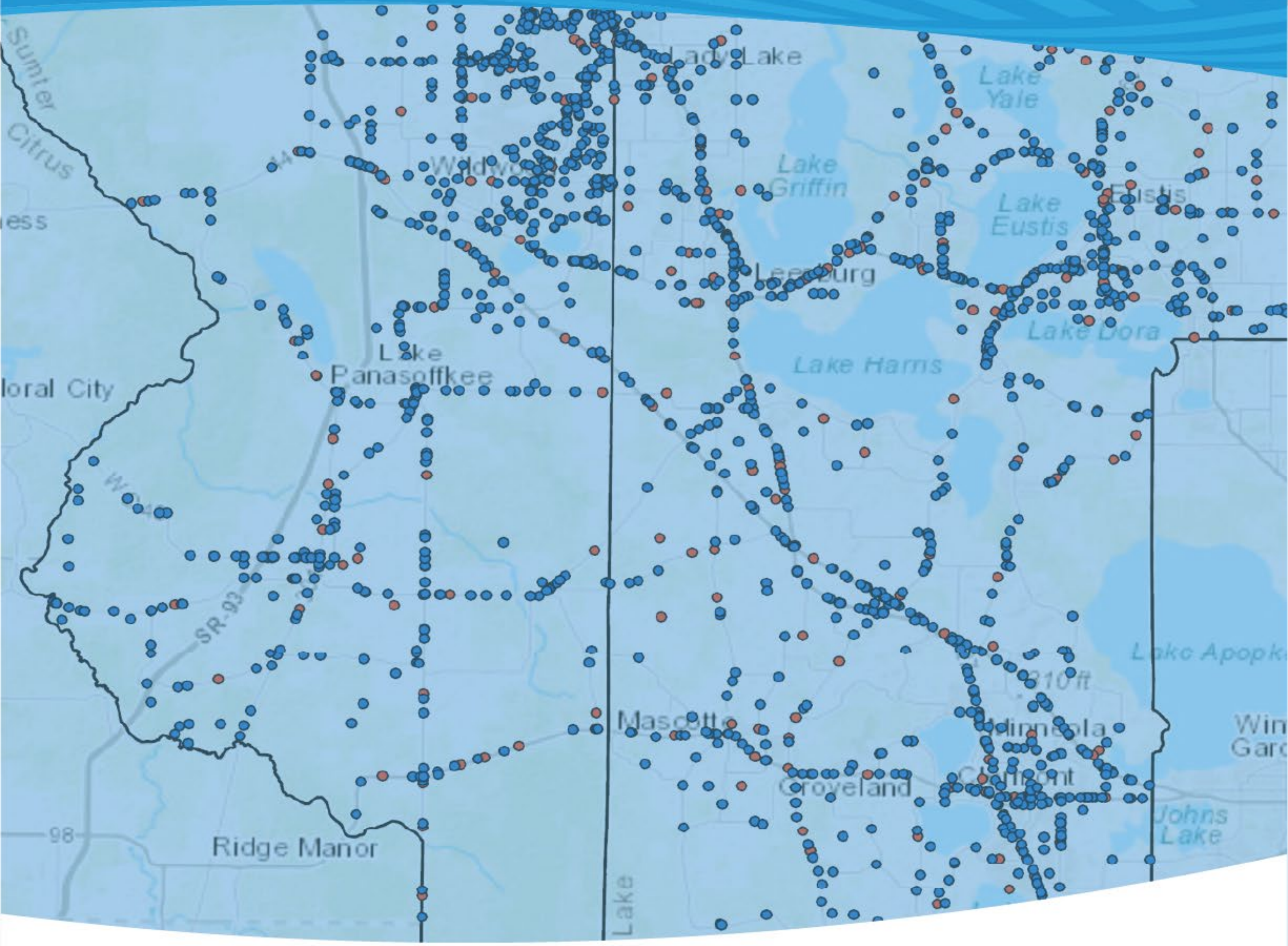

LAKE-SUMTER VISION ZERO SAFETY ACTION PLAN

May 2026

Lake-Sumter MPO
Metropolitan Planning Organization

UCF-SST

UCF

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SAFE STREETS AND ROADS FOR ALL (SS4A) CHECKLIST

This document responds directly to the requirements of the SS4A Self-Certification Eligibility Worksheet by the grantor, the U.S. Department of Transportation. The Lake-Sumter MPO Board will adopt this plan in June 2026 to meet the requirements of a certified Safety Action Plan.

1. Leadership Commitment and Goal Setting	Refer to page vi, 2	☑
2. Planning Structure	Refer to page vii, 14	☑
3. Safety Analysis	Refer to page 3-6	☑
4. Engagement and Collaboration	Refer to page 14-16	☑
5. Policy And Process Changes	Refer to page 22-23	☑
6. Strategy and Project Selections	Refer to page 17-21	☑
7. Progress and Transparency	Refer to page 24-26	☑
8. Action Plan Date	See cover date.	☑

EXECUTIVE SUMMARY

Between 2015 and 2024 **4,539** Fatal and serious injury crashes occurred in the Lake-Sumter region.

Fatal and serious injury crashes account for 4.2% of all crashes in the region, almost double the statewide average for Florida at **2.4%.** These crashes are preventable.

In 2024, UCF received a **$689,992** Safe Streets and Roads for All Grant from USDOT and FHWA to create the Lake-Sumter Vision Zero Action Plan. This plan creates an action-oriented list of policies and projects to achieve safer streets using the Safe System Approach.

Fatal & Serious Injury (KA) Quick Facts

KA is killed or serious injury.

Fatal (K) refers to a fatal injury that results in death at the scene or within 30 days after the motor vehicle crash in which the injury occurs.

Serious Injury (A) is any injury other than fatal that results in one or more of the following: Severe laceration, significant loss of blood, broken or distorted extremity, crush injuries, severe skull, chest, or abdominal injury other than bruises or minor lacerations, significant burns, unconsciousness when taken from the crash scene, paralysis.

Source: Florida HSMV Uniform Traffic Crash Report Manual, https://www.flhsmv.gov/pdf/courts/crash/crashmanualcomplete.pdf

4,539	**Fatal & Serious Injury Crashes on Surface Streets* (2015-2024)**
707	**Fatal Crashes (K)**
3,832	**Serious Injury Crashes (A)**
$11.1 Billion	**Economic impact to the Lake-Sumter region.**

The Lake-Sumter MPO has adopted a goal of zero fatal and serious injury crashes by the year 2050 to align with MPO's 2050 Long-Range Transportation Plan and statewide initiatives. While the MPO is not an implementing agency, it works to program and fund transportation projects and support policies aligned with the LSMPO Vision Zero Action Plan. The commitment to zero Fatal and serious injury crashes by 2050 will be accomplished through a variety of regional partnerships including FDOT, Lake County, Sumter County, and local municipalities.

The regional crash analysis revealed:

- Rural roadways accounted for a higher proportion of KA crashes **(54.4%)** than urban roadways **(45.6%).**
- **70%** of intersection KA crashes happen at non-signalized intersections.
- **83%** of KA crashes fall within the following four crash types: Off-Road/Rollover, Left-turn/Angle, Rear-End, and Pedestrian/Bicycle.
- Highest rate of KA crashes happens among the youngest drivers **aged 15-29**.
- KA crash involvement rate for male drivers is **twice** that of female drivers.

Purpose: This action plan identifies the high-risk network, high risk corridors, high-risk intersections, and specific safety actions to implement that are aligned with FHWA best practices and policies.

Impact: In the last 10 years, a total of 103,152 crashes have cost Lake and Sumter Counties approximately $15 billion, with 74% of those costs coming from 4,539 fatal and serious injury crashes.

Engagement: Public engagement was a central element of the Lake–Sumter MPO Vision Zero Safety Action Plan, providing insight into community perceptions of transportation safety and helping to inform data-driven and publicly supported strategies. Outreach included presentations to the MPO's Community Advisory Committee (CAC) and Technical Advisory Committee (TAC), as well as a public online survey conducted from October 2, 2025, to December 11, 2025.

Vision: Together, through action, we can prevent fatal and serious injury crashes to achieve safer streets and more livable communities in our region.

CHAPTER 1 INTRODUCTION

The University of Central Florida was awarded a $689,992 grant from USDOT Safe Streets for All (SS4A) program to work in coordination with the Lake-Sumter MPO to create the Lake-Sumter Vision Zero Action Plan. This plan emphasizes data-driven methods to identify high-risk locations and identify targeted interventions to reduce all fatal and serious injury crashes to zero in the Lake-Sumter region.

The Lake-Sumter MPO focuses on creating comprehensive, multi-modal transportation systems that enhance connectivity, safety, and mobility for residents and visitors. The organization works closely with local governments, state and federal agencies, and the community to identify transportation priorities, allocate funding, and implement projects that support economic growth and improve the quality of life.

Lake and Sumter counties, located in Central Florida (Figure 1-1), are known for their diverse demographics and rapidly growing populations. Lake County, established in 1887, spans approximately 1,156 square miles and boasts a population of over 367,000 residents as of 2020. Sumter County, though smaller in size with an area of around 580 square miles, has experienced significant population growth, particularly due to The Villages, a large and fast-growing retirement community. As of 2020, Sumter County's population exceeded 130,000, with a significant proportion of residents being retirees. The county's demographics reflect this, with a higher median age compared to the statewide average. The region is also known for its agricultural heritage, scenic landscapes, and a mix of rural and suburban living environments.

Figure 1-1: Location Map

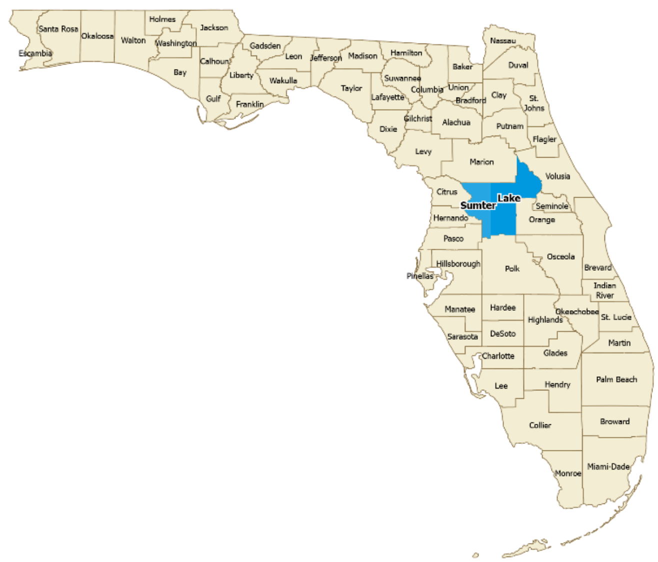
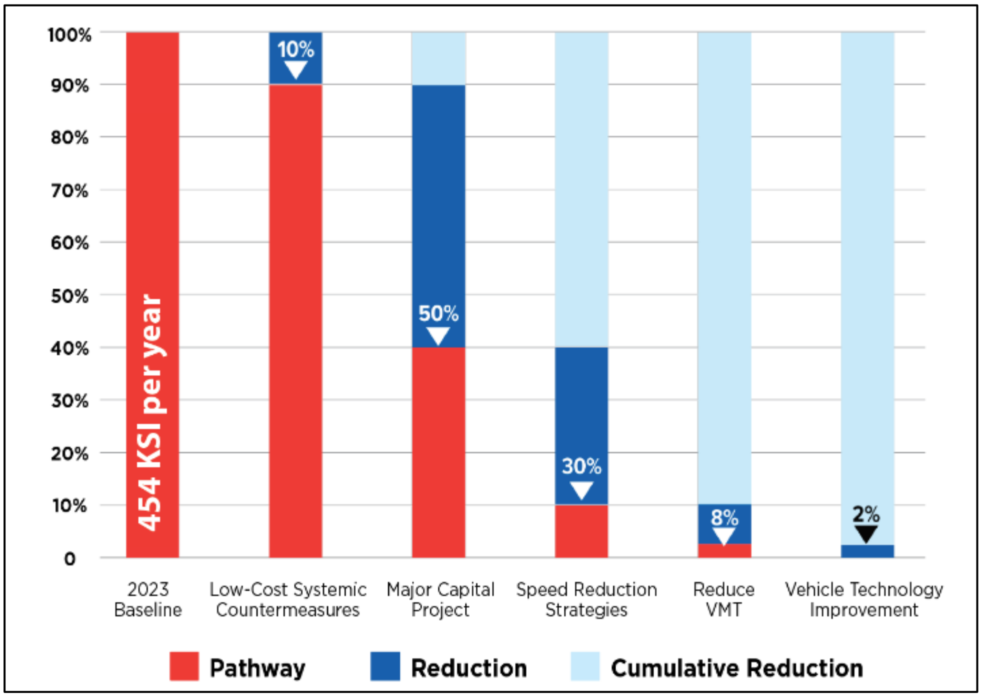


Figure 1-2: Safe System Components

In February 2018, the Lake-Sumter MPO Governing Board adopted a target of zero traffic-related fatalities and serious injuries and renews this commitment annually. This commitment to Vision Zero promotes a culture of safety grounded in Safe System (Figure 1-2), several key principles: traffic-related fatalities and serious injuries are preventable and unacceptable, human life takes priority over mobility, and human error is inevitable, therefore the transportation system should allow for it to happen without death or serious injury. This Vision Zero Safety Action Plan will provide a system-level approach to safety using the Safe System Approach, Shown in **Figure 1-3**, to create a holistic strategy focused on eliminating fatal and serious injury crashes to include the five key elements: Safer Road Users, Safer Vehicles, Safer Roads, Safer Speeds, and Post Crash Care.

Figure 1-3: Path to Zero Fatalities



The annual economic burden of crashes was calculated using the Florida Department of Transportation (FDOT) Annual Average Crash Cost. Crash costs include emergency services, medical services, lost wages and fringe benefits, household productivity loss, insurance, workplace costs, legal costs, congestion impacts, property damage, and the monetization of lost quality of life. Over the past 10 years, crashes have created $15 billion in economic burden to Lake and Sumter Counties.

A comprehensive approach with parallel action on several paths will create tangible and sustainable progress towards reaching our regional safety goal. Practitioners across the region have a shared responsibility to achieve safer streets through all phases of implementation, maintenance, operations, planning, design, and construction. As noted in Figure 1-4, a holistic approach utilizing the noted strategies could reduce traffic deaths to zero by 2050. This comprehensive strategy will be advanced through the policies and projects by the Lake-Sumter MPO to reduce risk and create a safer tomorrow for all that travel in our region. The Lake-Sumter MPO Board is committed to the goal of reducing fatal and serious injury crashes to zero by 2050 with the adoption of this plan.

CHAPTER 2 CRASH TRENDS AND SAFETY ANALYSIS

A crash analysis was completed utilizing Signal 4 Analytics crash data between January 2015 and December 2024 within street segments, signalized intersections, and unsignalized intersections in Lake and Sumter Counties. A total of 103,152 crashes including **4,539 fatal and serious injury (incapacitating injury)** occurred in this period, excluding crashes on limited access highways (I-75, FL-91, SR-91). Crashes were divided into five severity levels according to the KABCO injury classification scale and definitions established by the Federal Highway Administration (FHWA) shown in **Table 2-1**. Fatal (K) and Serious Injury (A), noted KA, crashes are the most severe and the targeted crash type to reduce to zero within this action plan.

The distribution of these severe crashes across the region is shown in **Figure 2-1**.

Figure 2-1: Map of Fatal and Serious Injury Crashes

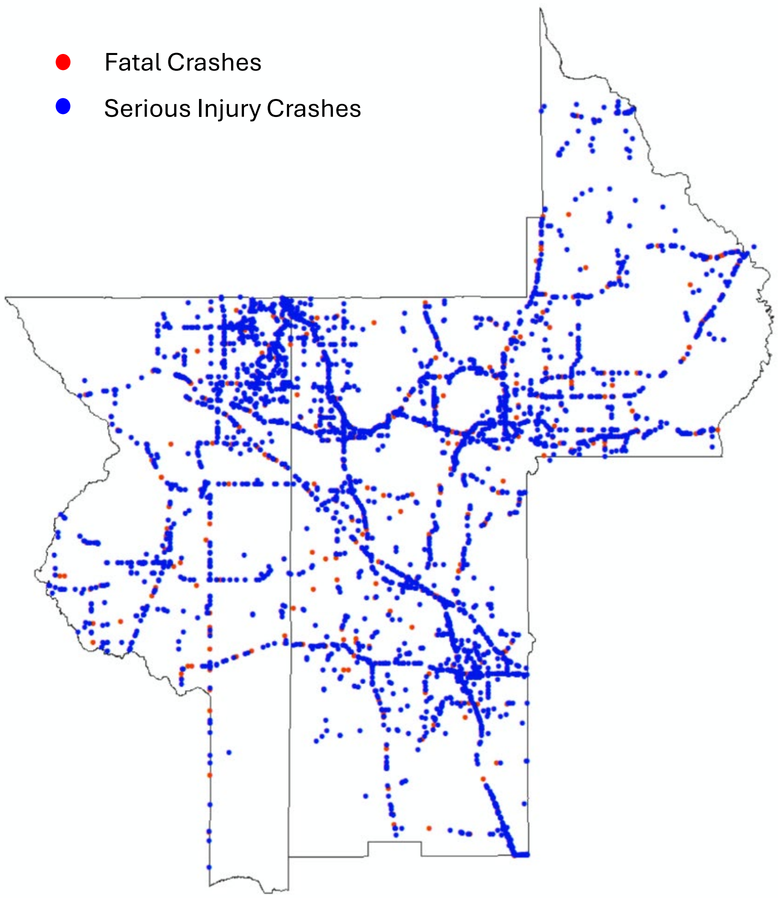


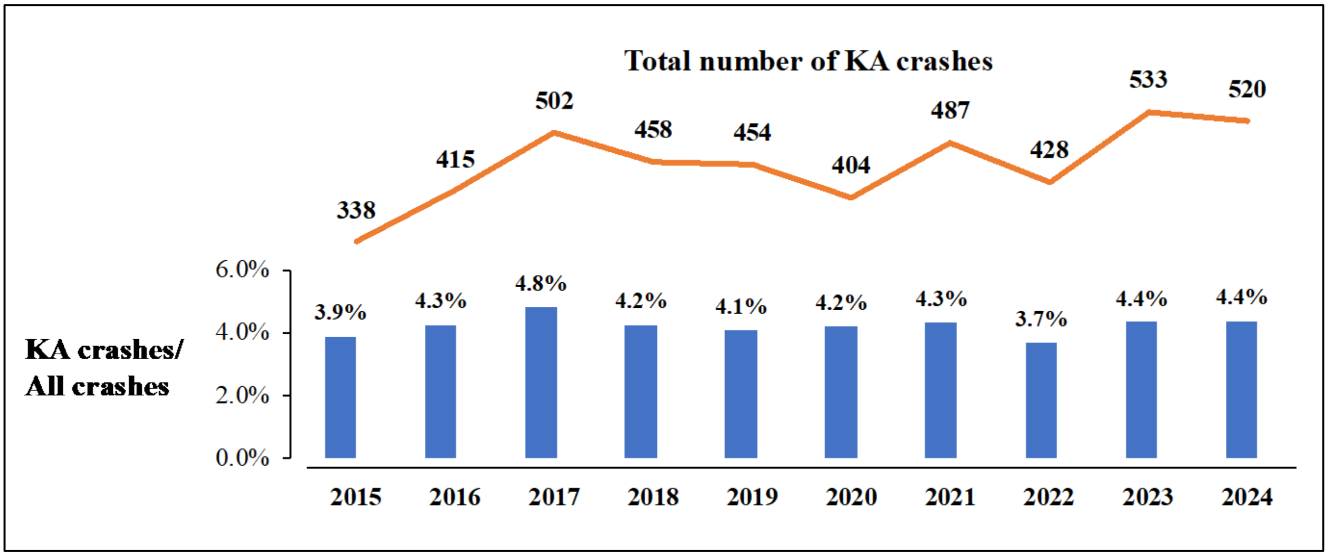
Table 2-1: Definition of Crash Severity in SS4A.

