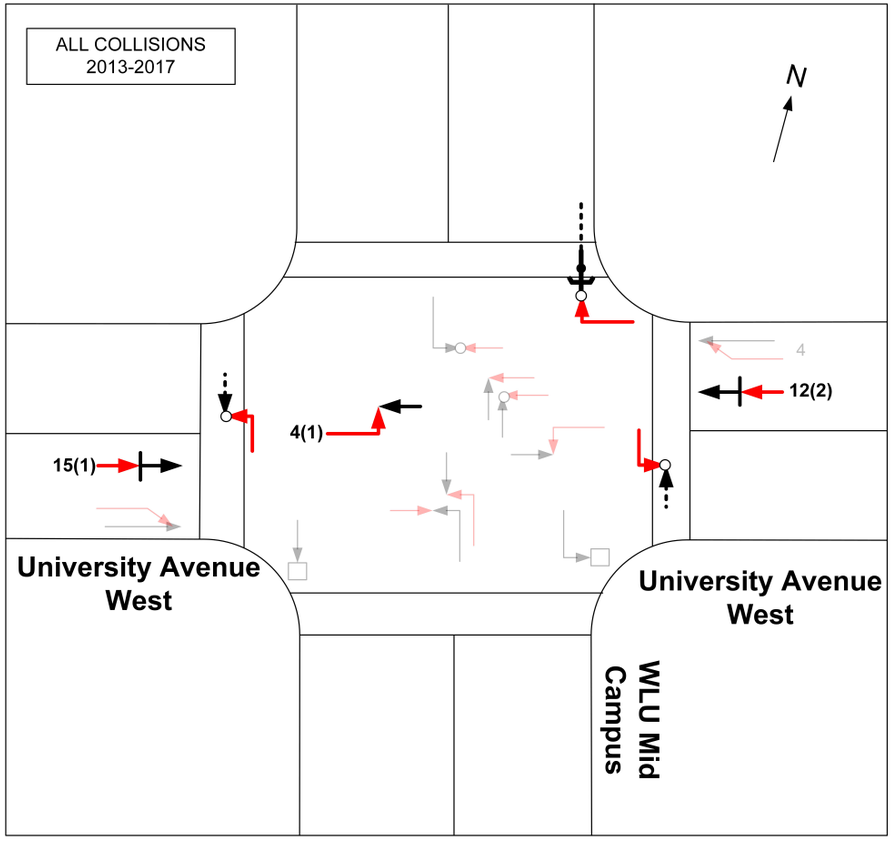

## Number of Injury Collisions by Collision Impact Type



## Field Investigation – University Avenue West between Midblock Pedestrian Signal (MPS) and Hazel Street

| Photo | Description |
|---|---|
| | Pedestrians crossing the road at midblock ("jaywalking") in the evening |
| | Short distance (around 130 metres) between the MPS and the intersection of Hazel Street at University Avenue West |

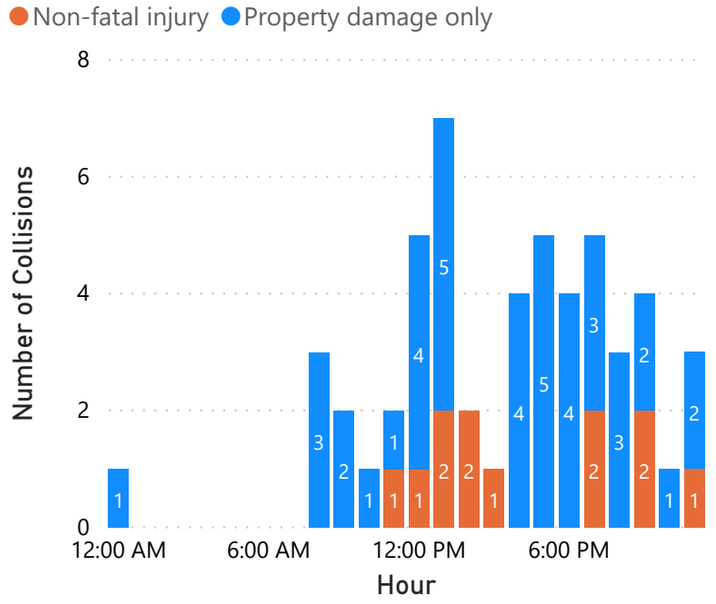
# University Ave at Hazel St/WLU Mid Campus



