



Roadway Safety Summary

August 2025

Report by



TABLE OF CONTENTS

Introduction	1
Roadway Safety Efforts	1
Roadway Safety Concepts	1
Roadway Safety Data	2
Crash Numbers and Trends	2
Crash Severity	3
Fatal Crashes	4
Crashes by Mode / Vulnerable Road Users	5
Location of Crashes	6
Crash Numbers by Driver Age	6
Crash Type	7
Economic Impact of Crashes	8
Comparison to Other Cities	8
Intersection Evaluation	9
Excess Crash Cost	10
Level of Service of Safety (LOSS)	10
Intersection Comparison	10
Trends In Intersection Safety	10
Intersection Mapping	12
Next Steps	13
Vision Zero Safety Action Plan and 2025 Recommended Work Tasks	13
Appendix	
Explanation of Data, Types of Crashes, Explanation of Intersection Evaluation and Excess Crash Cost Details	

LIST OF TABLES

Table 1. Economic Impact of Traffic Crashes in Windsor, 2023	8
Table 2. Fatal Crash Rate Comparison to Other Colorado Cities	9
Table 3. Top 50 Intersections by Excess Crash Cost	11
Table 4. Safety Based Action Items Developed During Road Safety Audits	13/14

LIST OF FIGURES

Figure 1. Types of Roadway Safety	1
Figure 2. Total Crashes 2020-2024	2
Figure 3. Total Crashes Compared to Population	3
Figure 4. Overall Crash Severity	3
Figure 5. Crash Trends by Severity	4
Figure 6. Fatal Crash Trend	4
Figure 7. Vulnerable User Crash Trends	5
Figure 8. Severity Impact on Vulnerable Road Users	5
Figure 9. Location of Crashes	6
Figure 10. At Fault Drivers by Age Compared to Licensed Drivers	7
Figure 11. Crash Types by Total Crashes and Severe Crashes	7
Figure 12. Mapping of 'Top Ten' Intersections with More Crashes than Expected	12

Page Left Intentionally Blank

INTRODUCTION

Windsor, Colorado is a fast-growing town nestled between the Front Range of the Rocky Mountains and Colorado's High Plains. Located just east of I-25 between the state capitals of Denver and Cheyenne, Wyoming, 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 serves as a bedroom community for nearby Loveland and Fort Collins.

Like other cities, Windsor experiences roadway crashes. With an average of 332 reported crashes each year, 37 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.

In Windsor, Colorado

332 crashes / year

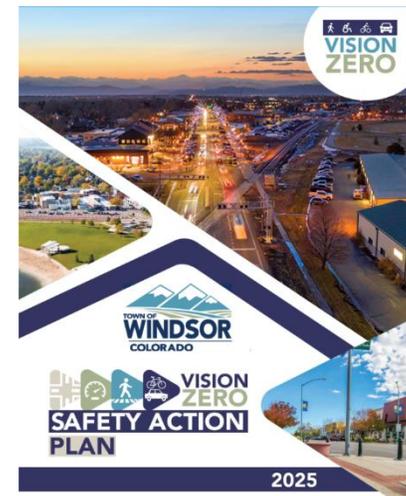
37 involve injury/fatal

ROADWAY SAFETY EFFORTS

In 2023, staff in Windsor's engineering division 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, and identification of action items and priority areas for safety improvements,
- Development of an ongoing process to obtain, review, and analyze crash data, and
- Creation of an annual Roadway Safety Summary Document.

Then, Windsor successfully applied for and received a federal grant to further enhance roadway safety by creating a Safe Streets For All Safety Action Plan (SAP). The plan, begun in 2024 and completed in the spring of 2025, makes the Town eligible for federal safety implementation funding. The effort included analysis, mapping, public outreach, and roadway safety audits in locations of greatest safety interest. The SAP provides general guidance and strategies for improving safety and relies on data analysis completed each year to identify specific safety actions.



This document is an update of the annual report and includes data and its analysis through 2024.

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.

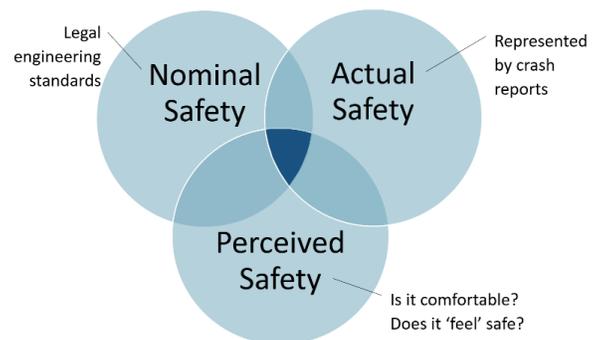


Figure 1. Types of Roadway Safety

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.

ROADWAY 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 (2020-2024).

Notes:

- See Appendix for details about and an explanation of the data as well as the definition and visual depictions of various crash types.

CRASH NUMBERS AND TRENDS

Total reported crashes are shown in **Figure 2**. It is understood that 2020 was 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.

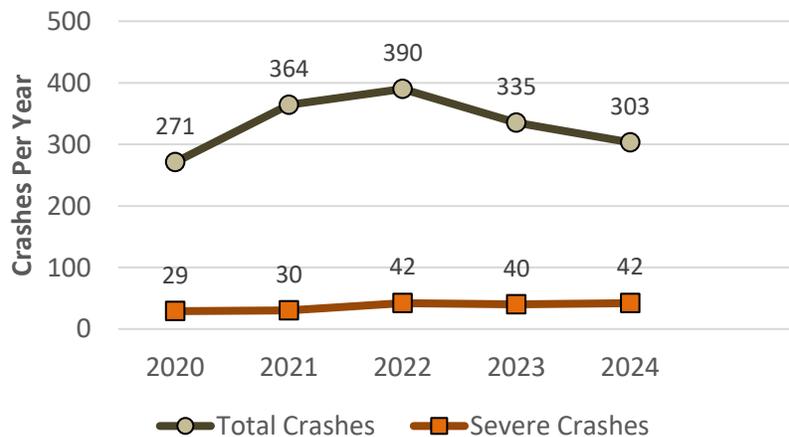


Figure 2. Total Crashes 2020-2024

Overall crashes are generally decreasing since 2022, and severe crashes are trending similar to previous years. Severe crashes are those that are coded (documented) as ‘suspected minor injury’, ‘suspected major injury’, or ‘fatal’.

Figure 3 shows the crash trend in the last ten years together with the population increase in the last ten years. The long term trend lines for both crashes and population are increasing, but the population is increasing more quickly than crash numbers. Comparisons of Windsor’s crash frequency to other cities and towns are provided on page 8.