KABCO Injury Classification Scale	Description	Crashes 2015-2024
K (Fatal Injury)	Fatalities within 30 Days	707
A (Serious Injury)	Incapacitating Injuries	3,832
B (Non-Incapacitating Injury)	Non-Incapacitating Injuries	9,565
C (Possible Injury)	Possible Injuries	15,493
O (No Injury)	Property Damage Only	73,555

Data Source: https://highways.dot.gov/media/20141

The rate of KA crashes annually in the MPO region is 4.2% of total crashes (shown in **Figure 2-2**). This KA rate is above the Florida average of 2.4%. While the total crash rate is less, the severity of those crashes is almost double the statewide average. In the last 10 years, a total of 73,555 crashes have cost the Lake and Sumter communities approximately $15 billion, with 74% of those crash costs resulting from 4,539 killed and serious injury crashes.

Figure 2-2: Number and Ratio of KA crashes in the Region, 2015-2024

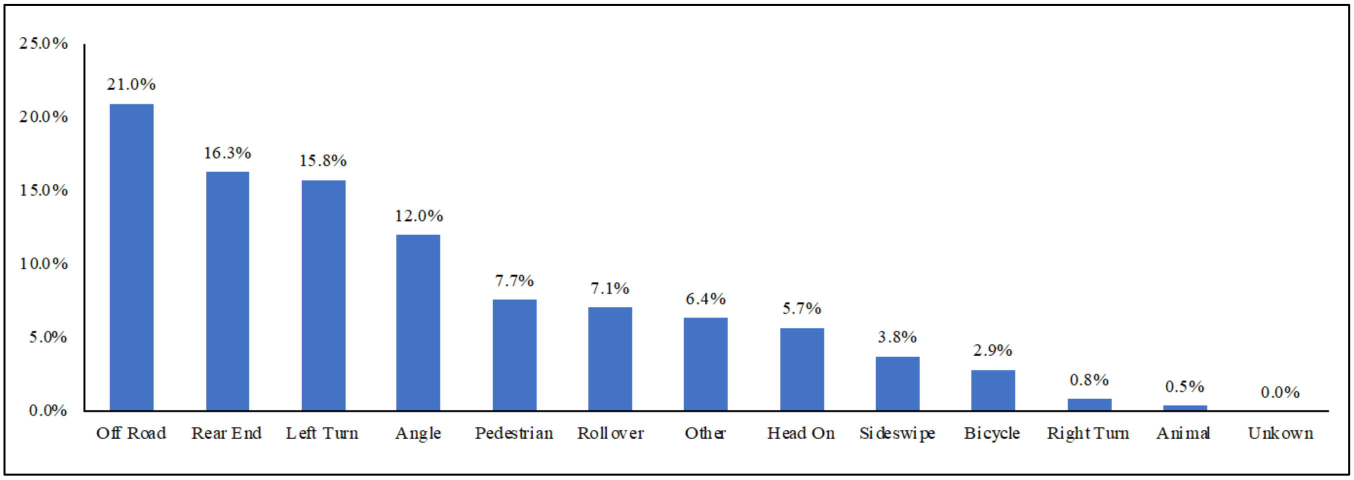


To understand these severe crashes, a full analysis is included in Appendix A and summarized below:

- **Crash Types:** Seven typical crash types including off-road/roll over (28.1%), left turn/angle (27.8%), rear-end (16.3%), and pedestrian/bicycle (10.6%) crashes, accounted for about 82.8% of the total KA crashes between 2015 and 2024 as shown in **Figure 2-3**.
- **Peak Crash Hours:** The highest peak hours for KA crashes are between 3:00pm to 7:00pm. The day of the week with the highest percentage of KA crashes with Fridays accounting for 15.5% or 1/6 of total crashes in a week. The months of the year with the highest risk are December, March, October, and April.
- **Crash Demographics:** The crash involvement rate for male drivers was twice that of female drivers. Among non-motorists, two-thirds of those involved in severe crashes were male. The highest crash involvement rate was observed among drivers aged 15-29 years.
- **Major Crash Types:** The type of vehicle with the highest percentage of KA crashes was passenger cars accounting for 37.4 %. Roadway segments accounted for 62% of KA crashes while intersections were 38%. Breaking down the intersections' crashes, the highest percentage of KA crashes happened within unsignalized intersections (69.5%). An analysis of the segments revealed the highest risk for KA crashes were along two-lane undivided

roadways at 62.3%. A majority of severe crashes happened within rural areas at 54.4% versus urban areas at 45.6%. Further analysis of intersection crash types showed that left-turn and angle crashes were the predominant KA crash types at both signalized and unsignalized intersections. At unsignalized intersections, they accounted for 63% of KA crashes, while at signalized intersections they accounted for 62%.

Figure 2-3: Percent of KA Crash Types, 2015-2024



Based on the type of intersection control or type of roadway segment configuration, the following are the major crash types identified for the LSMPO region as shown in **Table 2-2**.

Table 2-2:Predominant KA Crash Type by Location

Location Type	Predominant KA Crash Type
Unsignalized Intersection	Left-Turn
Signalized Intersection	Left-Turn
Undivided Two-Lane Segment	Off-Road
Undivided Multi-lane Segment	Rear-End
Divided Multi-lane Segment	Rear-End
Two-lane Segment with Center Turn Lane	Off-Road

The safety analysis was completed for KA crashes to compare the five years from 2015 to 2019 to the last five years, 2020 to 2024, to understand if crash trends are improving and if so, where they are improving. A summary of those results is shown in **Table 2-3**.

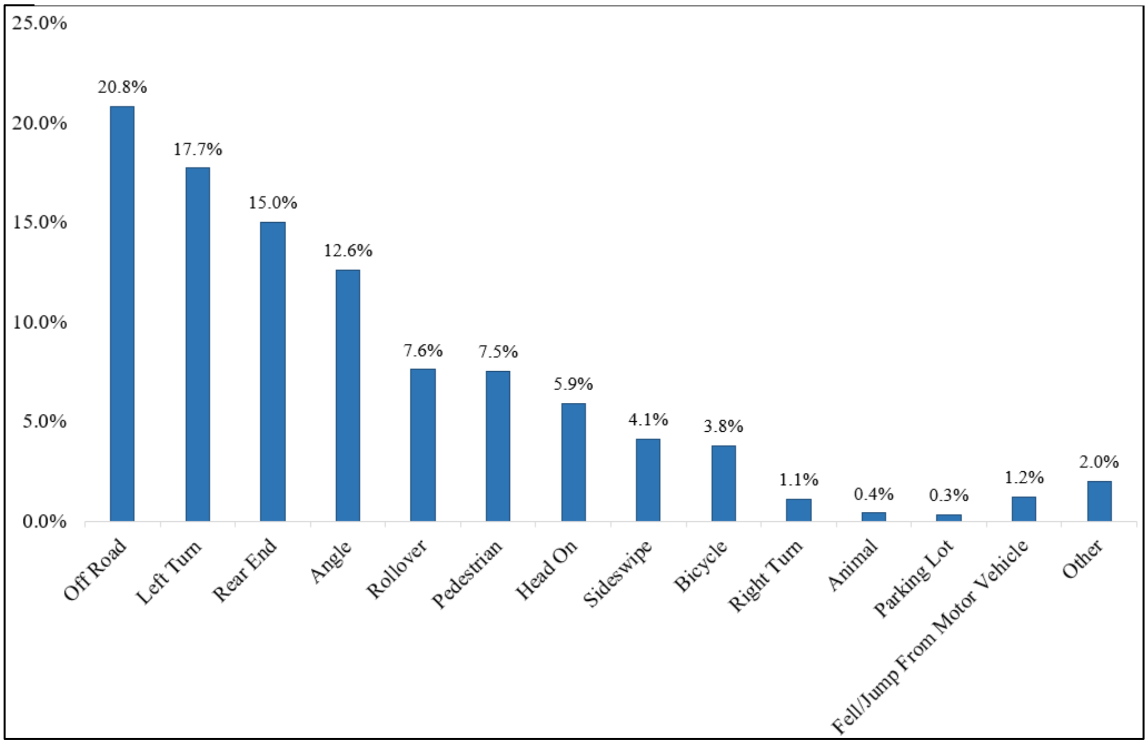
Table 2-3: Comparative KA crash analysis: 2015-2019 vs. 2020-2024

Condition	2015-2019	2020-2024	Change
Crash Type: Off-Road/Rollover	55	51.2	Decrease
Crash Type: Left-Turn/Angle	49.9	54.6	Increase
Crash Type: Rear-End	34.8	27.1	Decrease
Crash Type: Pedestrian/Bicycle	19.3	20.4	Increase
Lighting Condition: Daylight	108.5	115.6	Increase
Lighting Condition: Dark-Lighted	45.4	33.2	Decrease
Lighting Condition: Dark-Not Lighted	18.5	14.9	Decrease
Lighting Condition: Daybreak/Dusk	14.4	15.8	Increase
Intersection Type: Unsignalized	90.4	97.1	Increase
Intersection Type: Signalized	45.1	38.8	Decrease

Note: Crash Type and Lighting Condition comparisons in KA crash rate is per million vehicle miles traveled (MVMT) while Intersection Type is KA crash rate is per million Annual Average Daily Traffic (AADT).

A detailed assessment of the KA crashes over the five-year period, 2020 to 2024, reveals that 85% of all crashes in Lake and Sumter County are within the following four crash types: left-turn /angle, off-road/rollover, rear-end, and pedestrian/bicycle as shown in **Figure 2-4**.

Figure 2-4: Distribution of Total KA Crash Types, 2020 to 2024



Crash analysis for the top four crash types is included in **Table 2-4** and detailed in **Appendix A**.

Table 2-4: Top 4 Severe Crash Type Analysis for last 5 years

1. Left-Turn KA Crash Analysis (717 KA Crashes)	2020 to 2024
Intersection Crashes (vs. Segments)	83.4%
Unsignalized Intersections	72.5%
Four-Way Intersections	54.3%
Two-Way, Two-Lane Roads	53.8%
Urban (vs. Rural)	57.2%
Daylight Crashes	73.6%
Elevated Severe Crash Hours	1:00 to 6:00 pm
Highest KA crash day of week	Friday
Highest KA crash month	December
2. Rollover/Off-Road KA Crash Analysis (673 KA Crashes)	**2020 to 2024**
Segment Crashes (vs. Intersections)	84.3%
Unsignalized Intersections	85.8%
T-Intersection	71.3%
Two-Way, Two-Lane Roads	75.9%
Rural (vs. urban)	65.8%
Daylight Crashes	54.1%
Elevated Crash Hours	2:00 to 8:00pm
Highest KA Crash Day of Week	Saturday/Sunday
Highest KA Crash Month	April
3. Rear-End KA Crash Analysis (356 KA Crashes)	**2020 to 2024**
Segment Crashes (vs. Intersections)	62.9%
Unsignalized Intersections	56.4%
Four-Way Intersections	49.6%
Two-Way, Two-Lane Roads	44.6%
Urban (vs. Rural)	61.5%
Daylight Crashes	74.4%
Elevated Crash Hours	4:00 to 5:00pm
Highest KA Crash Day of Week	Wednesday
Highest KA Crash Month	March
4. Pedestrian/Bicycle KA Crash Analysis (268 KA Crashes- 179 Pedestrians & 89 Bicyclists)	**2020 to 2024**
Segment Crashes (vs. Intersections)	71.2%
Unsignalized Intersections	76.4%
T-Intersection Crashes	47.4%
Two-Way, Two-Lane Roads	58.4%
Urban (vs. Rural)	57.4%
Daylight Crashes	48.1%
Elevated Crash Hours	8:00 to 11:00pm
Highest KA Crash Day of Week	Friday
Highest KA Crash Month	October

Severe crash rates (including fatality and incapacitating injury crashes) have been a decreasing trend in Florida, while severe crash rates have been increasing in Lake and Sumter counties. Across the 10-year analysis period, the KA crash rate in Lake and Sumter exceeded the statewide average. Crash types including off-road, left turn, rear-end and angle crashes hold the highest risk while two-way, two-lane undivided roads exhibit the highest crash rates among roadway types. Comparing 2020–2024 with 2015–2019, the analysis indicates 22% decrease in the rear-end KA crash rate and the crash rate under dark-lighted conditions, while the left-turn/angle KA crash rate increased by 9% and the dawn/dusk KA crash rate by about 10%.

See the detailed Crash Trends and Safety Analysis in **Appendix A**.

CHAPTER 3 NETWORK SCREENING & HIGH INJURY NETWORK

A key component to a safety action plan is to identify the highest risk areas. This entails the development of a High-Injury Network (HIN) which highlights the roadways where a disproportionate number of fatal and serious injury crashes occur. Using the latest five years of crash data (2020-2024), the highest crash corridors, segments, and intersections were identified. All crashes in the analysis period were equated to an appropriate EPDO (Equivalent Property Damage Only) value. For the five crash severity categories (KABCO), the Florida Department of Transportation has an associated comprehensive crash cost. If a property damage crash is equal to 1, then the crash weighting factor can be calculated using values as shown in **Table 3-1** below.

Table 3-1: Predominant KA Crash Type by Location

Crash Severity	Comprehensive Crash Cost	Crash Weighting Factor
Fatal (K)	$10,890,000	1414
Severe Injury (A)	$888,030	115
Moderate Injury (B)	$180,180	23
Minor Injury (C)	$103,950	14
Property Damage Only (O)	$7,700	1

Source: Florida Department of Transportation State Safety Office's Crash Analysis Reporting (CARS) System, analysis years 2015 through 2019. Published by FDOT State Safety Office on 2/23/2022.

By assigning these values to all the crashes across the MPO region, a sliding window methodology using a length of 1-mile is pulled across the network to identify the segments to determine segment scores, then rank them from highest EPDO score to lowest.

The HIN includes the highest scoring corridors to include 50% of the KA crashes and a total of 158 miles (equivalent to 14% of region's network). Each corridor has an average length of 1.5 miles. The average number of KA crashes is 10.7 per corridor, including the highest observed of 45 KA crashes and lowest with 3 KA crashes. This High-Injury Network includes 74 pedestrian involved KA crashes (41% of all pedestrian KA crashes), 52 bicyclists-involved KA crashes (52% of all bicycle KA crashes), and 180 motorcycle involved KA crashes (51% of all motorcycle KA crashes). The High-Injury Network includes 106 unique corridors, 40 segments and 70 intersections.

Safety analysis was completed to understand the highest priority segments, intersections, and corridors. The full analysis and HIN methodology can be found in **Appendix B**.

HIGH-INJURY CORRIDORS

A total of 106 high-injury corridors were identified across the MPO region including 58 corridors in Lake County and 48 corridors in Sumter County. The corridors in Lake County account for 630 KA crashes within 98 miles. The corridors in Sumter County account for 515 KA crashes over 58 miles. A map of the corridors is shown in Figure **3-1** and a listing of the Top 20 corridors is included in **Table 3-2**.