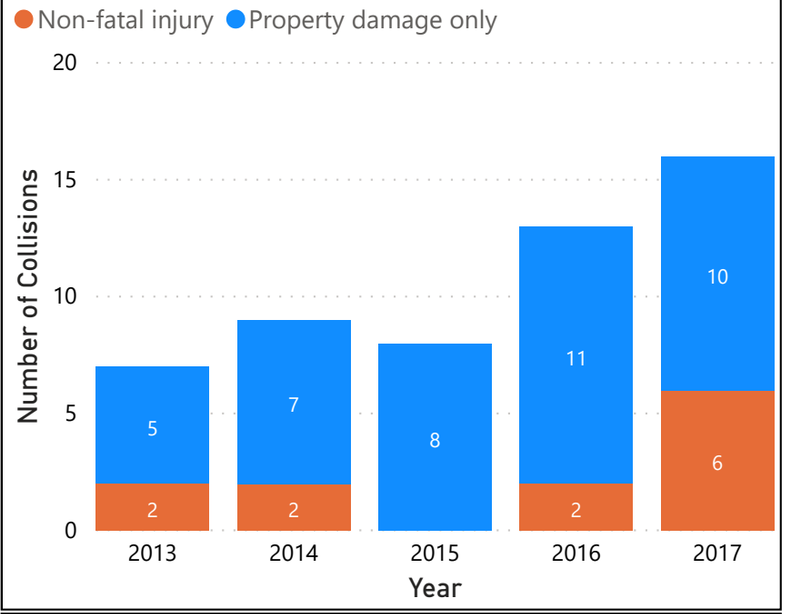

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

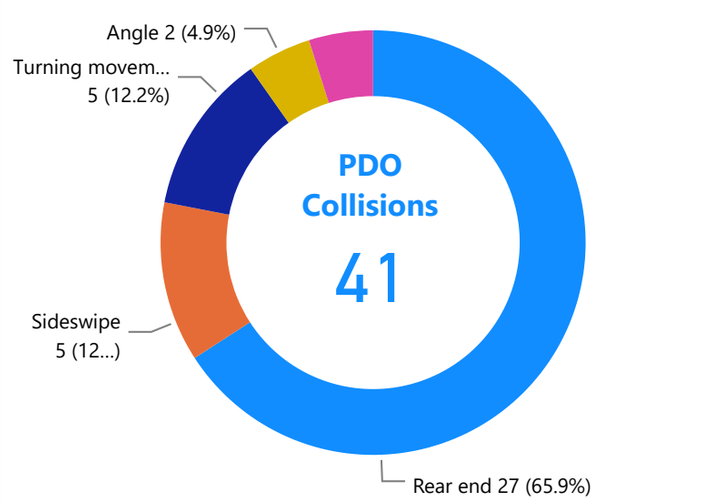
## Number of Collisions by Time of Day



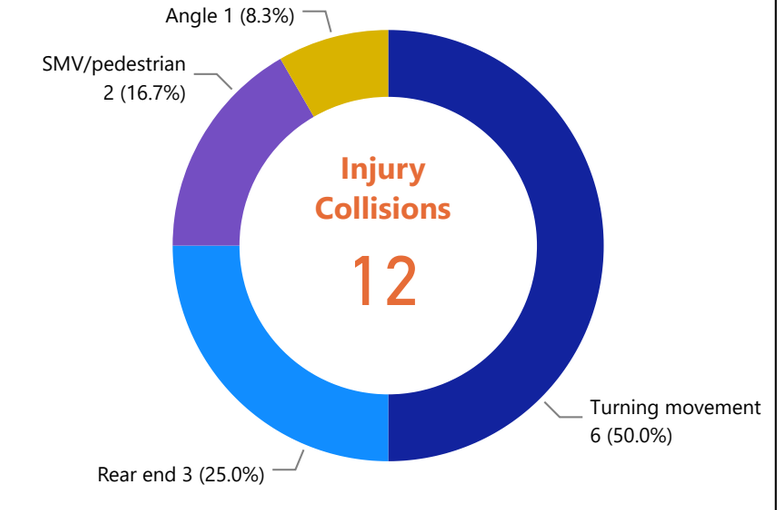

## Number of Collisions by Year



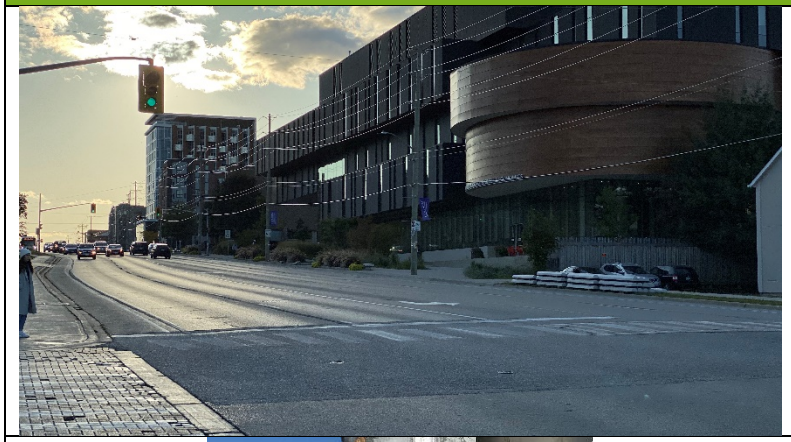
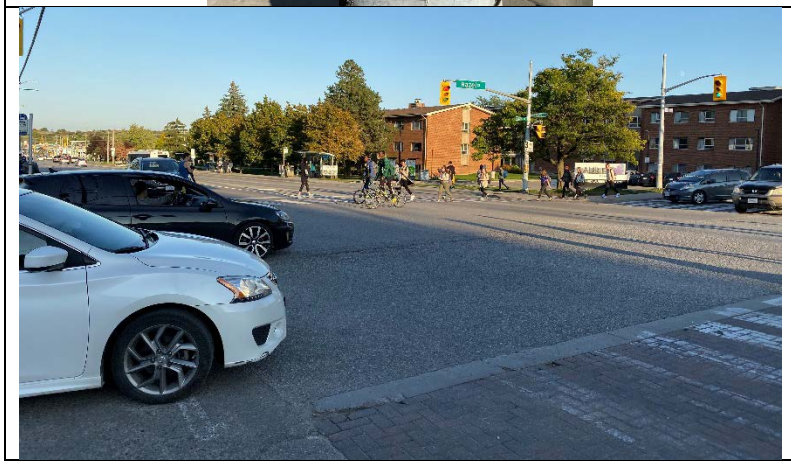

## Number of PDO Collisions by Collision Impact Type



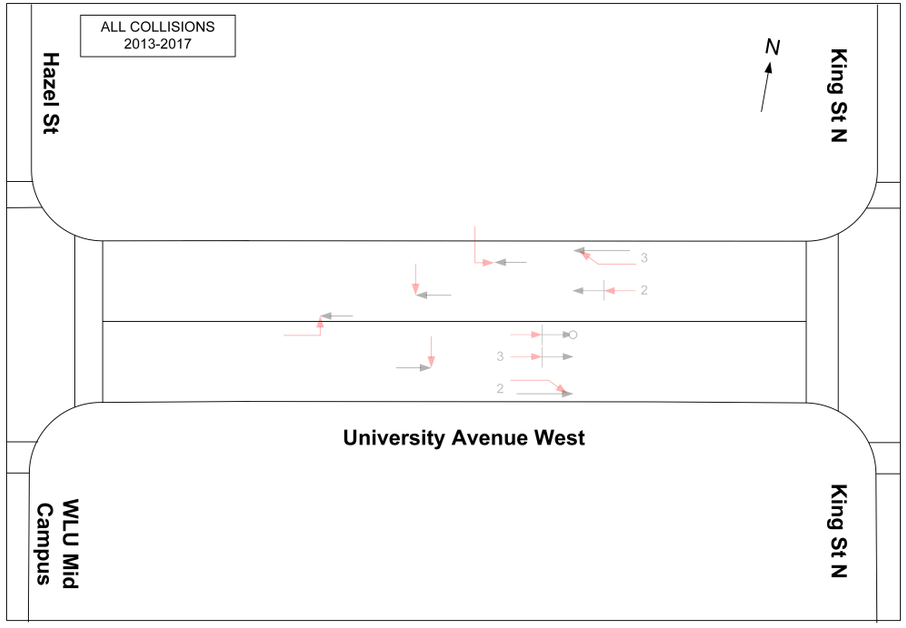

## Number of Injury Collisions by Collision Impact Type



## Field Investigation – Hazel Street at University Avenue West

| Photo | Description |
|---|---|
|  | Short distance (around 130 metres) between the MPS and the intersection of Hazel Street at University Avenue West |
| | No audible pedestrian push buttons at northeast and southeast corners of the intersection |
|  | High pedestrian and cyclist activity |

# University Ave btwn Hazel & King

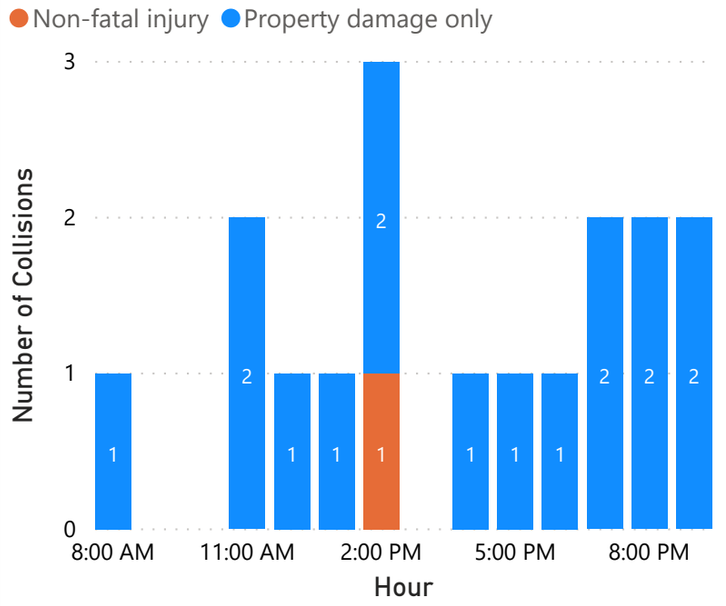



**Legend**

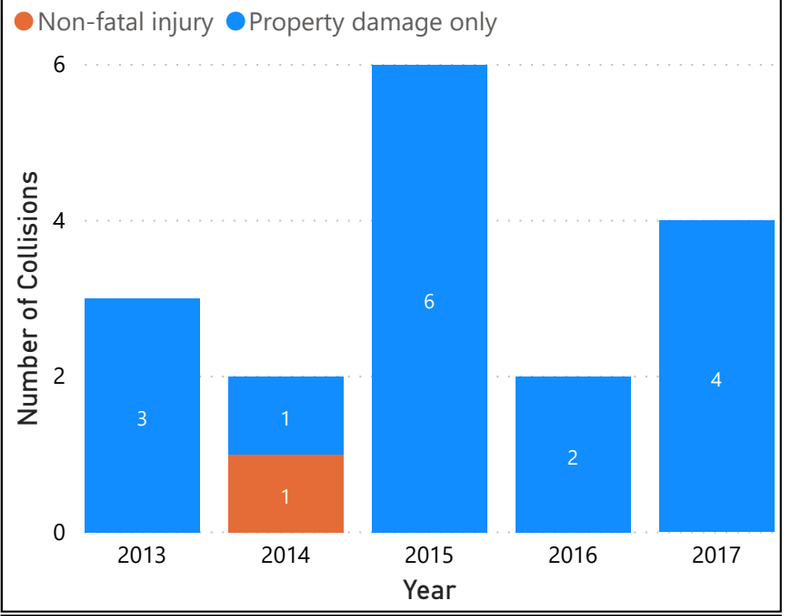
Approaching · Turning · Sideswipe · Injury
Angle · Pedestrian · Cyclist · Fatal
Rear End · Fixed Object · Unknown Movement · Assumed At Fault

xx (xx): PDO (Injury)