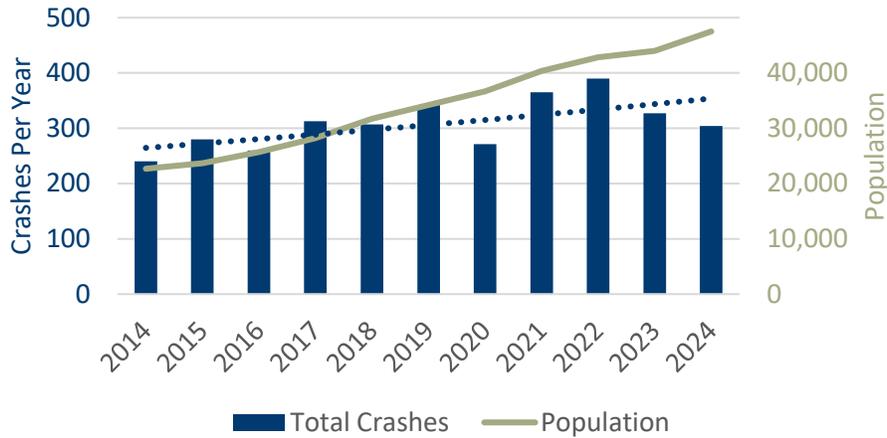


Figure 3. Total Crashes Compared to Population

CRASH SEVERITY

Thankfully, the majority (more than 80%) of crashes do not result in any injury. See **Figure 4**. Crashes that are included within the ‘severe crashes’ category throughout this report include ‘suspected minor injury’, ‘suspected major injury’, or fatal crashes and represent 11% of all reported crashes.

Only **11%**
of crashes involve a
documented injury/fatality

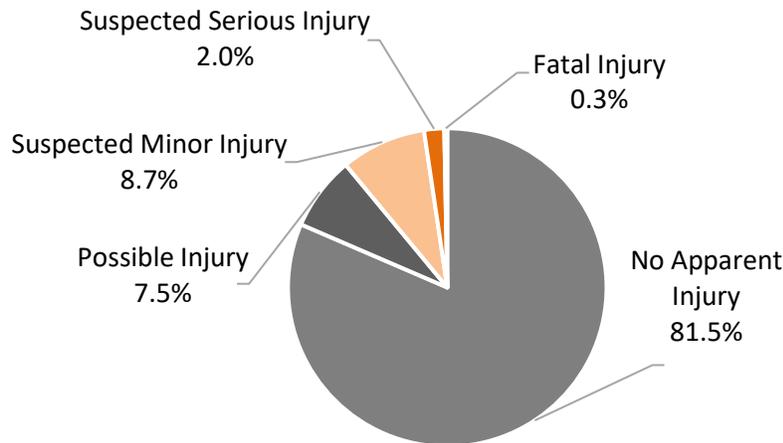


Figure 4. Overall Crash Severity

Figure 5 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.

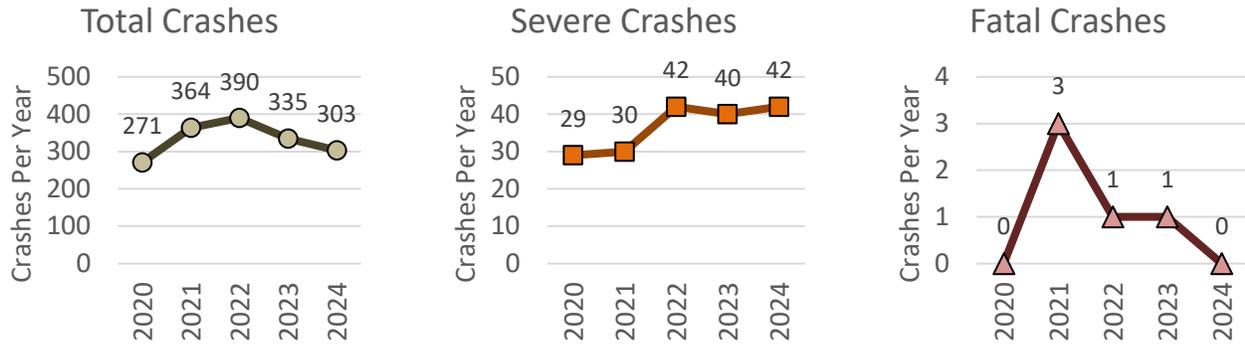


Figure 5. Crash Trends by Severity

FATAL CRASHES

The crash trends associated specifically with those resulting in a fatality are shown in **Figure 6**. Brief information about the mode and type of crash for fatal crashes are also noted.

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

- Six (6) involving only vehicles
- Three (3) 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 8.

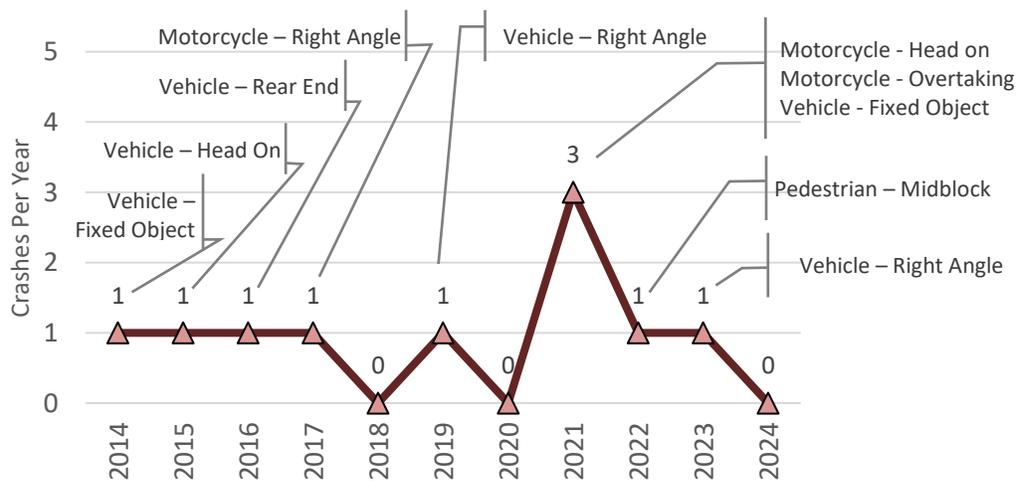


Figure 6. Fatal Crash Trend

CRASHES BY MODE / VULNERABLE ROAD USERS

Vulnerable road users include motorcyclists, bicyclists, and pedestrians. Trends in the past five years for crashes involving a vulnerable user are shown in **Figure 7**. As noted earlier, numbers tend to fluctuate due to the small number of crashes.

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

When vulnerable road users are involved in a crash, it is more likely to be a severe crash compared to other motor vehicle crashes.

While vulnerable road users are only involved in 4% of all crashes, they account for 60% of fatalities. See **Figure 8**. Because of this increased risk, vulnerable road users merit consideration in roadway safety efforts.