Figure 3-1: Top 106 High-Injury Corridors in Sumter County and Lake County

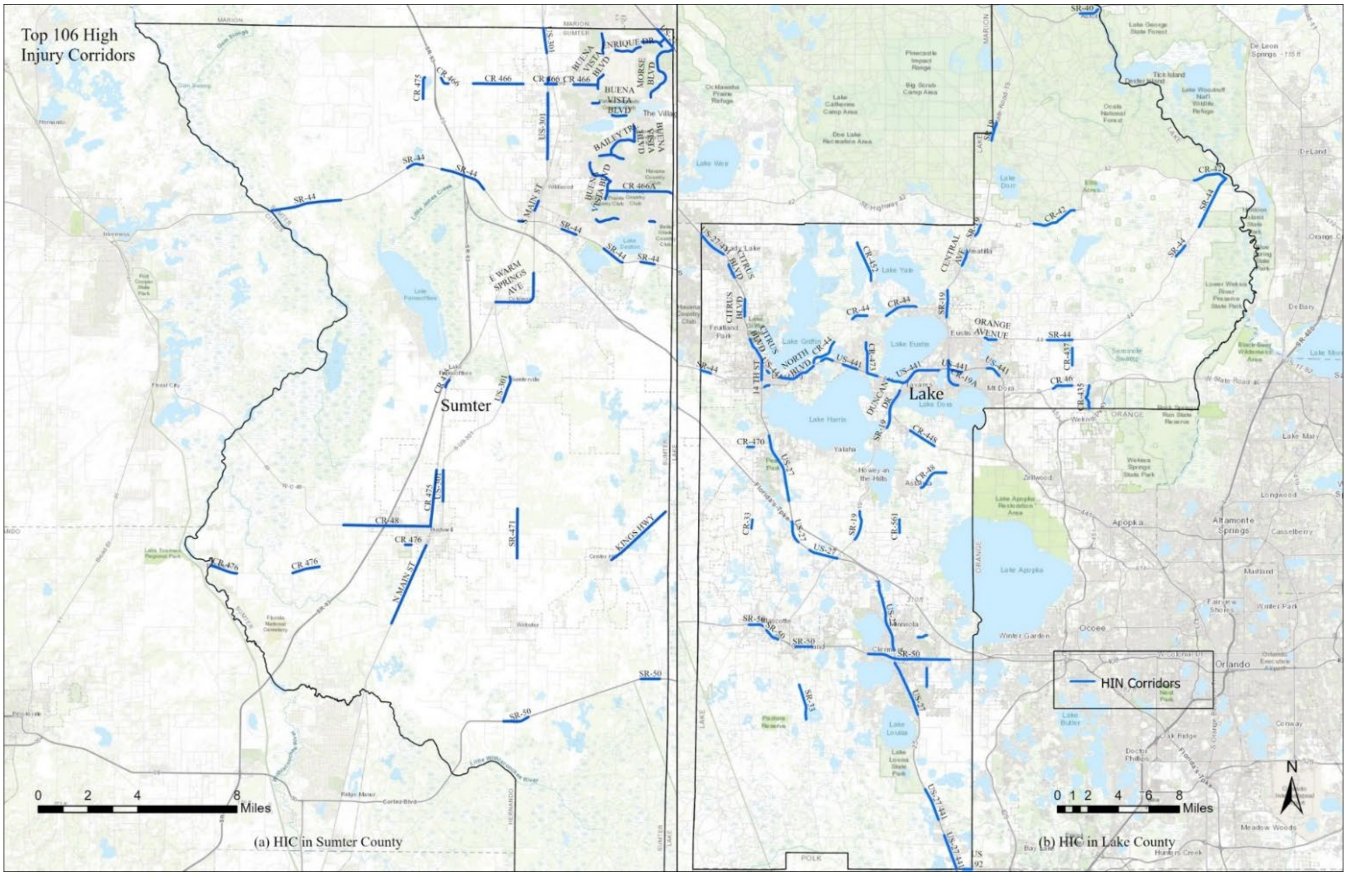


Table 3-2: Top 20 High Injury Corridors

No	Name	County	From Intersecting Road	To Intersecting Road	All Crashes (KABCO)	Total Severe Crashes (KA)	Total Pedestrian Involved KA Crashes	Total Bicyclist Involved KA Crashes	Total Motorcycle Involved KA Crashes	Per mile EPDO	Length (mile)
1	**S.R. 44**	Sumter	MORSE BLVD	VIVIENNE DR	177	24	0	0	3	13638	0.6
2	**U.S. 192**	Lake	KERSEY ST	OUTDOOR RV RESORTS	278	14	6	0	2	12467	0.6
3	**U.S. 301**	Sumter	NE 120 XING	C.R. 466	198	15	0	0	0	10262	0.3
4	**C.R. 475**	Sumter	RAMP 18130016	RAMP 18130020	50	6	0	0	0	10238	0.3
5	**S.R. 44 (DIXIE AVE)**	Lake	MCKENZIE ST	S 9TH ST	71	5	1	0	3	9911	0.4
6	**U.S. 27/441**	Sumter	MARION CNTY LINE	MORSE BLVD	434	46	1	0	2	9652	1.0
7	**C.R. 33**	Lake	AUSTIN MERRITT RD	CHARTER LN	62	7	0	0	0	9091	0.6
8	**S.R. 44**	Sumter	POWELL RD	BUENA VISTA BLVD	123	6	1	0	0	8616	0.6
9	**S.R. 44**	Lake	SPRUCE DR	RORY LN	35	7	1	1	1	8153	0.9
10	**U.S. 27/441**	Lake	PALM ST	GRAFFIN RD	679	23	5	1	2	7525	1.7
11	**U.S. 27 (14 TH ST)**	Lake	C.R. 44A/GRIFFIN RD	W MAIN ST	486	10	1	3	2	7390	1.2
12	**BUENA VISTA BLVD**	Sumter	ST CHARLES PL	PINELLAS PL	155	17	0	1	1	6515	0.8
13	**C.R. 19A**	Lake	W CHARLOTTE AVE	OLD U.S. 441	381	18	4	3	5	5818	2.0
14	**U.S. 441**	Lake	RAMP 11010005 WB OFF	SPRING HARBOR BLVD	261	8	0	0	0	5679	0.8
15	**BUENA VISTA BLVD**	Sumter	SOUTHERN TRCE	PARR DR	118	16	0	2	1	5539	0.7
16	**U.S. 441**	Lake	N LAKE ST	C.R. 44	788	22	1	1	7	5465	2.5
17	**S.R. 44**	Sumter	C.R. 231	C.R. 44A	321	23	4	1	1	5418	2.0
18	**S.R. 50**	Lake	PEARL ST	VILLA CITY RD	134	6	0	2	1	5354	1.0
19	**U.S. 441**	Lake	FROM PERKINS ST	LEE ST	94	4	0	1	0	5340	0.2
20	**C.R. 470**	Lake	PALMETTO AVE	C.R. 33	48	5	0	0	2	5080	0.4

HIGH-INJURY INTERSECTIONS

A total of 70 high-injury intersections were identified across the MPO region and include 27 signalized and 43 unsignalized intersections. Intersection selection criteria required the KA crash frequency to be equal or greater than 3 KA crashes within 5 years. The intersections were ranked by total KA crash frequency, fatal (K) crash frequency, and KA crash rate (calculated using the total entering vehicular volume). The 70 intersections are mapped in **Figure 3-2** and Top 10 intersections are listed in **Table 3-3** and **Table 3-4** for signalized and unsignalized, respectively.

Figure 3-2: Top 70 High-Injury Intersections in Sumter County and Lake County

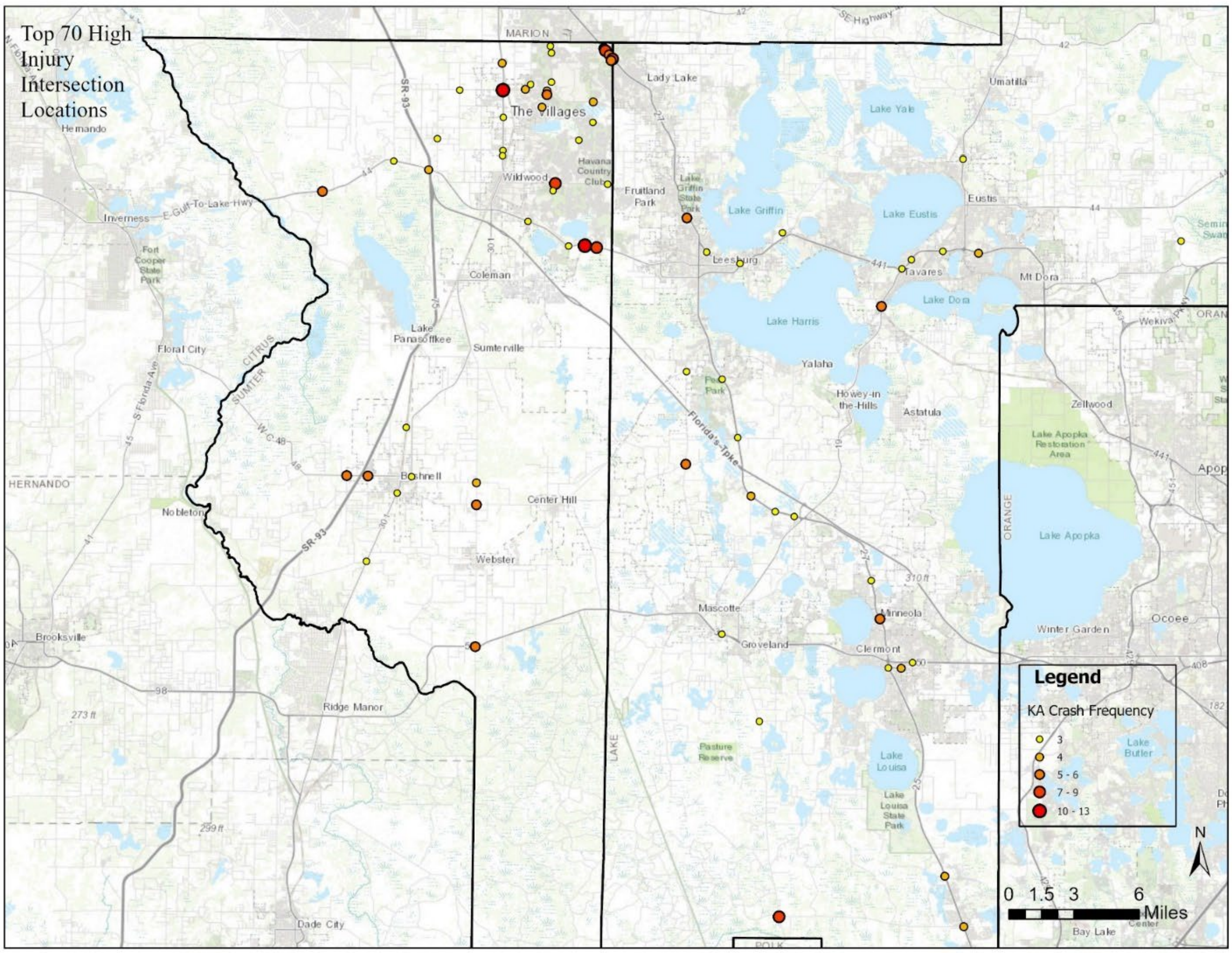


Table 3-3: Top 10 High Injury Intersections, Signalized

Priority	County	Intersection Type	Area	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
1	Sumter	Four Way Intersection	Urban	U.S. 301	C.R. 466	13	0	167	0.23
2	Sumter	Four Way Intersection	Urban	S.R. 44	Morse Blvd	11	1	96	0.17
3	Sumter	Four Way Intersection	Urban	C.R. 466A	Buena Vista Blvd	8	1	71	0.15
4	Sumter	Four Way Intersection	Urban	U.S. 27/441	Morse Blvd	8	0	75	0.08
5	Sumter	Four Way Intersection	Urban	U.S. 27/441	Ne 136th Ave	7	0	91	0.10
6	Sumter	T Intersection	Rural	S.R. 50	S.R. 471	6	1	27	0.22
7	Sumter	Four Way Intersection	Rural	C.R. 48	Lowery St	6	0	30	0.59
8	Sumter	Four Way Intersection	Urban	CITRUS BLVD	Dr MLK Jr Blvd	5	1	44	0.06
9	Sumter	Four Way Intersection	Rural	S.R. 471	E Southland Ave	5	0	20	0.19
10	Sumter	Four Way Intersection	Urban	U.S. 27/441	Bella Cruz Dr	5	0	38	0.07

Table 3-4: Top 10 High Injury Intersections, Unsignalized

Priority	County	Intersection Type	Area	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
1	Lake	T Intersection	Rural	S.R. 33	C.R. 474	9	1	35	0.29
2	Sumter	T Intersection	Urban	S.R. 44	Vivienne Dr	8	1	27	0.19
3	Lake	Four Way Intersection	Urban	C.R. 33	Bridges Rd	6	2	46	0.41
4	Lake	Four Way Intersection	Urban	S.R. 19	C.R. 561	6	2	24	0.10
5	Sumter	T Intersection	Rural	S.R. 44	C.R. 470	6	0	25	0.18
6	Sumter	T Intersection	Rural	C.R. 48	C.R. 616	5	2	11	0.49
7	Sumter	Roundabout	Urban	Morse Blvd	El Camino Real	5	1	104	0.08
8	Sumter	Four Way Intersection	Urban	Buena Vista Blvd	Parr Dr	5	0	14	0.22
9	Sumter	T Intersection/Access point	Urban	U.S. 27/441	Ne 86th Dr	5	0	16	0.07
10	Sumter	Four Way Intersection	Rural	S.R. 471	C.R. 476 E	4	2	6	0.20

HIGH-INJURY SEGMENTS

A total of 40 segments were identified as high-injury segments within the MPO region. These segments experienced a KA crash frequency of greater than or equal to 3 KA crashes in the five years analyzed. Each of the segments was ranked by the KA crash rate over million vehicle miles (MVM), total KA frequency, and fatal (K) crash frequency. Figure **3-3** below shows the locations of the high-injury segments while a listing of the Top 20 segments is included in **Table 3-5**.

Figure 3-3: Top 40 High-Injury Segments in Sumter County and Lake County

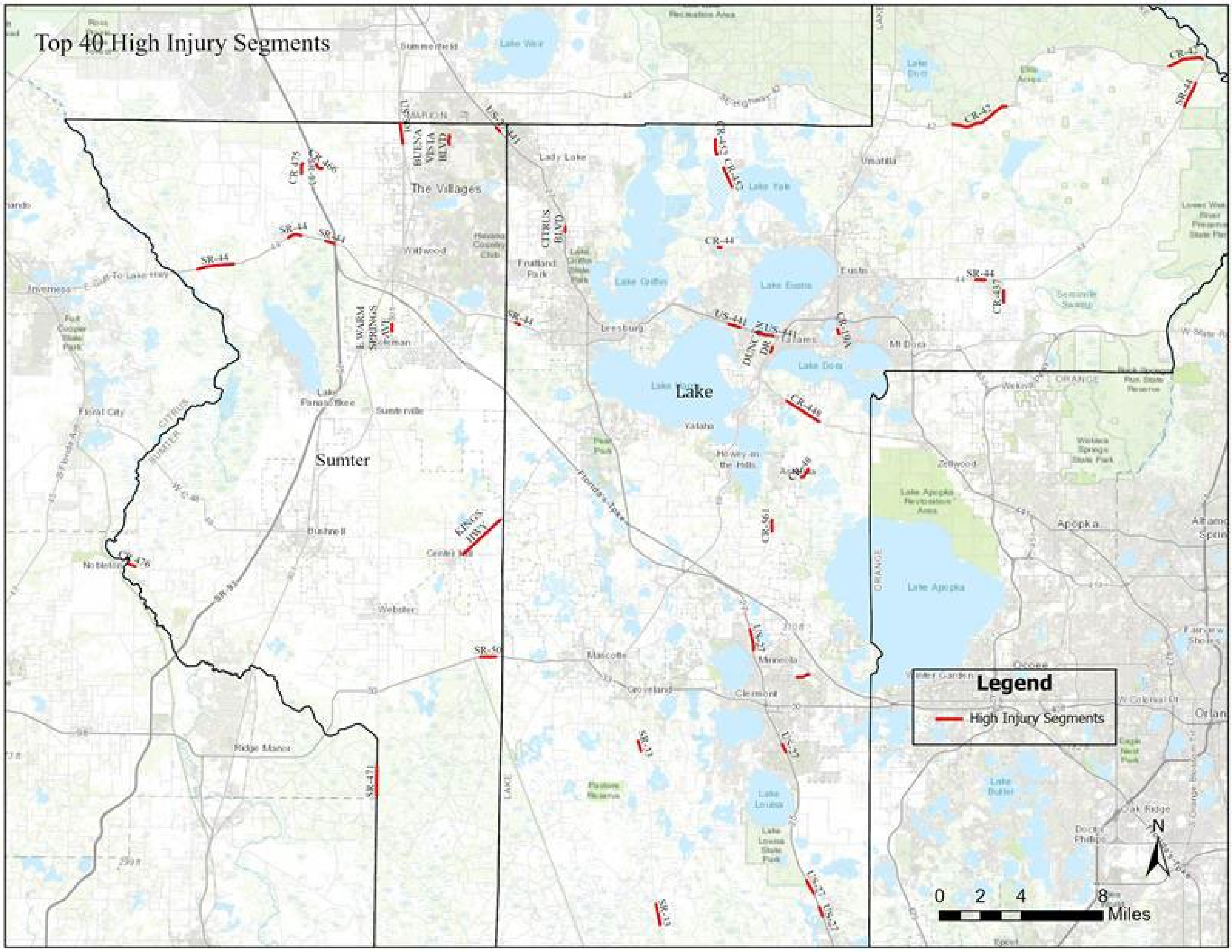


Table 3-5: Top 20 High Injury Segments

No	Roadway Name	County	From Intersecting Road	To Intersecting Road	Functional Class	Context Classification	Lane Per Direction	Speed (mph)	Total KA	Total BCO	KA Crash Rate
1	**C.R. 476**	Sumter	C.R. 647	C.R. 659	Rural Major Collector		1	45	3	16	1.27
2	**C.R. 44**	Lake	EMERALDA AVE	RHETT RD	Urban Major Collector	C3R	1	40	3	12	1.06
3	**U.S. 27/441**	Sumter	NE 138TH	LOWES	Urban Principal Arterial–Other	C3C	3	45	8	43	0.78
4	**C.R. 42**	Lake	TENTH ST	RIVER FOREST BLVD	Rural Major Collector		1	55	8	24	0.70
5	**C.R. 19A**	Lake	BAY RD	DODSON CUTOFF	Urban Minor Arterial	C3C	1	45	3	23	0.65
6	**C.R. 475**	Sumter	C.R. 245E	C.R. 246 S	Rural Major Collector		1	45	3	6	0.63
7	**S.R. 44**	Sumter	C.R. 231	RAMP 18120021 SB ON	Rural Principal Arterial–Other	C3C	2	45	5	73	0.59
8	**C.R. 561**	Lake	DOUBLE RUN RD	WHITE CYPRESS RD	Rural Major Collector	C2	1	50	4	7	0.50
9	**C.R. 48**	Lake	LAYLAINE DR	RANCH RD	Rural Major Collector		1	55	3	10	0.50
10	**U.S. 301**	Sumter	NE 41 LN	NE 37 PL	Urban Principal Arterial–Other	C2	1	55	5	13	0.48
11	**S.R. 44**	Lake	FOREST DR	TOMAHAWK TRL	Rural Principal Arterial–Other	C2	1	55	3	8	0.47
12	**C.R. 466**	Sumter	C.R. 475	N MAIN ST	Rural Major Collector		1	45	3	16	0.47
13	**C.R. 42**	Lake	C.R. 439	CLEARWATER LAKE REC	Rural Major Collector		1	55	7	40	0.36
14	**S.R. 44**	Lake	COUNTRYSIDE BLVD	UNSIGNED	Urban Principal Arterial-Other	C3R	2	55	3	8	0.353
15	**OLD HIGHWAY 50**	Lake	N HANCOCK RD	BLACK STILL LAKE RD	Urban Major Collector		1	35	3	16	0.31
16	**S.R. 33**	Lake	GROVENLAND FARMS RD	MCGILL RD	Rural Minor Arterial	C2	1	60	3	10	0.31
17	**U.S. 27/441**	Sumter	Lowe's Driveway	NE 136TH	Urban Principal Arterial–Other	C3C	3	45	3	52	0.31
18	**S.R. 44**	Sumter	C.R. 243	C.R. 475	Rural Principal Arterial–Other	C2	2	60	4	18	0.31
19	**C.R. 48 (KINGS HWY)**	Sumter	C.R. 702	C.R. 558	Rural Minor Collector		1	45	5	22	0.30
20	**S.R. 471**	Sumter	S CARTER RD	N GRADE RD	Rural Minor Arterial		1	60	3	6	0.27

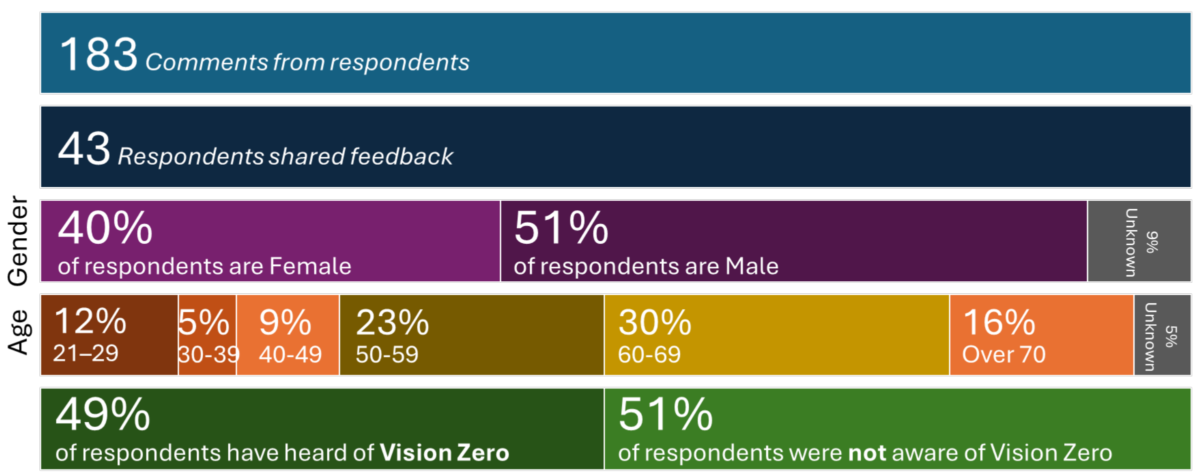
See the full Network Screening and High Injury Network in **Appendix B**.

