TOWN BOARD REGULAR MEETING

May 1, 2023 - 5:30 PM
1st Floor Conference Room, 301 Walnut Street, Windsor, CO 80550

To view Town Board meeting broadcasts, visit
www.windsorgov.com/MeetingsOnDemand.

AGENDA

A. CALL TO ORDER

1. Roll Call
2. Review of Agenda by the Board and Addition of Items of New Business to the Agenda for Consideration

B. BOARD DISCUSSION

1. 2023 Traffic Safety Program Report - Eric Bracke, Transportation Planner
2. Harvest Festival Parade Route - Tara Fotsch, Deputy Director of Parks, Recreation, and Culture
3. Future Meetings Agenda

C. EXECUTIVE SESSION

1. An Executive Session Pursuant to Colorado Revised Statutes § 24-6-402 (4)(a) and (4)(e)(I) for the Purpose of Determining Positions Relative to Matters that may be Subject to Negotiations; Developing Strategy for Negotiations; and Instructing Negotiators with Respect to a Proposed Real Property Exchange in the Downtown Area. (Shane Hale)

D. ADJOURN

The Town of Windsor will make reasonable accommodations for access to Town services, programs, and activities and will make special communication arrangements for persons with disabilities. Please call (970) 674-2400 by noon on the Thursday prior to the meeting to make arrangements.

MEMORANDUM

Date: May 1, 2023
To: Mayor and Town Board
From: Eric Bracke, Transportation Planner
Re: 2023 Traffic Safety Program Report - Eric Bracke, Transportation Planner
Item #: B.1.

Background / Discussion:
Since July 2022, Town staff has been working on developing a Roadway Safety Program that is data driven. We have analyzed crash history for the past ten years and have identified locations that are high crash locations. The analysis will be used to identify future improvements to intersections that will reduce crash rates. The executive summary and the summary report is attached.

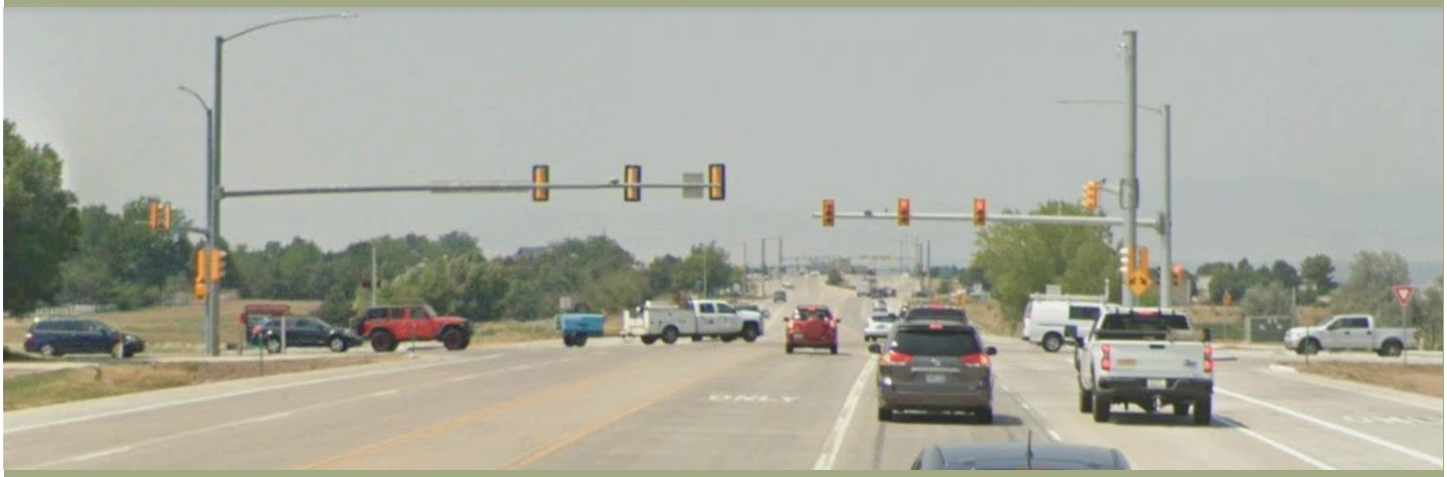
Financial Impact:
none at this time

Relationship to Strategic Plan:
Safe Infrastructure

Recommendation:

CC:

Attachments:
1. Windsor Roadway Safety Summary - final 4-26-23
2. Ex Summary Windsor Roadway Safety - final 4-26-23



TOWN OF WINDSOR COLORADO

Roadway Safety Summary

April 2023

Report by

TABLE OF CONTENTS

Introduction **1**
Roadway Safety Project 1
Roadway Safety Concepts 1
Explanation of Data 2
Types of Crashes 2
General Safety Data **4**
Crash Numbers 4
Crash Severity 5
Fatal Crashes 6
Crashes by Mode / Vulnerable Road Users 6
Motorcycle Crashes 7
Bicycle Crashes 7
Pedestrian Crashes 8
Bicycle / Pedestrian Crash Locations 8
School AGed Pedestrian / Bicycle Crashes 8
Location of Crashes 9
Number of Vehicles 9
Crashes by Month, Day, and Time 10
Crashes by Month of the Year 10
Crashes by Day of the Week 10
Crashes by Time of Day 10
Crash Numbers and Crash Type by Driver Age 11
Driving Under the Influence (DUI) Crashes 12
Economic Impact of Crashes 13
Comparison to Other Cities 14
Types of Crashes **15**
Intersection Evaluation **16**
Intersections by Excess Crash Cost 16
Crash Prediction Models 16
Traffic Volumes 17
Level of Service of Safety (LOSS) 17
Trends In Intersection Safety 17
Intersection Mapping 19
Pattern Recognition 20
Detailed Intersection Review 20
SH 257 / Eastman Park Drive 21
SH 257 / East Garden Drive 22
Westgate Drive / SH 392 23
7th Street / Eastman Park Drive 24
15th Street / Main Street 25
9th Street / Main Street 26
Next Steps **27**
Using a Safe System Approach to Safety 27
Collaborative partners 27
Improving the Data for the Future 28

LIST OF TABLES

Table 1. Economic Impact of Traffic Crashes in Windsor, 2022 13
Table 2. Fatal Crash Rate Comparison to Other Colorado Cities 14
Table 3. Summary of Crash Types Involved in the Highest Number of Severe Crashes 15
Table 4. Prediction Model Used in the Analysis for Each Intersection 17
Table 5. Top 50 Intersections by Excess Crash Cost 18
Table 6. Summary Information on Top 10 Intersections 19
Table 7. Intersections with Patterns of a Particular Crash Type 20

LIST OF FIGURES

Figure 1. Types of Roadway Safety 1
Figure 2. Crash Type Diagrams 2,3
Figure 3. Total Crashes 2018-2022 4
Figure 4. Total Crashes Compared to Population 4
Figure 5. Overall Crash Severity 5
Figure 6. Crash Trends by Severity 5
Figure 7. Fatal Crash Trend 6
Figure 8. Vulnerable User Crash Trends 6
Figure 9. Severity Impact on Vulnerable Road Users 7
Figure 10. Motorcycle Crash Location 7
Figure 11. Bicycle Crash Location 7
Figure 12. Visual Depiction of Frequent Types of Bicycle Crashes 8
Figure 13. Location of Crashes Involving School Aged Students in a Crosswalk 8
Figure 14. Location of Crashes 9
Figure 15. Number of Vehicles Involved 9
Figure 16. Crashes by Month of the Year 10
Figure 17. Crashes by Day of the Week 10
Figure 18. Crashes by Time of Day 10
Figure 19. At Fault Drivers by Age Compared to Licensed Drivers 11
Figure 20. Crash Type by Driver Age 11
Figure 21. DUI Crash Type 12
Figure 22. Age of At-Fulat DUI Driver Compared to Licensed Drivers 12
Figure 23. Crash Types by Total Crashes and Severe Crashes 15
Figure 24. Mapping of 'Top Ten' Intersections with More Crashes than Expected 19
Figure 25. SH 257 / Eastman Park Drive Details 21
Figure 26. SH 257 / East Garden Drive Details 22
Figure 27. SH 257 / Westgate Drive / SH 392 Details 23
Figure 28. 7th Street / Eastman Park Drive Details 24
Figure 29. 15th Street / Main Street Details 25
Figure 30. 9th Street / Main Street Details 26
Figure 31. Safe Systems Approach to Transportation Safety 27

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INTRODUCTION

Windsor, Colorado is a fast-growing town nestled between the Front Range of the Rocky Mountains and Colorado's High Plains region. Located just east of I-25 between the state capitals of Denver and Cheyenne, the home rule municipality straddles Larimer and Weld Counties. With more than 40,000 residents, the community is home to significant commercial and industrial businesses and also serves as a bedroom community for nearby Loveland and Fort Collins.

In Windsor, Colorado

340 crashes / year

27 involve injury/fatal

Like other cities, Windsor experiences roadway crashes. With an average of 340 reported crashes each year, 27 of which involve an injury or fatality, the impact of traffic crashes touches every aspect of a community's physical and emotional well-being including families, workplaces, emergency responders, neighborhoods, livelihoods, mobility and ,more. Improving roadway safety by reducing the number and severity of crashes is a priority.

ROADWAY SAFETY PROJECT

In fall 2022, staff in Windsor's Engineering Department began an effort to comprehensively review roadway safety in Windsor. Efforts included:

- Gathering of crash data and development of an internal crash database and tools for evaluation,
- Collaborative work with the Police Department,
- Analysis of data,
- Identification of action items and priority areas for safety improvements, and
- Development of an ongoing process to obtain, review, and analyze crash data.

This document represents the first of what is anticipated to be an annual report. In future years, the analysis can be updated to provide a benchmarking tool to track progress on safety initiatives and look for new trends. The document will also serve as an ongoing tool to determine strategies and countermeasures to further improve roadway safety.

ROADWAY SAFETY CONCEPTS

Roadway safety can be categorized in three ways: 'nominal safety' (national engineering/safety standards), 'perceived safety' (whether a location 'feels' safe or not), and 'actual safety' (the number and severity of crashes). See ***Figure 1***. These three types of safety are distinctly different in terms of definitions but are not necessarily mutually exclusive.

While the goal of a transportation system is to function within the overlap of the three types of safety, this project focused on actual safety with the analysis of reported crashes. Nominal safety is advanced through various engineering infrastructure projects, and perceived safety (sometimes referred to as the level of comfort while using the roadway) is recognized as also an important element of the overall transportation system. Many strategies for addressing actual safety will also support nominal and perceived safety.

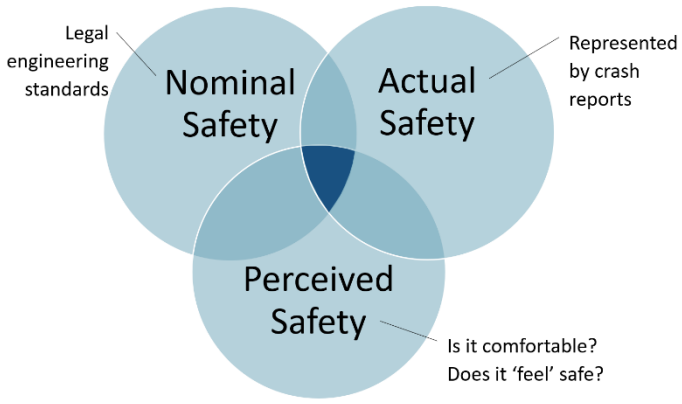


Figure 1.
Types of Roadway Safety

EXPLANATION OF DATA

The starting point for crash data used in this project was data obtained from the Colorado Department of Transportation (CDOT). All crash reports involve the completion of a standardized Colorado Crash Form and are required to be submitted to the Department of Revenue (DOR), which then forwards them to CDOT. Some minor quality control is done by CDOT, albeit more diligently on crashes that occur on the state highway system (such as SH 392 and SH 257) than on local roads. Crash data from 2011 - 2020 was obtained from CDOT. That is the most current data that CDOT has.

Crash reports that occurred in 2021 and 2022 were obtained from LexisNexis, a company that the Windsor Police Department uses to process their reports before sending them to the DOR. Every report was reviewed individually for accuracy. This data from the last two years will be the most current, complete, and accurate. The CDOT data is helpful to look for trends but should be used with some caution and an understanding that some reports, especially on local roads may not be captured or fully accurate in terms of details. An additional complication is that the state implemented a crash report update on the crash form in 2019. The older data used the old form which is less comprehensive.

All the data (both CDOT data and the newer data from Windsor PD) was imported into crash analysis software called Crash Magic. This program houses the data, and merges information from both the old form and the new form, can run processes to create 'calculated fields' based on input in several locations, and can create intersection diagrams that visually depict crash types at a certain location. Intersection identification numbers (called Facility ID numbers) were created and added to all relevant crash records to assist with accurately locating crashes.

Moving forward, Windsor Police Department will continue to complete crash reports, and they will be submitted to both the state as required and captured by Crash Magic for local use. Windsor engineering staff will complete quality control on the reports. It is expected that with time, the database will become more and more accurate in terms of historical data.

This report is based on the data detailed above. Most reviews involve an analysis of three to five years of data beginning in 2018 (2018-2022 for five-year evaluations and 2020-2022 for three-year evaluations).

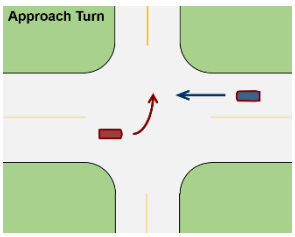
TYPES OF CRASHES

Throughout the document, there is detailed discussion and analysis regarding a variety of crash types. The most frequently noted crash categories are listed below with an explanation and definition for each one. Some are depicted in the diagrams at right (***Figure 2***).

Crash reports will often indicate "front to side" collisions (also known as broadside). As indicated in the definitions and the diagrams, the circumstances related to the front of a vehicle striking the side of another vehicle can vary, and the mitigation to address these collisions may be very different depending on the type of crash. More detailed descriptions (approach turn, right angle, and overtaking turn) are explained below and used in this report.

Approach Turn

Two vehicles traveling in opposite directions, one turns left (or attempts a U-turn) in front of the oncoming vehicle and is struck.



Bicycle

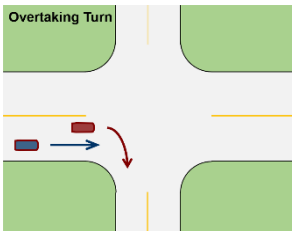
Any crash that involves a bicyclist.

Fixed Object

A single vehicle crash where a fixed object other than a parked vehicle is struck.

Overtaking Turn

Two vehicles traveling in the same direction, the front vehicle turns right or left and is hit as the following vehicle tries to pass on the right or left.



Parking Related

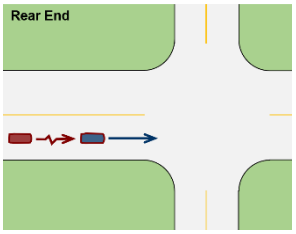
Any crash involving a parked vehicle or a vehicle entering/leaving a parking space.

Pedestrian

Any crash that involves a pedestrian.

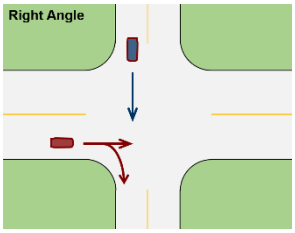
Rear End

Two vehicles traveling in the same direction, the leading vehicle struck by the following vehicle.