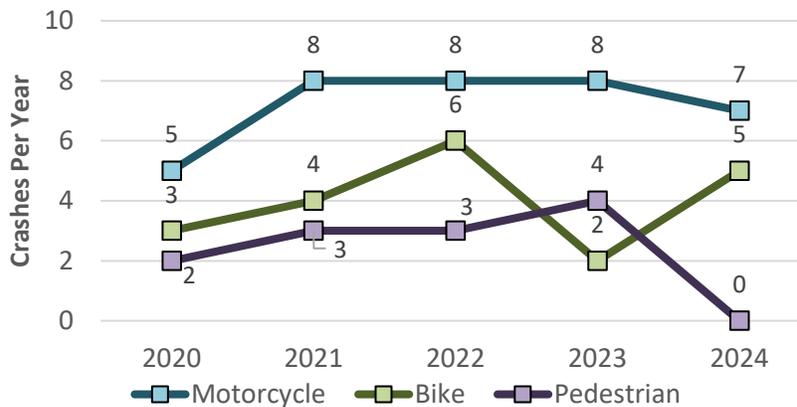


Figure 7. Vulnerable User Crash Trends

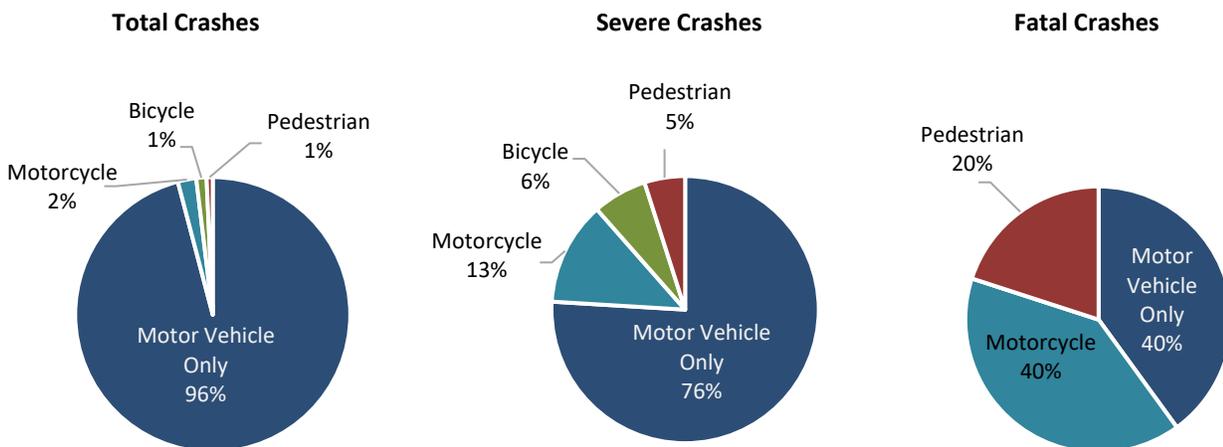


Figure 8. Severity Impact on Vulnerable Road Users

LOCATION OF CRASHES

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 9**, most crashes (69%) occur at an intersection, driveway, or alley access. Intersections are a focus for safety improvements.

69%
of crashes occur at an intersection, driveway or alley access

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 (see fixed object crash type on page 7) along stretches of roadway are more prevalent. Windsor's data shows that while it is an urbanizing area, there are still some roads that are rural in nature, hence there is more of a mixture of intersection and often single vehicle non-intersection crashes.

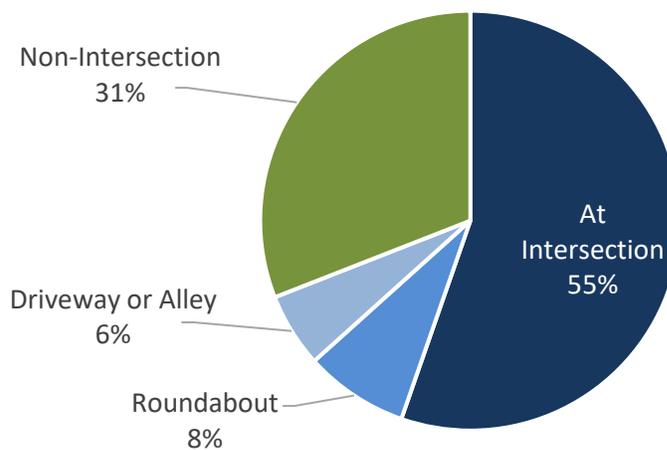


Figure 9. Location of Crashes

CRASH NUMBERS BY DRIVER AGE

Figure 10 compares the number of crashes by age of at-fault drivers with the percentage of licensed drivers in that age category. The percent of licensed drivers information is from the Federal Highway Administration's Office of Highway Policy Information and is current as of 2022. Drivers aged 15-19 are more than **three** 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.

Teenagers represent **5%** of all drivers but are responsible for **17%** of all 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.

Roadway Safety Summary

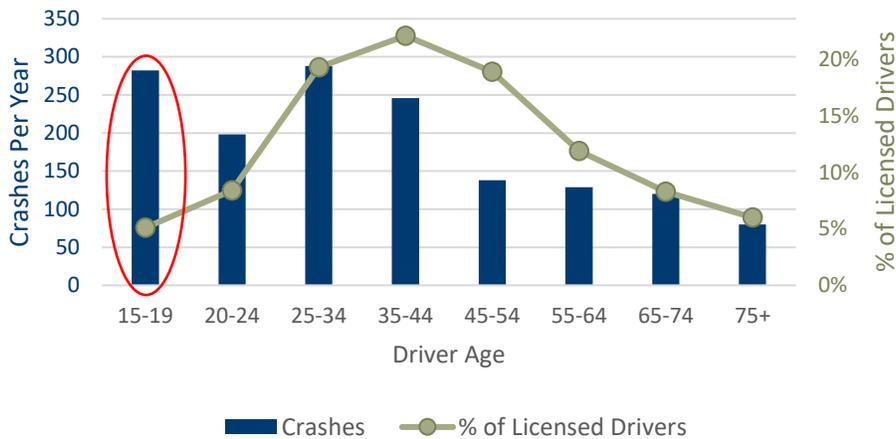


Figure 10. At Fault Drivers By Age Compared to Licensed Drivers

CRASH TYPE

Crashes are categorized into a variety of types. Definitions and explanations of those types are included in the Appendix. **Figure 11** indicates the type of crashes that occur, both when evaluated among all crashes, and then only among those that are severe. Right angle, rear end, fixed object and approach turn crashes are the largest percentage of severe crashes. While all traffic crashes are of concern, those that most commonly result in more serious consequences are of special interest.