CHAPTER 4 ENGAGEMENT AND COLLABORATION

Public engagement was a central element of the Lake–Sumter MPO Vision Zero Safety Action Plan, providing insight into community perceptions of transportation safety and helping to inform data-driven and publicly supported strategies. Engagement activities were designed to capture input on unsafe behaviors, infrastructure deficiencies, and priority locations for safety improvements. Outreach included presentations to the MPO's Community Advisory Committee (CAC) and Technical Advisory Committee (TAC), as well as a public online survey conducted from October 2, 2025, to December 11, 2025. Together, these efforts ensured that the Safety Action Plan reflects both technical analysis and community experience.

The online survey received responses from 43 participants and generated 183 comments (see **Figure 4-1**). Respondents represented a mix of residents, commuters, visitors, and workers in Lake and Sumter Counties, with a notable share identifying as government staff, elected officials, or advisory committee members. Survey respondents primarily relied on personal vehicles for daily travel. Walking, bicycling, and transit use were reported at very low levels, indicating that safety perceptions captured through the survey largely reflect the experience of drivers. This context is important when interpreting the findings, particularly those related to pedestrian and bicycle safety.

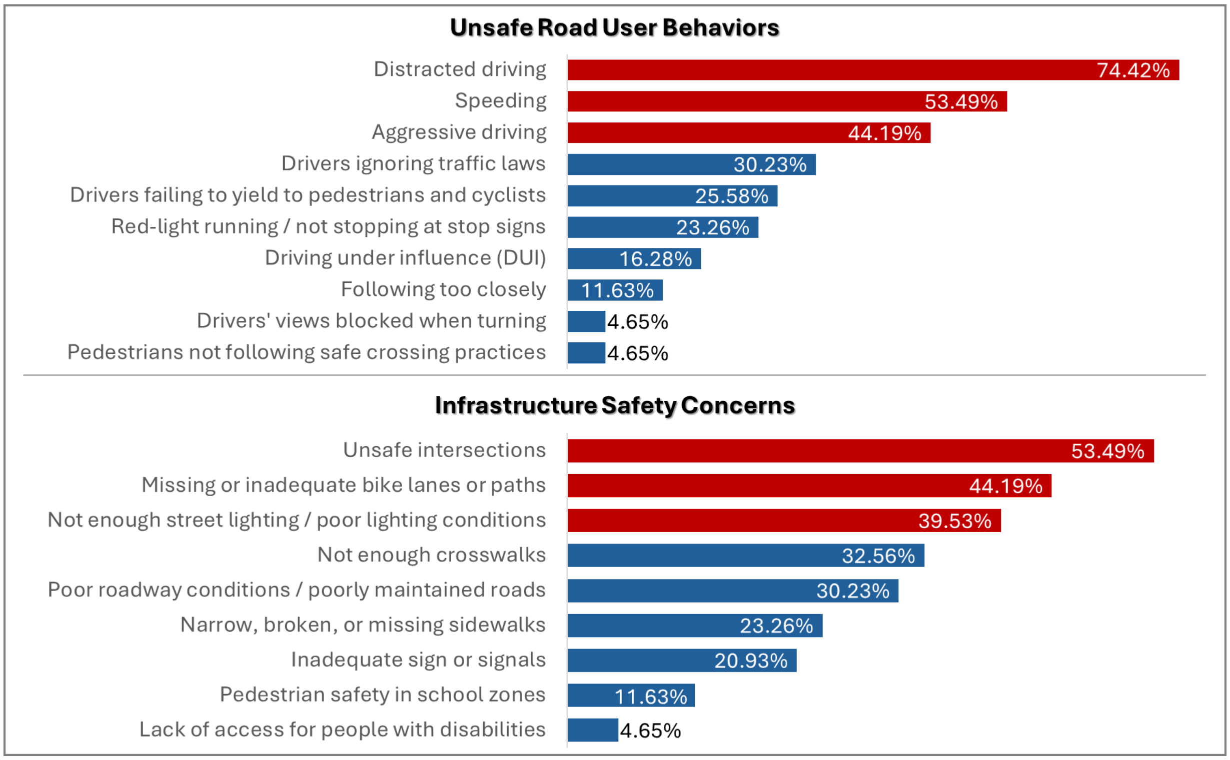
Figure 4-1: Summary of Survey Respondents' Demographics



Survey participants identified unsafe road user behavior as the most significant contributor to transportation safety issues in the region, with distracted driving being the most frequently cited concern, followed by speeding and aggressive driving.

Infrastructure-related concerns most notably identified unsafe intersections, inadequate or missing bicycle facilities, and poor street lighting or nighttime visibility as major safety issues. These findings (shown in **Figure 4-2**) highlight that safety challenges in Lake and Sumter Counties include both behavioral and physical factors, underscoring the need for integrated strategies that address roadway design, operations, enforcement, and education.

Figure 4-2: Key Safety Concerns Identified by Respondents



Note: Red bars indicate the top three items in each category.

Survey respondents also provided location-based input identifying areas perceived as unsafe for driving, as well as for walking, bicycling, or crossing roadways. Reported unsafe driving locations were concentrated along major regional corridors; while walking and bicycling concerns were more frequently associated with wide, high-speed roadways, commercial areas, and multi-lane crossings. A substantial share of the reported unsafe locations overlapped with the High-Injury Network (HIN), demonstrating strong alignment between community perception and crash-based safety analysis. Locations identified by respondents frequently exhibited recurring issues such as difficult turning movements, inadequate traffic signal operations, poor intersection design, limited pedestrian crossing opportunities, and lack of sidewalks or bicycle facilities.

Survey responses revealed mixed perceptions regarding existing transportation safety infrastructure. Sidewalk availability emerged as a notable concern. Roadway signs and pavement markings were generally viewed more positively, with many respondents indicating that markings are visible and understandable. Perceptions of pedestrian and bicycle facilities varied, with a large share of respondents selecting neutral responses, suggesting inconsistent conditions or limited exposure to non-motorized travel. School zone safety received relatively favorable feedback, with most respondents indicating that drivers generally comply with posted school zone speed limits and that enforcement is adequate. While these findings are encouraging, continued monitoring and targeted improvements remain important.

Public Support for Transportation Safety Strategies

Survey participants expressed strong support for a range of transportation safety strategies, particularly those focused on infrastructure improvements. The highest levels of agreement were recorded for roadway design improvements, enhanced pedestrian crossings, and increased investment in sidewalks and pedestrian facilities. These results indicate clear public prioritization of safer, more accessible infrastructure for pedestrians and other vulnerable road users.

Respondents also demonstrated strong support for protected bicycle facilities, improved street lighting, traffic enforcement, and education and awareness initiatives. Collectively, these responses suggest that the public favors a comprehensive approach that combines engineering, enforcement, and education to improve safety outcomes.

Open-ended comments reinforced these findings, with respondents frequently emphasizing pedestrian and bicycle safety, concerns about speeding and aggressive driving, and the need for safer roadway design. Additional themes included the importance of interagency coordination, public education, and dedicated funding to support long-term safety improvements.

In addition to the public survey, the project team conducted four meetings with the MPO's CAC and TAC between October 2025 and February 2026. These meetings included both in-person and virtual sessions and focused on project initiation, crash analysis findings, High-Injury Network development, public engagement results, and proposed safety countermeasures. Feedback from committee members helped validate analytical findings, identify priority concerns, and refine proposed strategies. This collaborative process ensured that the Safety Action Plan aligns with local priorities, technical feasibility, and broader regional transportation goals.

Public engagement findings indicate that transportation safety concerns in Lake and Sumter Counties are driven primarily by perceived unsafe driving behaviors and infrastructure deficiencies, particularly at intersections and along major corridors. While most respondents rely on personal vehicles, there is strong recognition of the need to improve safety for pedestrians and bicyclists through enhanced crossings, sidewalks, lighting, and roadway design.

The strong alignment between community-identified unsafe locations and the High-Injury Network highlights the value of integrating public input with crash-based analysis. Survey results demonstrate broad public support for infrastructure-focused safety strategies, complemented by enforcement, education, and interagency coordination. Together, these findings provide a clear foundation for prioritizing safety investments that address both documented crash risk and community-identified needs across Lake and Sumter Counties.

A full reporting of the Public Engagement activities can be found in **Appendix C**.

CHAPTER 5 STRATEGIES AND PRIORITIZATION, AND PROJECT SELECTIONS

The preceding chapters examined ten years of crash trends (2015–2024), conducted an in-depth analysis of recent crashes (2020–2024), identified the High Injury Network across the two counties, and performed data-driven risk assessment to understand the patterns contributing to severe and recurring safety concerns. This chapter transitions from diagnosis to implementation. It presents a comprehensive set of strategies designed to reduce crash frequency and severity while advancing the Vision Zero goal of eliminating traffic fatalities and serious injuries. The strategies outlined herein incorporate both engineering and other countermeasures to address infrastructure-related deficiencies and safety risk factors consistent with the Safe System approach.

Recommended countermeasures were selected based on nationally recognized, evidence-based safety resources to ensure technical credibility and demonstrated effectiveness. Infrastructure and operational treatments are aligned with the Proven Safety Countermeasures published by the Federal Highway Administration (FHWA). Quantitative estimates of expected crash reduction are supported by documented Crash Modification Factors (CMFs) obtained from the CMF Clearinghouse. Additionally, behavioral, enforcement, and policy-related safety strategies are informed by “Countermeasures That Work” document by the National Highway Traffic Safety Administration. Collectively, these nationally recognized references provide an evidence-based foundation to ensure that proposed safety interventions are consistent with current transportation safety research and best practices.

The chapter is organized to present the major safety challenges and targeted responses, then outlines a project prioritization framework, and concludes with corridor-specific countermeasure recommendations for the Top 30 High Injury Corridors.

ENGINEERING COUNTERMEASURES:

Table 5-1 below outlines the specific safety countermeasures aligned with the predominant severe crash types in Lake and Sumter Counties based on the 2020 to 2024 dataset. A full description of the individual crash reductions by countermeasure is detailed in **Appendix D**.

Table 5-1: LSMPO Proposed Safety Countermeasures

Crash Type	Countermeasures	Crash Reduction Potential
Left-Turn/Angle-Unsignalized **528 KA crashes (30.3%)**	• Double-Up Oversized Advanced Signage w/ Street Name Plaques and Flashing Beacons • Retroreflective Sheeting on Sign Posts • Enhanced Edge Line Pavement Markings • Doubled-up STOP AHEAD & STOP Signs	**10-27% reduction**
Left-Turn/Angle-Signalized **189 KA crashes (26.4%)**	• Protected Left-Turn Phasing • Red-Light Cameras • Yellow Change Interval Optimization • Signal Backplates • Roadway Lighting • Upgrade Signing/Marking & Advance Beacons	**8-77% reduction**
Roadway Departure **673 KA Crashes (28.3%)**	• Edge Line Longitudinal Rumble Strips • Centerline Longitudinal Rumble Strips • Wide Edge Line Striping • Retroreflective Sign Posts, Enhanced Delineators, Sequential Dynamic Chevron Signs • Guardrail Systems • Safety Edge Treatment • High Friction Surface Treatment • Automated Speed Enforcement Cameras	**13-64% reduction**
Rear-End **356 KA Crashes (15.0%)**	• Speed Limit Evaluation/Reduction • Traffic Calming Treatments • Speed Enforcement Devices • Variable Speed Limits • Dynamic "Queue Ahead" Warning Signs • Lane Width Reductions • High Friction Surface Treatment • Yellow Change Interval Optimization • Extension of All-Red Clearance • Dynamic Signal Warning Flashers • Traverse Rumble Strips	**6-67% reduction**
Bicycle/Pedestrian **268 KA Crashes (11.3%)**	• Pedestrian Hybrid Beacons (PHBs) • Rectangular Rapid Flashing Beacons (RRFBs) • Midblock Pedestrian Signals (MPS) • Sidewalks on Both Sides of Roadway • Roadway Lighting • High-Visibility Crosswalk Markings • Leading Pedestrian Interval Signal Timing • Advanced STOP Bars & Signage • Pedestrian Median Refuge Islands • Pedestrian Countdown Signal Heads • Traverse Rumble Strips • Dedicated Bike Facilities (standard, buffered, protected)	**14-75% reduction**

PRIORITIZATION FRAMEWORK

The prioritization framework developed for this Vision Zero Action Plan is data driven. It emphasizes crash severity, expected safety effectiveness of proposed countermeasures, relative implementation cost, and project readiness. The purpose of this prioritization process is to:

- Ensure that locations with the greatest safety need receive highest attention,
- Prioritize treatments with demonstrated crash reduction effectiveness,
- Consider implementation feasibility and relative cost, and
- Provide a transparent and replicable scoring methodology.

The total prioritization score is calculated out of 100 points, distributed across four categories. The Safety Risk Score is based on KA crash frequency and KA crash rate, Safety Benefit reflects the crash reduction related with safety countermeasures, Relative Cost is based on scale and complexity of implementing proposed countermeasures, and Timeline for Implementation is assigned based on the delivery period. See the full scoring methodology in **Appendix D, Section D.4**.

Using the prioritization scoring methodology, the top 30 highest corridors were identified. For each corridor, a fact sheet was developed to summarize roadway characteristics, crash patterns, contributing patterns and factors, and proposed countermeasures. These targeted improvement strategies serve as an implementation guide. Each corridor was evaluated for location specific safety countermeasures, then mapped at specific high-risk locations. A listing of the countermeasures is shown in **Table 5-2** and a summary of the 30 corridors is included in **Table 5-3**. The full summary and map for each corridor is included in **Appendix D**.

This plan focuses on defining evidence-based countermeasures designed to reduce crash frequency and severity. Both engineering and complementary safety strategies are proposed using nationally recognized safety guidance to ensure technical credibility and consistency with current best practices. A data-driven prioritization framework was developed to systematically evaluate safety risk, expected safety benefit, relative cost, and implementation timeline. This approach provides a transparent and replicable method for sequencing projects based on both safety need and feasibility. The chapter presented the Top 30 High-Injury Corridors, incorporating crash statistics, contributing factors, narrative-based crash pattern analysis, and both corridor-level and location-specific countermeasures. Countermeasures were selected through a structured review process that examined detailed crash narratives, identified recurring crash mechanisms, and screened candidate treatments to ensure context-appropriate and evidence-based recommendations. Collectively, the strategies, prioritization framework, and corridor-specific profiles establish a comprehensive and actionable safety improvement plan for the Lake-Sumter MPO region.

Table 5-2: Safety Countermeasures Labeled

No.	Countermeasure	No.	Countermeasure
A	Lighting	**Q**	Center/Edge Rumble Strips
B	Refresh Pavement Markings	**R**	Dynamic Speed Feedback Signage
C	Advanced STOP Ahead Signs	**S**	Vehicles Entering When Flashing Signage
D	Reduce Lane Width	**T**	Reflective Sheeting on Sign Posts
E	Pavement Friction Surface Treatment	**U**	Remove Sight Distance Limitations
F	Leading Pedestrian Interval	**V**	Double-Up Advanced Warning Signage
G	Automated Speed Enforcement Cameras	**W**	Queue Ahead Signage
H	Sidewalks	**X**	Access Management Study
I	High Visibility Crosswalks	**Y**	Safety Edge Treatment
J	Pedestrian Hybrid Beacon (PHB)	**Z**	Optimized Signal Timing
K	Pedestrian Refuge Island	**AA**	Dynamic Signal Warning Flashers
L	Road Safety Audit	**BB**	Signal Backplates
M	Variable Speed Limits	**CC**	Prohibit Right-Turns During Pedestrian Phase
N	Transverse Rumble Strips	**DD**	Traffic Calming Infrastructure
O	Enhance Curve Delineation	**EE**	Roundabout
P	Wide Edge Lines	**FF**	Protected Bike Lane

Table 5-3: Top 30 Corridors

Priority	County	Corridor Name	Begin Limit	End Limit	Fatal (K)	Serious Injury (A)	Major KA Crash Type	Safety Countermeasures (Table 5-2)
1	Sumter	SR 44	Morse Blvd	Vivienne Dr	3	21	Left-Turn/Angle	A-G, BB
2	Lake	US 192	Kersey St	Outdoor RV Resorts	3	11	Rear-End	A-D, G-M, BB
3	Sumter	US 301	NE 120	CR 466	0	15	Left-Turn/Angle	A, B, E, F, BB
4	Sumter	CR 475	Ramp 18130016	Ramp 18130020	2	4	Left-Turn/Angle	A-B, N-R, BB
5	Lake	Dixie Ave	McKenzie St	S 9th St	2	3	Off-Road/Rollover	A, B, P, S-V, BB
6	Sumter	US27/441	Marion County Line	Morse Blvd	2	44	Left-Turn/Angle	A,B,D-F, L, W, X,V, BB
7	Lake	CR 33	Austin Merritt Rd	Charter Ln	3	4	Left-Turn/Angle	A, B, E, R, Y, BB
8	Sumter	SR 44	Powell Rd	Buena Vista Blvd	3	3	Rear-End	A, B, D, F, Z, AA, BB
9	Lake	SR 44	Spruce Dr	Rory Ln	5	2	Left-Turn/Angle	B, Q, Y, E, A, H, R ,BB
10	Lake	Citrus Blvd	Palm St	Griffin Rd	5	18	Left-Turn/Angle	X, A, B, E, L, V, I, J, K, F, BB
11	Lake	14th St	W Main St	Griffin Rd	4	6	Left-Turn/Angle	A, B, X, L, CC, J, K, BB
12	Sumter	Buena Vista Blvd	St Charles Pl	Pinellas Pl	2	15	Left-Turn/Angle	DD, I, E, A, B, BB, O, R, EE
13	Lake	CR 19A	W Charlotte Ave	Old US 441	6	12	Left-Turn/Angle	H, FF, V, I, J, K, C, A, B, L, CC, G, BB
14	Lake	US 441	Off Ramp 11010005 WB	Spring Harbor Blvd	2	6	Left-Turn/Angle	A, B, W, E, F, CC, L, G, BB
15	Sumter	Buena Vista Blvd	Southern Trace	Parr Dr	1	15	Left-Turn/Angle	B, A, F, V, BB, O, T, S
16	Lake	North Blvd	N Lake St	CR 44	5	17	Left-Turn/Angle	S, B, Z, W, M, P, E, H, I, F, FF, A, L, G, BB
17	Sumter	SR 44	CR 231	CR 44A	5	18	Left-Turn/Angle	A, V, F, L, C, BB, U, S, X, B, Q, E, R
18	Lake	SR 50	Pearl St	Villa City Rd	3	3	Left-Turn/Angle	A, B, FF, C, R, BB, H, I, Z
19	Lake	US 441	Perkins St	Lee St	0	4	Left-Turn/Angle	Z, BB, W, A, F, K, B, V
20	Lake	CR 470	Palmetto Ave	CR 33	1	4	Left-Turn/Angle	B, A, E, H, C, T, U, Q, Y, BB, I
21	Lake	US 441	Professional Dr	Tavares Ave	2	3	Left-Turn/Angle, Off-Road/Rollover, Head-On	B, P, Q, T, E, C, U, V, G, R
22	Lake	SR 19	CR 561	Progressive Aerodyne	3	9	Left-Turn/Angle	C, V, E, A, B, R, S, N, Q
23	Lake	SR 50	West Ave	CR 455	8	23	Left-Turn/Angle	I, F, K, H, FF, A, V, S, X, Z, BB, W, M, E, G
24	Lake	US 441	Hilltop Rd	Dillard Rd	7	23	Left-Turn/Angle	I, F, K, FF, V, S, X, Z, BB, W, M, A, B, O, E, L, G
25	Sumter	CR 466	CR 201	CR 106	0	8	Left-Turn/Angle	A, B, E, F, BB, C, T, U,
26	Lake	US 27/441	Golden Eagle Blvd	US Hwy 192	3	18	Left-Turn/Angle	Z, BB, W, M, E, S, F, I, K, H, V, FF, A, B, L
27	Lake	US 27	Hawthorne Rd	Dewey Robbins Rd	10	16	Left-Turn/Angle	Z, BB, W, M, E, U, S, F, I, K, H, FF, V, A, B
28	Sumter	Morse Blvd	El Camino Rd	CR 466	5	20	Left-Turn/Angle	S, Z, I, BB, DD, Q, E, B, A, O, EE, R
29	Lake	US27/441	Frank Jarrell Rd	Holly Grove Blvd	4	15	Left-Turn/Angle	Q, W, M, A, B, R, BB, E, U, S
30	Sumter	Hillsborough Trl	Enterprise Dr	Morse Blvd	0	6	Off-Road/Rollover	B, A, S, DD, E, P, EE, R

CHAPTER 6 POLICY AND PROCESS CHANGES

Accomplishing the LSMPO Vision Zero Action Plan goals relies on the integration of safety policies and projects led by LSMPO, Lake and Sumter Counties, FDOT, and all the municipalities. This strategy ensures that each initiative addresses systemic challenges, optimizes resource allocation, and delivers impactful results.