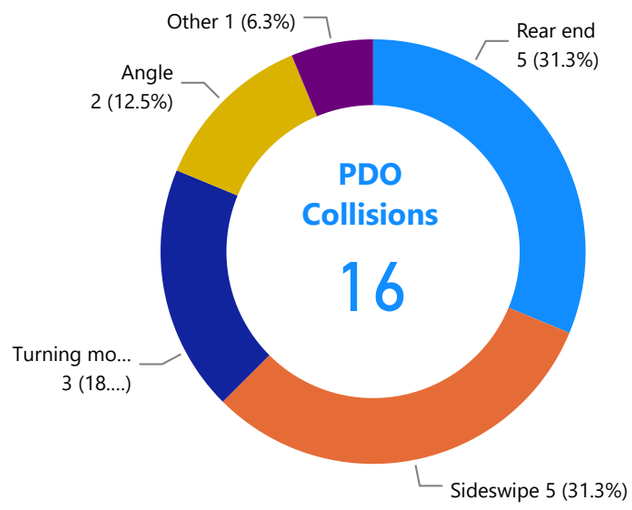
## Number of Collisions by Time of Day




## Number of Collisions by Year



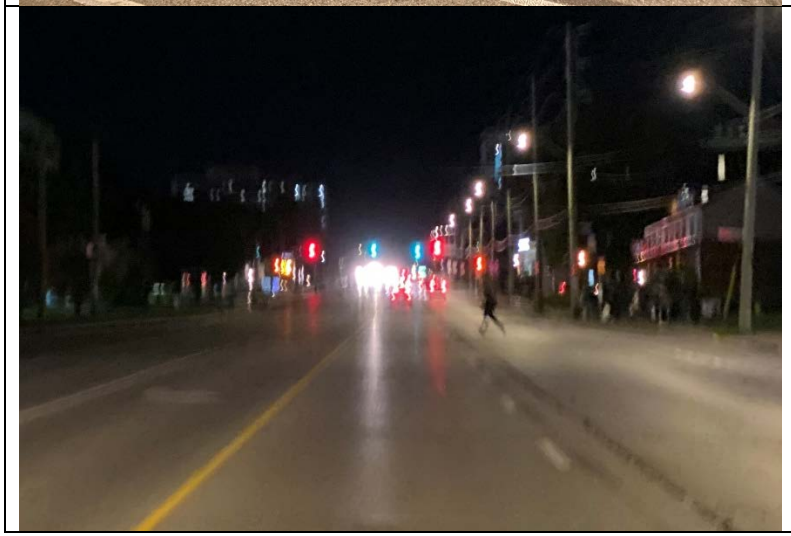

## Number of PDO Collisions by Collision Impact Type



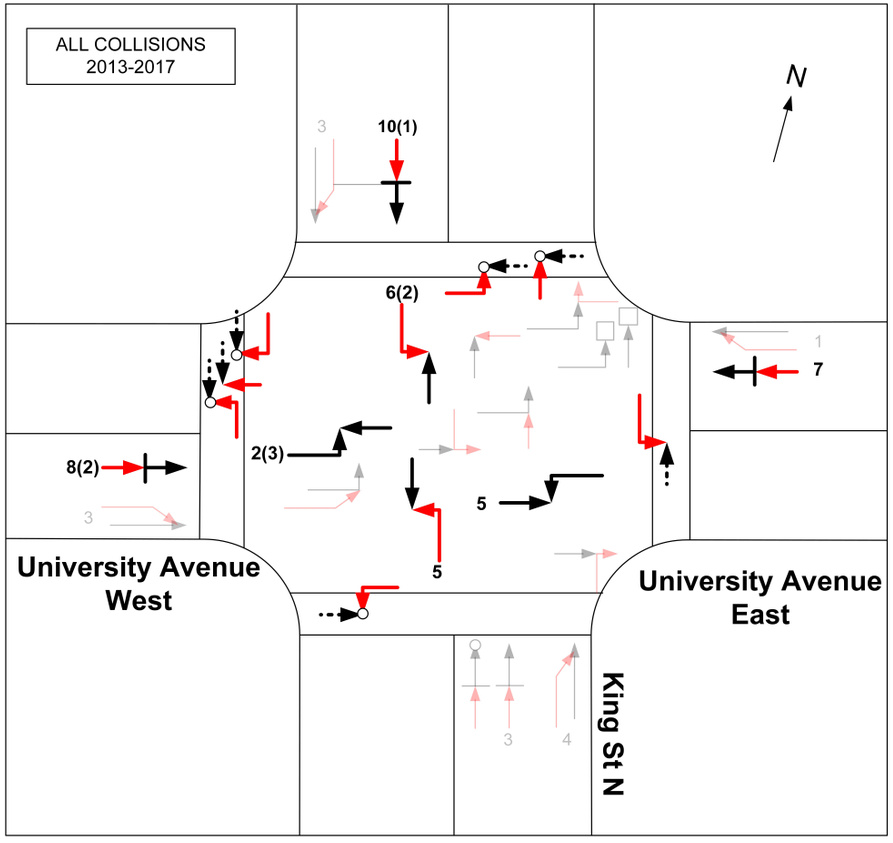

## Number of Injury Collisions by Collision Impact Type

## Field Investigation – University Avenue West between Hazel Street and King Street North

| Photo | Description |
|---|---|
| | Two driveways (Maple Court and University Commons Plaza's parking lot access) next to each other on the north side of University Avenue West |
| | Small parking lot (6 parking spaces) on the north side of University Avenue West |

| Photo | Description |
| --- | --- |
| | Lack of street lighting on the south side of University Avenue West in the evening |
|  | Pedestrians crossing the road at midblock ("jaywalking") in the evening |