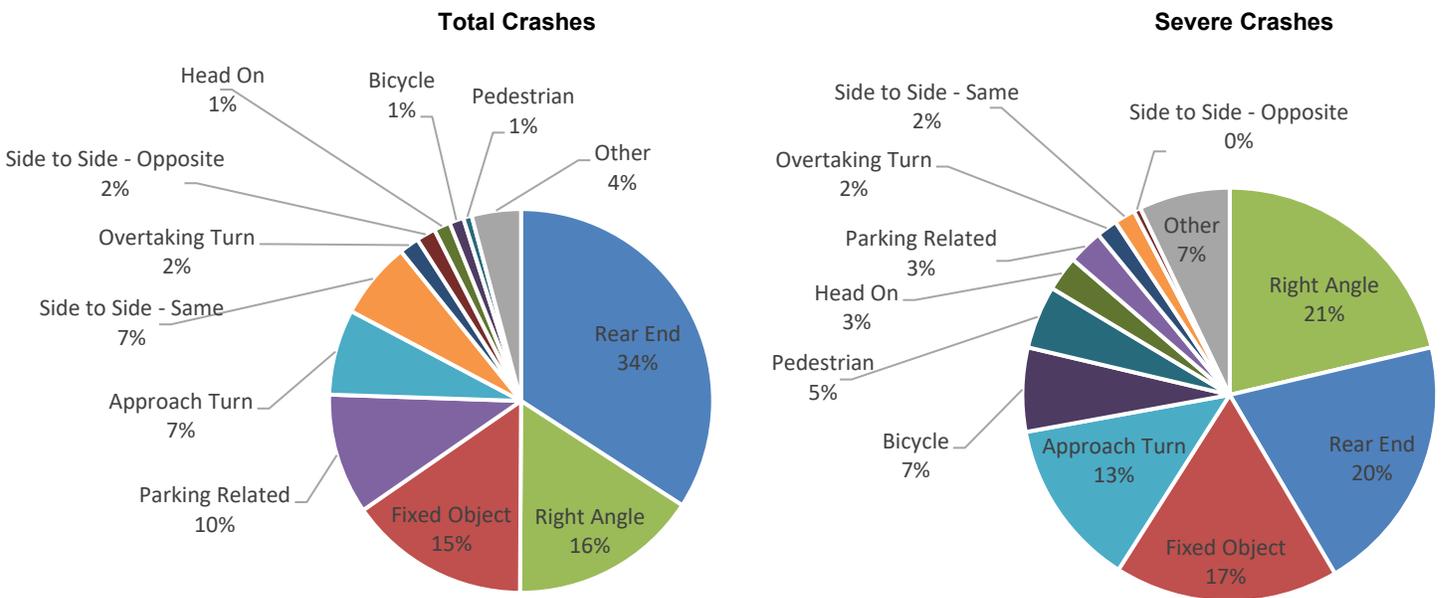


Figure 11. Crash Types by Total Crashes and Severe Crashes

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 2024 was more than \$12 million. See **Table 1**. This is a significant reduction from the economic impact in 2023, which was more than \$ 21 million. The change is a reflection of reduced major injury and zero fatal crashes.

Societal cost of crashes in Windsor
 2023: **\$21 million**
 2024: **\$12 million**
42% Improvement

The crash costs shown are adjusted to reflect 2024 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. 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, 2024

Crash Severity	Number of Crashes	Cost Per Crash	Societal Cost
Property Damage Crashes	241	\$ 13,300	\$ 3,205,300
Possible Injury Crashes	20	\$ 82,200	\$ 1,644,000
Suspected Minor Injury Crashes	36	\$ 145,900	\$ 5,252,400
Suspected Major Injury Crashes	6	\$ 399,300	\$ 2,395,800
Fatal Crashes	0	\$ 7,543,400	\$ 0
Total	303		\$ 12,497,500

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 different population than 47,005. 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 less than 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, 2020 - 2024					Fatal Crash Rate (Crashes / 100,000 Population)
		2020	2021	2022	2023	2024	
Erie	37,526	0	1	0	0	1	1.1
Windsor	47,005	0	3	1	1	0	2.1
Louisville	20,125	1	0	0	0	2	3.0
Evans	22,339	1	0	0	1	2	3.6
Northglenn	38,206	1	4	0	0	4	4.7
Lafayette	30,441	0	2	3	3	0	5.3
Littleton	44,050	3	3	1	3	2	5.4
Montrose	21,690	2	1	1	1	1	5.5
Pueblo West	35,120	1	2	3	4	0	5.7
Avg. CO Cities	33,689						5.8
Englewood	34,492	3	1	4	2	2	7.0
Fountain	32,151	4	2	4	2	1	8.1
Wheat Ridge	31,613	6	2	3	3	2	10.1
Brighton	43,205	6	7	4	6	6	13.4

INTERSECTION EVALUATION

Total crash numbers at locations can be informative – on a ‘heat map’ for example. However, because vehicle volumes and other elements at specific locations vary widely, it is difficult to draw relevant and comparative conclusions from total crashes alone. Therefore, an additional analysis is conducted that allows for a data-based intersection comparison.

The effort follows the national best practice outlined in the *Highway Safety Manual* (HSM) published by the Transportation Research Board (TRB) and the American Association of State Highway and Transportation Officials (AASHTO). The procedure is a statistical process that utilizes inputs including crash numbers, severity, vehicle volumes, roadway geometry and type of control at a location. The analysis then accounts for the somewhat random nature of crashes, and the outcome is an evaluation of intersection safety that can be compared from one location to another. It identifies locations that have a higher-than expected crash frequency where there is likely the most opportunity for reduction of crashes. Details on methodology, models, and costs are included in the Appendix. The result of the analysis is provided in two forms:

EXCESS CRASH COST

The analysis identifies the expected number of crashes at a particular intersection given the inputs and compares that against the actual number of crashes. The difference in expected crashes and actual crashes can be monetized as 'excess crash costs'. This is the annual cost associated with crashes that are above the expected number of crashes for an intersection and provides an indication of locations with unusually high numbers of crashes. Locations with high excess crash costs may have significant potential for reducing crashes. Intersection statistics can also be compared against one another. A more detailed explanation of the methodology is in the Appendix.

LEVEL OF SERVICE OF SAFETY (LOSS)

While excess crash cost is a quantitative approach that provides a specific number (dollar amount), CDOT uses a similar analysis and reports results in a more qualitative fashion called Level of Service of Safety (LOSS). LOSS is reported on a scale of 1-4.

- LOSS 1 and 2 reflect locations with less than expected crashes.
- LOSS 3 reflects locations with above average number of crashes
- LOSS 4 reflects locations with above the 80th percentile number of crashes.

Intersections with a crash history that fall into LOSS 1 and 2 may still have a pattern that can be mitigated but would likely result in lower overall crash reduction. Locations that are identified as LOSS 3 and 4 indicate the highest potential for crash reduction with a mitigating project.

The reporting of the LOSS analysis gives the Town information needed to determine locations that may score favorably in the review process for CDOT safety funds.

INTERSECTION COMPARISON

The above detailed analysis was completed for 192 intersections in Windsor using three years of data (2022-2024). The results of excess crash costs and CDOT LOSS are shown in **Table 5** for the 50 intersections with the greatest excess crash costs and likely the most potential for improvement.

Note that since injury and fatal crashes have higher crash costs associated with them, the ranking method gives more weight to locations with more severe crashes compared to locations with primarily "fender benders".

63%
of intersections in Windsor have fewer and less severe crashes than predicted.

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 3** lists the change in crash trends in two ways:

- Change in excess crash cost: The base calculation includes three years of data (2022-2024), and the comparison is against the previous three years of data (2019-2021). All the comparisons are made on a crash/year basis.
- Change in intersection rank from the previous year. This column identifies whether the location is 'moving up' or 'down' the table list when compared to other locations.

Roadway Safety Summary

In both cases, 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 3. Top 50 Intersections by Excess Crash Cost