Policies establish guiding principles and process changes necessary for consistent and effective project execution.

Projects represent tangible outcomes of the planning process, translating strategic visions into real-world improvements.

Policies and project actions can be achieved through four phases:

Phase 1: Assessment. This phase is completed within this report to identify needs, set priorities, and prepare the groundwork. This plan prepares the groundwork for the programming of the projects and identify the policy improvements needed.

Phase 2: Early Implementation. This phase allows the testing of strategies and the ability to demonstrate quick wins to build momentum and stakeholder confidence. Policies include the expansion of educational outreach with partners and seeking grant funding for partners like Safe Routes to School and Highway Safety Improvement Program (HSIP). Project implementation can be the deployment of maintenance related upgrades like signal backplates, striping upgrades, and signal timing upgrades.

Phase 3: Full Implementation. This phase creates transformative change to the High-Injury Network for improved safety, accessibility, and mobility. Policies include the formalization of safety policies embedded in regulatory and planning frameworks to guarantee adherence to the safe system approach. Project implementation of large-scale infrastructure projects to include permanent safety upgrades, speed management infrastructure, and multimodal facilities.

Phase 4: Monitoring, Evaluation, and Adjustment. Phase 4 includes measuring performance to gauge effectiveness and making improvements to create a continuous process for success. The output from this phase will provide opportunities for data-driven refinements to sustain long-term success. Monitoring the compliance and effectiveness of implemented policies and adjust as needed based on outcomes and evolving needs. Conduct post-implementation project evaluations to measure impact (i.e., crash reductions, improved mobility) and address any unintended consequences.

Actions within policies are listed with **Table 6-1**. Time frames are given in four categories: Annual (yearly), Short-Term is less than two years, Mid-Term is 2 to 5 years, and Long-Term is greater than 5 years.

Table 6-1: LSMPO Policy Actions

Policy Action	Term	Lead Agency	Partner Agency
Prepare annual report to track progress	Annual	LSMPO	-
Meet annually with LSMPO Board to review progress and performance towards goal of meeting zero by 2050.	Annual	LSMPO	-
Meet with Lake and Sumter County to discuss safety projects and enforcement opportunities	Annual	LSMPO	Lake County/ Sumter County
Prioritize fatal and serious injury crashes in all traffic studies, planning documents, and safety assessments prepared for LSMPO	Short-Term	LSMPO	-
Integrate High-Injury Network assessment into the next LRTP development and update the list of highest priority corridors.	Mid-Term	LSMPO	-
Integrate lighting upgrades to meet latest FDOT criteria on all projects.	Short-Term	LSMPO	FDOT/Counties/ Municipalities
Develop a policy to promote and encourage lighting improvements for pedestrians to create safe nighttime connectivity between crosswalks and transit stops.	Mid-Term	LSMPO	Counties/ Municipalities
Support local municipalities to explore the feasibility of 20 mph speed limits for residential districts to align with Florida Statutes.	Mid-Term	LSMPO	Municipalities
Utilize FDOT context classification and speed management practices within the Florida Design Manual to support target speeds within project planning and design phase to integrate target speeds into design phase.	Short-Term	LSMPO	Counties/ Municipalities
Explore opportunities to collaborate on emerging technologies with public and private partners.	Mid-Term	LSMPO	FDOT/Counties/ Municipalities

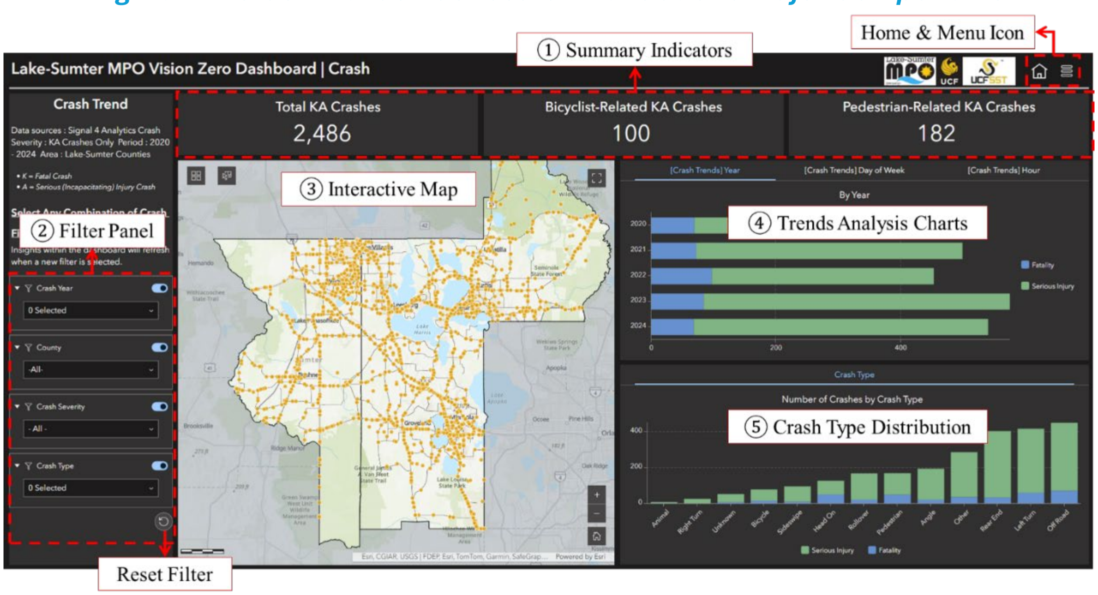
CHAPTER 7 PROGRESS MONITORING AND TRANSPARENCY

Annual monitoring requires on-going evaluation of the plan's actions to achieve the region's goal of achieving zero killed and serious injury crashes by the year 2050. The Lake-Sumter MPO Technical Advisory Committee and Governing Board will review and evaluate the program and outcomes on an annual basis. Two tools are available to measure progress – the Lake-Sumter Vision Zero Safety Action Plan Annual Report which will be available annually and the Vision Zero Dashboard (Figure 7-1). The document sand dashboard is publicly accessible at www.lakesumtermpo.com.

The Lake-Sumter Vision Zero Action Plan Annual Report will provide an annual status of the crash metrics from the previous year. This report will focus on fatal and serious injury crashes specifically and report on an array of information regarding those crashes.

The Lake-Sumter MPO Vision Zero Dashboard integrates regional crash trend analysis and High-Injury Network (HIN) screening into a unified, interactive decision-support platform. The Crash Trends component provides a system-level overview of fatal and serious injury crashes across time, geography, and crash type, enabling users to monitor patterns and assess overall safety conditions within the region. The High-Injury Network Dashboard identifies and ranks corridors, segments, and intersections with elevated concentrations of severe crashes. The dashboard provides detailed crash diagnostics and countermeasure summaries, supporting targeted safety improvements and strategic investment for the Top 30 ranked High-Injury Corridors. See **Appendix G** for complete Vision Zero Dashboard users guide.

Figure 7-1: Crash Trends Dashboard Interface and Major Components



These components allow users to move seamlessly from regional safety monitoring to location-specific diagnostic review, facilitating data-informed planning and advancing Vision Zero objectives for the Lake-Sumter MPO region.

Lake-Sumter MPO Annual Safety Report Template

Lake-Sumter Vision Zero Action Plan Adopted 2026

Report Year:

Crash Statistics: January XXXX through December XXXX

The Lake-Sumter MPO Annual Safety Report provides an annual performance update which progress towards achieving zero killed and serious injury (KSI) crashes in the Lake-Sumter MPO region is measured. This report utilizes data from Signal Four Analytics for all crashes in the region, excluding Interstate 75.

Year XXXX Crashes

Fatal/Killed Crashes	Serious Injury Crashes	Total KSI Crashes

KSI Crash Trend: Last 5 years

Year	Fatal/Killed Crashes	Serious Injury Crashes
Year 0		
Year -1		
Year -2		
Year -3		
Year -4		
Year -5		

Year XXXX vs. Previous Year (XXXX) KSI Crashes by Mode:

MODE	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Mode
Vehicle:			
Motorcycle:			
Bicycle:			
Pedestrian:			

Year XXXX KSI Crashes by Type:

CRASH TYPE	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Crash Type
Left-Turn:			
Angle:			
Rear-End:			
Off-Road:			
Sideswipe:			
Right-Turn:			
Bicycle:			
Pedestrian:			
Other:			

Lake-Sumter Vision Zero Action Plan Adopted 2026 (Continued)

Year XXXX KSI Crashes vs. Previous Year by Lighting Conditions: vs. Previous Year

	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Lighting Conditions
Daylight:			
Dark-Lighted			
Dark-Not Lighted			
Dawn			
Dusk			

Year XXXX KSI Crashes by Road Context vs. Previous Year

	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Road Context
Rural			
Urban			

Year XXXX KSI Crashes by Road Type vs. Previous Year

	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Road Type
Segments (Between Intersections)			
Intersections			

Year XXX KSI Crashes by Contributing Factors vs. Previous Year

CONTRIBUTING FACTOR	Current Year, XXXX	Last Year, XXXX	KSI Crash Trend by Contributing Factor
Hit & Run			
Red-Light Running			
Alcohol/Drugs			
Speeding			
Aggressive Driving			
Distracted Driving			

Projects programmed in Year XXXX from Vision Zero Action Planned.

Project Name	County (Lake/Sumter)	Phase & Year (Example: Design, FY29)	Safety Countermeasures included in Scope

Summary: (summarize trends and outcome from year's report above)

Submitted to USDOT: (Date)

APPENDICES

APPENDIX A

In-Depth Crash Trends and Safety Analysis

APPENDIX A: In-Depth Crash Trends and Safety Analysis

AI. 10 Years Trends

AI.1. Introduction

Lake and Sumter Counties, located in Central Florida, are known for their diverse demographics and rapidly growing populations. Lake County, established in 1887, spans approximately 1,156 square miles and boasts a population of over 367,000 residents as of 2020. The county is characterized by its picturesque lakes and rolling hills, which contribute to its name and natural beauty. The largest city in Lake County is Clermont, renowned for its outdoor recreational opportunities and rapidly expanding suburban areas. Sumter County, though smaller in size with an area of around 580 square miles, has experienced significant population growth, particularly due to the Villages, a large and fast-growing retirement community. As of 2020, Sumter County's population exceeds 130,000, with a significant proportion of residents being retirees. The county's demographics reflect this, with a higher median age compared to the state average. The region is also known for its agricultural heritage, scenic landscapes, and a mix of rural and suburban living environments.

The Lake-Sumter Metropolitan Planning Organization (MPO) focuses on creating comprehensive, multi-modal transportation systems that enhance connectivity, safety, and mobility for residents and visitors. The organization works closely with local governments, state and federal agencies, and the community to identify transportation priorities, allocate funding, and implement projects that support economic growth and improve the quality of life. Through strategic planning and community engagement, the Lake-Sumter MPO aims to develop transportation solutions that meet the current and future needs of the region.

In February 2018, the Lake-Sumter MPO (LSMPO) Governing Board adopted targets of zero traffic-related fatalities and serious injuries and has annually renewed this commitment in subsequent years. This concept, known as Vision Zero, promotes a culture of safety grounded in several key principles: traffic-related fatalities and serious injuries are preventable and unacceptable, human life takes priority over mobility, human error is inevitable, therefore the transportation system should allow for it to happen without death or serious injury. This Safety Action Plan will provide a system-level approach to safety using the Safe System Approach to create a holistic strategy focused on eliminating fatal and serious injury crashes to include the five key elements: Safer Road Users, Safer Vehicles, Safer Roads, Safer Speeds, and Post Crash Care.

AI.2. Data processing

AI.2.1. Data collection

In this plan, we analyzed crashes that occurred in street segments, signalized intersections, and unsignalized intersections in Lake and Sumter Counties between January 2015 and December 2024. A total of 107,193 crashes were collected for the analysis from the Signal 4 Analytics platform had occurred in roadways excluding limited access highways (I-75, FL-91, SR-91).

Additional analyses were conducted for crash severity levels. The crashes were divided into five severity levels according to the KABCO injury classification scale and definitions from the Federal Highway Administration (FHWA) (FHWA, 2022b). In this system, “K” is designated as the fatal injury or any injury that results in death within a 30-day period after the crash occurrence. “A” is designated as the incapacitating injury, which is defined as disabling injury, such as broken bone, severed limb, etc. This injury type usually requires transporting and hospitalization to medical facility. “B” denotes the non-incapacitating evident injury, which is defined by non-disabling injury, such as laceration, scrape, bruise, etc. “C” denotes possible injury. And “O” denotes no injury. This crash type is usually referred to as Property Damage Only (PDO) crash. **Table A-1** shows how the labels were used to obtain the severity scale.

Table A-1 Definition of Crash Severity in S4A.

KABCO Injury Classification Scale	**Label in S4A**
K (fatal injury)	Fatalities 30 Days
A (incapacitating injury)	Incapacitating Injuries
B (non-incapacitating evident injury)	Non Incapacitating Injuries
C (possible injury)	Possible Injuries
O (no injury)	None of above

During the analysis period, a total of 4,539 crashes resulting in fatality (K) or incapacitating injury (A) occurred, as shown in **Figure A-1**. KA crashes are the sum of the fatal and incapacitating injury crashes.

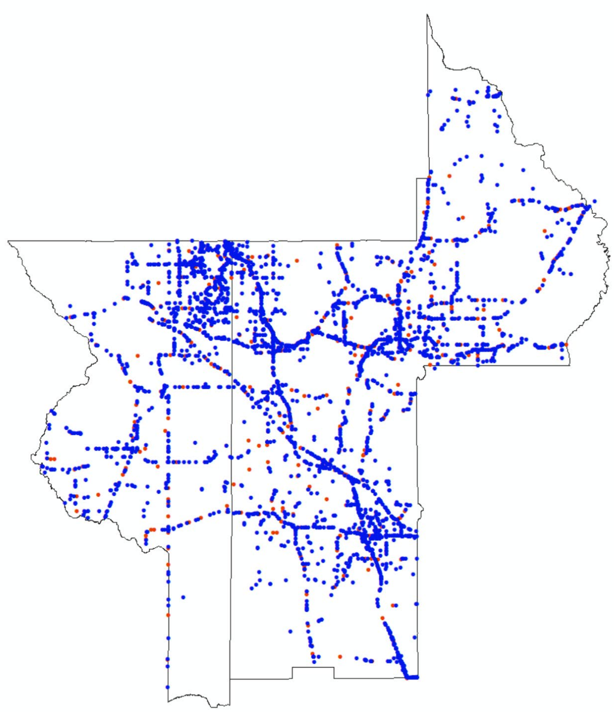


Figure A-1. Crashes in Lake-Sumter counties between 2015 and 2024 (Red points for fatalities (K), blue points for incapacitating injuries (A)).

AI.2.2. Data description

Among the 107,193 crashes, 4,539 crashes with fatalities (K) and incapacitating injuries (A) occurred in the last ten years (2015-2024). **Table A-2** shows the yearly number of KA crashes and the ratio of KA to all crashes, which accounted for 4.2% of all crashes.

Table A-2. Crash data in Lake-Sumter Counties, 2015-2024.

Year	Total severe crashes (KA)	All crashes (KABCO)	Ratio of KA/all crashes
2015	338	8707	3.9%
2016	415	9753	4.3%
2017	502	10421	4.8%
2018	458	10788	4.2%
2019	454	11039	4.1%
2020	404	9534	4.2%
2021	487	11265	4.3%
2022	428	11647	3.7%
2023	533	12214	4.4%
2024	520	11825	4.4%
Total	***4539***	***107193***	***4.2%***

Figure A-2 presents the number of KA crashes (fatal and incapacitating injuries) for the ten years (2015 to 2024), along with the ratio of KA crashes from all crashes. Over the past decade, the number of KA crashes has shown a fluctuating upward trend, peaking in 2023. While the absolute number varied considerably, the percentage of KA crashes relative to all crashes remained relatively stable, mostly ranging between 4.1% and 4.8%. A notable increase in 2023 may warrant further investigation into contributing factors. Despite a slight decrease in 2024, both the count and proportion of KA crashes remain elevated compared to earlier years.