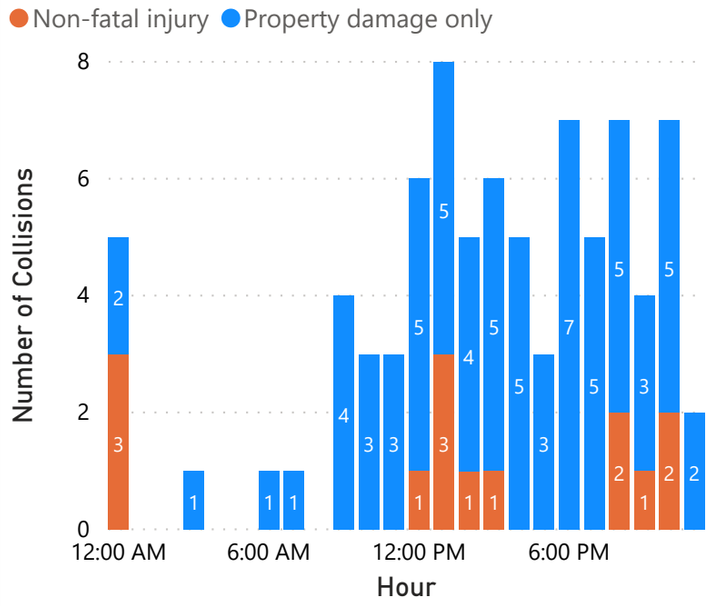
# King St at University Ave



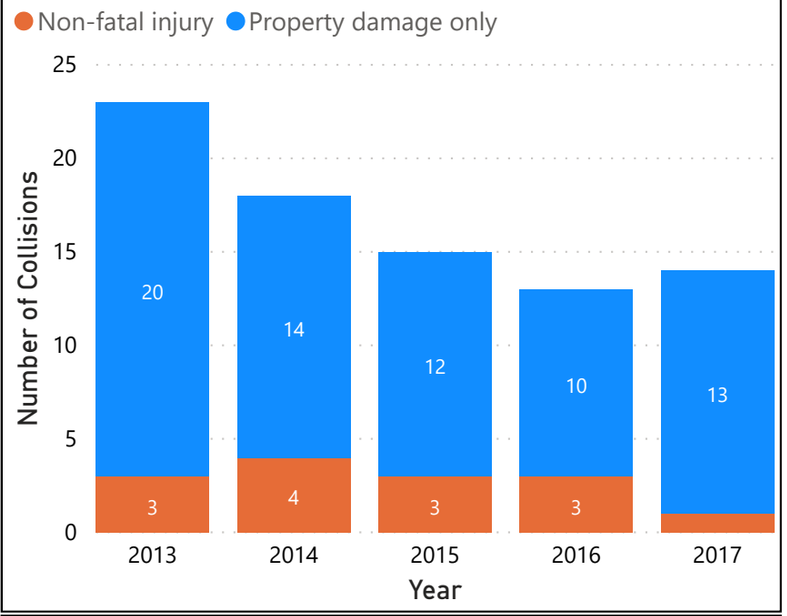

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

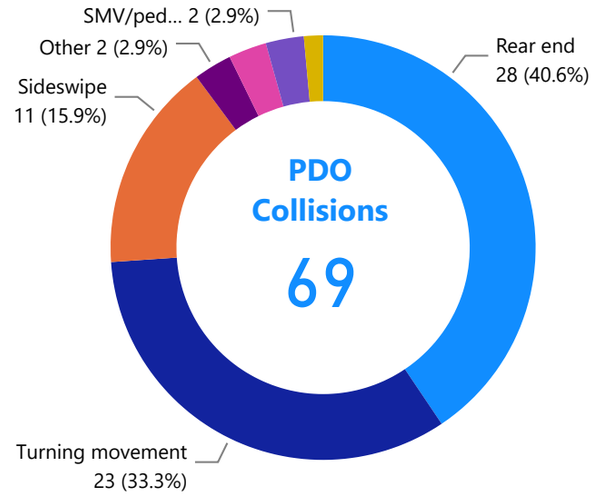
## Number of Collisions by Time of Day



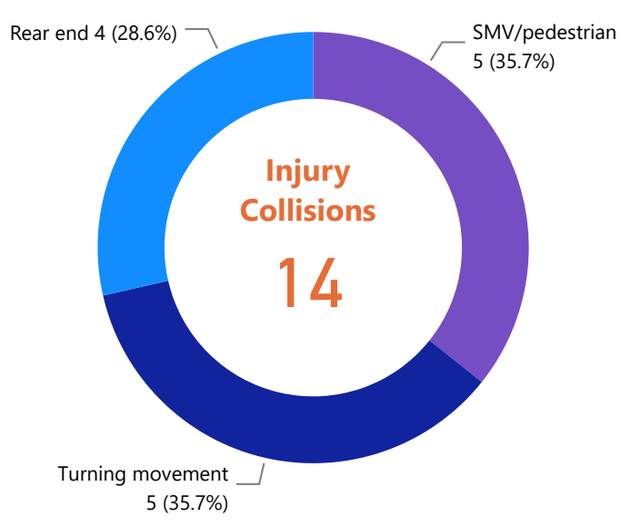

## Number of Collisions by Year




## Number of PDO Collisions by Collision Impact Type

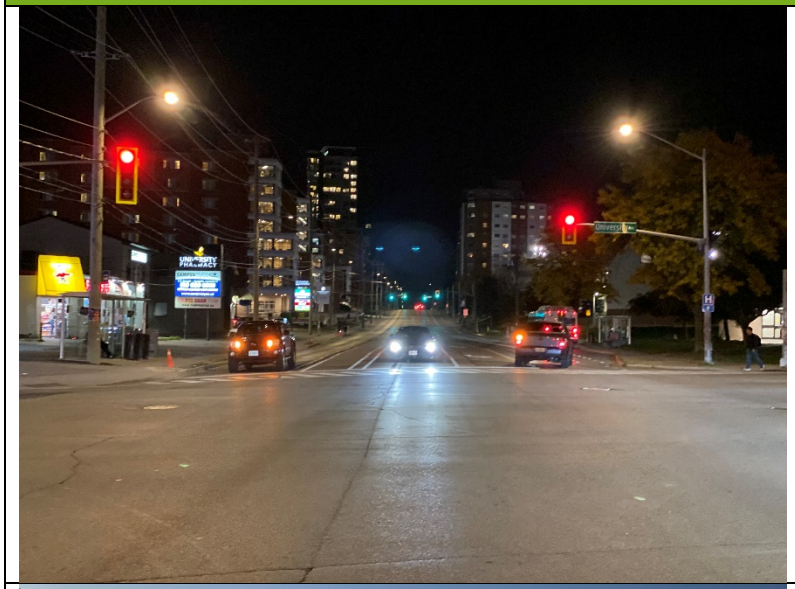



## Number of Injury Collisions by Collision Impact Type

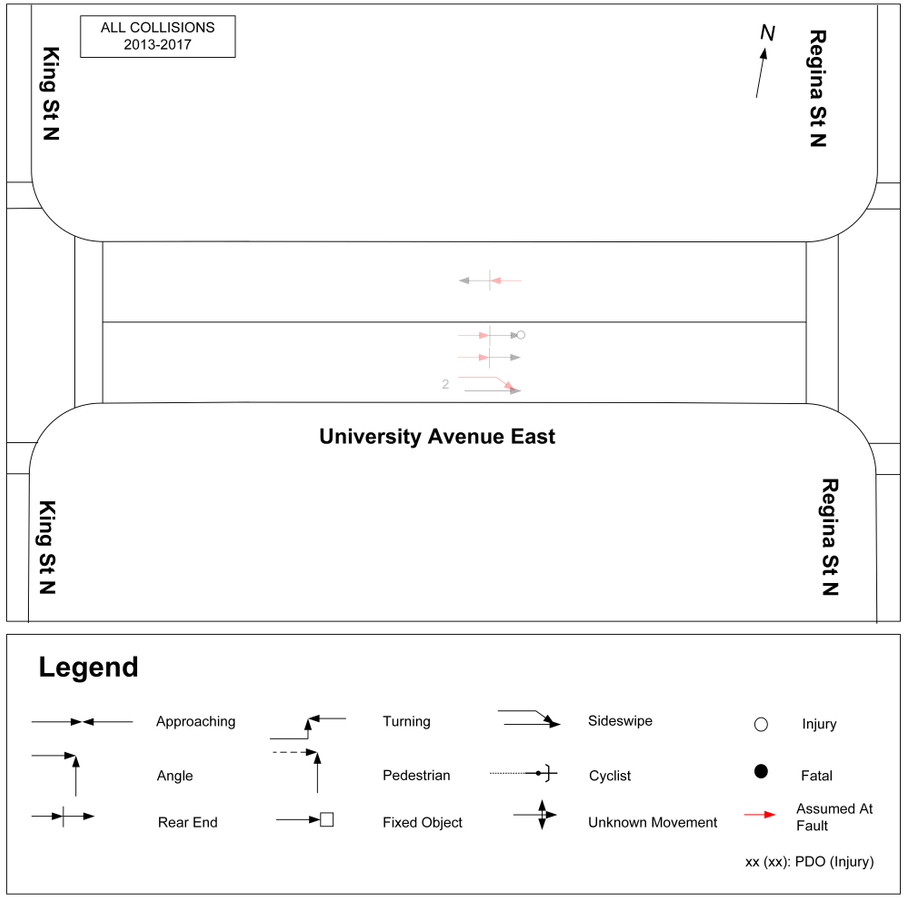


## Field Investigation – King Street North at University Avenue

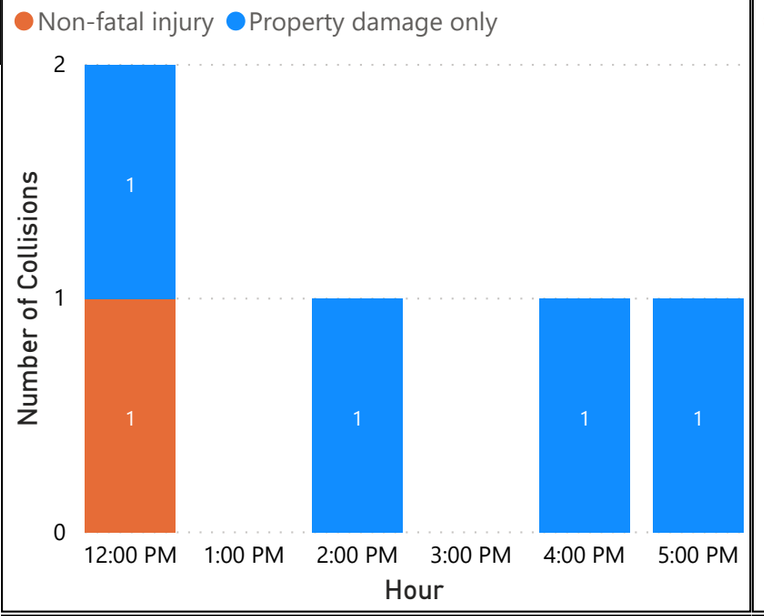
| Photo | Description |
|---|---|
| | Optically programmable signals were used for both westbound left-turn and through movements |
| | Narrow pedestrian crosswalks forcing pedestrians to walk outside of the pedestrian crosswalks |

| Photo | Description |
| --- | --- |
|  | The southbound left-turn lane is directly opposite northbound through lane (the photo was taken from the view of southbound left-turn lane) |
| | No left-turn guide lines for tight northbound left-turn |