Rank	Fac ID	Intersection		Traffic Volume			Model Predicted Crashes		Actual Adjusted Crashes		Excess Crash/year and Excess Crash			CDOT LOSS		Crash Trends			Control	
		N/S Street	E/W Street	Major Street Volume	Minor Street Volume	Total AADT	Crashes/Year	FI Crashes/Year	Expected Crashes/Year	Expected FI Crashes/Year	Excess PDO	Excess FI	Excess Expected Crash Value (\$)	LOSS Total Crashes	LOSS FI Crashes	2019 - 2021 vs. 2022 - 2024 Δ Crash Cost	Last Year's Rank	Change in Rank since 2024		
Top 10 Intersections	1	10	SH 257 (west intersection) / SH 392	17,856	7,905	25,761	6.5	1.3	12.1	2.4	4.5	1.1	\$227,358	LOSS 4	LOSS 4	\$136,291	2	+1	4SG	
	2	8	WCR 15 / 15th Street	SH 392	19,809	5,394	25,203	5.6	1.1	10.4	1.5	4.5	0.4	\$116,136	LOSS 4	LOSS 3	\$99,726	7	+5	4SG
	3	12	SH 257 (east intersection) / SH 392 / Main Street	13,950	10,695	24,645	6.4	1.3	11.3	1.6	4.6	0.3	\$111,519	LOSS 4	LOSS 3	\$13,742	3	0	4SG	
	4	9	SH 257 / WCR 17	WCR 74 / Harmony Road	13,578	7,254	20,832	5.1	1.0	6.6	1.5	1.1	0.5	\$94,887	LOSS 4	LOSS 4	\$48,696	4	0	4SG
	5	13	SH 257	Eastman Park Drive	12,462	6,417	18,879	4.4	0.9	7.0	1.3	2.2	0.4	\$92,076	LOSS 4	LOSS 4	\$10,234	1	-4	4SG
	6	116	SH 257 / WCR 17	WCR 72	6,603	1,953	8,556	0.7	0.2	1.7	0.3	0.8	0.1	\$32,435	LOSS 4	LOSS 4	\$27,396	22	+16	4ST
	7	480	9th Street	SH 392 / Main Street	19,344	1,395	20,739	1.9	0.3	4.3	0.3	2.4	0.0	\$32,255	LOSS 4	LOSS 3	\$6,753	12	+5	3SG
	8	478	12th Street	SH 392 / Main Street	19,716	2,325	22,041	1.4	0.3	2.6	0.4	1.1	0.1	\$27,591	LOSS 4	LOSS 3	-\$20,500	8	0	4ST
	9	14	SH 257	Crossroads Boulevard	12,555	4,557	17,112	1.8	0.4	3.4	0.4	1.5	0.0	\$25,301	LOSS 4	LOSS 3	\$4,731	9	0	3SG
	10	304	WCR 17	Eastman Park Drive	10,416	4,743	15,159	2.3	0.5	3.1	0.5	0.7	0.1	\$19,523	LOSS 3	LOSS 3	-\$46,780	5	-5	RBT
Next 15 Intersections	11	308	Water Valley Prkwy (west in Eastman Park Drive	7,905	2,790	10,695	1.7	0.3	2.2	0.4	0.4	0.1	\$17,692	LOSS 3	LOSS 3	\$17,692	41	+30	RBT	
	12	121	Westgate Drive	SH 392	25,110	9,579	34,689	9.1	1.8	6.6	1.9	-2.6	0.1	\$17,362		LOSS 3	\$17,362	27	+15	4SG
	13	479	10th Street	SH 392 / Main Street	19,251	2,325	21,576	0.9	0.2	1.8	0.2	0.8	0.0	\$17,214	LOSS 4	LOSS 3	-\$11,932	26	+13	3ST
	14	305	WCR 17	New Liberty Road	7,905	5,022	12,927	2.1	0.4	3.3	0.3	1.3	-0.1	\$17,114	LOSS 4		-\$9,531	10	-4	RBT
	15	113	WCR 15 / 15th Street	WCR 68 1/2 / Jacoby Road	6,510	2,883	9,393	0.5	0.1	1.3	0.2	0.8	0.0	\$17,031	LOSS 4	LOSS 3	\$8,102	14	-1	3ST
	16	207	Highland Meadows Parkway	Steeplechase Drive	4,557	3,999	8,556	0.9	0.2	1.3	0.3	0.3	0.1	\$16,480	LOSS 3	LOSS 4	\$16,480	21	+5	4ST
	17	306	WCR 17	Crossroads Boulevard	8,277	5,952	14,229	2.3	0.5	2.8	0.5	0.5	0.1	\$16,347	LOSS 3	LOSS 3	\$5,298	15	-2	RBT
	18	209	17th Street	CR 68 1/2 / Jacoby Road	6,417	4,650	11,067	1.1	0.4	1.8	0.4	0.6	0.1	\$15,832	LOSS 4	LOSS 3	\$11,529	59	+41	4ST
	19	128	Covered Bridge Parkway	New Liberty Road	4,883	1,860	6,743	0.7	0.1	1.5	0.1	0.8	0.0	\$15,449	LOSS 4	LOSS 3	\$8,402	16	-3	4ST
	20	303	WCR 13	New Liberty Road	9,300	4,185	13,485	2.1	0.4	3.0	0.4	1.0	0.0	\$12,832	LOSS 3		-\$1,249	13	-7	RBT
	21	124	11th Street	SH 392 / Main Street	19,530	5,115	24,645	5.4	1.1	6.3	1.0	0.9	0.0	\$12,597	LOSS 3		-\$8,269	11	-10	4SG
	22	429	WCR 15 / 15th Street	West Birch Drive	7,254	2,325	9,579	1.1	0.2	1.9	0.3	0.8	0.0	\$12,527	LOSS 4	LOSS 3	\$6,048	18	-4	4ST
	23	483	5th Street	SH 392 / Main Street	16,182	1,395	17,577	1.3	0.3	2.1	0.3	0.8	0.0	\$10,659	LOSS 4		\$3,634	24	+1	4ST
	24	484	4th Street	SH 392 / Main Street	16,089	1,860	17,949	0.9	0.2	1.5	0.2	0.7	-0.1	\$9,755	LOSS 4		\$2,411	20	-4	3ST
	25	481	8th Street	SH 392 / Main Street	19,437	2,325	21,762	1.3	0.3	2.0	0.3	0.7	0.0	\$9,153	LOSS 4		-\$1,343	25	0	4ST
	26	455	SH 257	Kodak Drive	13,020	930	13,950	0.5	0.1	0.7	0.2	0.2	0.0	\$8,937	LOSS 3	LOSS 3	-\$17,779	19	-7	3ST
	27	215	7th Street / WCR 17	Garden Drive	9,393	1,395	10,788	0.5	0.1	0.7	0.2	0.2	0.0	\$8,937	LOSS 3	LOSS 3	\$146	0	+46	3ST
	28	301	CR 5	LCR 32 E / Westgate Drive	6,882	4,464	11,346	4.2	0.6	4.3	0.6	0.1	0.0	\$7,887	LOSS 3	LOSS 3	\$7,887	0	+45	RBT
	29	422	WCR 13 / Colorado Boulevard	Cherry Blossom	10,137	930	11,067	0.6	0.2	0.8	0.2	0.1	0.0	\$7,877	LOSS 3	LOSS 3	\$7,877	29	0	4ST
	30	456	SH 257	Poudre Trail Road	13,020	930	13,950	0.5	0.1	0.6	0.2	0.0	0.0	\$6,943	LOSS 3	LOSS 3	\$6,943	31	+1	3ST
	31	425	WCR 15 / 15th Street	Windshire Drive	7,626	1,163	8,789	0.4	0.1	0.5	0.1	0.1	0.0	\$6,668	LOSS 3	LOSS 3	\$6,668	32	+1	3ST
	32	476	14th Street	SH 392 / Main Street	19,716	2,325	22,041	0.9	0.2	1.0	0.3	0.0	0.0	\$6,088	LOSS 3	LOSS 3	-\$201	30	-2	3ST
	33	477	13th Street	SH 392 / Main Street	19,716	2,325	22,041	0.9	0.2	0.6	0.3	-0.4	0.0	\$5,947	LOSS 3	LOSS 3	\$5,947	0	+40	3ST
	34	127	WCR 23	Eastman Park Drive / CR 6	3,906	1,953	5,859	0.2	0.1	0.4	0.1	0.1	0.0	\$5,687	LOSS 3	LOSS 3	\$5,687	37	+3	3ST
	35	106	CR 5 / Fairgrounds Avenue	Steeplechase Drive	9,765	4,650	14,415	1.4	0.4	1.4	0.4	-0.1	0.0	\$5,322	LOSS 3	LOSS 3	\$5,322	17	-18	3SG
36	17	WCR 23 / Great Western Drive	Eastman Park Drive	3,906	1,953	5,859	0.6	0.1	0.9	0.1	0.3	0.0	\$5,099	LOSS 3	LOSS 3	\$3,369	0	+37	4ST	
37	461	7th Street / WCR 17	Walnut Street	8,649	2,232	10,881	1.2	0.3	1.4	0.3	0.3	0.0	\$4,491	LOSS 3	LOSS 3	-\$19,278	23	-14	4ST	
38	446	WCR 17	Champion Drive	4,650	465	5,115	0.1	0.0	0.3	0.0	0.1	0.0	\$4,300	LOSS 4	LOSS 4	\$3,111	36	-2	3ST	
39	105	CR 5 / Fairgrounds Avenue	Aladar Drive / Arena Circle	9,300	930	10,230	0.6	0.1	0.8	0.2	0.1	0.0	\$4,054	LOSS 3	LOSS 3	\$4,054	38	-1	4ST	
40	451	WCR 19 / Hollister Lake Road	Sundance Drive	9,300	465	9,765	0.4	0.1	0.4	0.1	0.0	0.0	\$3,742	LOSS 3	LOSS 3	\$3,678	39	-1	4ST	
41	214	7th Street / WCR 17	Stone Mountain Drive	9,393	930	10,323	0.4	0.1	0.6	0.1	0.3	0.0	\$3,337	LOSS 4		-\$6,377	40	-1	3ST	
42	500	Green River Drive	New Liberty Road	5,580	465	6,045	0.2	0.0	0.2	0.1	0.0	0.0	\$3,145	LOSS 3	LOSS 4	\$3,145	43	+1	3ST	
43	459	WCR 15	Harmony Ridge Parkway	1,674	1,395	3,069	0.1	0.0	0.2	0.0	0.1	0.0	\$3,010	LOSS 4	LOSS 4	\$3,010	44	+1	3ST	
44	485	3rd Street	SH 392 / Main Street	15,996	1,163	17,159	0.7	0.2	0.8	0.1	0.2	0.0	\$2,862	LOSS 3		\$2,002	34	-10	3ST	
45	101	CR 5 / Fairgrounds Avenue	Highland Cove Drive / Cou	9,765	837	10,602	0.5	0.1	0.6	0.1	0.0	0.0	\$2,632	LOSS 3	LOSS 3	\$2,632	47	+2	4ST	
46	462	7th Street / WCR 17	Elm Street	8,649	465	9,114	0.5	0.1	0.5	0.1	-0.1	0.0	\$2,383		LOSS 3	\$1,656	0	+27	4ST	
47	427	WCR 15 / 15th Street	Grand Avenue	7,254	1,395	8,649	0.8	0.2	0.6	0.2	-0.2	0.0	\$2,337		LOSS 3	\$2,337	0	+26	4ST	
48	131	WCR 15	Crossroads Boulevard	9,300	279	9,579	0.4	0.1	0.4	0.1	0.0	0.0	\$2,313		LOSS 3	-\$4,466	33	-15	4ST	
49	450	WCR 19 / Hollister Lake Road	Saratoga Way	8,370	698	9,068	0.4	0.1	0.5	0.1	0.2	0.0	\$2,077	LOSS 3		\$2,039	50	+1	4ST	
50	120	SH 257	East Garden Drive	12,090	2,325	14,415	2.4	0.4	2.5	0.4	0.2	0.0	\$2,065	LOSS 3		-\$85,096		-44	4SG	