Right Angle

Two vehicles traveling on perpendicular streets one fails to yield or passes a traffic control device and strikes the other.

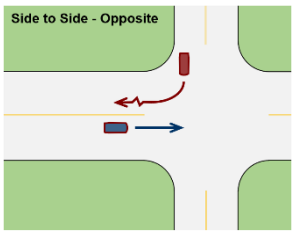


Sideswipe Opposite Direction (also side to side opposite)

Two vehicles traveling in opposite directions, one veers into the wrong lane and strikes the side of the other car. This often occurs when a vehicle waiting at a STOP sign or traffic signal is struck by a vehicle turning right from a perpendicular road (frequently during icy conditions).

Sideswipe Same Direction (also side to side same)

Two vehicles traveling in the same direction, one vehicle veers into the other striking it in the side (usually due to improper lane changes).



Other

Other crashes that do not fit into any other category.

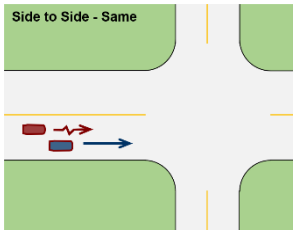


Figure 2.
Crash Type Diagrams

GENERAL SAFETY DATA

This section of the report provides an overview of general safety data for the Town of Windsor. Unless otherwise noted, the data represents a compilation or average of five years of data (2018-2022).

CRASH NUMBERS

Total reported crashes are shown in ***Figure 3*** and are generally trending upward. 2020 is understood to be a unique year due to the pandemic, with reduced travel volumes throughout the year.

'Severe'
Crashes are those that are classified as minor, major, or fatal injury.

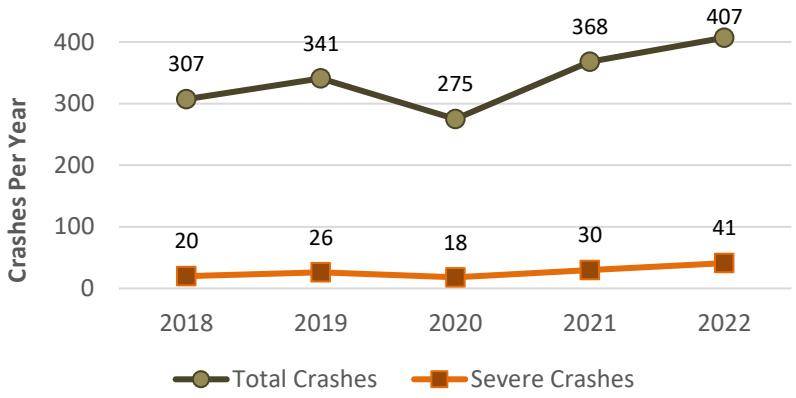


Figure 3. Total Crashes 2018-2022

Overall crashes are up 33% in five years, and severe crashes are up 105%. Severe crashes are those that are coded (documented) as 'suspected minor injury', 'suspected major injury', or 'fatal'. While increasing crashes are always a source of concern, these numbers should be reviewed from several perspectives.

As noted in the introduction, the data from 2013-2020 is data obtained from CDOT. While the numbers are informative, some crash reports may be missing or not captured, especially on the local road system. This can result in an impression of increasing crashes when the more current data is simply more comprehensive.

Figure 4 shows the crash trend in the last ten years together with the population increase in the last ten years. The two trend lines are similar, reflecting the fact that Windsor is fast growing, and the increased population tends to result in increased crash numbers.

Comparisons of Windsor's crash frequency to other cities and towns are provided on page 14.

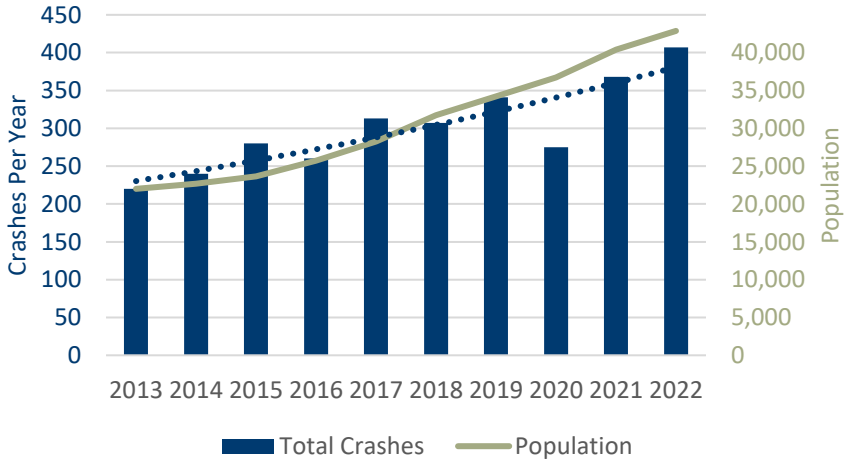


Figure 4. Total Crashes Compared to Population

CRASH SEVERITY

Thankfully, the majority (more than 80%) of crashes do not result in any injury. See ***Figure 5.*** Crashes that are included within the 'severe crashes' category throughout this report include 'suspected minor injury', 'suspected major injury', or fatal crashes and represent 8% of all reported crashes.

A review of whether that percentage has changed in the last years indicates that the percentage of severe crashes compared to all crashes is increasing - from 6.5% in 2018 to 10.1% in 2022. This is not necessarily unusual, as the percentage of severe crashes increased across the country, especially during the pandemic when there were fewer overall crashes, but more severe crashes.

Only **8%** of crashes involve a documented injury/fatality

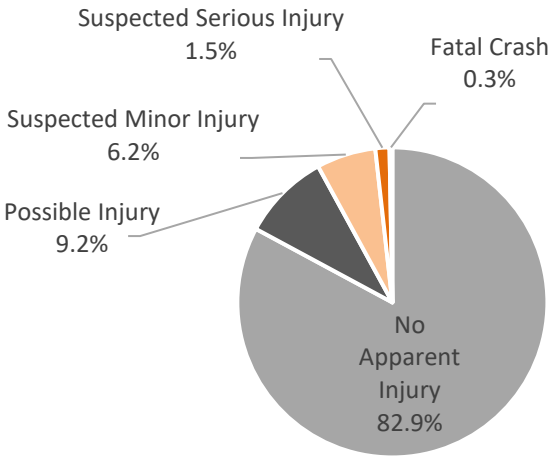


Figure 5. Overall Crash Severity

Figure 6 shows the five-year crash trends by severity. It is important to note that fatal crash numbers tend to fluctuate more due to the small number of crashes and due to regression to the mean. Regression to the mean is the statistical tendency for data points to adjust towards the long-term average. Because of these things, caution is needed when looking for trends in fatal crash numbers.

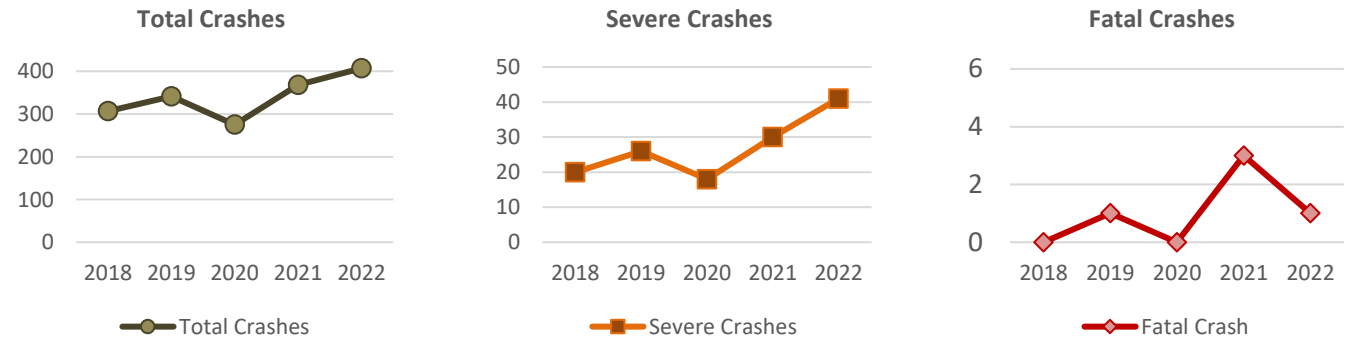


Figure 6. Crash Trends by Severity

FATAL CRASHES

The crash trends associated specifically with those resulting in a fatality are shown in ***Figure 7***. Brief information about the mode and type of crash for fatal crashes in the last five years are also noted.

There have been ten (10) crashes that resulted in a fatality in the last ten years in Windsor.

- Five (5) involving vehicles
- Four (4) involving motorcycles
- One (1) involving a pedestrian.

A comparison of how these fatal crash numbers compare with those in other communities is included on page 14.

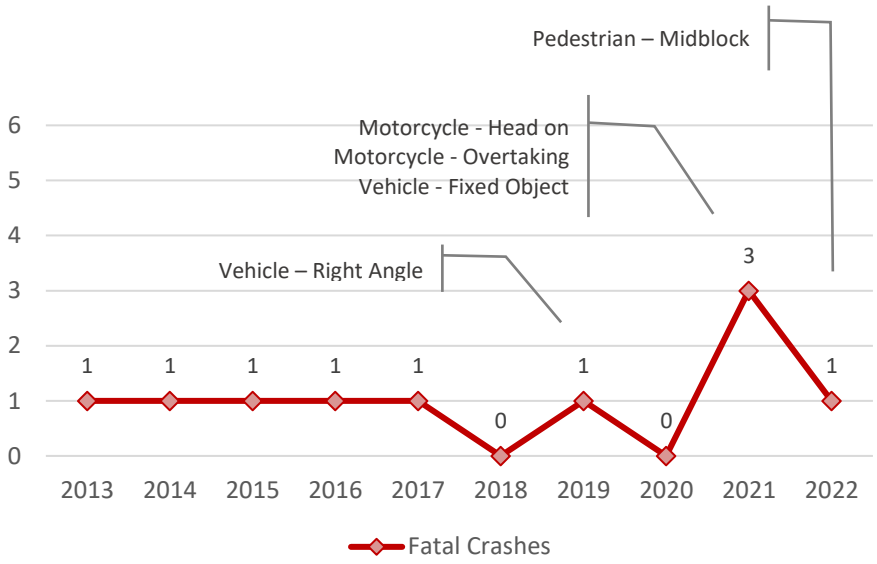


Figure 7. Fatal Crash Trend

CRASHES BY MODE / VULNERABLE ROAD USERS

Trends in the past five years for crashes involving a vulnerable user are shown in ***Figure 8.*** As noted earlier, numbers tend to fluctuate due to the small number of crashes, however, both bicycle and motorcycle crashes are generally increasing.

Many roadway safety evaluations limit their review of vulnerable road users to only those on bicycles or pedestrians. This evaluation includes motorcyclists as vulnerable road users. The data shows that fatal crashes involving motorcycles are more frequent than those involving bicycles or pedestrians.

When vulnerable road users (motorcyclists, bicyclists, and pedestrians) are involved in a crash, it tends to be more severe. While motor vehicle crashes remain by far the most prevalent (96% of all crashes), they account for just 40% of fatalities. See ***Figure 9***.

Vulnerable road users are involved in
4% of all crashes but
60% of fatal crashes

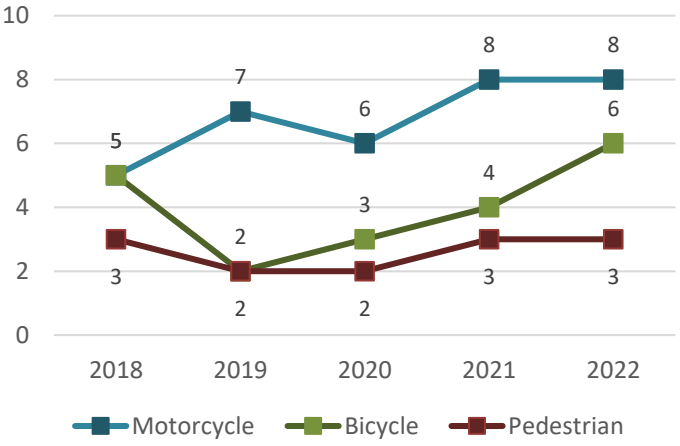


Figure 8. Vulnerable User Crash Trends

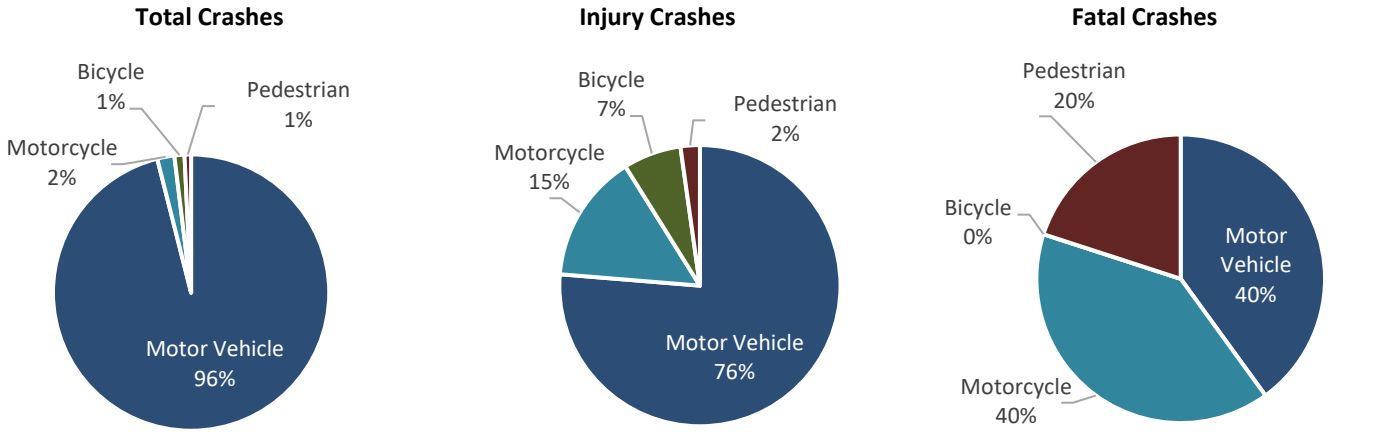


Figure 9. Severity Impact on Vulnerable Road Users

MOTORCYCLE CRASHES

There have been a total of 34 motorcycle crashes in the last five years. Twenty (20) of them, or 59% of motorcycle crashes were severe, including two (2) fatalities. The locations of motorcycle crashes are shown in ***Figure 10***.

The most frequent type of motorcycle crash is categorized as 'other' meaning that the type of crashes varies and does not fall into a typical category such as rear end or approach turn. This category would include the run-off-the-road crashes. The second most frequent type of motorcycle crash is a fixed object crash. Among motorcycle crashes, 41% are single vehicle crashes, which is twice the percentage of all crashes.