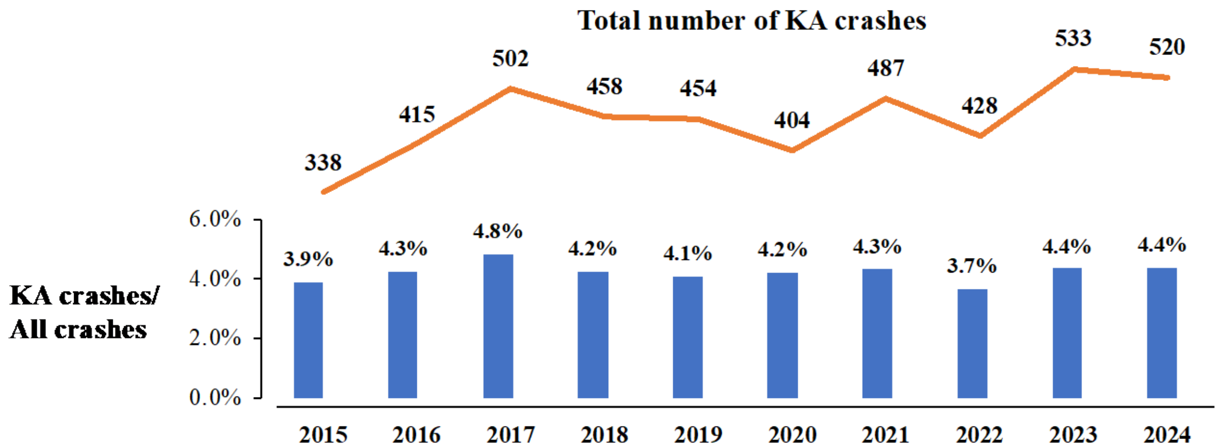


Figure A-2. The number (line graph) and ratio (histogram) of KA crashes between 2015 and 2024.

AI.3. Crash type

Figure A-3 presents the percentage of different crash types in total KA crashes. Seven typical crash types including off-road/roll over (28.1%), left-turn/angle (27.8%), rear-end (16.3%), and pedestrian/bicycle (10.6%) crashes, accounted for about 82.8% of the total KA crashes between 2015 and 2024. Off-road crashes are the dominating the KA crash type in Lake and Sumter Counties, making up 21.0% of the total KA crashes. Moreover, rear-end, left-turn, and angle crashes account for 16.3%, 15.8%, and 12.0% of KA crashes, respectively.

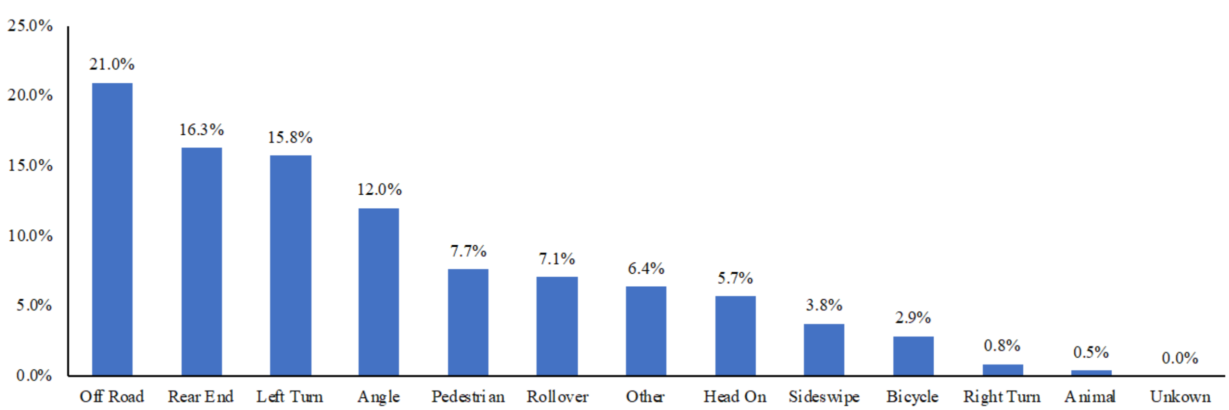


Figure A-3. Percentage of different crash types of the total KA crashes between 2015 and 2024.

AI.4. Crash time

AI.4.1. Time of day

Figure A-4 illustrates the percentage by hour of day in total KA crashes. The highest peak hours for KA crashes are 15:00 to 16:00 at 6.5% and 16:00 to 17:00 at 6.4%. Both could be considered in the afternoon peak period.

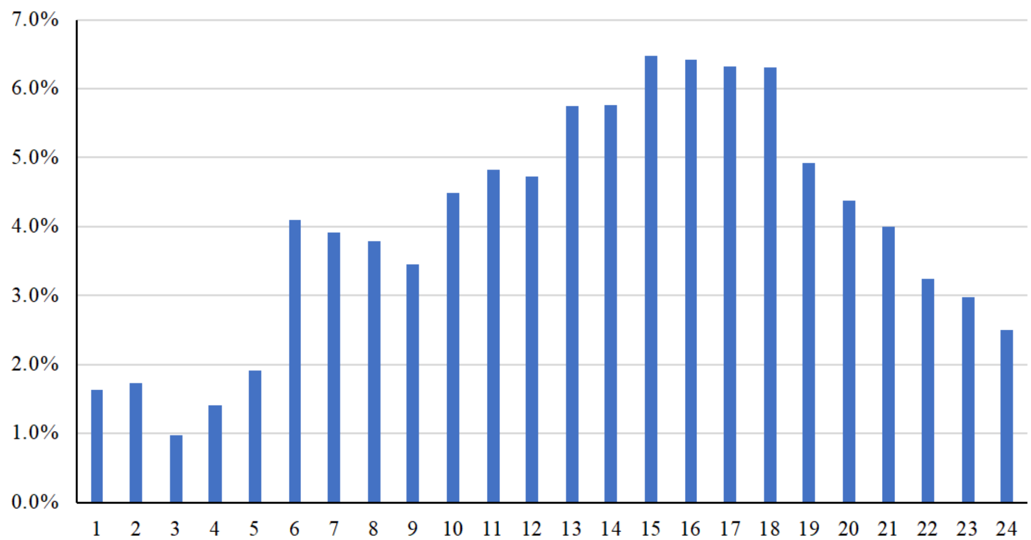
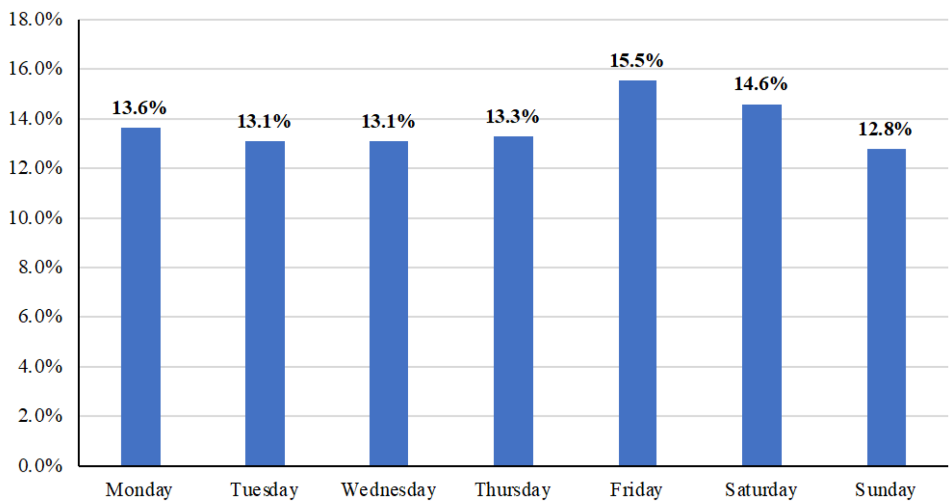


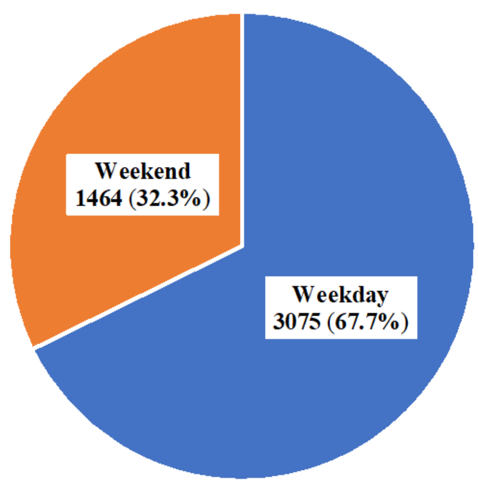
Figure A-4. KA crashes between 2015 and 2024 by the hour of the day.

AI.4.2. Day of the week

Taking into consideration the crash counts between 2015 and 2024, the average number of crashes per day of the week and month can be calculated. The weekday with the highest crashes occurred on Friday at 15.5% of the KA crashes, as shown in **Figure A-5**. The weekend period was Friday at 18:00 to Sunday at 23:59, 32.3% of KA crashes were found to occur during the weekend period. Moreover, the majority of the KA crashes during the weekdays from Monday to Friday at 67.7% of total crashes.



a) Day of week



b) Weekday and weekend (including Friday evenings)

Figure A-5. KA crashes between 2015 and 2024 by day of the week.

AI.4.3. Month of the year

Regarding months, December tends to have the highest number of KA crashes (9.3%). Moreover, March, April, and October each had about 9% of KA crashes, as shown in **Figure A-6**.

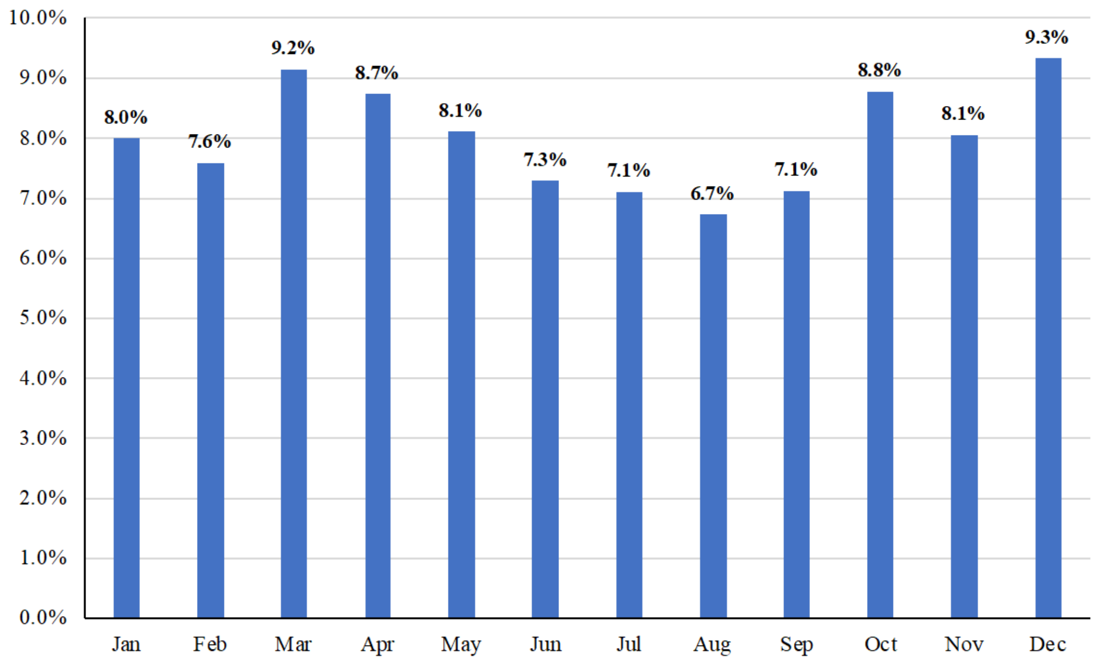
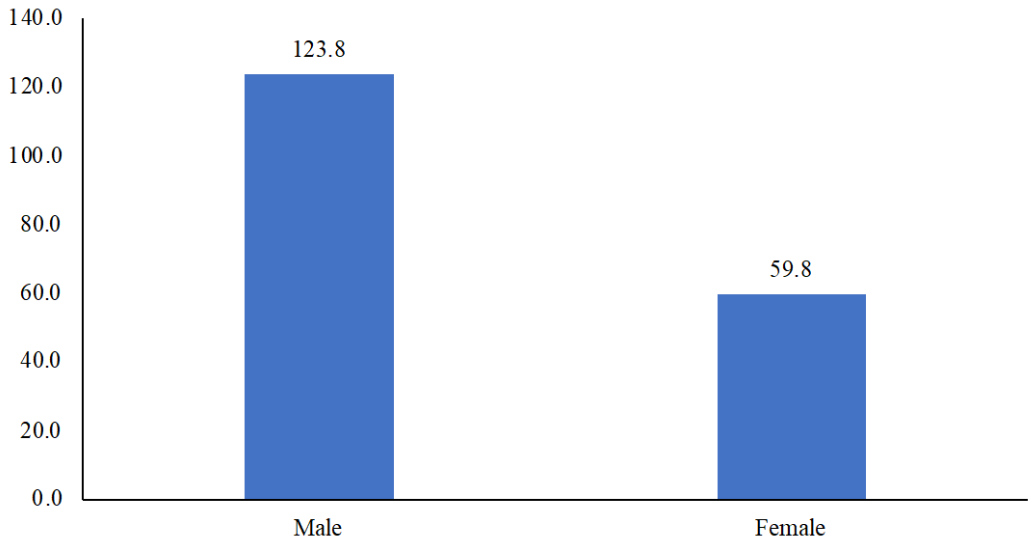


Figure A-6. KA crashes between 2015 and 2024 by month of the year.

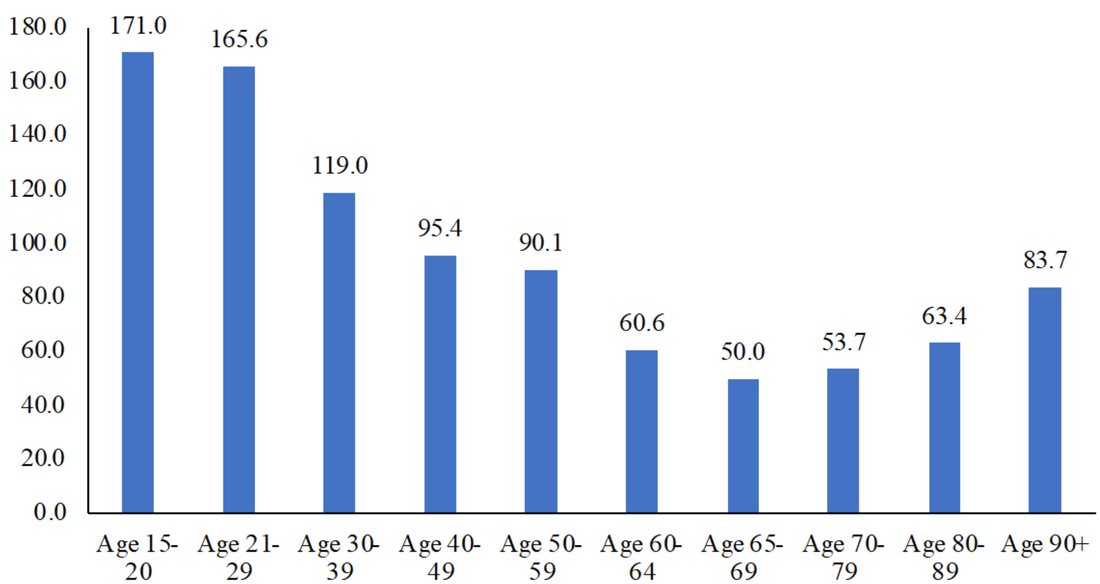
AI.5. Drivers' Characteristics

According to the Annual Licensed Driver Report by Florida Department of Highway Safety and Motor Vehicles (FLHSMV, 2025), the numbers of licensed drivers by age groups have been extracted to calculate the KA crash frequency per 10 thousand licensed drivers by gender and different age distribution, as shown in **Figure A-7**.

As shown in the figure, the crash involvement rate for male drivers (123.8) was almost double that of female drivers (59.8), indicating a substantially higher risk exposure or risk-taking behavior among males. Moreover, the crash involvement rates across age groups exhibit a distinct U-shaped distribution. The highest rates are observed among the youngest drivers—specifically those aged 15–20 (171.0) and 21–29 (165.6)—indicating a heightened crash risk likely attributable to driving inexperience, increased risk-taking behavior, or overconfidence. Following this peak, crash rates decline steadily with increasing age, reaching a low of 50.0 among drivers aged 65–69. This reduction may reflect more cautious driving habits, accumulated driving experience, or a decrease in driving exposure among middle-aged individuals. However, a notable resurgence in crash rates emerges among older adults. Crash involvement begins to rise again in the 70–79 age group (53.7), increases further in the 80–89 group (63.4), and peaks at 83.7 among drivers aged 90 and older. This upward trend among older populations may be linked to age-related declines in reaction time, vision, and cognitive function, as well as medical conditions that affect driving capabilities. The observed pattern underscores the importance of age-specific safety interventions, including targeted driver assessment, re-evaluation programs, and infrastructure enhancements that support aging drivers.



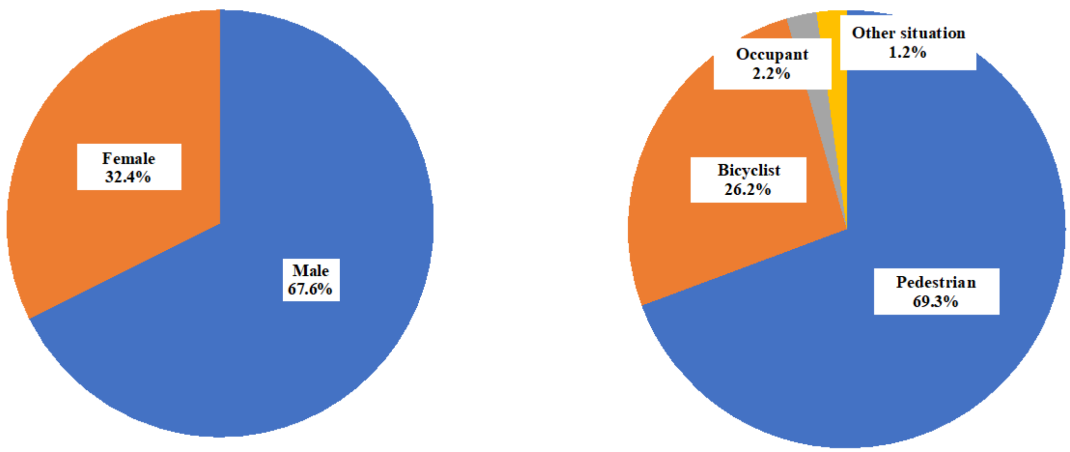
a) Gender distribution of drivers in KA Crashes 2015-2024



b) Age distribution of drivers

Figure A-7. KA crash frequency per 10 thousand licensed drivers between 2015 and 2024 by the driver's gender and age.

Regarding non-motorists (including pedestrians, bicyclists, occupants and skateboards, etc.), the gender distribution and road user type are shown in **Figure A-8**. Among the non-motorists, 69.3% and 26.2% of non-motorists are pedestrians and bicyclists, respectively. Similar to the drivers, 67.6% of the non-motorists involved in crashes are male.



a) Gender distribution of non-motorists b) Distribution of non-motorists

Figure A-8. Gender and age distribution of crash-related non-motorists for last ten years (2015-2024).

AI.6. Vehicle types

For the vehicle types shown in **Figure A-9**, 37.4% of KA crashes involve passenger cars, followed by SUVs, pickups, and motorcycles that account for 20.7%, 15.5%, and 10.1%, respectively.