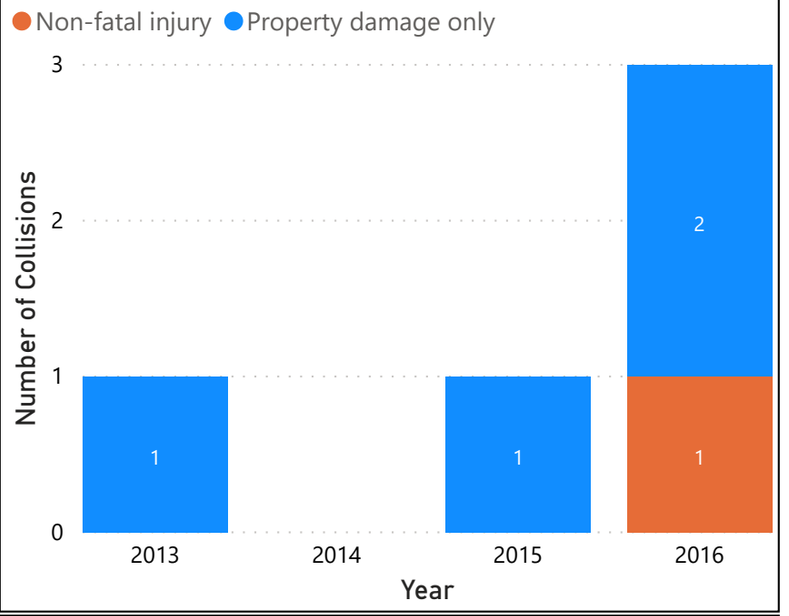
# University Ave btwn King & Regina



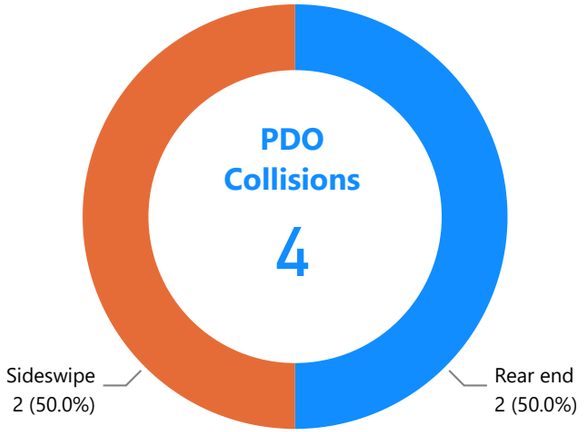

## Number of Collisions by Time of Day




## Number of Collisions by Year




## Number of PDO Collisions by Collision Impact Type

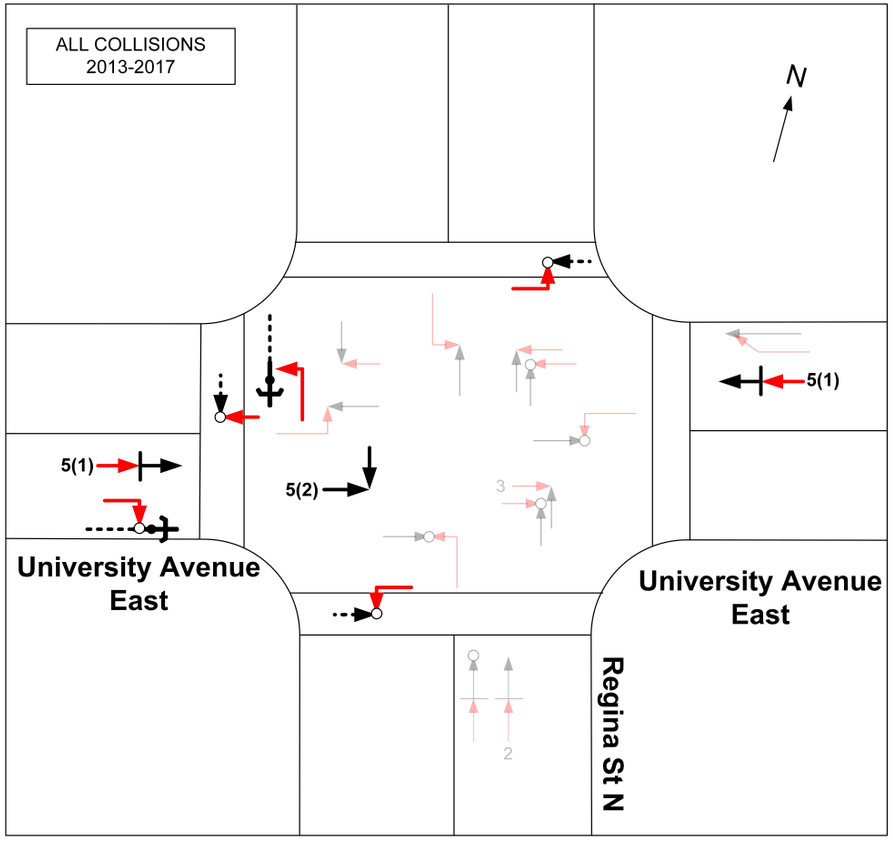



## Number of Injury Collisions by Collision Impact Type

## Field Investigation – University Avenue East between King Street North and Regina Street North

| Photo | Description |
|---|---|
| | Short distance (around 100 metres) between the intersection of King Street North at University Avenue and the intersection of Regina Street North at University Avenue East |
| | A small reflective sign warns cyclists about exiting traffic from driveway when riding on sidewalk |
| | No bike lanes on this midblock segment |