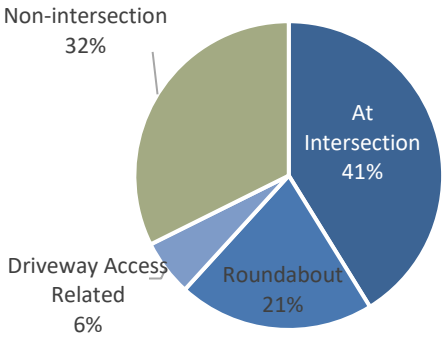


Figure 10. Motorcycle Crash Location

BICYCLE CRASHES

There have been a total of 20 bicycle crashes in the last five years. Nine (9) of them, or 45% of bicycle crashes were severe. About 90% of bicycle crashes occur at some type of intersection (see ***Figure 11***). The data highlights the importance of focusing bicycle safety improvements at intersections. Bicycle projects along roadway segments are an important component to support cycling comfort but will be less likely to reduce crash numbers than intersection projects.

Depictions of the most frequent types of bicycle crashes at intersections are shown in ***Figure 12***. A significant contributing circumstance in bicycle crashes includes riding against traffic (on sidewalk or in the street) where motorists may not be looking for bicyclists). This represents an opportunity for community wide education to make motorists aware of the possibility of bicyclists approaching from the right and discouraging bicyclists from riding against traffic.

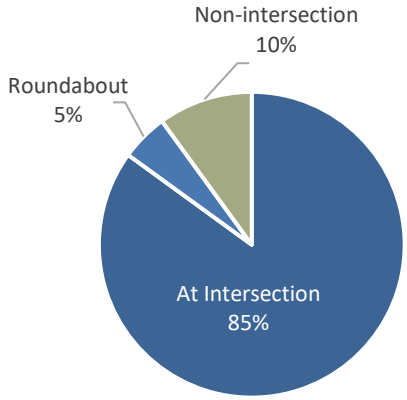


Figure 11. Bicycle Crash Location

There have been three locations with more than one bicycle crash in the last five years. Information on those locations and crashes is included below.

PEDESTRIAN CRASHES

There have been a total of 13 pedestrian crashes in the last five years. Three (3) of them - 23% of pedestrian crashes were severe, including one fatality. There have been no locations with multiple pedestrian crashes. The fatality did not occur at an intersection or in a crosswalk.

There were no locations with more than one pedestrian crash in the last five years.

BICYCLE / PEDESTRIAN CRASH LOCATIONS

If pedestrian and bicycle crashes are combined, there are several locations with multiple crashes. They are listed below. Because the total numbers remain statistically low, a safety audit of these locations may (or may or not) show a particular pattern or trend that can be addressed.

- 7th Street / Stone Mountain - 3 total crashes
  - 2 bicycle and 1 pedestrian crash all involved right turning vehicles and at least one of the bicycle crashes involved riding against traffic.
- 15th Street / Jacoby - 2 total crashes
  - 2 bicycle crashes both involving right turns and at least one involved riding against traffic.
- 11th Street / Main - 2 total crashes
  - 2 bicycle crashes both traveling against traffic and crossing against the signal.

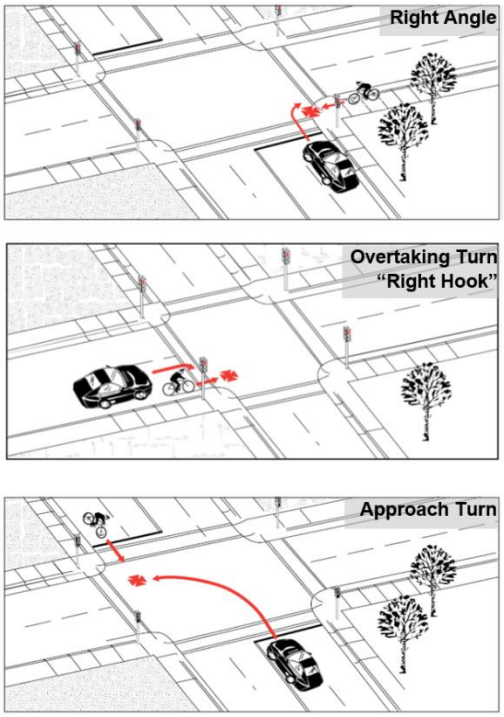


Figure 12. Visual Depiction of Frequent Types of Bicycle Crashes

SCHOOL AGED PEDESTRIAN / BICYCLE CRASHES

A review of pedestrian and bicycle crashes involving students headed to / from school has identified a few items for potential safety reviews.

There were two crashes in 2021 involving students which were in crosswalks with a crossing guard present. The locations of those are shown in ***Figure 13***. This is a highly unusual occurrence. Consideration should be given to reviewing the type of crossing (is a signal with some sort of red indication appropriate for the crossing on Main Street?), perhaps additional training for crossing guards, and education for students and the broader community.

In 2022 there were three crashes involving students in the vicinity of the high school and middle school.

Figure 13. Location of Crashes Involving School Aged Students in a Crosswalk

- 7th Street / Main Street - involving a turning vehicle hitting a pedestrian
- 11th Street / Main Street - a bicyclist failed to yield
- 11th Street south of Main Street - a pedestrian that stepped into traffic.

Although the circumstances involving the crashes are different, the trend of crashes involving students is concerning, and an education campaign may be helpful.

LOCATION OF CRASHES

67%
of crashes occur at an intersection, driveway or alley access

Crash reports generally show information on location such as cross streets and an indication of whether a crash was related to some type of intersection. As shown in ***Figure 14***, most crashes (67%) occur at an intersection, driveway, or alley access. Intersections are a focus for safety improvements.

In urban areas, the percentage of crashes that occur at an intersection, driveway, or alley access is often 70% or even higher. In rural areas, single vehicle run-off-the-road crashes along stretches of roadway are more prevalent. Windsor's data shows that it is an urbanizing area, but still has many rural areas.

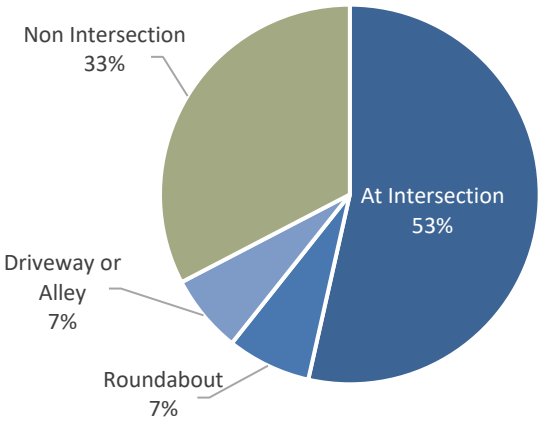


Figure 14. Location of Crashes

NUMBER OF VEHICLES

Figure 15 shows the number of vehicles involved in crashes that occur in Windsor. Single vehicle crashes account for just 21% of all crashes.

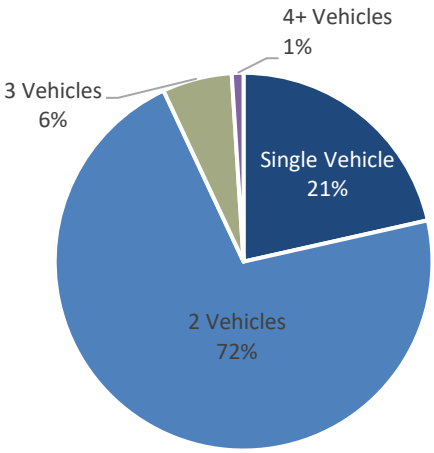


Figure 15. Number of Vehicles Involved

CRASHES BY MONTH, DAY, AND TIME

The variations of crashes in intervals of time can identify when crashes are more prevalent. While the fluctuations tend to vary similarly with the fluctuations in volumes, the information can be used to target educational campaigns and/or enforcement.

CRASHES BY MONTH OF THE YEAR

A review of crashes by month, over five years, shows that April sees the fewest crashes (averaging 21 per month) while September sees the most crashes (averaging 34 per month). This is a variation of more than 50%. The crashes in September may be impacted by the annual start of school. See ***Figure 16***.

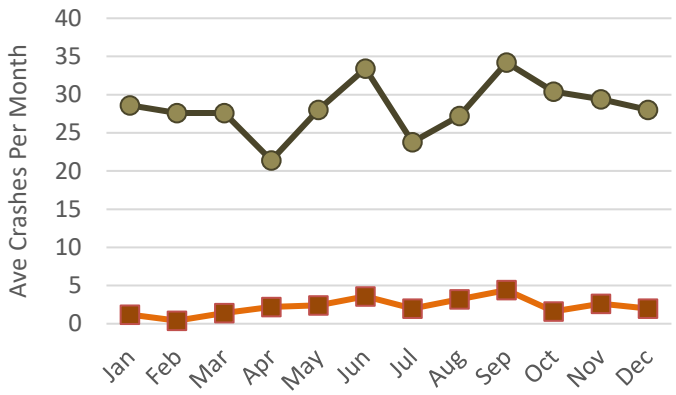


Figure 16. Crashes by Month of the Year

CRASHES BY DAY OF THE WEEK

Figure 17 shows that more crashes occur on Fridays than on any other day of the week. Daily variation in crashes generally tracks with daily variation in traffic volumes (Friday typically has the highest traffic volumes).

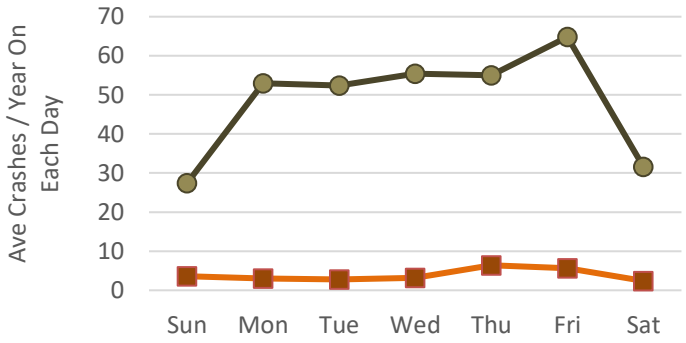


Figure 17. Crashes by Day of the Week

CRASHES BY TIME OF DAY

Crashes each year are compiled by time of day in ***Figure 18***. The most striking takeaway from this information is the much higher occurrence of crashes in the afternoon hours between 3 pm and 5 pm than at other times of the day. That is also the time when traffic volumes are highest, but the increase in crashes may be higher proportionally to the increase in volumes. This can be a reflection that congestion can be a contributing factor to crash numbers.

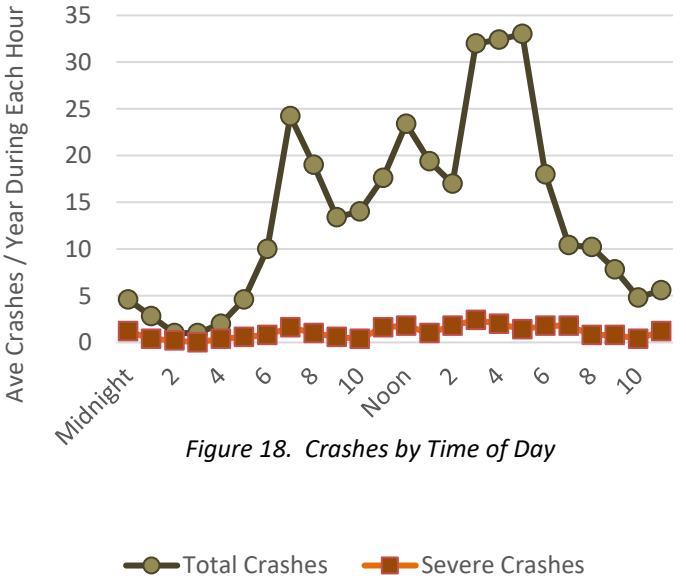


Figure 18. Crashes by Time of Day

CRASH NUMBERS AND CRASH TYPE BY DRIVER AGE

Figure 19 compares the number of crashes by age of at-fault drivers with the percentage of licensed drivers in that age category. Drivers aged 15-19 are more than **four** times as likely to be involved in a crash as would be expected given the number of licensed drivers in that age group. Drivers in their early 20s are also over-represented in crashes. All other age groups are under-represented in crashes.

This trend of higher numbers than expected of young drivers in crashes is not unique to Windsor. It does indicate the impact of driver inexperience as a likely key factor in crashes and offers insight into potential countermeasures to address this challenge.

Teenagers represent
4% of all drivers
but are responsible for
18% of all crashes

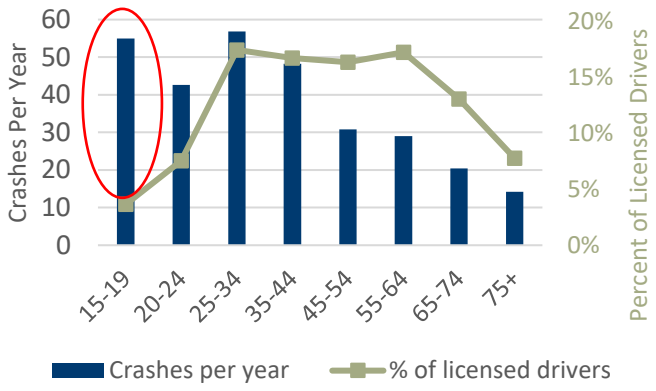


Figure 19. At Fault Drivers By Age Compared to Licensed Drivers

Figure 20 compares the types of crashes that older drivers (aged 65+) are involved in against the prevalence of those crashes among all drivers. Older drivers are significantly over-represented in right angle crashes. These types of crashes are often related to running a red light or STOP sign and/or entering a roadway from a side street and having to judge gaps in traffic. Right angle crashes tend to be crashes that cause more injury due to higher speeds.

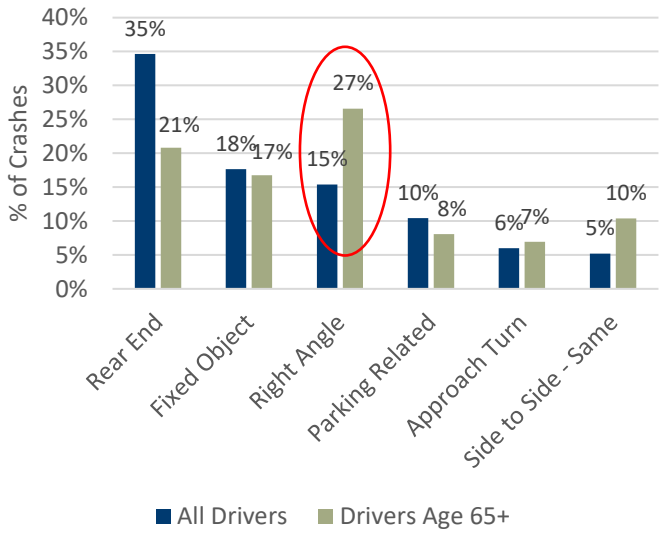


Figure 20. Crash Type by Driver Age

DRIVING UNDER THE INFLUENCE (DUI) CRASHES

Crashes that involve suspected Driving Under the Influence (DUI) have different characteristics than many other crashes. ***Figure 21*** shows the type of crashes involved with DUI.

A majority of the crashes involve the impaired driver hitting either a fixed object or a parked car.

Twenty-one percent (21%) of all crashes involve just one vehicle. However, among DUI crashes the percentage of single vehicle crashes increases to almost half (45%).