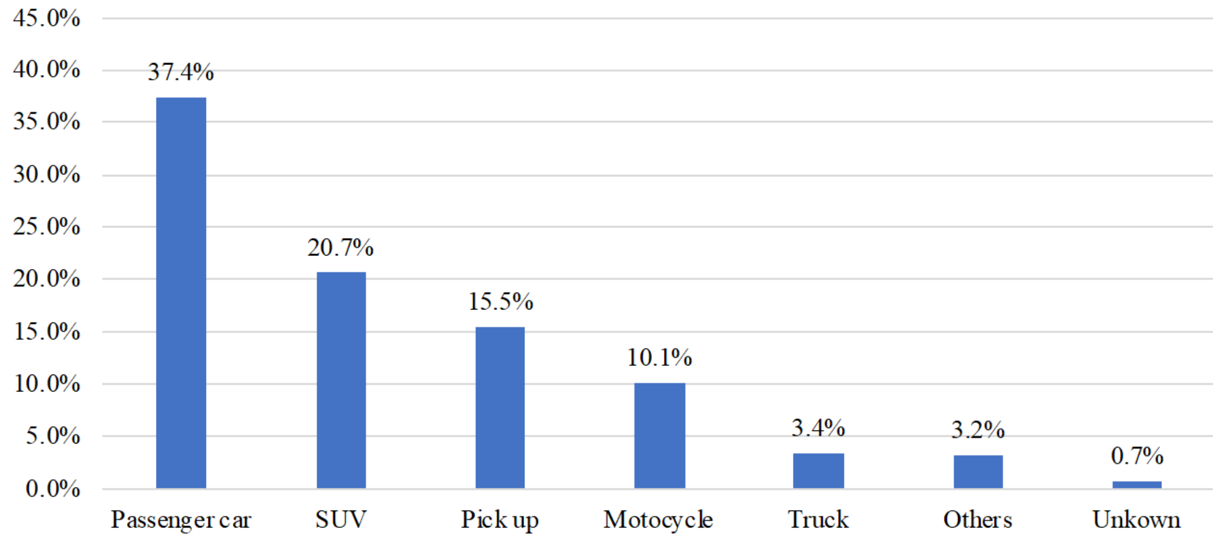


Figure A-9. KA crashes between 2015 and 2024 by vehicle type.

AI.7. Crash by road type

To explore the roadway types, the crash report includes the location of the crash to be at intersections or roadway segments. For the roadway types shown in **Figure A-10**, 62.0% of KA crashes happened at roadway segments and 38.0% at intersections.

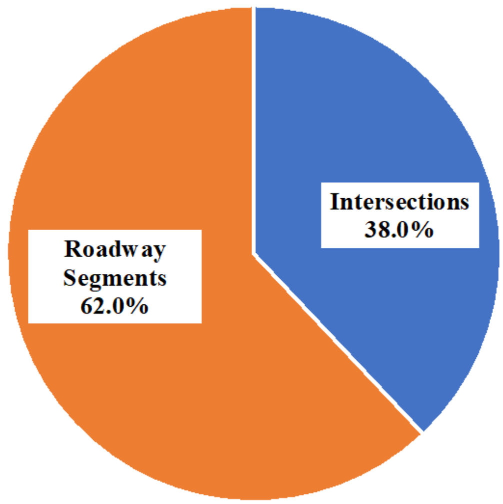


Figure A-10. KA crashes between 2015 and 2024 by intersections and roadway segments.

Intersections were classified into two categories: signalized and unsignalized. As shown in **Figure A-11**, 69.5% of KA crashes occurred at unsignalized intersections (including non-controlled, stop-controlled, yield-controlled), while the remaining 30.5% occurred at signalized intersections.

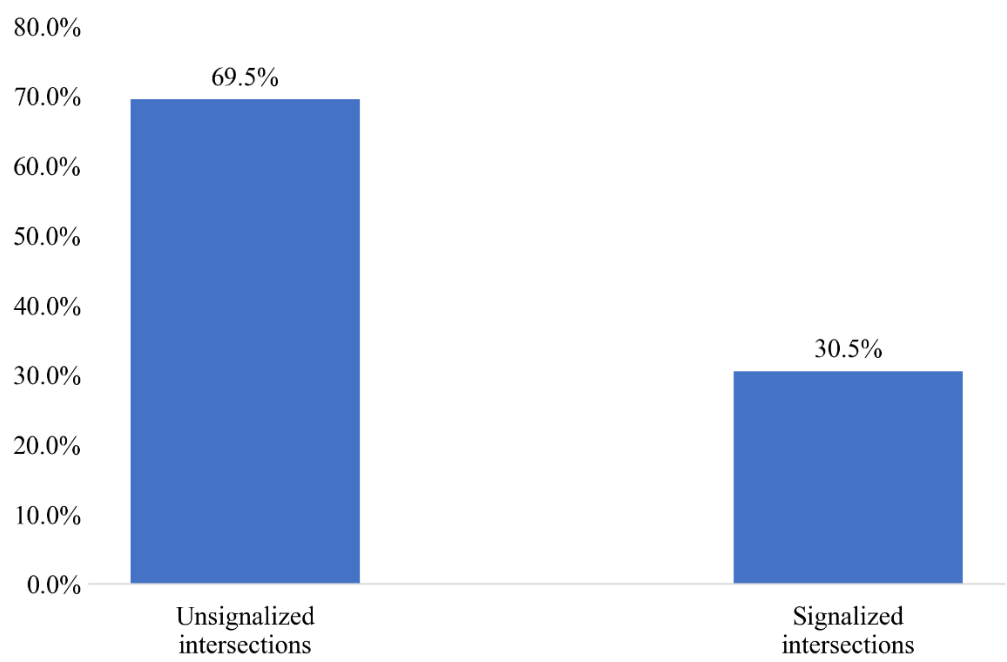


Figure A-11. KA crashes between 2015 and 2024 by intersection control.

Regarding different types of roadways that are shown in **Figure A-12**, 62.3% of crashes happened on two-way two-lane, undivided roads and 20.5% on two-way, divided roads with positive median barrier, respectively.

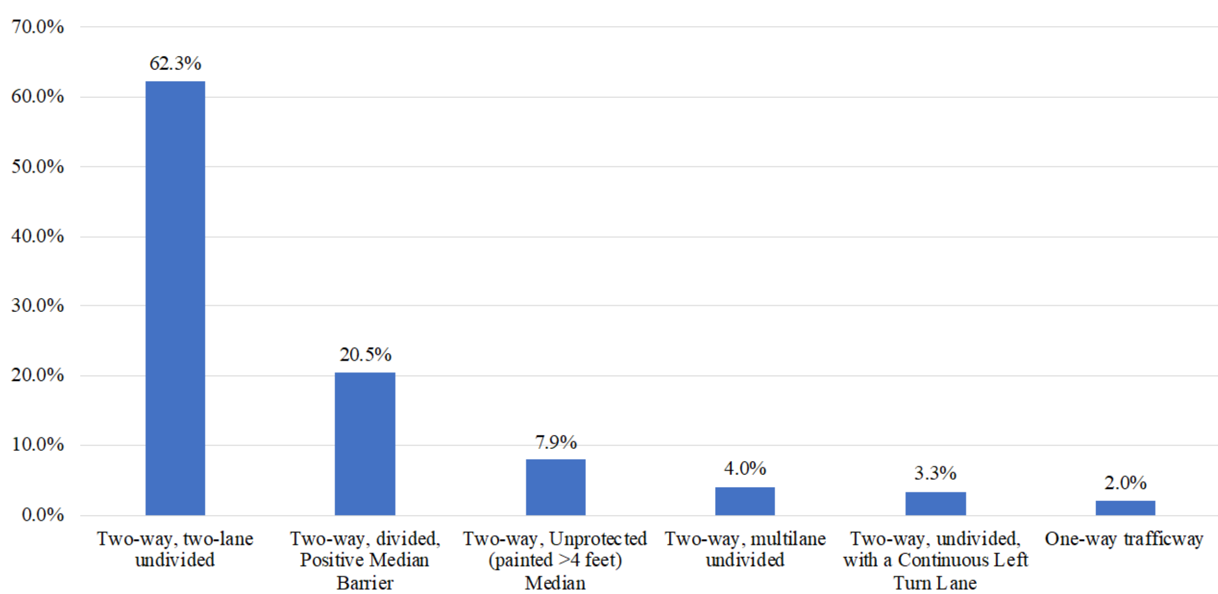


Figure A-12. KA crashes between 2015 and 2024 by the type of roadway.

Moreover, 54.4% of KA crashes occurred in rural areas, while 45.6% in urban areas, as illustrated in **Figure A-13**.

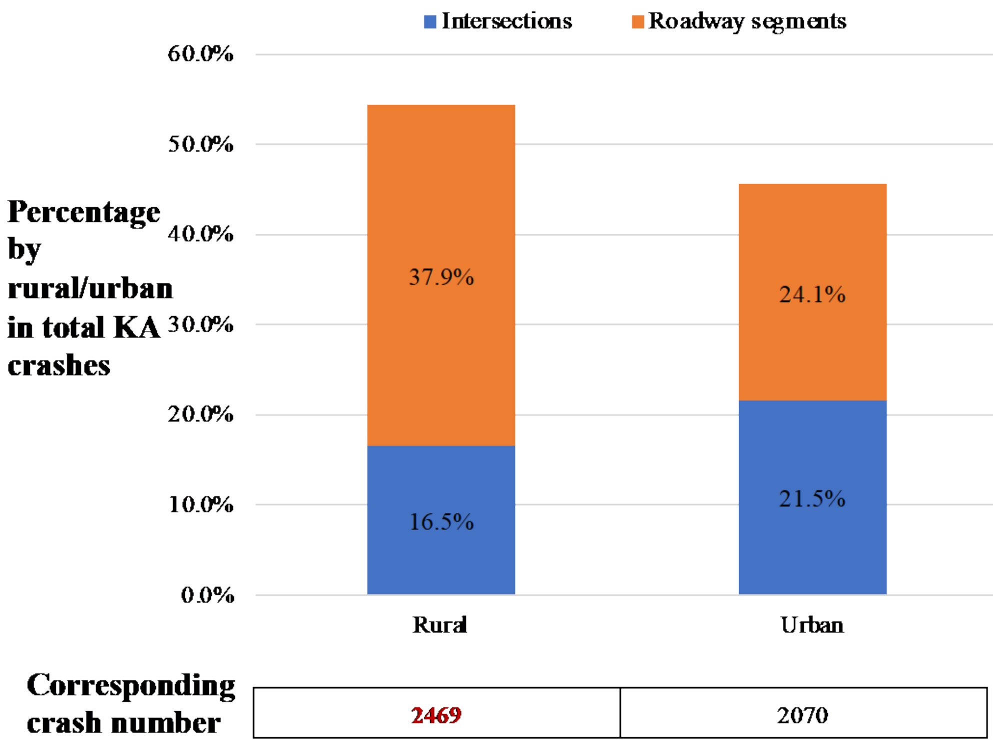


Figure A-13. KA crashes between 2015 and 2024 by rural and urban areas.

Figure A-14 shows crashes from 2015-2024 in Lake-Sumter counties by the type of road and circumstances. The distribution of KA crashes varies significantly by intersection and roadway type, with distinct patterns emerging in both crash type composition and severity.

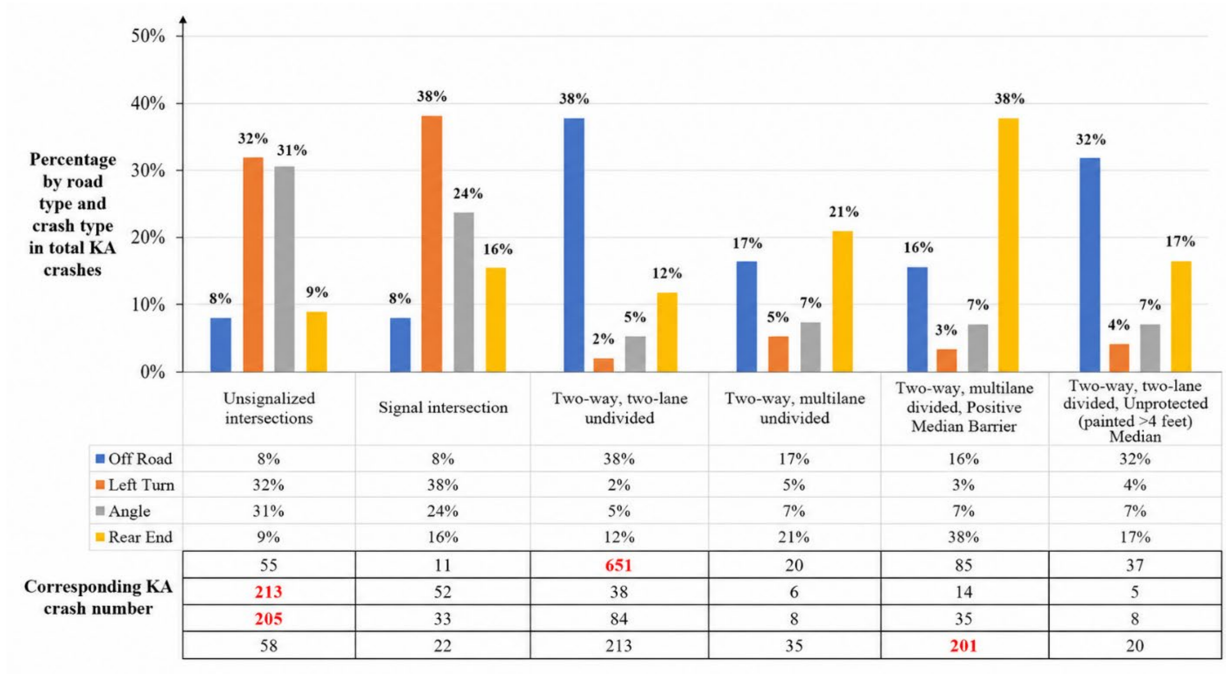


Figure A-14. KA crash types by intersection and roadway categories between 2015 and 2024.

At intersections, left-turn and angle crashes continued to be the most prevalent KA crash types. At unsignalized intersections, left-turn crashes accounted for 32% of all KA crashes, followed by angle crashes (31%) and rear-end crashes (9%). Together, left-turn and angle crashes represented 63% of all KA crashes at unsignalized intersections, highlighting the importance of turning and crossing conflicts at these locations. At signalized intersections, left-turn crashes accounted for the highest proportion (38%), followed by angle crashes (24%) and rear-end crashes (16%). These findings indicate that left-turn crashes remain the dominant severe crash type regardless of traffic control, while angle crashes are more common at unsignalized intersections than at signalized intersections.

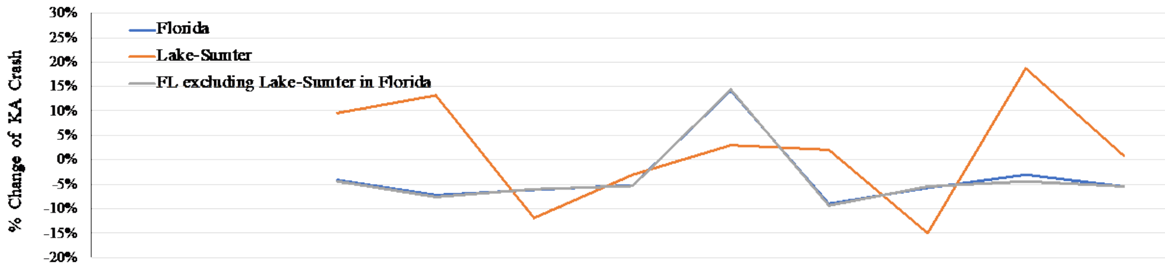
From the perspective of roadway -segments, off-road crashes dominate KA crash profiles, particularly on two-way, two-lane undivided roadways, where they account for 38% of all severe crashes (fatal and incapacitating crashes combined)—by far the highest proportion. This suggests that narrow lanes, lack of shoulders, or roadside hazards may lead to frequent roadway departures. Rear-end crashes follow at 22%, highlighting potential issues with speed variation or limited sight distance. A similarly high percentage of off-road crashes (38%) is seen on two-way, multilane roads with positive median barriers, pointing to persistent risks despite divided infrastructure—possibly due to high speeds or limited recovery space.

Furthermore, two-way, two-lane, divided roads with painted medians (under 4 feet) are linked to elevated proportions of left-turn (13%) and rear-end (17%) crashes. The absence of physical separation between opposing traffic appears insufficient to prevent conflict between turning vehicles and through traffic and may contribute to queue-related collisions and maneuvering difficulties.

Overall, these findings underscore the critical need for intersection signal upgrades, protected turn phasing, and geometric enhancements on both arterial and rural segments. Improvements such as channelized turn bays, rumble strips, clear zone recovery features, and median redesign could substantially reduce crash severity in the most problematic areas.

AI.8. Comparison between Lake-Sumter and Florida

Figure A-15 presents the trends of KA crashes in Lake and Sumter Counties and compares it with the whole State of Florida.



	Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Florida	% of KA crash	2.92%	2.80%	2.60%	2.44%	2.31%	2.64%	2.40%	2.26%	2.18%	2.06%
	% Change		-4.12%	-7.20%	-6.12%	-5.22%	14.15%	-9.03%	-5.75%	-3.75%	-5.24%
Lake-Sumter	% of KA crash	3.88%	4.26%	4.82%	4.25%	4.11%	4.24%	4.32%	3.67%	4.36%	4.40%
	% Change		9.61%	13.21%	-11.87%	-3.13%	3.03%	2.02%	-15.00%	**18.75%**	0.77%
FL excluding Lake-Sumter	% of KA crash	2.91%	2.78%	2.57%	2.41%	2.28%	2.61%	2.37%	2.24%	2.13%	2.02%
	% Change		-4.40%	-7.68%	-6.00%	-5.29%	14.35%	-9.31%	-5.50%	-4.43%	-5.43%

Note: % of KA crash = (Num of KA crashes) / (Num of Total crashes)

% Change = {(previous year's % of KA crash) – (current year's % of KA Crash)} / (previous year's % of KA crash

Figure A-15. KA crash trends in Lake-Sumter Counties and Florida for 2015-2024.

An analysis of KA crash proportions across Florida reveals a generally declining trend over the past decade. Statewide, the proportion of KA crashes dropped from 2.92% in 2015 to 2.06% in 2024, with year-to-year percentage changes generally falling between -9% and +14%, indicating moderate volatility within a generally declining trend.

In contrast, the Lake–Sumter region exhibits significantly greater volatility and persistently elevated KA crash proportions. Beginning at 3.88% in 2015, the region's KA crash rate remained well above the state average throughout the 10-year period, reaching a peak of 4.36% in 2023, which represented a 18.75% increase over the previous year—the largest annual spike observed in any region during the timeframe. Even in years where statewide or surrounding county crash proportions declined, Lake–Sumter frequently showed opposite or amplified changes, highlighting localized safety concerns.