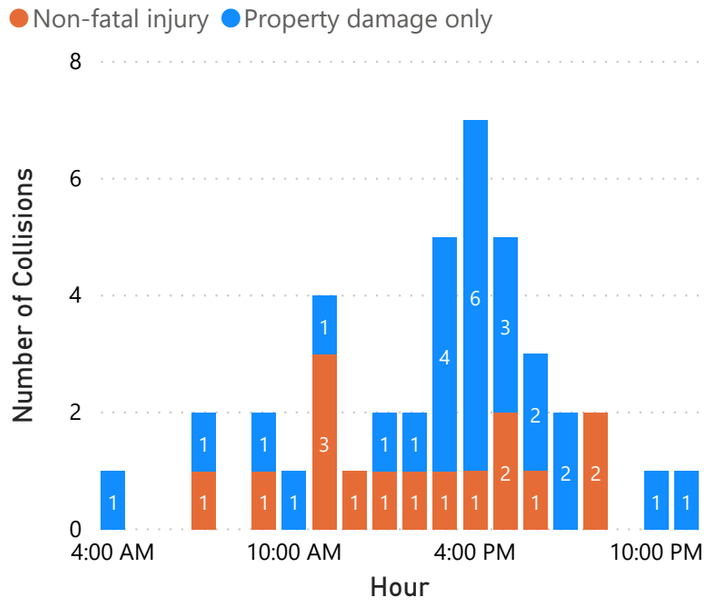
# University Ave at Regina St



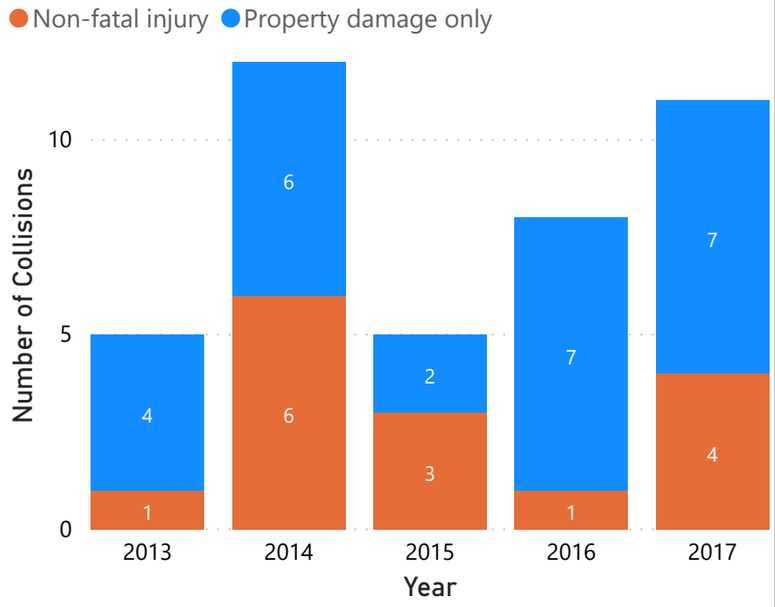

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

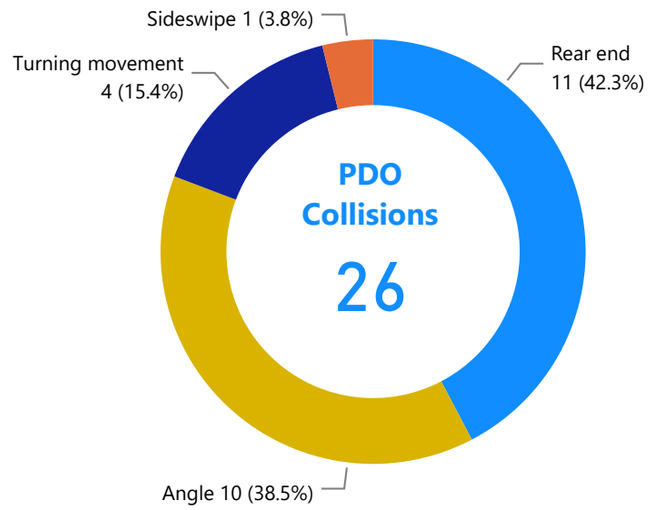
## Number of Collisions by Time of Day



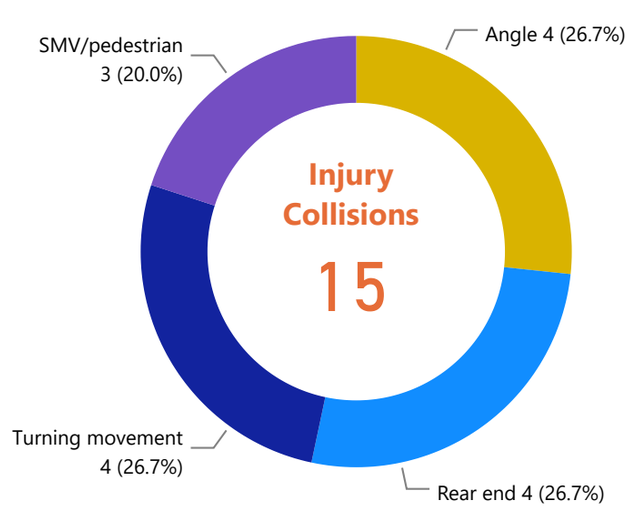

## Number of Collisions by Year



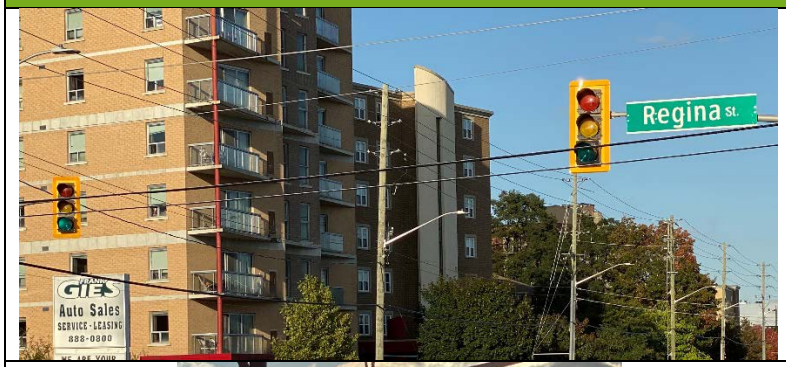

## Number of PDO Collisions by Collision Impact Type



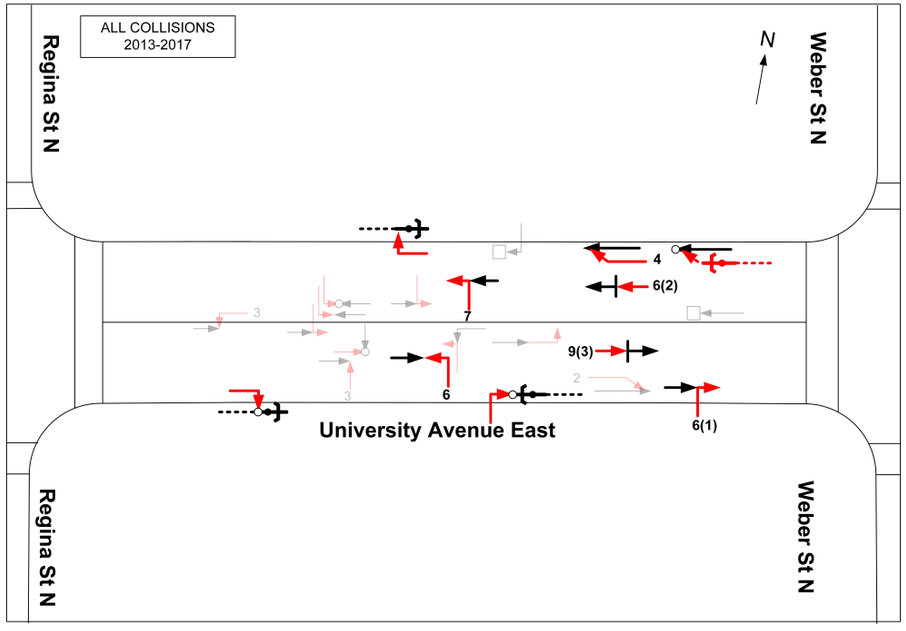

## Number of Injury Collisions by Collision Impact Type



## Field Investigation – Regina Street North at University Avenue East

| Photo | Description |
|---|---|
|  | A optically programmable eastbound through signal |
| | The pedestrian signal on the south side of the road (southeast corner) was not directly facing the pedestrian crosswalk |