45%
of DUI crashes are single vehicle crashes

DUI crashes are **twice** as likely to be severe

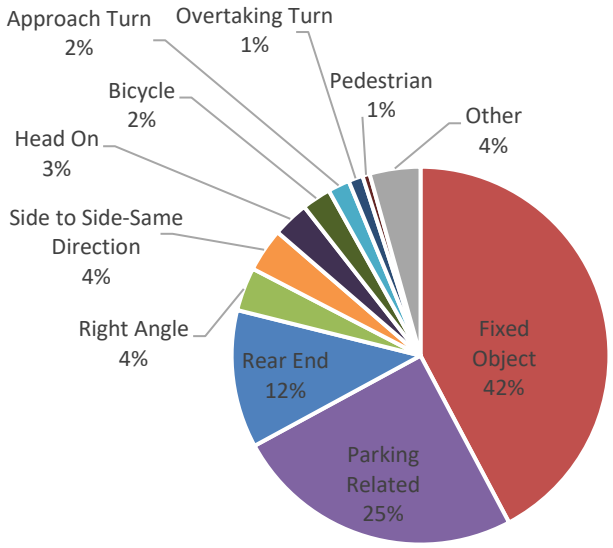


Figure 21. DUI Crash Type

Figure 22 shows the age of the at-fault driver in a DUI crash plotted against the percentage of licensed drivers in that age category. Drivers below the age of 35 are significantly over-represented in alcohol-related crashes given the number of licensed drivers in those age groups. Also surprising is that drivers aged 15-19 are over-represented even though they have not reached the legal drinking age.

DUI crashes tend to be more severe when compared to all other crashes. Overall, 8.0 % of all crashes involve a documented injury or fatality. Among DUI crashes, 15.5% are severe.

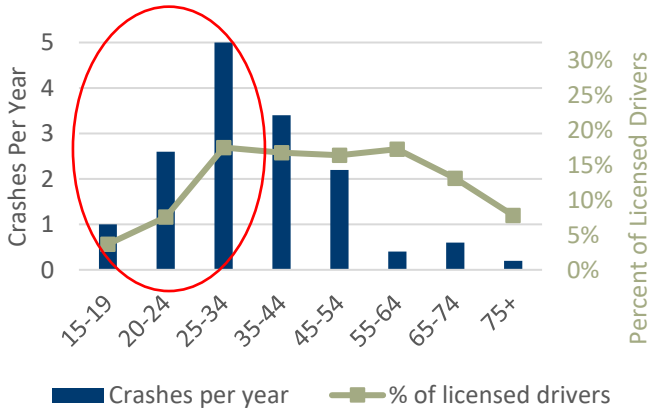


Figure 22. Age of At-Fault DUI Driver Compared to Licensed Drivers

In Windsor, the location with the most crashes involving an impaired driver in the last five years occurred at the intersection of Main Street and 7th Street with a total of seven (7) crashes.

ECONOMIC IMPACT OF CRASHES

Using figures determined by the Federal Highway Administration and published in the Highway Safety Manual, an estimation of economic costs associated with crashes in Windsor can be made. The annual societal cost of traffic crashes in Windsor in 2022 was more than $20 million. See ***Table 1.*** The crash costs shown are adjusted to reflect 2022 values. Crash costs include monetary losses associated with medical care, emergency services, property damage, and lost productivity. They also include costs related to the reduction in the quality of life related to injuries.

Societal cost of crashes in Windsor in 2022:
$20 million

A study completed by the National Highway Traffic Safety Administration (NHTSA) identified who pays the costs of the economic impact of crashes. The NHTSA study found that society at large pays for about 75% of all costs incurred for traffic crashes. Those costs are passed on to the public through insurance premiums, taxes, direct out of pocket payments for goods/services, and increased medical costs.

Table 1. Economic Impact of Traffic Crashes in Windsor, 2022

Crash Severity	Number of Crashes	Cost Per Crash	Societal Cost
Property Damage Crashes	333	$ 12,400	$ 4,129,200
Possible Injury Crashes	33	$ 76,300	$ 2,517,900
Suspected Minor Injury Crashes	33	$ 135,200	$ 4,461,600
Suspected Major Injury Crashes	7	$ 370,000	$ 2,590,000
Fatal Crashes	1	$ 6,970,800	$ 6,970,800
Total	**407**		**$ 20,669,500**

COMPARISON TO OTHER CITIES

The most consistent way to compare Windsor's crash frequency with that of other cities is to compare the fatal crash rate (crashes per 100,000 population). Fatal crashes are used for this comparison as they are required to be reported to the National Highway Traffic Safety Administration's Fatal Accident Reporting System (FARS) which helps ensure 'apples to apples' comparisons. ***Table 2*** is sorted by fatal crash rate and compares Windsor to other communities in Colorado with similar population. Populations of comparison cities are generally within about 15,000 of Windsor's population.

For consistency, all population estimates in this analysis were obtained from the U.S. Census. It is acknowledged that population estimates completed by Windsor show a higher population than 35,788. If a higher population number were used, the fatal crash rate would be even lower for Windsor. Crash data for other communities is from the Colorado Department of Transportation (CDOT) and is consistent with FARS.

Windsor's fatal crash rate is lower than most comparable communities, and close to only half that of average Colorado communities.

Windsor's fatal crash rate is significantly

lower

than most comparable Colorado communities.

Table 2. Fatal Crash Rate Comparison to Other Colorado Cities

Colorado Cities								
City	Population	Fatal Crashes, 2018 - 2022					Avg.	Fatal Crash Rate (Crashes / 100,000 Pop.)
		2018	2019	2020	2021	2022		
Brighton	40,693	5	4	6	8	4	5.4	**13.3**
Wheat Ridge	32,722	1	1	6	3	3	2.8	**8.6**
Fountain	29,677	3	1	4	2	2	2.4	**8.1**
Montrose	20,648	2	2	2	1	0	1.4	**6.8**
Englewood	33,516	1	0	3	1	4	1.8	**5.4**
Northglenn	37,333	3	2	1	4	0	2	**5.4**
Lafayette	31,002	0	1	0	2	4	1.4	**4.5**
Littleton	45,191	1	3	2	3	1	2	**4.4**
Pueblo West	33,800	5	0	1	1	0	1.4	**4.1**
Windsor	35,788	0	1	0	3	1	1	**2.8**
Louisville	20,975	1	0	1	0	0	0.4	**1.9**
Evans	22,296	0	1	1	0	0	0.4	**1.8**
Erie	31,686	0	0	0	0	0	0	**0.0**
Avg. CO Cities	31,948							**5.2**

TYPES OF CRASHES

As noted earlier, crashes are categorized into a variety of types. Definitions and explanations of those types are included in the introduction. This section provides a more detailed review of some of the most prevalent crash types, and those that tend to result in the most serious injury/fatal crashes.

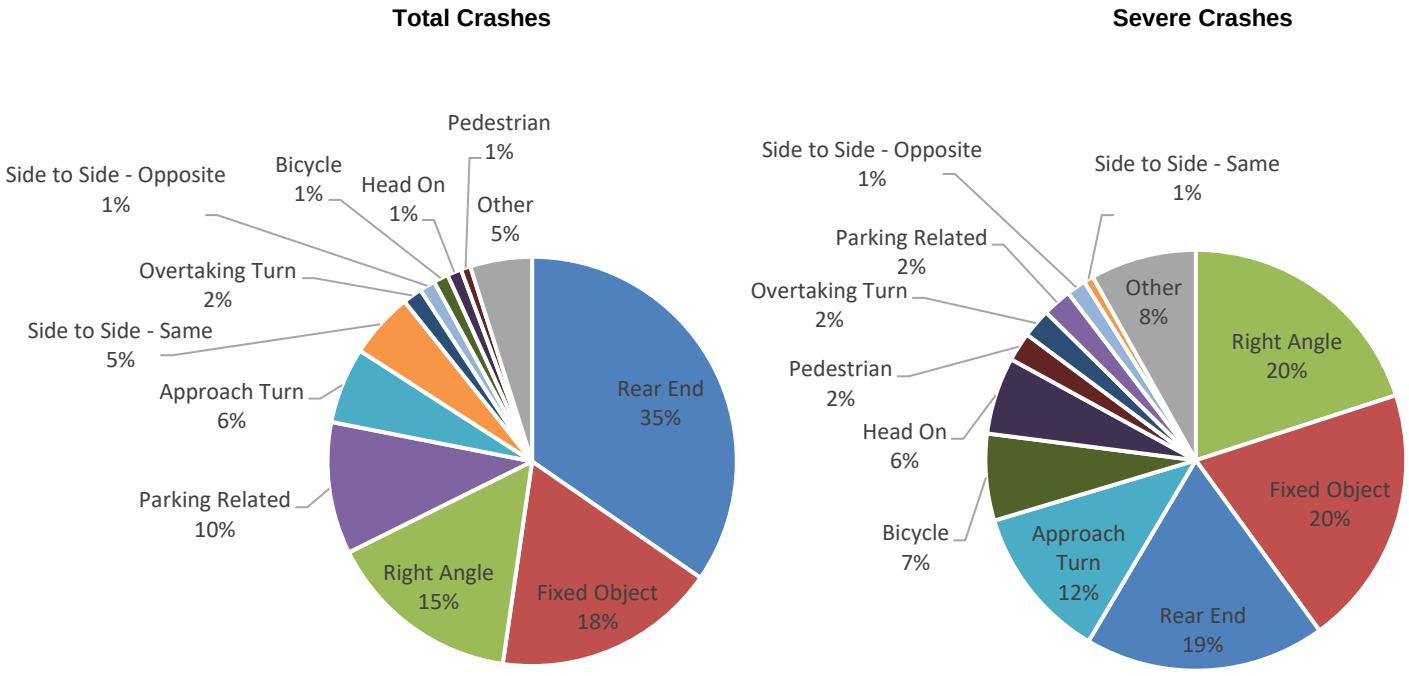


Figure 23. Crash Types by Total Crashes and Severe Crashes

Figure 23 indicates the type of crashes that occur, both when evaluated among all crashes, and then only among those that are severe. Right angle, approach turn, bicycle, and head on crashes have a higher percentage of severe crashes. Note that motorcycle crashes are not separated as a type of crash type in this figure. While all traffic crashes are of concern, those that result in more serious consequences are of special interest.

Table 3 provides a numerical summary of the crash types that are involved in the highest number of injury / fatal crashes each year. Those types with the most crashes may have greater prospects for safety improvements.

Type of Crash	Number of Crashes / Year	Percent of Crashes that are severe	Number of Severe Crashes / Year
Right Angle	52.2	10.3 %	**5.4**
Fixed Object	60.0	9.0 %	**5.4**
Rear End	117.6	4.3 %	**5.0**
Motorcycle*	6.8	58.8 %	**4.0**
Approach Turn	20.4	15.7 %	**3.2**
Bicycle	4.0	45.0 %	**1.8**
Head On	3.8	42.1 %	**1.6**
Pedestrian	2.6	23.1 %	**0.6**

Table 3. Summary of Crash Types Involved in the Highest Number of Severe Crashes

** Motorcycle crashes are not separated as a crash type in Figure 19.*

INTERSECTION EVALUATION

Most of this report is a summary of the numbers, types, and patterns of crashes. This information can be used to identify overall trends and help to understand general mitigation and safety efforts throughout Windsor. The next element is to use the crash data to identify specific locations for potential improvements.

Total crash numbers at any location identify where the most crashes occur. While helpful, because volumes and other elements at specific locations vary widely, it is difficult to draw relevant conclusions from just crash frequency. Therefore, an additional analysis is conducted to identify intersections where there are more crashes than expected considering traffic volumes, roadway geometry, type of traffic control, etc.

INTERSECTIONS BY EXCESS CRASH COST

To identify locations with the most potential for crash reduction, it is important to use methods that account for traffic volumes, roadway geometry, and type of control at intersections as those factors have an impact on the number of crashes at a given location.

It is also necessary to acknowledge that even though traffic crashes are partially deterministic (i.e., factors affecting crash potential can be controlled), crashes are, to some extent, random events. This random nature of crashes can make it more difficult to determine if a location is truly a problem versus a location where normal variation led to a high crash frequency during the analysis period. To identify locations that warrant further investigation it is helpful to use a methodology that accounts for the somewhat random nature of crashes.

In 2010 the Transportation Research Board (TRB) and the American Association of State Highway and Transportation Officials (AASHTO) published the *Highway Safety Manual* (HSM). The HSM includes a statistical approach that considers traffic volumes and intersection types while also accounting for the natural fluctuation of data called regression to the mean. The result is the identification of locations that have a higher-than-expected crash frequency even after accounting for random variation.

CRASH PREDICTION MODELS

The method in the Highway Safety Manual that is applied for this evaluation uses crash prediction models to predict the number of crashes at each location given traffic volumes, roadway geometry, and type of control at each intersection. The predictions are compared to the actual number of crashes at each location (adjusted to account for regression to the mean). The more the actual adjusted number of crashes exceeds the number of predicted crashes (expressed as excess crash cost) the more likely it is that a location might benefit from targeted improvements.

Several crash prediction models were considered including those found in the Highway Safety Manual 1st edition, models developed for the Colorado Department of Transportation (CDOT) in 2009, and models developed for CDOT in 2018. Model results were compared to actual Windsor crash data and the models that best matched the data in each intersection category were selected for use (see ***Table 4)***.

Number of Legs* at an intersection	Type of Control	Model Used
3	Stop Controlled	CDOT 2018
4	Stop Controlled	CDOT 2018
3	Signalized	CDOT 2018
4	Signalized	CDOT 2018
All	Roundabout	NCHRP 888

** Legs: Segments of roadway connected to an intersection*

Table 4. Prediction Model Used in the Analysis for Each Intersection

TRAFFIC VOLUMES

Traffic volumes in Windsor were down in 2020 by about 20% due to COVID-19. To account for this, three-year average traffic volumes used for analysis at each location were reduced by 7% to account for the reduced volumes in 2020.

Average ADT over three years = (V + V + 0.8V)/3 = 0.93V = -7%

This analysis was completed for 191 intersections in Windsor using three years of data (2020-2022). The evaluation shows that only 27% have an excess crash cost and 73% have a negative crash cost (indicating less crashes than predicted). This means that when aggregated and averaged, intersections in Windsor have less crashes and/or severity than what would be predicted.

73%
of intersections in Windsor have fewer and less sever crashes than predicted.

Table 5 shows the 50 intersections with the greatest excess crash costs (grey highlighted column). Since injury crashes have higher crash costs associated with them, the ranking method gives more weight to locations with more injury crashes compared to locations with primarily "fender benders".

LEVEL OF SERVICE OF SAFETY (LOSS)

While excess crash cost is a quantitative approach, CDOT uses a similar but more qualitative approach to identify locations with more crashes than expected termed Level of Service of Safety (LOSS). LOSS is a scale from 1 – 4. LOSS 3 and 4 indicate locations with an above average number of crashes and above the 85th percentile number of crashes respectively compared to estimates from a crash prediction model. Calculation of LOSS was completed in this review and results are included in ***Table 5***. LOSS is included as it may identify some additional intersections – especially with lower volumes -- that may warrant further investigation. It also gives the Town information needed to determine locations that may score favorably in the review process for CDOT safety funds.

TRENDS IN INTERSECTION SAFETY

In addition to identifying intersections with higher-than-expected crash numbers and severity, reviewing crash trends can identify changing conditions and safety at specific locations. ***Table 5*** lists the change in excess crash costs both positively and negatively. As noted earlier, the base calculation includes three years of data (2020-2022) and the comparison is against the previous three years of data (2017-2019). All the comparisons are done on a crash/year basis. Locations with more significant improvement in safety trends are shaded green, while locations with increasing excess crash costs are shaded in red. Note that in locations with few crashes, a single injury/fatal crash can create a pronounced swing in excess crash costs. In these cases, judgment is needed to determine whether a trend is significant or not.