FAC ID Facility Identification Number
N/S North / South
E/W East / West
AADT Annualized Average Daily Traffic
FI Fatal / Injury
PDO Property Damage Only

LOSS Level of Service of Safety
CDOT Colorado Department of Transportation
CONTROL Type of intersection control
SG Signalized
ST Stop Controlled
RBT Roundabout

Legend:
 Increasing Crash Trend
 Improving Safety Trend

INTERSECTION MAPPING

Figure 12 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 cost. These intersections will be a focus of potential improvements and monitoring for safety.

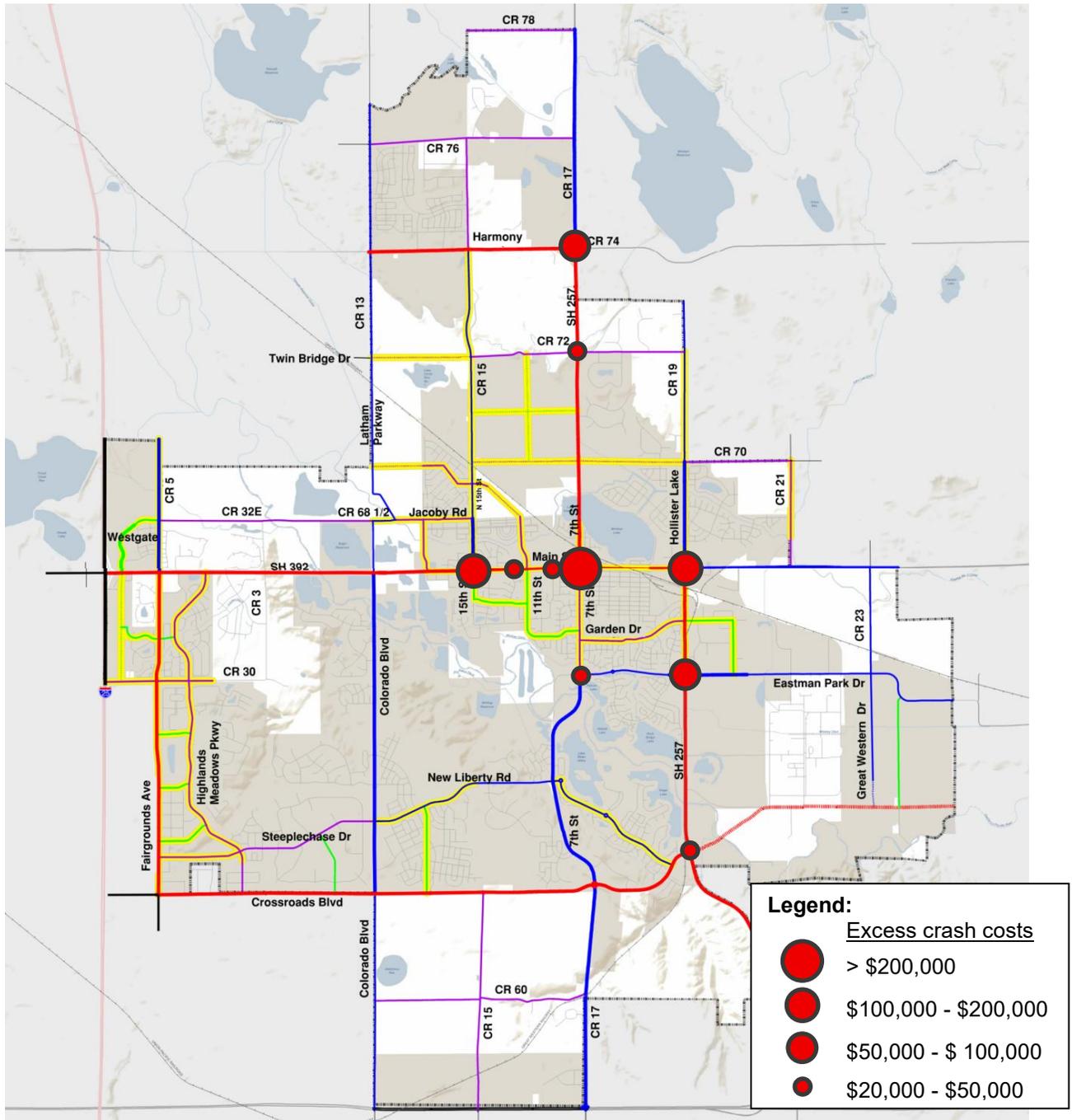


Figure 12. Mapping of 'Top Ten' Intersections with More Crashes than Expected.