# University Ave btwn Regina & Weber

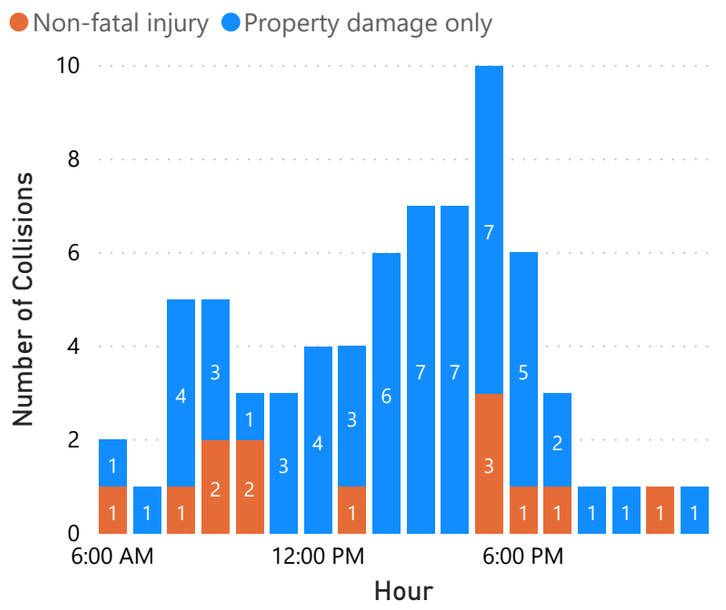



**Legend**

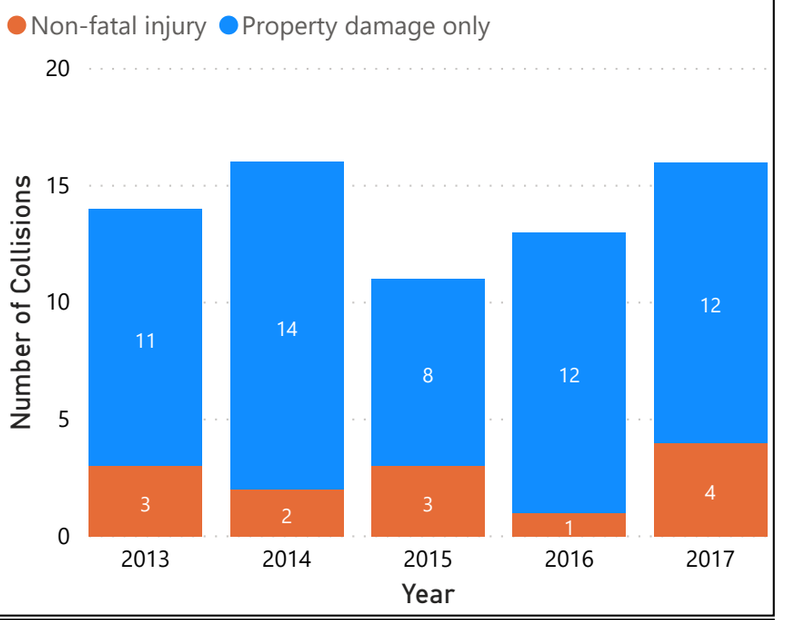
Approaching · Turning · Sideswipe · Injury
Angle · Pedestrian · Cyclist · Fatal
Rear End · Fixed Object · Unknown Movement · Assumed At Fault

xx (xx): PDO (Injury)

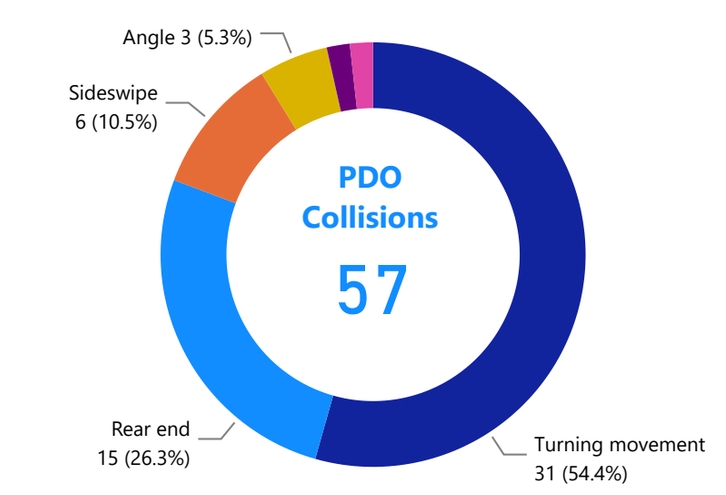
## Number of Collisions by Time of Day



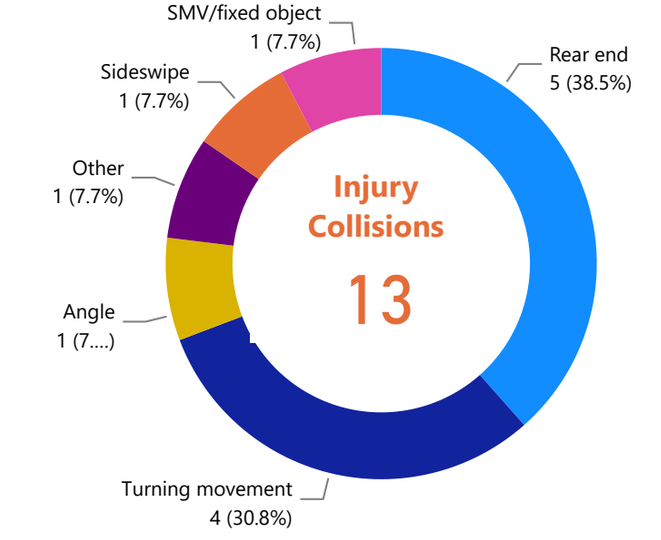

## Number of Collisions by Year



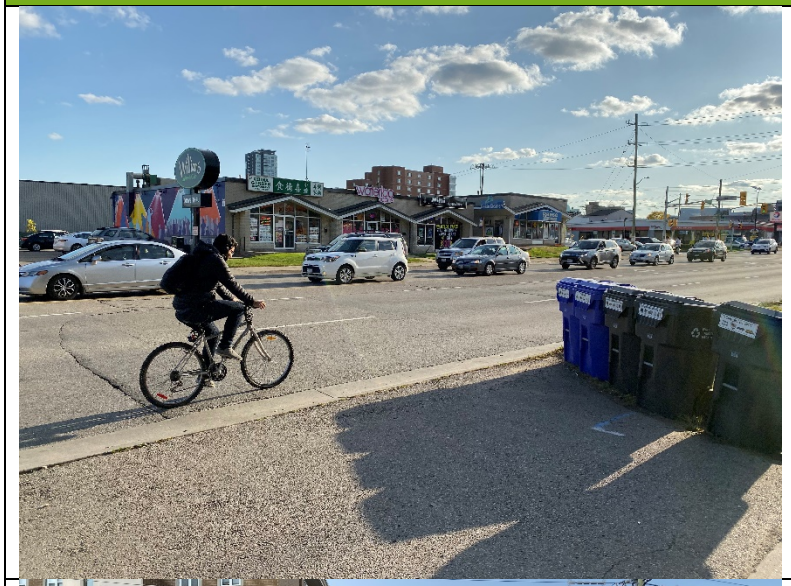

## Number of PDO Collisions by Collision Impact Type




## Number of Injury Collisions by Collision Impact Type



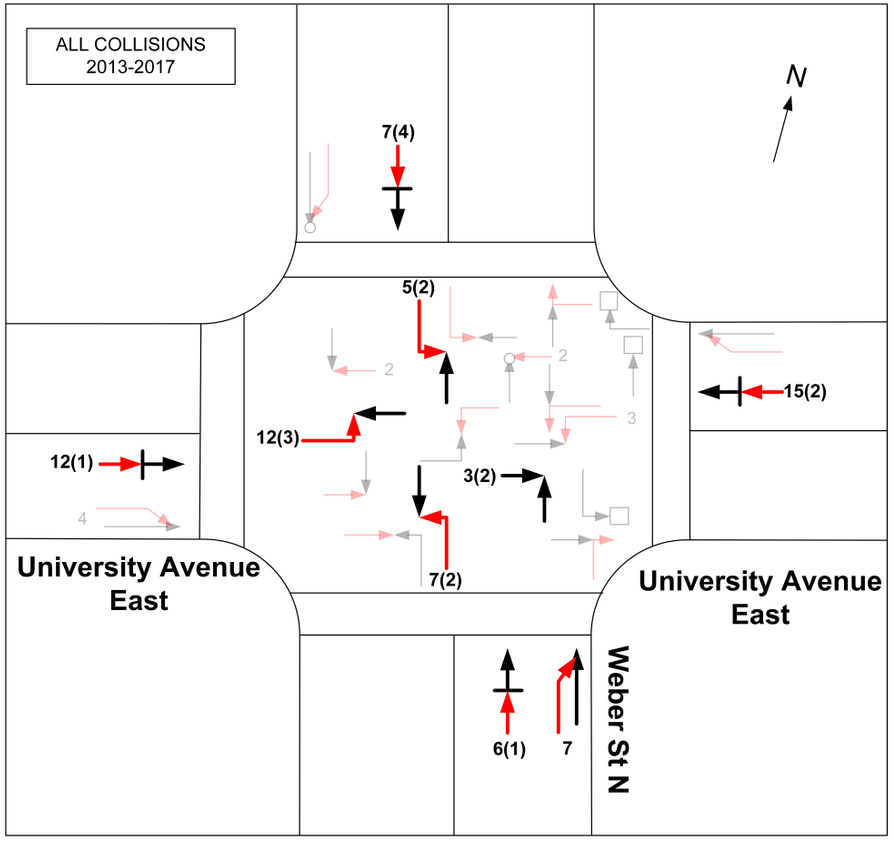
## Field Investigation – University Avenue East between Regina Street North and Weber Street North

| Photo | Description |
|---|---|
|  | No bike lanes at this midblock location, cyclists ride with traffic or ride on sidewalks |
| | Many wide driveways on both sides of the road, where some vehicles turned onto driveways at a high speed |

| Photo | Description |
| --- | --- |
| | Some properties on the south side have two driveways |
| | Vehicles exiting from the driveways blocked by the heavy through movements during peak periods |

| Photo | Description |
| --- | --- |
| | During peak periods, traffic on University Avenue East had to give “courtesy gaps” to vehicles wanting to enter or exit the driveways |