Table 5. Top 50 Intersections by Excess Crash Cost

	Fac ID	Intersection N/S Street	Intersection E/W Street	Traffic Volume Major Street Volume	Traffic Volume Minor Street Volume	Traffic Volume Total AADT	Model Predicted Crashes Predicted Crashes/ Year	Model Predicted Crashes Predicted FI Crashes/ Year	Actual Adjusted Crashes Expected Crashes/ Year	Actual Adjusted Crashes Expected FI Crashes/ Year	Excess Crash Costs Excess PDO	Excess Crash Costs Excess FI	Excess Crash Costs Excess Expected Crash Value ($)	CDOT LOSS LOSS Total Crashes	CDOT LOSS LOSS FI Crashes	Crash Trends 2017 - 2019 vs. 2020 - 2022 Δ Crash Cost	Control
Top 10 Intersections	13	SH 257	Eastman Park Drive	10,928	6,045	16,973	4.1	0.6	8.8	1.2	4.1	0.6	$217,757	LOSS 4	LOSS 4	$87,620	4SG
	120	SH 257	East Garden Drive	10,230	2,325	12,555	2.2	0.3	3.3	0.7	0.7	0.3	$105,153	LOSS 4	LOSS 4	$92,723	4SG
	121	Westgate Drive	SH 392	23,250	6,510	29,760	7.3	1.3	8.4	1.6	0.7	0.3	$100,890	LOSS 3	LOSS 3	$13,967	4SG
	9	SH 257 / WCR 17	WCR 74 / Harmony Road	15,345	6,510	21,855	5.5	0.9	6.6	1.2	0.8	0.3	$86,803	LOSS 3	LOSS 3	-$11,072	4SG
	304	WCR 17	Eastman Park Drive	10,230	4,650	14,880	2.5	0.3	5.8	0.5	3.1	0.2	$85,167	LOSS 4	LOSS 4	$85,966	RBT
	10	SH 257 (west intersecti	SH 392	17,205	7,905	25,110	6.6	1.2	8.4	1.4	1.6	0.2	$80,246	LOSS 3	LOSS 3	$53,874	4SG
	478	12th Street	SH 392 / Main Street	19,065	2,325	21,390	1.3	0.3	2.2	0.5	0.6	0.2	$69,632	LOSS 4	LOSS 4	-$37,051	4ST
	12	SH 257 (east intersectio	SH 392 / Main Street	13,485	10,230	23,715	6.4	1.1	12.0	1.0	5.7	0.0	$60,926	LOSS 4		-$107,316	4SG
	306	WCR 17	Crossroads Boulevard	7,208	5,022	12,230	2.3	0.3	2.6	0.4	0.1	0.2	$45,846	LOSS 3	LOSS 4	$59,200	RBT
	455	SH 257	Kodak Drive	12,090	930	13,020	0.5	0.1	1.7	0.2	1.1	0.1	$38,274	LOSS 4	LOSS 4	$21,807	3ST
Next 15 Intersections	14	SH 257	Crossroads Boulevard	12,090	4,185	16,275	1.8	0.4	3.5	0.4	1.7	0.0	$30,757	LOSS 4	LOSS 3	$13,156	3SG
	305	WCR 17	New Liberty Road	7,440	4,650	12,090	2.2	0.3	4.4	0.3	2.1	0.0	$29,158	LOSS 4	LOSS 3	$51,460	RBT
	8	WCR 15 / 15th Street	SH 392	18,600	5,580	24,180	5.7	1.0	7.9	1.0	2.1	0.0	$26,322	LOSS 4	LOSS 3	$6,731	4SG
	429	WCR 15 / 15th Street	West Birch Drive	7,440	2,325	9,765	1.1	0.2	1.9	0.2	0.8	0.0	$22,725	LOSS 4	LOSS 3	-$1,660	4ST
	480	9th Street	SH 392 / Main Street	18,368	1,395	19,763	1.9	0.2	3.1	0.2	1.2	0.0	$17,054	LOSS 4	LOSS 3	-$53,999	3SG
	128	Covered Bridge Parkwa	New Liberty Road	4,883	1,860	6,743	0.7	0.1	1.8	0.1	1.1	0.0	$16,306	LOSS 4	LOSS 3	$16,659	4ST
	106	CR 5 / Fairgrounds Ave	Steeplechase Drive	9,765	4,650	14,415	0.6	0.1	0.9	0.2	0.3	0.0	$16,296	LOSS 4	LOSS 3	$24,024	3ST
	461	7th Street / WCR 17	Walnut Street	8,231	2,232	10,463	1.1	0.2	2.1	0.2	1.0	0.0	$16,009	LOSS 4	LOSS 3	-$11,571	4ST
	113	WCR 15 / 15th Street	WCR 68 1/2 / Jacoby Road	6,510	2,883	9,393	0.5	0.1	0.9	0.1	0.3	0.0	$15,025	LOSS 4	LOSS 3	-$8,314	3ST
	116	SH 257 / WCR 17	WCR 72	6,045	1,581	7,626	0.6	0.1	1.0	0.1	0.4	0.0	$14,492	LOSS 4	LOSS 3	$8,466	4ST
	452	SH 257	Walnut Street	10,695	1,395	12,090	0.5	0.1	0.7	0.1	0.2	0.0	$13,273	LOSS 3	LOSS 3	$8,244	3ST
	303	WCR 13	New Liberty Road	7,905	4,418	12,323	2.2	0.3	3.1	0.3	0.8	0.0	$13,015	LOSS 3	LOSS 3	-$9,204	RBT
	209	17th Street	CR 68 1/2 / Jacoby Road	3,255	4,650	7,905	0.7	0.1	1.0	0.1	0.2	0.0	$10,160	LOSS 3	LOSS 3	-$7,156	4ST
	476	14th Street	SH 392 / Main Street	19,530	2,325	21,855	0.9	0.2	0.8	0.2	-0.2	0.0	$9,834		LOSS 3	-$2,756	3ST
	482	6th Street	SH 392 / Main Street	13,485	1,395	14,880	1.1	0.2	1.6	0.2	0.4	0.0	$9,346	LOSS 3	LOSS 3	-$20,952	4ST
	456	SH 257	Poudre Trail Road	12,090	930	13,020	0.5	0.1	0.4	0.1	-0.1	0.0	$9,149		LOSS 3	$12,802	3ST
	475	16th Street	SH 392/Main Street	18,600	1,395	19,995	1.1	0.2	1.4	0.2	0.2	0.0	$8,784	LOSS 3	LOSS 3	-$17,475	4ST
	131	WCR 15	Crossroads Boulevard	7,440	279	7,719	0.3	0.1	0.4	0.1	0.0	0.0	$7,871	LOSS 3	LOSS 4	$5,752	4ST
	451	WCR 19 / Hollister Lake	Sundance Drive	9,300	465	9,765	0.4	0.1	0.5	0.1	0.1	0.0	$6,370	LOSS 4	LOSS 3	-$1,935	4ST
	308	Water Valley Parkway (	Eastman Park Drive	7,905	2,790	10,695	1.9	0.2	2.0	0.3	0.1	0.0	$5,734	LOSS 3	LOSS 3	$14,372	RBT
	207	Highland Meadows Par	Steeplechase Drive	3,813	1,535	5,348	0.5	0.0	0.8	0.0	0.3	0.0	$5,195	LOSS 4	LOSS 3	$2,076	4ST
	101	CR 5 / Fairgrounds Ave	Highland Cove Drive / Cou	9,765	837	10,602	0.5	0.1	0.6	0.1	0.0	0.0	$4,116	LOSS 3	LOSS 3	$3,798	4ST
	500	Green River Drive	New Liberty Road	5,115	465	5,580	0.1	0.0	0.2	0.0	0.0	0.0	$4,067	LOSS 3	LOSS 4	$3,779	3ST
	111	WCR 15	WCR 72	5,115	1,116	6,231	0.5	0.1	0.4	0.1	0.0	0.0	$2,799		LOSS 3	$3,095	4ST
	119	WCR 19 / Hollister Lake	WCR 70	6,045	1,163	7,208	0.6	0.1	0.5	0.1	-0.1	0.0	$1,837		LOSS 3	$1,293	4ST
	445	WCR 17	Southgate Drive	4,650	233	4,883	0.1	0.0	0.2	0.0	0.1	0.0	$1,296	LOSS 4		$975	3ST
	428	WCR 15 / 15th Street	Cold Creek Drive	7,440	465	7,905	0.2	0.0	0.3	0.0	0.1	0.0	$1,192	LOSS 4		-$1,059	4ST
	214	7th Street / WCR 17	Stone Mountain Drive	8,603	930	9,533	0.3	0.1	0.6	0.1	0.2	0.0	$1,120	LOSS 4		-$17,854	3ST
	469	Hannah Way	WCR 74 / Harmony Road	14,648	93	14,741	0.1	0.0	0.2	0.0	0.1	0.0	$989	LOSS 4		$821	3ST
	446	WCR 17	Champion Drive	4,650	465	5,115	0.1	0.0	0.2	0.0	0.1	0.0	$938	LOSS 4		-$1,718	3ST
	526	Windshire Drive	WCR 68 1/2 / Jacoby Road	3,023	1,163	4,185	0.3	0.0	0.3	0.0	0.0	0.0	$897		LOSS 3	$559	4ST
	489	Nankeen Drive	SH 392 / WCR 68	11,625	279	11,904	0.2	0.0	0.3	0.0	0.1	0.0	$800	LOSS 4		$1,023	3ST
	449	WCR 19 / Hollister Lake	Boxwood Drive	6,975	1,860	8,835	0.9	0.1	0.6	0.1	-0.3	0.0	$570		LOSS 3	$2,690	4ST
	112	WCR 15 / 15th Street	Guardian Drive	5,348	1,163	6,510	0.2	0.0	0.4	0.0	0.1	0.0	$569	LOSS 3		$914	3ST
	425	WCR 15 / 15th Street	Windshire Drive	5,580	1,163	6,743	0.3	0.0	0.4	0.0	0.1	0.0	$490	LOSS 3		$939	3ST
	204	Highland Meadows Par	Colonial Park Drive / Mura	1,674	698	2,372	0.1	0.0	0.1	0.0	0.0	0.0	$275	LOSS 3		-$491	4ST
	498	Hilltop Drive	New Liberty Road	5,115	372	5,487	0.1	0.0	0.1	0.0	0.0	0.0	$186	LOSS 3		-$2,811	4ST
	211	11th Street	Walnut Street	3,255	1,827	5,082	0.4	0.1	0.4	0.1	0.1	0.0	$178	LOSS 3		-$11,577	4ST
	433	SH 257 / WCR 17	Ventana Way	5,813	419	6,231	0.1	0.0	0.2	0.0	0.0	0.0	$153	LOSS 3		-$100	3ST
	522	N Shore Circle (east int	WCR 72	2,000	186	2,186	0.1	0.0	0.1	0.0	0.0	0.0	$132	LOSS 3		-$296	4ST

Legend: Increasing Crash Trend / Improving Safety Trend

INTERSECTION MAPPING

Figure 24 shows the location of the top ten intersections sorted by excess crash costs in Windsor. The size of the dot on the map is relative to the amount of excess crash dost. ***Table 6*** summarizes the information in a table, and providing an indication whether the crash trend is getting better (increasing safety) or worse (increasing crashes).

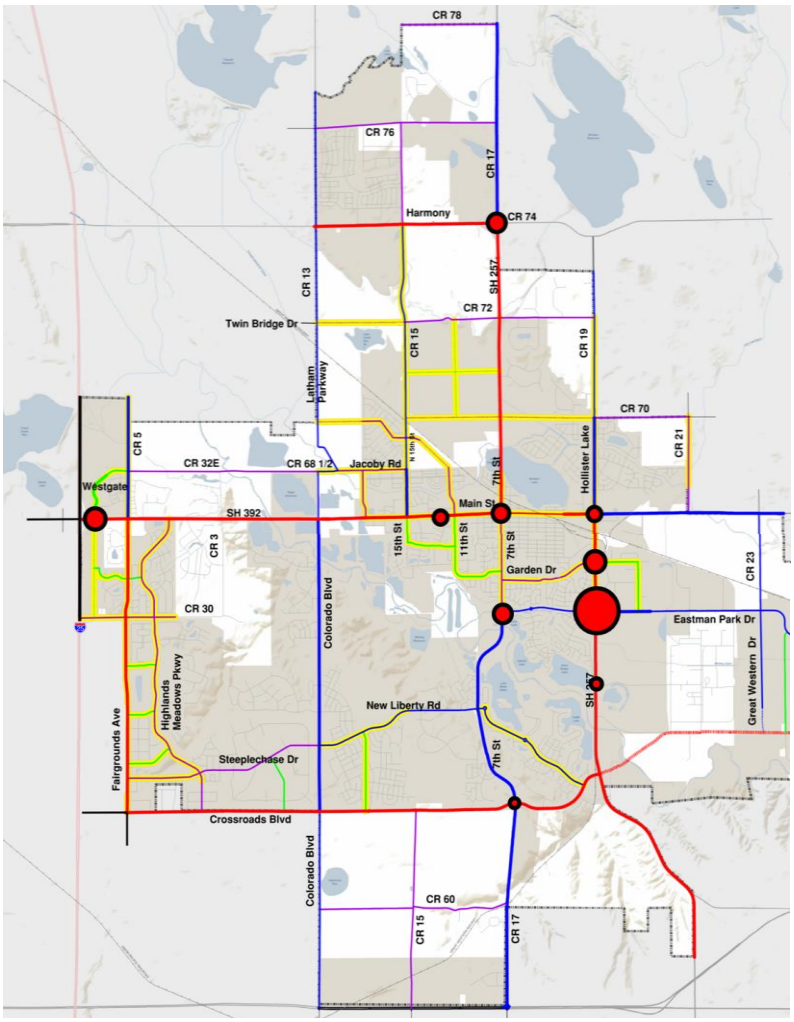


Figure 24. Mapping of 'Top Ten' Intersections with More Crashes than Expected.

Table 6. Summary Information on Top 10 Intersections

Rank	Location	Intersection Control	Excess Crash Cost	# Crashes (3 years)	Trend in Safety
1	SH 257 / Eastman Park	4 legs - signal	$ 217 k	34	**Increasing crashes**
2	SH 257 / East Garden	4 legs - signal	$ 105 k	13	**Increasing crashes**
3	Westgate / SH 392	4 legs - signal	$100 k	26	Slightly increasing crashes
4	SH 257 / Harmony	4 legs - signal	$ 87 k	21	Slightly improving safety
5	7th / Eastman Park	4 legs - roundabout	$ 85 k	20	**Increasing crashes**
6	7th / Main	4 legs - signal	$ 80 k	27	Slightly increasing crashes
7	12th / Main	4 legs - stop controlled	$ 69 k	9	Slightly improving safety
8	Hollister (SH 257) / Main	4 legs - signal	$ 61 k	42	**Improving safety**
9	7th / Crossroads	5 legs - roundabout	$46 k	8	**Increasing crashes**
10	SH 257 / Kodak	3 legs - stop controlled	$ 38 k	10	Slightly increasing crashes

PATTERN RECOGNITION

Table 7 identifies intersections where a pattern of a particular crash type is identifiable. The evaluation is a statistical analysis developed by the Colorado Department of Transportation and compares the prevalence of a particular crash type at an intersection against the typical expected proportion of that crash type at the intersection. The table indicates the control type, the location, and the number of that type of crash in three years (2020 – 2022). Only intersections with at least three crashes in three years (average one per year) are included.