NEXT STEPS

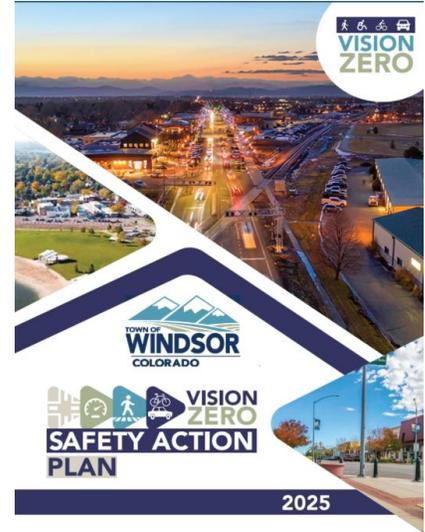
This **Roadway Safety Summary** is a compilation of the data-based analysis related to the safety of Windsor's roadway system. It provides a holistic and comprehensive look at overall crash numbers, severe crashes, trends and patterns, and a detailed screening of intersections to identify locations and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

VISION ZERO SAFETY ACTION PLAN AND 2025 RECOMMENDED WORK TASKS

Windsor recently completed a Vision Zero Safety Action Plan (SAP) funded through the federal government's Safe Streets For All (SS4A) program. The project involved visioning, a stakeholder committee, public involvement and a commitment from the Town towards roadway safety. All the efforts for the Safety Action Plan were informed by the crash data.

One element of the SAP was to complete roadway safety audits (RSAs) at key intersections of safety interest. RSAs were completed at 21 locations with specific outcomes developed. Those Action Items are detailed in the Safety Action Plan and reprinted in **Table 4**.

The analysis completed with this annual review is in alignment with those outcomes, and it is recommended that 2025 work tasks be guided by the priority elements in **Table 4**.



Windsor Corridors - Safety Based Action Items **Table 4. Safety Based Action Items Developed During Road Safety Audits**

Priority Items

Corridor	Cross Streets		Jurisdiction	On the High Risk Network?	Additional Review	Considerations	Outcomes			
	Start	End					Short Term, Low Cost Action	Operational Actions	Design / Construction	Longer Term Items / Planning
SH392 (Main)	12th Street	7th Street	CDOT	Yes	Review w RSA Group 1 Audit on 12-6-2024	Ped crossing for schools, McDonalds Driveway, EB congestion (rear ends) and WB approach turn crashes. See recommendations for specific items at major intersections	Educational outreach for school students. Review training with crossing guard	Consider signal timing review of corridor to get more EB green time.	Either removal of crosswalk or update to red light. Add median refuge if crosswalk remains. McDonalds driveway should be 3/4, and other changes at intersections per ACP	Corridor plan needed - i.e. address EB traffic, multi modal interests. Implementation of ACP would address approach turn crashes.
SH 392 (Main)	7th Street	Chimney Park	CDOT	Yes	Corridor review - RSA Group 2 Audit on 12-11-2024	Downtown Area. Parking and pedestrian crossings.	Review parking locations close to crosswalks			Coordinate with implementation of Downtown Master Plan
SH 257	SH 392	Crossroads	CDOT	Yes	Corridor Review - RSA Group 3 Audit on 12-18-2024	School congestion. Traffic diversion - especially WB from SH 392.		Overall operations in corridor. Consider school specific timing plans		Consider overall circulation and connectivity review.