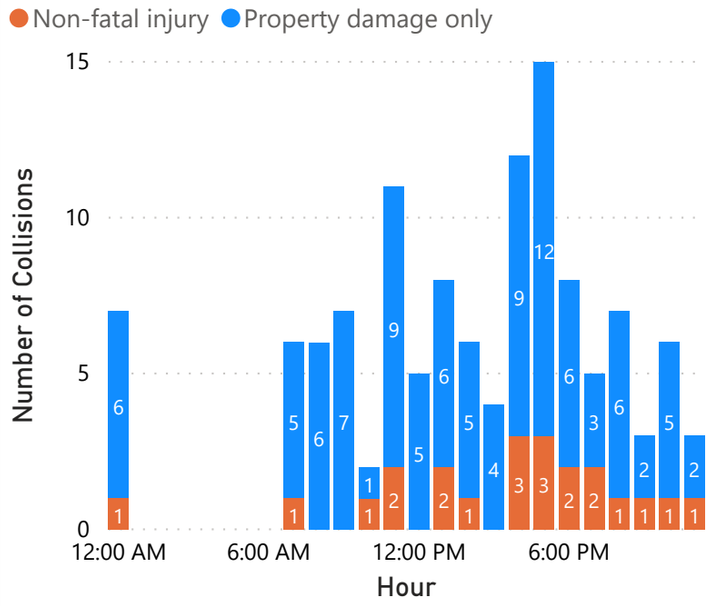
# Weber St at University Ave



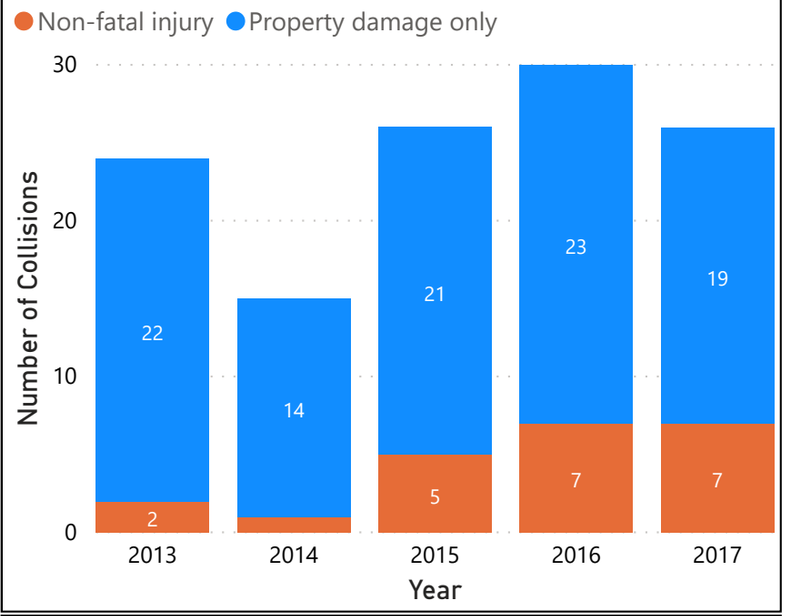

## Legend

- Approaching
- Angle
- Rear End
- Sideswipe
- Turning
- Pedestrian
- Fixed Object
- Cyclist
- Injury
- Fatal
- At Fault
- xx (xx): PDO (Injury)

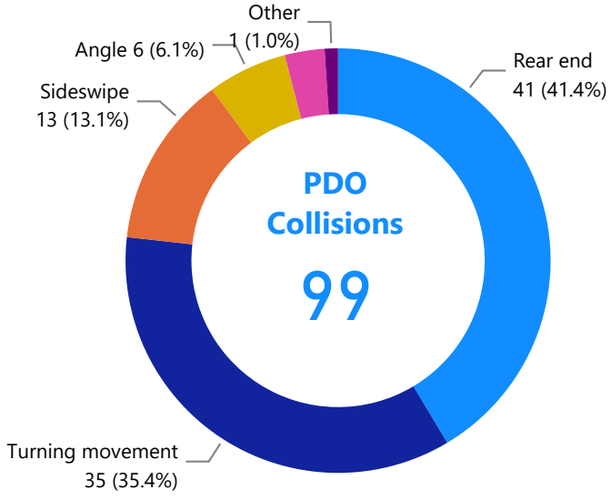
## Number of Collisions by Time of Day



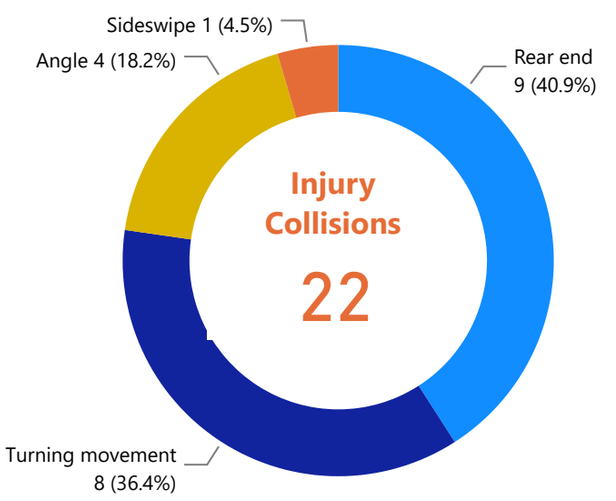

## Number of Collisions by Year



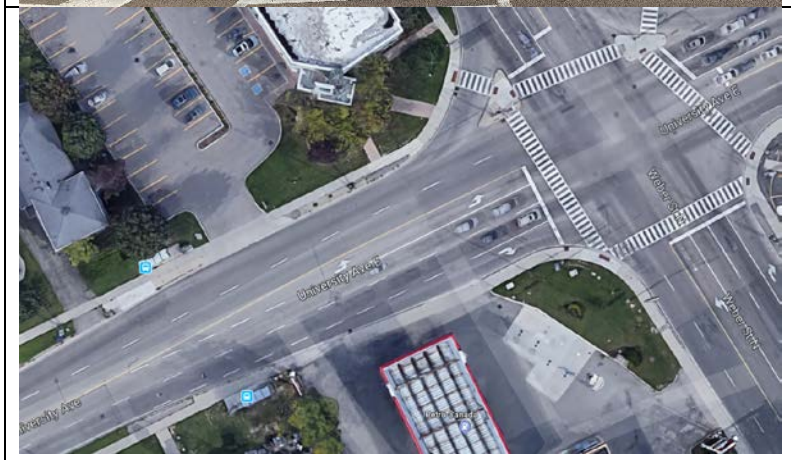

## Number of PDO Collisions by Collision Impact Type




## Number of Injury Collisions by Collision Impact Type



## Field Investigation – Weber Street North at University Avenue East

| Photo | Description |
|---|---|
| | Pedestrians crossed the road without using the pedestrian refuge island |
| | Cyclists ride on the pedestrian crosswalks |
|  (Source: Google Maps) | When buses service the westbound far side bus stop located approximately 60 metres west of the intersection, traffic in the curb lane was blocked by the stopped bus and queues spilled back into the intersection |