It is important to note that some locations in the table may not have had a very high number of a particular crash type, but because of a lack of other types of crashes, that the statistics indicate a pattern. Alternatively, there may be locations with higher numbers of a particular type of crash but due to higher numbers of other crashes, the pattern evaluation may not identify them. The bottom line is that this more detailed information about the types and patterns of crashes can aid in gaining greater understanding during safety audits and identifying locations with opportunities for improvement, but consideration should be applied using engineering judgement, and a holistic safety review.

Table 7. Intersections with Patterns of Particular Crash Types

Control	N/S Street	E/W Street	# Crashes (3 years)	
Approach Turn Crashes				
Signal	15th Street	Main Street	15	*
Signal	9th Street	Main Street	5	
Right Angle Crashes				
Signal	Westgate	SH 392	9	*
Signal	11th Street	Main Street	6	
Stop	15th Street	West Birch Drive	6	
Stop	15th Street	Cold Creek Drive	3	
Rear End Crashes				
Stop	4th Street	Main Street	6	
Signal	SH 257	Harmony Road	17	
Stop	SH 257	East Garden Dr	11	*
Stop	SH 257	CR 72	5	

Crash patterns can also be reviewed for bicycle and pedestrian crashes. For Windsor, there was only one location that had multiple crashes involving bicycle riders or pedestrians in the last three years. 11th Street and Main Street was the location with two bicycle crashes in the last three years. Those two crashes may have been a more ransom occurrence rather than a statistical trend, however, due to the vulnerability of the people involved in the crashes, it is valuable to note these locations.

Several of these locations (denoted with an *) are discussed in more detail beginning on the next page.

DETAILED INTERSECTION REVIEW

Several locations identified through the intersection screening and pattern recognition analysis are listed on the following pages together with their 5-year trend, and an intersection crash diagram that visually depicts the direction and type of crashes that have occurred tin the last three years. The locations were chosen based on excess crash costs, crash type, and safety trend. A summary of the data and potential next steps are also included.

This information can serve as a starting point for future safety audits and the development of mitigation measures.

SH 257 / EASTMAN PARK DRIVE

This location is the highest ranked intersection in terms of excess crash cost, which would indicate that there is an opportunity for improvements. There were 34 crashes in the last three years, four (4) of them severe, and four (4) more with possible injury. Of particular concern is the large increase in crashes in 2021 and 2022.

The types and direction of crashes are varied, although the most frequent crash type involves northbound rear end crashes, eastbound turning crashes, and several approach turn crashes. The adjacent railroad crossing may be a complicating factor.

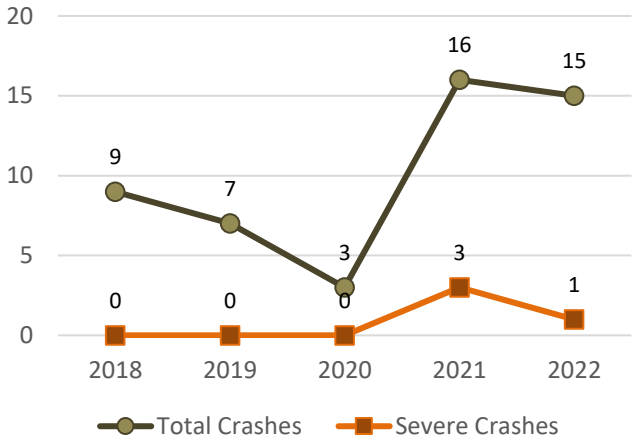
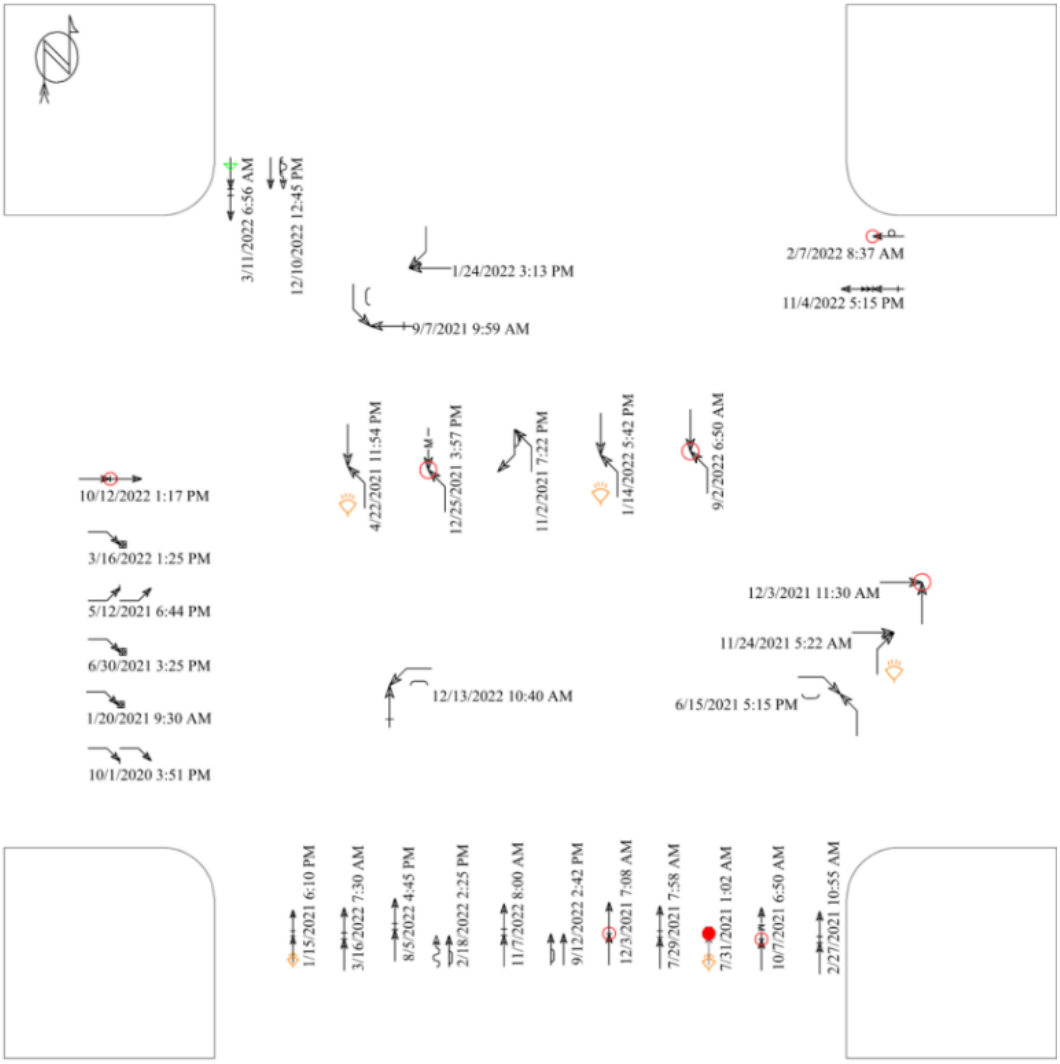


Figure 25. SH 257 / Eastman Park Drive Details



SH 257 / EAST GARDEN DRIVE

The intersection at SH 257 and East Garden is the second ranked intersection in Windsor. With 13 crashes in the last three years, none of which were identified as severe (although seven of the crashes involved a possible injury), there are other locations with higher crash numbers, but due to overall lower vehicle volumes, statistically this location is identified as a location with potential for improvement.

Of note is the pattern of northbound rear-end crashes. This could be a function of platoons of vehicles arriving right at the end of green phase, or during the red interval. A potential mitigation measure could be to review the signal timing, and see whether coordinating the timing with the signal to the south (at Eastman Park) is an option to reduce the number of vehicles arriving on red.

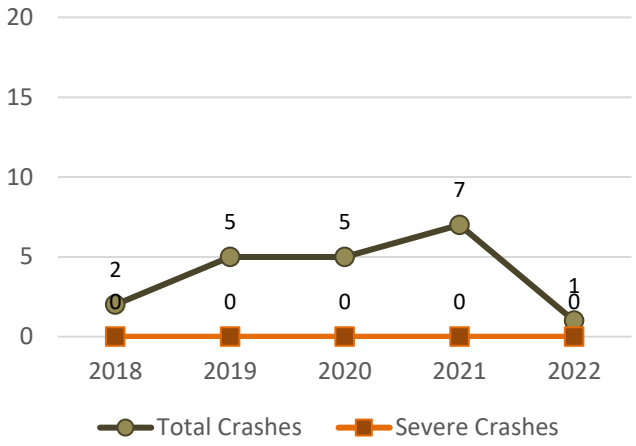
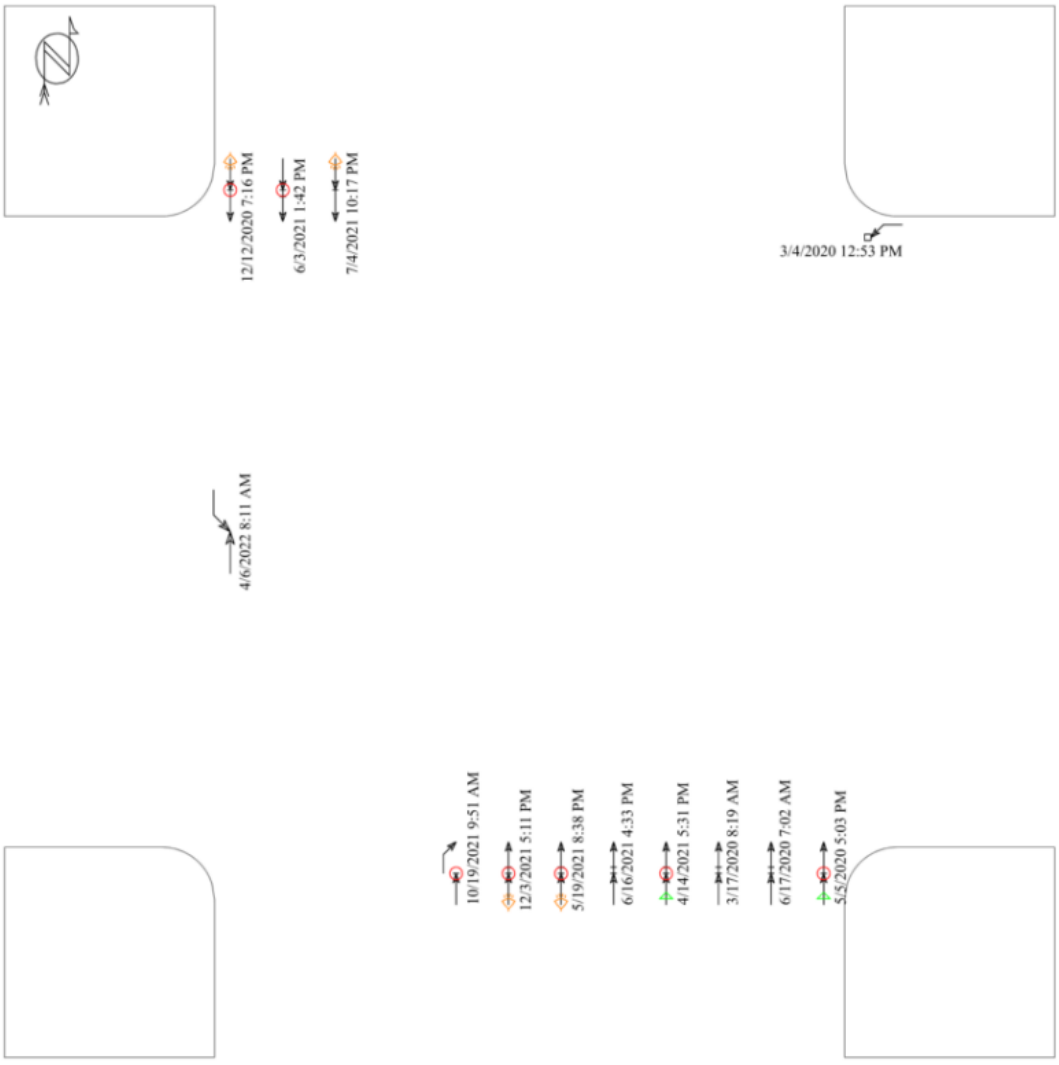


Figure 26. SH 257 / East Garden Drive Details



WESTGATE DRIVE / SH 392

This location is very close to the I-25 interchange, with a series of signals in proximity. There have been 26 crashes in the last three years, five (5) of them severe, and one (1) more with a possible injury. Of particular concern is the pattern of large increases in crashes in the last two years.

There are two distinct patterns of crashes: There are a number of westbound rear end crashes. This could be a function of platoons of vehicles arriving from CR 5 during the end of the green phase, or during the red interval. There is also a pattern of eastbound vehicles likely running the red light. These vehicles are arriving from the interchange and may not be paying attention or may be impatient with red signals. In both patterns, a review of and adjustment to the time relationships between adjacent signals (signal coordination) may be a potential mitigation measure.