Roadway Safety Summary

Table 4 Continued. Safety Based Action Items Developed During Road Safety Audits

Windsor Intersections - Safety Based Action Items

Priority Items

Rank	Fac ID	Intersection N/S Street E/W Street	Jurisdiction	On the High Risk Network?	Additional Review	Considerations	Outcomes			
							Short Term, Low Cost Action	Operational Actions	Design / Construction	Longer Term Items
1	13	SH 257 Eastman Park Drive	CDOT	Yes	Safety Audit - Group 3 Audit on 12-18-2024	Recently completely rebuilt - RR to west. Only 4 crashes in 2024. MONITOR	MONITOR	Review operations if SH 257 signal timing is reviewed		
2	10	SH 257 (west intersection) / 7th Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	Striping redone for parking on EB approach. EB/WB left turn ped protected phasing	Add delineators on SW corner bulbout to reduce curb strikes	Consider getting new TMCs for timing refinements		See SH392 corridor review recommendations
3	12	SH 257 (east intersection) / Hollister Lake Road	CDOT	Yes	Office Safety Audit and included in Group 3 Audit on 12-18-2024	Development pressure (NE). Tight turns due to porkchops (sideswipes). Inadequate radius on NE corner. Recent ped protect (by CDOT)		Review corridor signal timing for 257 (school specific timing plans?)	Recommended geometric improvements (for safety) with adjacent development	
4	9	SH 257 / WCR 17	WCR 74 / Harmony Road	CDOT	Yes	Office Safety Audit Audit on 12-18-2024	Project in process for widening to west. EB rear end over hill.	Consider coordination with Timmath signals to west. Consider protected only left turn phasing N/S	Adding lanes on Harmony	
5	304	WCR 17	Eastman Park Drive	Windsor	Yes	Office Safety Audit Audit on 1-22-2025	WB crashes predominant. Minor changes made. Crashes trending down. NB queuing is a concern. MONITOR	MONITOR		Monitor operations and consider NB right turn slip lane for added capacity
6	120	SH 257	East Garden Drive	CDOT	Yes	Safety Audit - Group 3 Audit on 12-18-2024	School based operational issues.	Review corridor signal timing for 257 (school specific timing plans?)		
7	8	WCR 15 / 15th Street	SH 392	CDOT	Yes	Safety Audit - Group 3 Audit on 12-18-2024	EB AT crashes. Negative offset due to raised medians. SB has extra signal head implying 2 through lanes	Adjust (remove one) SB signal heads to align with lanes	Consider protected only left turns (maybe by time of day after 1 pm)	Consider removing last 50 ft of medians on SH 392 to eliminate negative offset.
8	478	12th Street	SH 392 / Main Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	ACP has this as a double 3/4 movement.		Implement ACP for 3/4 movement.	See SH392 corridor review recommendations
9	14	SH 257	Crossroads Boulevard	CDOT	Yes	Safety Audit - Group 3 Audit on 12-18-2024	Recent work by CDOT. Concern about EB right function. Crosswalk on west leg (pulled back). Potential Qing onto RR tracks		Needs porkchop on SW corner. (Also NW corner, but not as critical)	Consider coordination with RR and PUC to facilitate RR preemption
10	305	WCR 17 (7th Street)	New Liberty Road	Windsor	Yes	Safety Audit - Group 4 Audit on 1-22-2025	EB fixed object crashes in dark. EB failure to yield.	Update approach signage to standard roundabout ahead signage (add advisory speed plaque). Consider removing or relocating ped crossing signs on approaches to make Yield signs more visible.	Consider ways to slow EB traffic on approach such as Sinusoidal rumble strips?	
11	124	11th Street	SH 392 / Main Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	New directional ramps installed on south leg. Recent work by CDOT included ped protect and LPIs in all directions. Accesses to south with congestion and safety concerns.	Review congestion and safety concerns at accesses to south. Add DO NOT BLOCK across driveways.		See SH392 corridor review recommendations
12	480	9th Street	SH 392 / Main Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	CDOT timing changes with ped scramble and EB RT blank out sign during walk phase. WB approach turn crashes in pm peak hour. EB rear ends.		Consider WB left turn phase by time of day. Existing master arm adequate.	See SH392 corridor review recommendations
13	303	WCR 13	New Liberty Road	Windsor	No					
14	113	WCR 15 / 15th Street	WCR 68 1/2 / Jacoby Road	Windsor	No	Safety Audit - Group 4 Audit on 1-22-2025	EB Jacoby and SB 15th there are bike lanes to the right of RTL.	Update striping when possible to move SB bike lane to left turn RTL. EB bike lane should end prior to intersection.	Additional street lighting on east side.	
15	306	WCR 17	Crossroads Boulevard	Windsor	Yes					
16	128	Covered Bridge Parkway	New Liberty Road	Windsor	No	Safety Audit - Group 4 Audit on 1-22-2025	Changed to an ALL WAY STOP and medians modified for emergency services. MONITOR	MONITOR	If needed, consider removing left turn lanes and adding bulbouts to shorten pedestrian crossing distances and eliminate multiple threat risk.	
17	106	CR 5 / Fairgrounds Avenue	Steeplechase Drive	Windsor/Loveland	No	Office Safety Audit Audit on 1-22-2025	Recently relocated intersection and signalized. Crashes trending down. MONITOR .	MONITOR		
18	429	WCR 15 / 15th Street	West Birch Drive	Windsor	No					
19	455	SH 257	Kodak Drive	CDOT	Yes					
20	484	4th Street	SH 392 / Main Street	CDOT	Yes	Corridor review - Group 2 12-11-2024	Parking located within intersection. WB parking on west side of intersection results in vehicles backing into crosswalk. Bulbout on NE corner would shorten crossing distance.	Relocate parking from within intersection if/when driveway is relocated. Remove one parking space WB just west of intersection to eliminate vehicles backing into crosswalk.	Per 10-2024 crossing evaluation - consider bulbouts and RRFB.	See Main Street downtown corridor review recommendations
21	207	Highland Meadows Parkway	Steeplechase Drive	Windsor	No					
22	116	SH 257 / WCR 17	WCR 72	CDOT	Yes					
23	461	7th Street / WCR 17	Walnut Street	Windsor	Yes					
24	483	5th Street	SH 392 / Main Street	CDOT	Yes	Corridor review - Group 2 12-11-2024	Existing bulbouts and gate posted RRFBs.			See Main Street downtown corridor review recommendations
25	481	8th Street	SH 392 / Main Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	Intersection shown as r/i/ro in ACP. WB AT crashes.			See SH392 corridor review recommendations. Implementation of ACP would address crash issue.
26	479	10th Street	SH 392 / Main Street	CDOT	Yes	Safety Audit - Group 1 Audit on 12-6-2024	Intersection shown as 3/4 in ACP.			See SH392 corridor review recommendations. Implementation of ACP would address crash issue.
na	427	15th	Grand	Windsor	No	Safety Audit - Group 4 Audit on 1-22-2025	SB 15th there are bike lanes to the right of RTL. Within reduced speed school zone and crossing guard. Two crosswalks - only one with RRFB.	Update striping when possible to move SB bike lane to left turn RTL. Review training with crossing guard	Update RRFB infrastructure to incorporate both crosswalks in RRFB (See Jacoby and Windshire).	
na	307	SH 257	Pointe Plaza	CDOT	Yes	Corridor Audit w/ Group 3 Audit on 12-18-2024	Operational issues at school times.			Needs holistic area circulation review. See SH 257 corridor review recommendations

Intersection not reviewed with this set of Road Safety Audits

APPENDIX

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. Any data from 2011 - 2020 was obtained from CDOT.

Crash reports that occurred in 2021 or later (through 2024) were obtained from Windsor Police Department before they send them to the DOR. Every report was reviewed individually for accuracy. This data 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) is 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) are 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 2020 (2020-2024 for five-year evaluations and 2022-2024 for three-year evaluations).

TYPES OF CRASHES

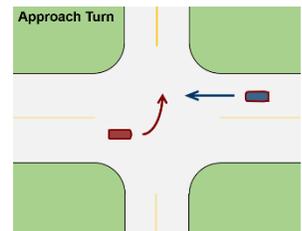
Throughout the document, there is detailed discussion and analysis regarding a variety of crash types. The most frequently noted crash categories are listed below with an explanation and definition for each one. Some are depicted in the diagrams at right.

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.

Roadway Safety Summary

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

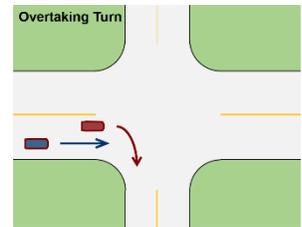
Any crash that involves a bicyclist and a motor vehicle.

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

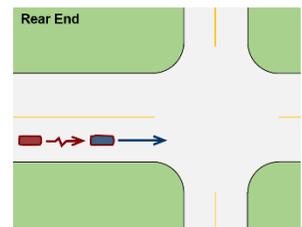
Any crash involving a parked vehicle or a vehicle entering/leaving a parking space.

Pedestrian

Any crash that involves a pedestrian and a motor vehicle.

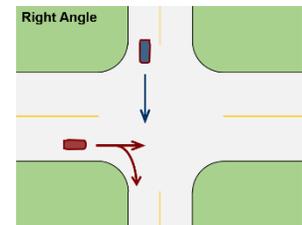
Rear End

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



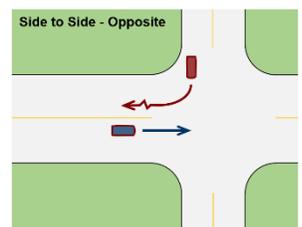
Right Angle

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



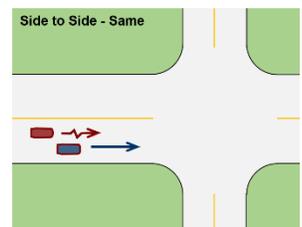
Sideswipe Opposite Direction (also side to side opposite)

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.

INTERSECTION EVALUATION

Information in the intersection evaluation section of the report is used to identify specific locations with the anticipated highest potential for crash reduction. The analysis is conducted to identify intersections where there are more crashes than expected considering traffic volumes, roadway geometry, type of traffic control, and crash severity.

INTERSECTION BY EXCESS CRASH COSTS

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 below).

Prediction Model Used in the Analysis for Each Intersection

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