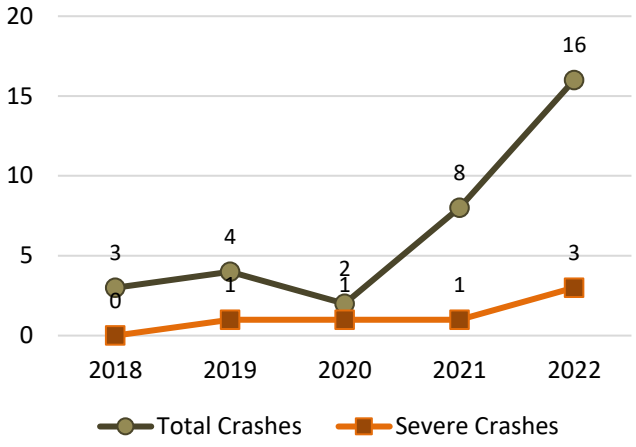
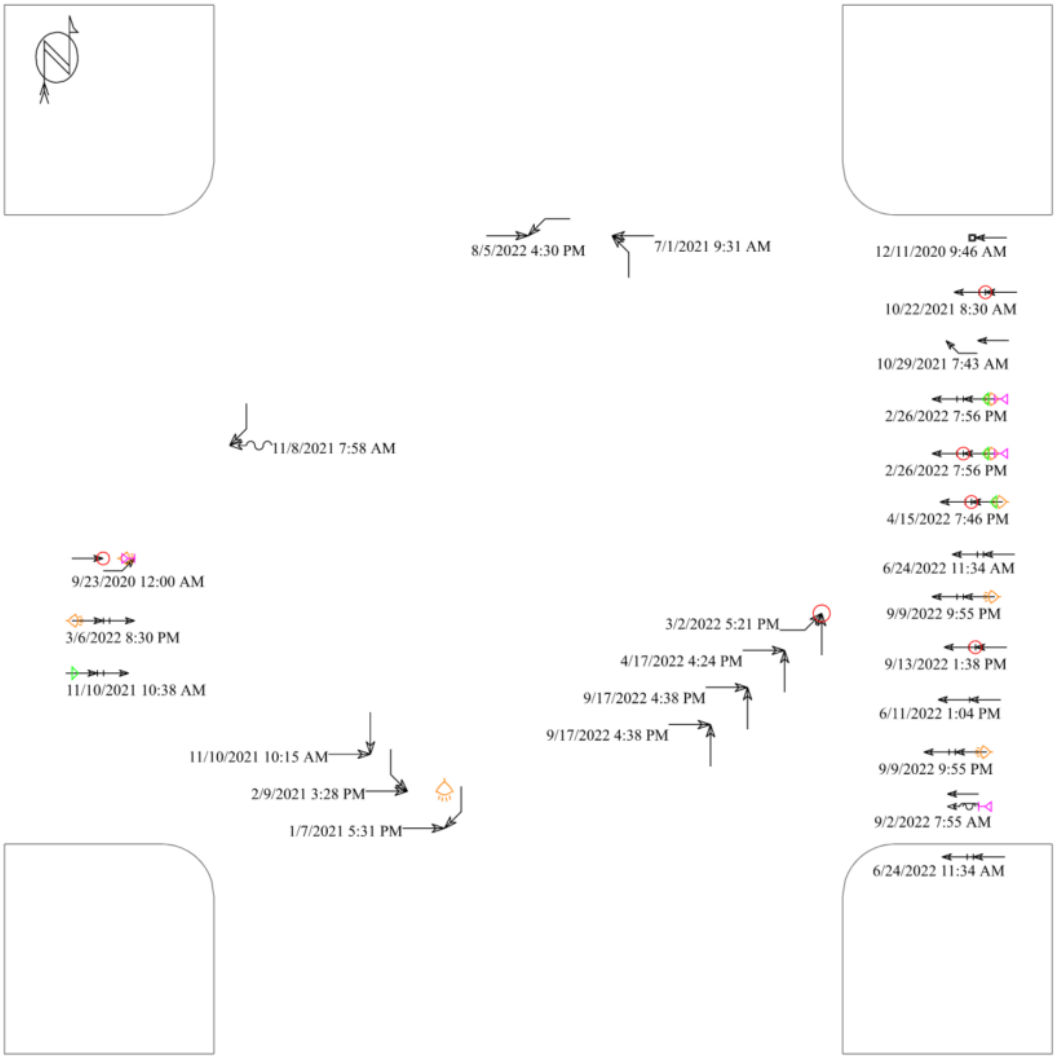


Figure 27. Westgate Drive / SH 392 Details



7TH STREET / EASTMAN PARK DRIVE

The intersection at 7th Street and Eastman Park Drive is a roundabout. It is the highest ranked roundabout in the intersection screening analysis. Crash history involves 20 crashes in the last three years, none of them severe, and just one (1) with a possible injury. The lack of severe crashes is typical of the safety patterns in roundabouts where there are few (if any) higher speed, higher injury crashes.

The crash diagram below indicates a strong pattern of westbound vehicles entering the roundabout without yielding to traffic in the roundabout. The crash trend is better in 2022 than in 2021 and may be the result of minor changes enacted in the last year. A follow up safety audit review could review whether refinements to sight distance, landscaping, signage, striping etc. could further support the YIELD requirement for westbound entering vehicles.

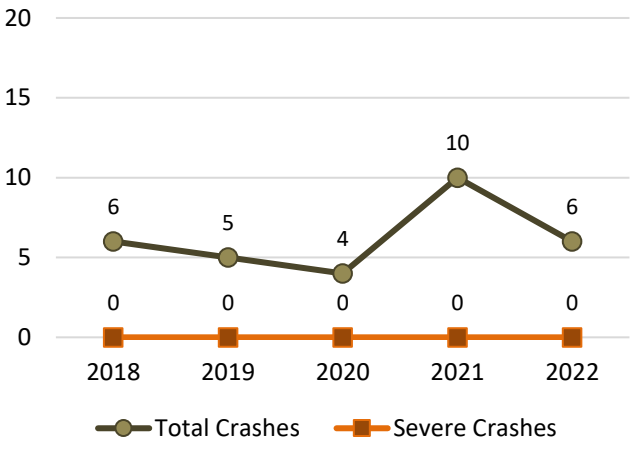
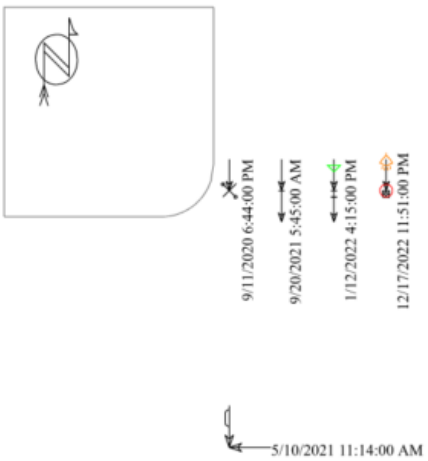
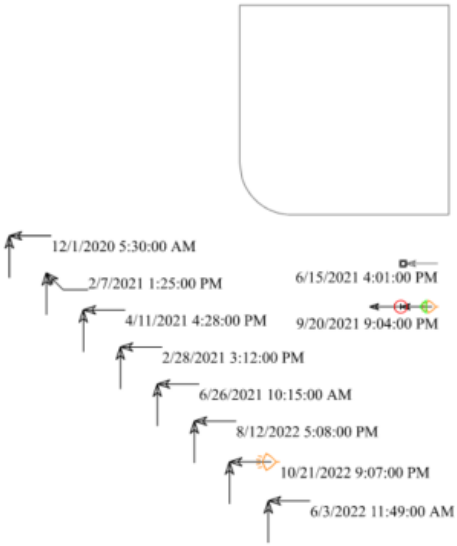
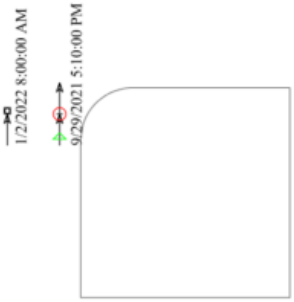


Figure 28. 7th Street / Eastman Park Drive Details







15TH STREET / MAIN STREET

The intersection at 15th Street and Main on the west end of the downtown area has seen 26 crashes in the last three years with a distinctly increasing crash trend since 2020. Only three (3) crashes have been severe in the last three (3) years.

The crash diagram and the pattern recognition process identified this location as having an unusually high number of approach turn crashes (those involving left turning vehicles). This signalized intersection has left turn phasing, but also allows left turns permissively when the light is simply green. A safety audit should include a review of sight distance (the ability for left turn vehicles to see oncoming traffic) and signal phasing to determine whether protected only phasing is appropriate.

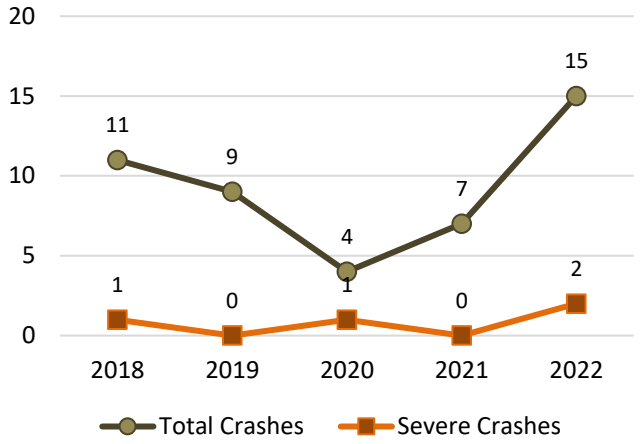
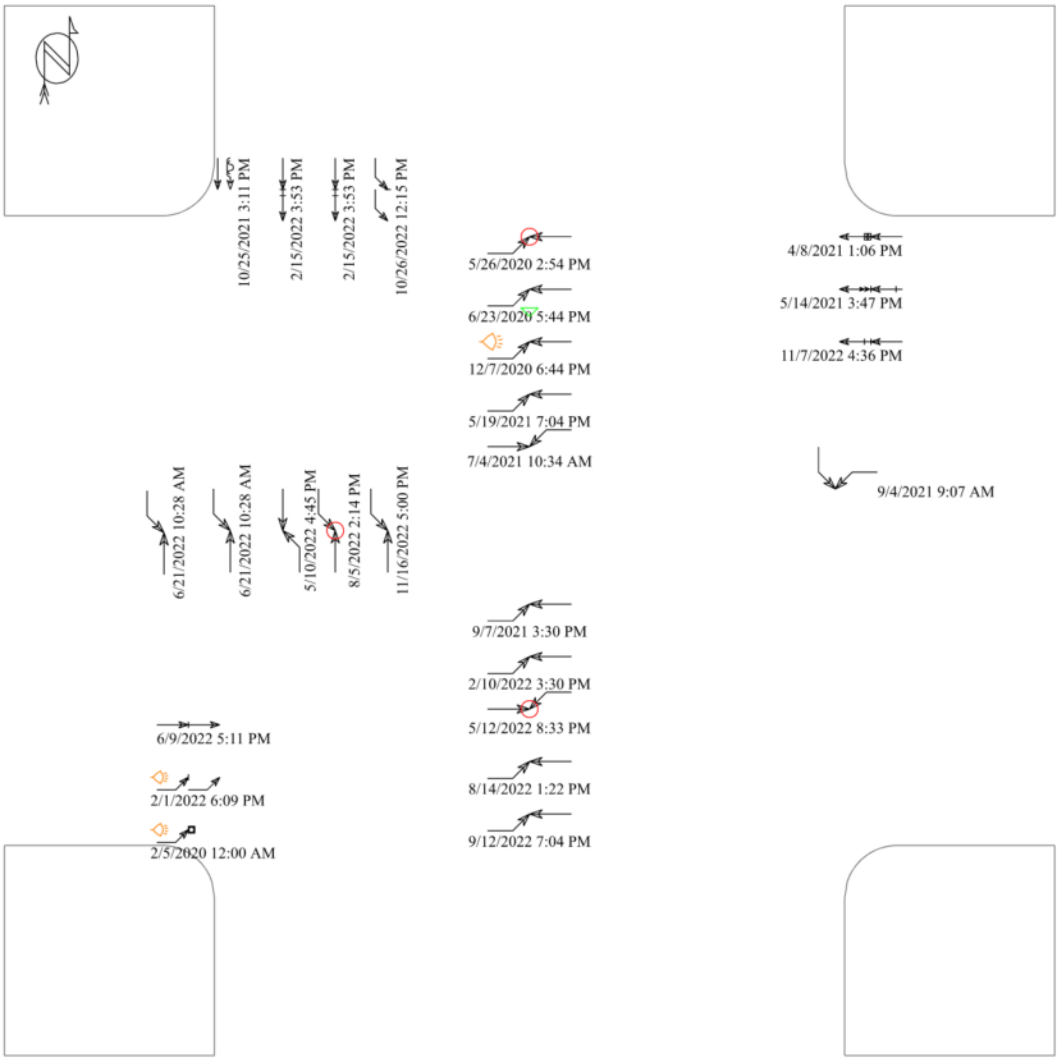


Figure 29. 15th Street / Main Street Drive Details



9TH STREET / MAIN STREET

The intersection at 9th Street and Main is a three-legged signalized intersection right in front of the school. While the crash numbers are not terribly high, the trend is not increasing, and excess crash costs would place the intersection as 15th on the list of the top 50, there is however a distinct pattern to the crashes: eastbound rear end crashes, and westbound approach turn crashes (involving westbound vehicles trying to make a left turn).

Knowing what types of crashes are occurring offers opportunities to explore specific countermeasures. At this location, the striping for the center median could be reviewed to determine whether motorists are not using the center turn lane. Motorists trying to turn from the westbound through lane, may have limited sight distance to see oncoming traffic in the far lane.

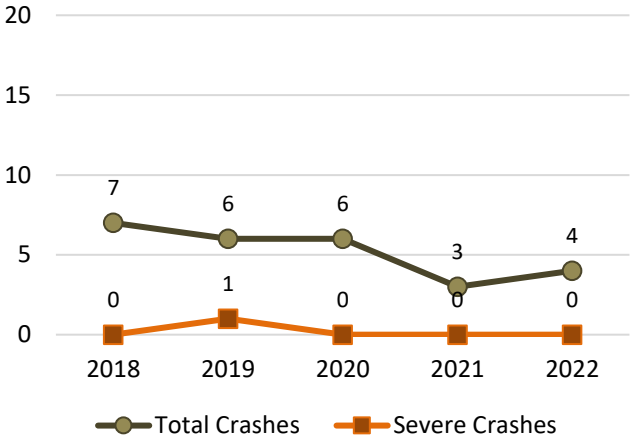
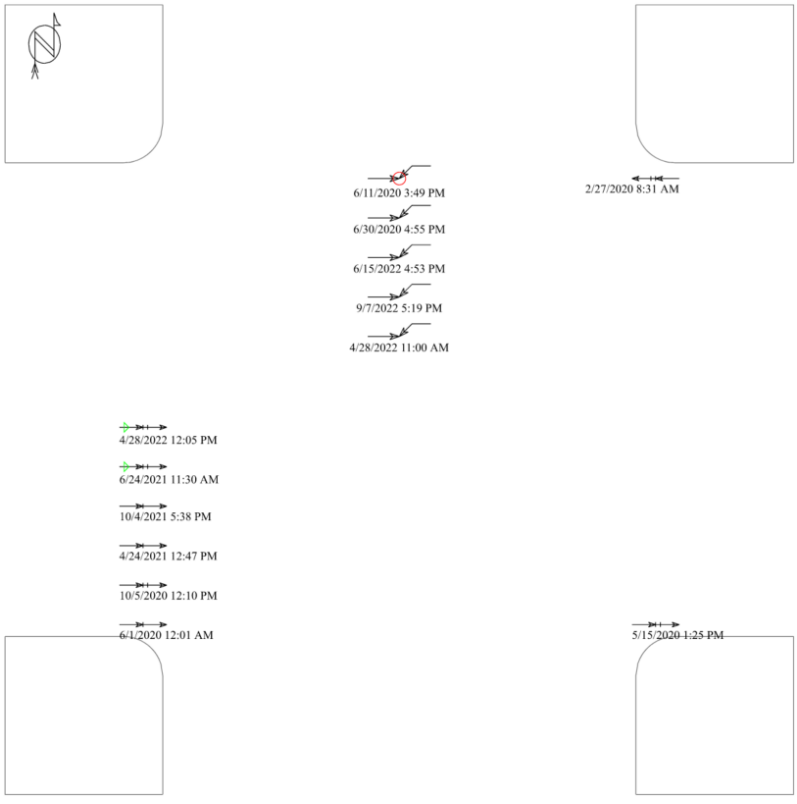


Figure 29. 9th Street / Main Street Drive Details



NEXT STEPS

This ***Roadway Safety Summary*** is a compilation of the data-based analysis related to the safety of Windsor's roadway system. It provides a holistic and comprehensive look at overall crash numbers, severe crashes, trends and patterns, and a detailed screening of intersections to identify locations and types of crashes to be targeted for improvements.

In coming years, this type of review of the data may be completed regularly such that improvements and trends can be followed, and the effectiveness of various efforts determined.

USING A SAFE SYSTEM APPROACH TO SAFETY

The U.S. Department of Transportation and the National Safety Council has a national roadway safety strategy called the ***Safe System Approach*** to transportation safety. The focus is on reducing the number and severity of crashes using a series of principles that includes safer roads and a proactive, data driven approach to addressing safety. The graphic for the approach is shown in ***Figure 30***.

The information in this report fits directly into a safe systems approach and is intended to be an important first step to develop and implement an ongoing roadway safety program. Subsequent efforts in the engineering realm may involve the following:

- Safety audits at particular locations. A starting point for the audits would be to choose the locations with the highest excess crash costs, and/or increasing trends of crashes. The detailed intersection reviews on the previous pages offer some initial ideas for improvements.
- Identification of mitigation / countermeasures for both low-cost improvements, and higher cost geometric changes.
- Use this information to pursue safety funding at the state and national level.

Figure 30. Safe Systems Approach to Transportation Safety

COLLABORATIVE PARTNERS

Roadway safety encompasses much more than just engineering staff, and a successful program involves a number of collaborative partners. This can include the Police Department, school district, other departments within Windsor government, community organizations and more. The information in this report can help inform the work the partners do. Components of a safety program that these partners are well positioned to contribute to include:

- Enforcement
- Education / Communication
- Policies / Programs
- Emergency Response

An example would be a multi-partner approach to improving school aged pedestrian / bicycle safety in the vicinity of Windsor schools through education of students and crossing guards, enforcement during school times, and engineering review of crossing types.

Ultimately, this document can serve as the first iteration of a **Roadway Safety Action Plan**.

IMPROVING THE DATA FOR THE FUTURE

The Roadway Safety Summary is based upon the crash data available for review. With appreciation to the Windsor Police Department, and the Windsor engineering staff, the data accuracy and level of detail is improving. Information available for 2021 and 2022 crashes is vastly improved from what was captured in earlier years.

With the state's implementation of the new crash reporting form (DR 3447), a collaborative effort will need to continue to further understand the complexity of the new form, the most beneficial fields for safety analysis, and the process to get that information from the form into the analysis software. Specific areas of focus include:

- Ensuring location data through geocoding is accurate.
- Consistent identification of whether crashes are intersection related or not.
- Details on types of crashes using standardized descriptions.
- Details regarding crashes involving vulnerable road users (such as pedestrian and bicyclist age).
- Crashes involving impairment.

The ability to make the data as meaningful as possible is dependent on the continued improvement of the quality of data and analysis to develop and implement effective strategies and countermeasures.

Executive Summary

Traffic crashes have a profound impact on those involved, their families, and the community.

The Town of Windsor has completed a Roadway Safety Project with the belief that a systematic, data driven, collaborative effort **<u>can</u>** result in a reduction in the number and severity of crashes. The project involved:

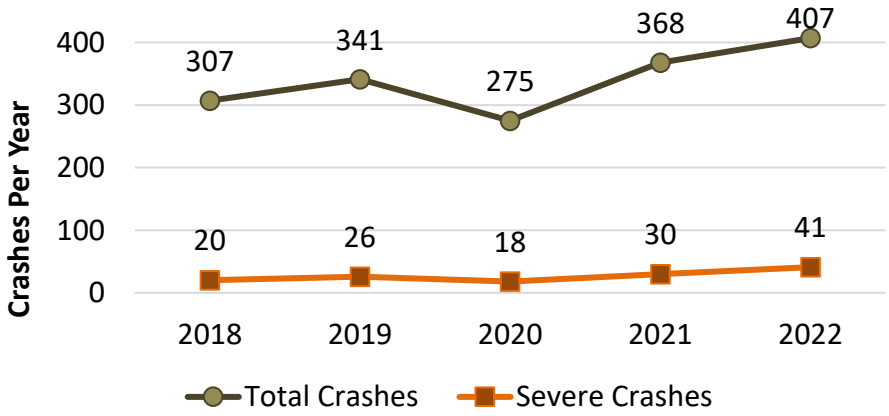
- Gathering crash data from multiple sources.
- Entering data into new crash analysis software.
- 'Scrubbing' most recent data for completion and accuracy.
- Development of intersection screening tools.
- Review of crash trends and patterns.
- Completion of the first annual Roadway Safety Summary.
- Collaboration with Police Department on ongoing crash report processes.

340

Average number of reported crashes on Windsor's roadways each year

27

Crashes each year involve an injury/fatality



Crash numbers are trending up, however, the population is increasing more quickly than crash numbers.

83%

Of all crashes do not involve an injury

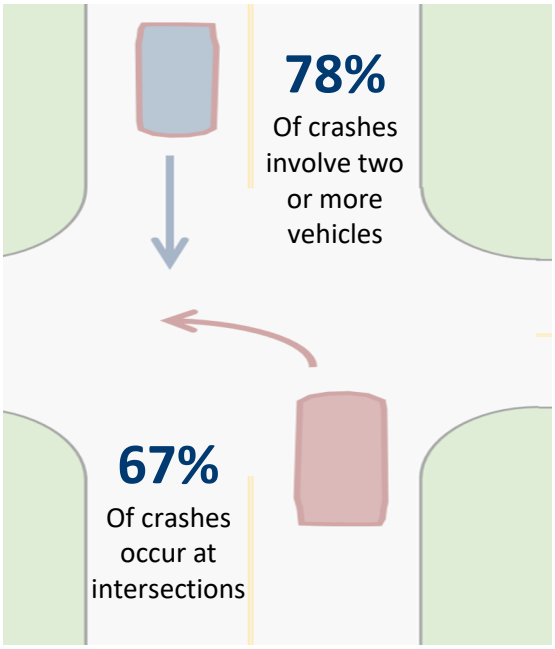
6.2%

of crashes are considered 'severe' (involving a minor injury, major injury or fatality).

The total societal cost of traffic crashes each year in Windsor is approximately **$ 20 million**.

Teenagers represent **4%** of all drivers

but are responsible for **18%** of all crashes.



Intersections are a priority for safety efforts.

<u>Windsor Compared to Others</u>

When compared to other municipalities, Windsor's fatal crash rate is lower than most similar Colorado communities.

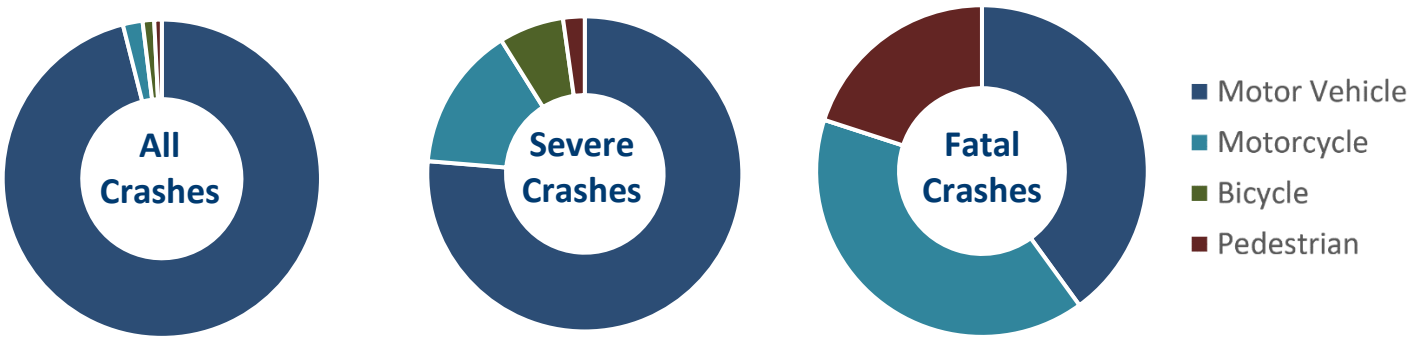
2.8

Windsor's fatal crashes / 100,000 population.

5.2

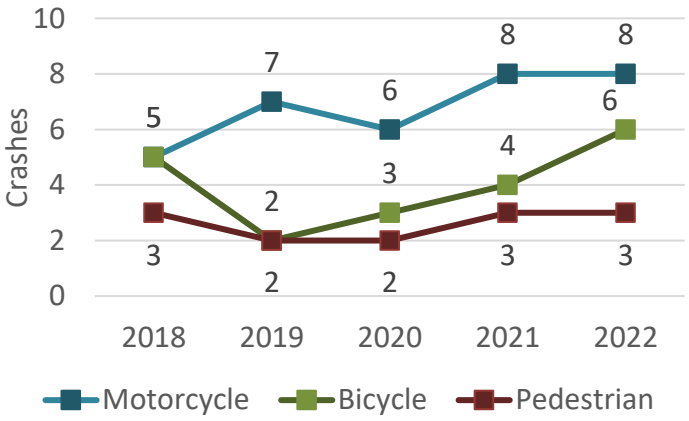
Average fatal crashes / 100,000 population for similar Colorado communities.

Vulnerable Road Users



Vulnerable road users (pedestrians, bicyclists, and motorcyclists) are involved in **4%** of all crashes but make up **60%** of fatal crashes. Motorcyclists have the highest number and severity of crashes among vulnerable users.

There have been **5** crashes in the last three years involving school aged students walking/biking to/from school.

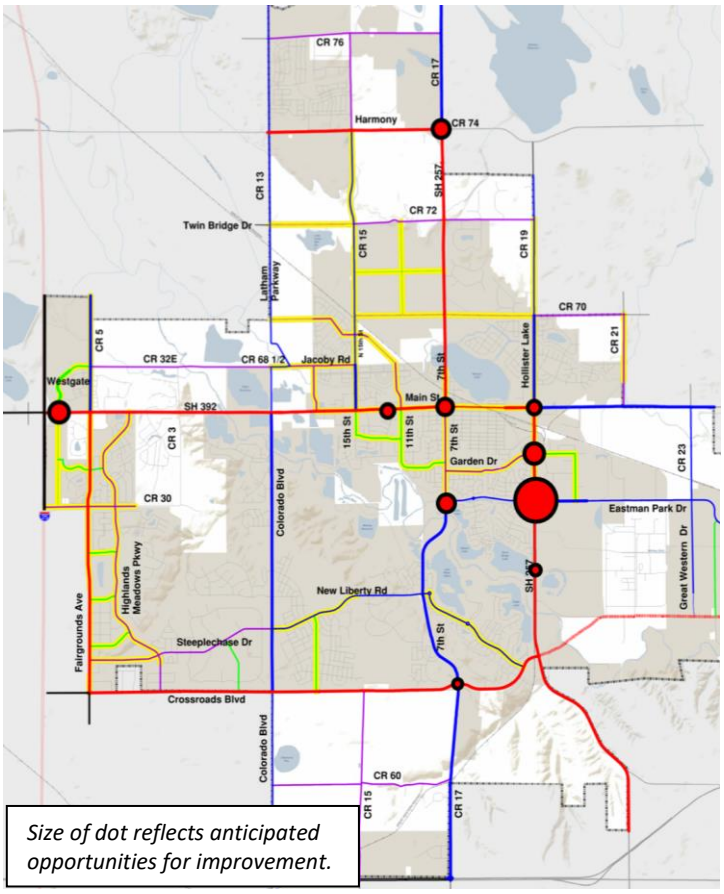


Intersections

Intersections were evaluated using a statistical evaluation of crash numbers that accounts for intersection geometry, traffic volumes, and control type.

73% of intersections in Windsor have fewer and less severe crashes than predicted. The top ten intersections with potential for improving safety are:

Location	# crashes (3 yrs.)
Hollister Rd / Main St	42
SH 257 / Eastman Park	34
7th St / Main St	27
Westgate Dr / SH 392	26
SH 257 / Harmony Rd	21
7th St / Eastman Park	20
SH 257 / East Garden	13
SH 257 / Kodak Dr	10
12th / Main St	9
7th St / Crossroads Blvd	8



Size of dot reflects anticipated opportunities for improvement.

Next Steps

This project serves as a starting point for a Roadway Safety Program in Windsor. It provides the data, tools, analysis, process, and understanding needed to reduce the number and severity of crashes.

MEMORANDUM

Date: May 1, 2023
To: Mayor and Town Board
From: Tara Fotsch, Deputy Director of PRC
Re: Harvest Festival Parade Route - Tara Fotsch, Deputy Director of Parks, Recreation, and Culture
Item #: B.2.

Background / Discussion:
Currently, no left turn is permitted at the intersection of 7th and Walnut by means of temporary structures. In 2024, the Town intends on installing permanent structures which force a parade route change because large Harvest Festival Parade float entries will no longer be able to make the left turn onto Walnut street. They are able to at the current time becasue staff removes the temporary barriers.

Engineering and Parks, Recreation & Culture Staff were asked to determine if the parade route can be modified to bring the parade back to Main Street (Hwy 357), starting this August. Given this request, and knowing this is a CDOT highway, staff has inquired about the possibility and determined associated costs with this proposed change.

The presentation and subsequent discussion will be around the feasibility, logistics and cost associated with the proposed change to the Harvest Festival Parade Route.

Financial Impact:
Approximately $50,000 in associated costs to move the parade to Main Street

Relationship to Strategic Plan:

Recommendation:
Staff will be seeking Town Board direction

CC:

Attachments:

MEMORANDUM

Date: May 1, 2023
To: Mayor and Town Board
From: Shane Hale, Town Manager
Re: Future Meetings Agenda
Item #: B.3.

Background / Discussion:

Financial Impact:

Relationship to Strategic Plan:

Recommendation:

CC:

Attachments:
1. 2023 Future Meetings Agenda

FUTURE TOWN BOARD MEETINGS

May 8, 2023 5:30 p.m.	Town Board Work Session Board/Manager/Attorney Monthly Meeting Sustainable Windsor Colorado Recycling Education Police Station Construction Update Board Chambers Voting Panel Orientation (5 minutes)
May 8, 2023 7:00 p.m.	Town Board Regular Meeting
May 15, 2023 5:30 p.m.	Town Board Work Session Regional Nonpotable Water Quality Update FLOCK Camera Discussion
May 22, 2023 5:30 p.m.	Town Board Work Session Meet the Board – New Employees Draft Energy Plan Historic Preservation Commission Draft Preservation Plan
May 22, 2023 7:00 p.m.	Town Board Regular Meeting
May 29, 2023	Canceled – Memorial Day Holiday
June 5, 2023 5:30 p.m.	Town Board Special Meeting
June 12, 2023 5:30 p.m.	Town Board Work Session Board/Manager/Attorney Monthly Meeting
June 12, 2023 7:00 p.m.	Town Board Regular Meeting
June 19, 2023 5:30 p.m.	Town Board Work Session
June 26, 2023 5:30 p.m.	Town Board Work Session **CANCELLED FOR CML**
June 26, 2023 7:00 p.m.	Town Board Regular Meeting **CANCELLED FOR CML**
July 3, 2023 5:30 p.m.	Town Board Work Session

Future Work Session Topics

- DDA Entertainment District
- Telecom Code (Pending FCC Rules)
- Weld RE-4 School Land Dedication/Cash in lieu of Land Update
- Smart Meter Project (Brian)
- Revenue Projections (August 7)
- Capital Improvement Plan (September 18 – Public Services Campus)
- Utility Rates and Fees (October 9th)
- Operating Budget (Saturday, October 14th)
- Follow-up Budget Questions (November 13th)