Notably, across all the 10 years analyzed, the KA crash rate in Lake–Sumter exceeded both the statewide average and the average for Florida excluding Lake–Sumter. Despite some year-to-year fluctuations, this persistent overrepresentation suggests that the region may be influenced by factors such as infrastructure deficiencies, greater exposure to high-risk roadway environments, or limitations in local enforcement and mitigation strategies. The volatility and elevated levels of severe crashes suggest that Lake–Sumter may require targeted interventions distinct from statewide trends.

AI.9. Trends of KA crashes by 5 years classification

AI.9.1. Crash related people (gender and age)

In this section we look into the 5 years' increments of the last decade. According to the Annual Licensed Driver Report by Florida Department of Highway Safety and Motor Vehicles (FLHSMV, 2020 and 2025), the numbers of licensed drivers by age groups as of January 2020 and 2025 have been extracted to calculate the KA crash frequency per 10 thousand licensed drivers by gender and different age distribution for 2015-2019 and 2020-2024, respectively.

As illustrated in **Figure A-16**, male drivers consistently exhibited higher crash involvement rates than female drivers across both time periods.

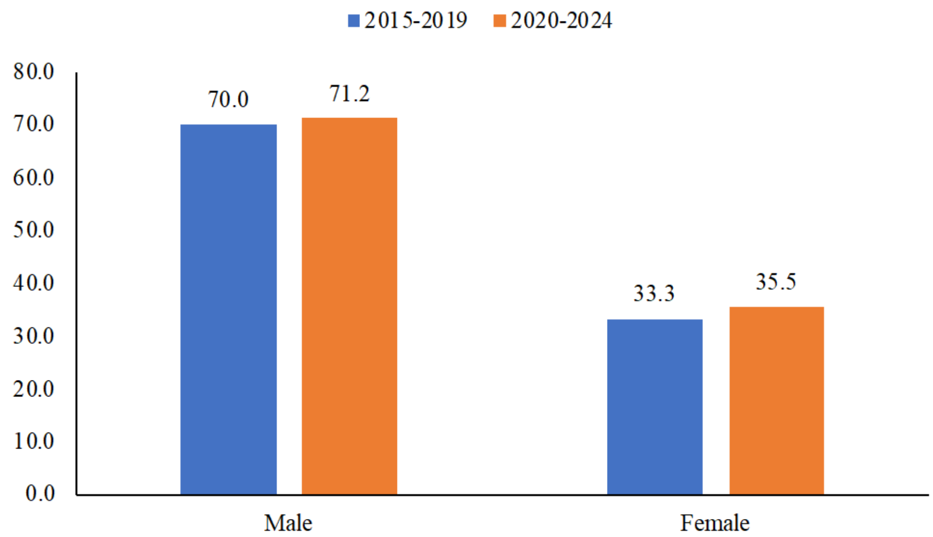


Figure A-16. Comparison of KA crash rate by drivers' gender (per 10 thousand licensed drivers) in KA crashes in Lake-Sumter Counties among 2015-2019 and 2020-2024.

From the period 2015–2019 to 2020–2024, crash rates increased for both male and female drivers. For male drivers, the crash rate rose modestly from 70.0 to 71.2, representing a 1.7% increase. In comparison, female drivers experienced a relatively larger increase, from 33.3 to 35.5, which reflects a 6.6% growth over the same period.

Although male drivers consistently exhibited higher absolute crash rates in both timeframes—more than double that of female drivers—the higher relative increase among female drivers suggests a gradual narrowing of the gender disparity in crash involvement. This shift may reflect changes in driving exposure, behavioral patterns, or demographic shifts in driver population, warranting further exploration into gender-specific risk factors and safety interventions. As illustrated in the **Figure A-17**, crash involvement rates (KA crash rate per 10 thousand licensed drivers) across age groups exhibit a pronounced U-shaped distribution during both periods (2015–2019 and 2020–2024).

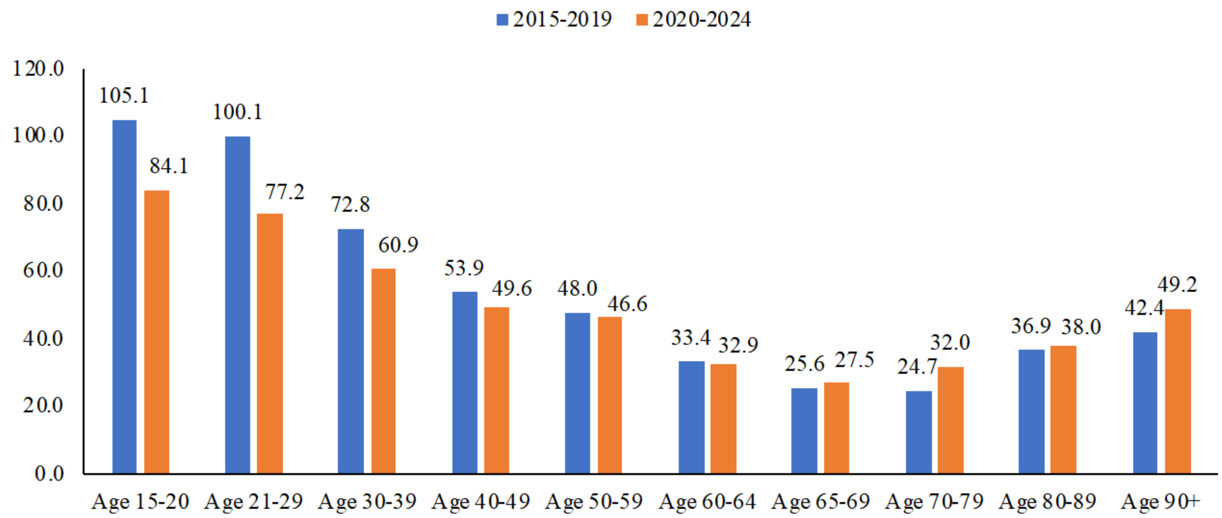


Figure A-17. Comparison of KA crash rate by drivers' age distribution (per 10 thousand licensed drivers) in KA crashes in Lake-Sumter Counties between 2015-2019 and 2020-2024.

The highest crash rates were consistently observed among the youngest drivers (under age 20) and the oldest drivers (aged 90+), confirming well-established findings regarding elevated crash risk at both ends of the age spectrum due to inexperience and age-related decline, respectively. When comparing the two time periods (2015–2019 vs. 2020–2024), overall crash rates declined slightly for younger and middle-aged groups (ages 15–39), while remaining relatively stable for drivers aged 40–69. Older age groups (70+) exhibited modest increases in crash rates.

However, Poisson rate ratio tests revealed that none of these differences were statistically significant, indicating that the observed shifts likely reflect general variation rather than meaningful structural changes.

From a policy standpoint, these trends highlight the value of age-specific safety interventions. For younger drivers, continued investment in early-stage driver education, graduated licensing, and parental supervision remains important. For older drivers, programs focused on functional fitness screening, refresher training, and post-crash emergency response may become increasingly relevant as the population continues to age and retain licensure longer.

AI.9.2. Vehicle type

According to the Vehicle and Vessel Reports and Statistics by Florida Department of Highway Safety and Motor Vehicles (FLHSMV, 2020 and 2025), the total numbers of registered vehicles as of January 2020 and 2025 have been extracted to calculate the KA crash frequency per 10 thousand registered vehicles by vehicle types for 2015-2019 and 2020-2024, respectively. As shown in **Figure A-18**, KA crash rates per 10,000 registered vehicles vary notably across vehicle types and between the two time periods.

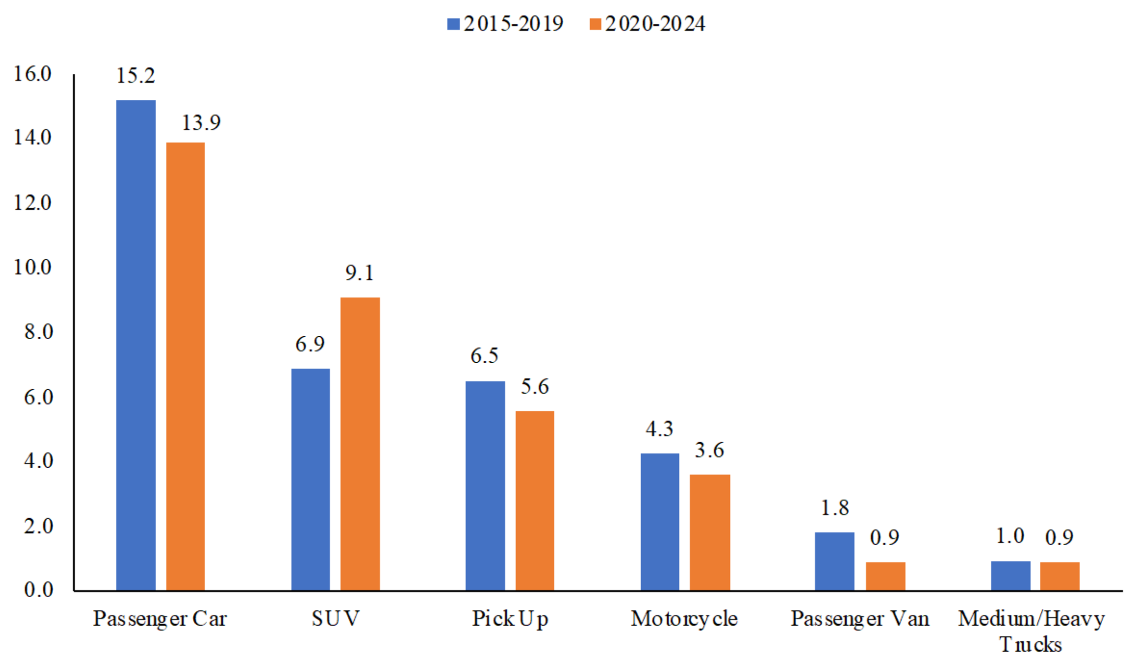


Figure A-18. Comparison of KA crash rate per 10 thousand registered vehicles by vehicle type in Lake-Sumter Counties among 2015-2019 and 2020-2024.

Passenger cars consistently exhibited the highest crash rates across both periods, although the rate declined modestly from 15.2 to 13.9, suggesting incremental improvements in safety or exposure management. In contrast, SUVs experienced a substantial increase in crash rate, rising from 6.9 to 9.1. This growth may be attributed to their increasing market penetration, greater use across a broad demographic spectrum, and potential risk factors such as maneuverability challenges or driver overreliance on perceived safety features. Pickup showed a reduction in crash rate from 6.5 to 5.6, while motorcycles declined from 4.3 to 3.6. These reductions may reflect enhanced rider education, enforcement measures, or the effectiveness of targeted safety campaigns. Passenger vans recorded the most significant proportional decline, dropping by nearly 50% from 1.8 to 0.9. This trend may be linked to a reduction in commercial or group transport activities, heightened fleet management practices, or a shift in operational deployment. Medium and heavy trucks also saw a slight decrease (from 1.0 to 0.9), maintaining their position among the lowest crash rates per registered vehicle type. These evolving trends underscore the importance of tailoring safety policies and interventions to specific vehicle types, particularly in light of shifting vehicle ownership patterns and usage behaviors.

Poisson rate ratio tests were conducted to assess whether the changes in KA crash rates per 10,000 registered vehicles were statistically significant between 2015–2019 and 2020–2024. Although crash rates varied across vehicle types between the two periods, none of the observed changes reached statistical significance.

AI.9.3. Roadway type

Based on the Annual Average Daily Traffic (AADT) Historical Dataset Metadata, published by the Florida Department of Transportation, detailed Annual Average Daily Traffic (AADT) of major and minor roadways of the intersections have been obtained for years 2019 and 2024. Then, the crash rates per million AADT are calculated for two periods, 2015–2019 to 2020–2024.

As shown in **Figure A-19**, unsignalized intersections exhibited higher KA crash rates than signalized intersections during both study periods. Between 2015–2019 and 2020–2024, the KA crash rate at unsignalized intersections increased from 90.45 to 97.14 crashes per million AADT.

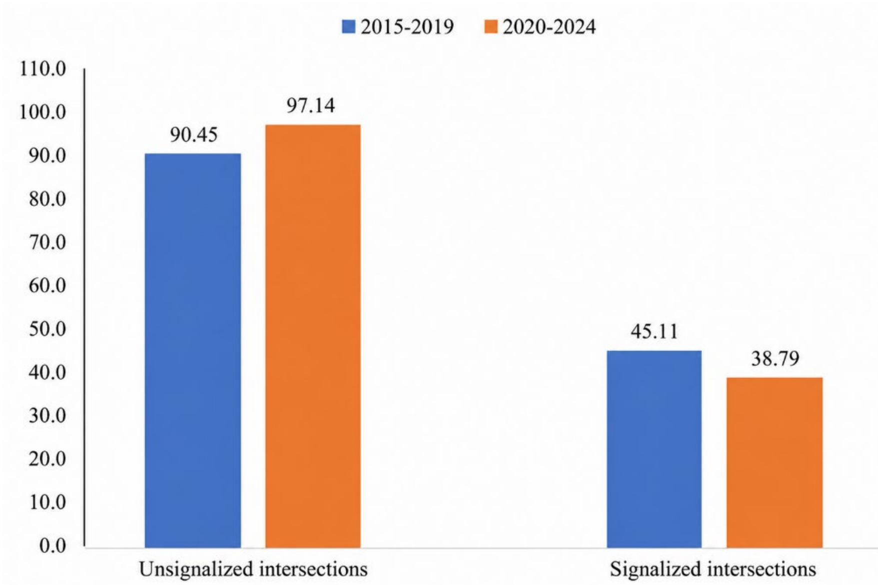


Figure A-19. Comparison of KA crash rate per million AADT by intersection types in Lake-Sumter Counties among 2015-2019 and 2020-2024.

In contrast, signalized intersections showed a notable reduction in crash rate, from 44.9 to 38.0, suggesting possible safety gains through signal timing improvements, enforcement, or infrastructure upgrades. However, the rate remains relatively high, indicating that signals alone do not eliminate crash risk, especially for turning movements or during red-light violations. These findings indicate that the relative distribution of KA crash rates between the two intersection control types remained generally consistent over time, with only modest temporal changes

Poisson rate ratio tests were performed to evaluate whether changes in KA crash rates between 2015–2019 and 2020–2024 were statistically significant. Although the KA crash rate increased slightly at unsignalized intersections and decreased at signalized intersections, neither change was statistically significant ($p > 0.05$), indicating that the observed differences between the two periods were not sufficient to conclude a meaningful temporal change.

The Public Road Mileage and Travel (DVMT) Report, 2018 and 2023 published by the Florida Department of Transportation provides detailed data on county-level daily and annual vehicle miles traveled (VMT) across various roadway classifications. Leveraging this dataset, KA crash rates were calculated per million vehicle miles traveled (MVMT) at year 2018 and 2023 for 2015-2019 and 2020-2024, respectively. This normalization allows for a more accurate assessment of crash risk by accounting for exposure, enabling valid temporal and spatial comparisons across different driving environments. **Figure A-20** compares the crash rates per million vehicle miles traveled (MVMT) across different roadway types between two five-year periods: 2015–2019 and 2020–2024.

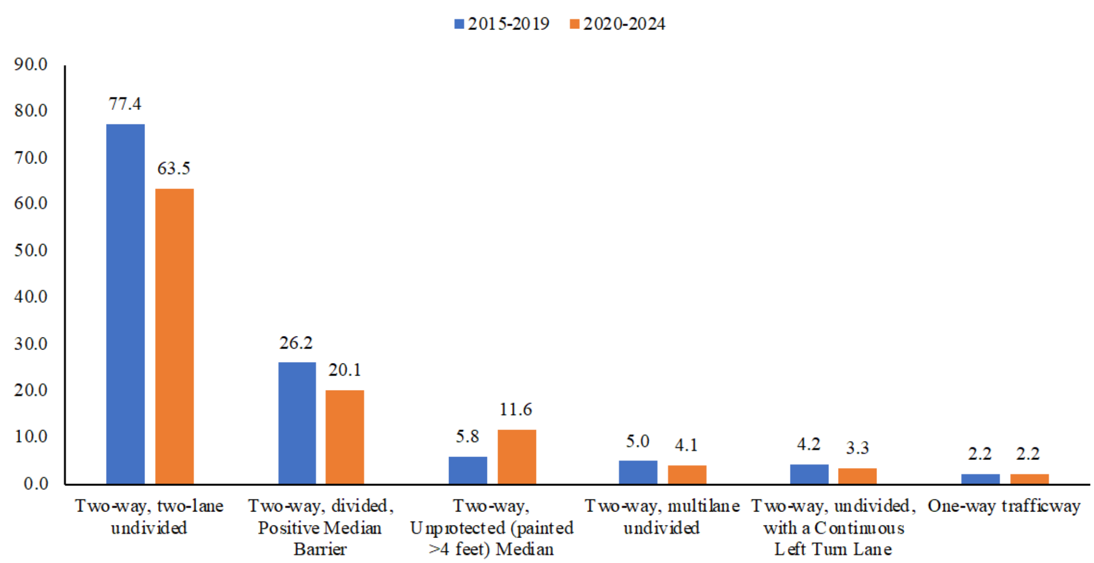


Figure A-20. Comparison of KA crash rate per million Vehicle Miles Traveled (MVMT) by roadway types in Lake-Sumter Counties between 2015-2019 and 2020-2024.

The results highlight that two-way, two-lane undivided roads consistently exhibit the highest crash rates per MVMT across both periods, although the rate decreased from 77.4 to 63.5, indicating a modest improvement. Despite this decline, the crash burden on these typically rural or lower-class suburban roadways remains disproportionately high, reaffirming their persistent safety concern. In contrast, several roadway types demonstrated a reduction in crash rates. Two-way divided roads with positive median barriers showed a notable decrease from 26.2 to 20.1, reinforcing the protective role of physical medians in mitigating severe collisions. However, a sharp increase was observed for two-way divided roads with painted (>4 feet) medians, where the crash rate rose from 5.8 to 11.6 per MVMT. This trend suggests that painted medians may offer inadequate separation and fail to prevent high-risk interactions, such as head-on or crossing-path crashes. Other roadway types remained relatively stable or declined slightly. Two-way multilane undivided roads decreased from 5.0 to 4.1, and roads with continuous two-way left-turn lanes fell from 4.2 to 3.3, suggesting incremental gains from design features that may help regulate turning movements or lane transitions. One-way trafficways maintained a consistent crash rate of 2.2 across both periods, reflecting stable performance under controlled directional flow.

These findings underscore the importance of roadway-specific safety strategies, particularly for undivided or partially divided facilities. Engineering countermeasures—such as installing physical medians, applying access management techniques, or deploying rumble strips—may be crucial to reducing crash risk and improving overall traffic safety in these settings.

Poisson rate ratio tests were performed to assess whether changes in crash rates per million vehicle miles by roadway types were statistically significant between 2015–2019 and 2020–2024. Overall, while no roadway configuration exhibited statistically significant changes in crash rates, the directional trends suggest a need for targeted safety countermeasures—particularly for undivided and partially divided roadways—such as geometric redesigns, physical median installation, or enhanced access control strategies.

AI.9.4. Lighting and weather conditions

As shown in **Figure A-21**, crash rates per million vehicle miles traveled (MVMT) under different lighting conditions varied notably between the two periods.

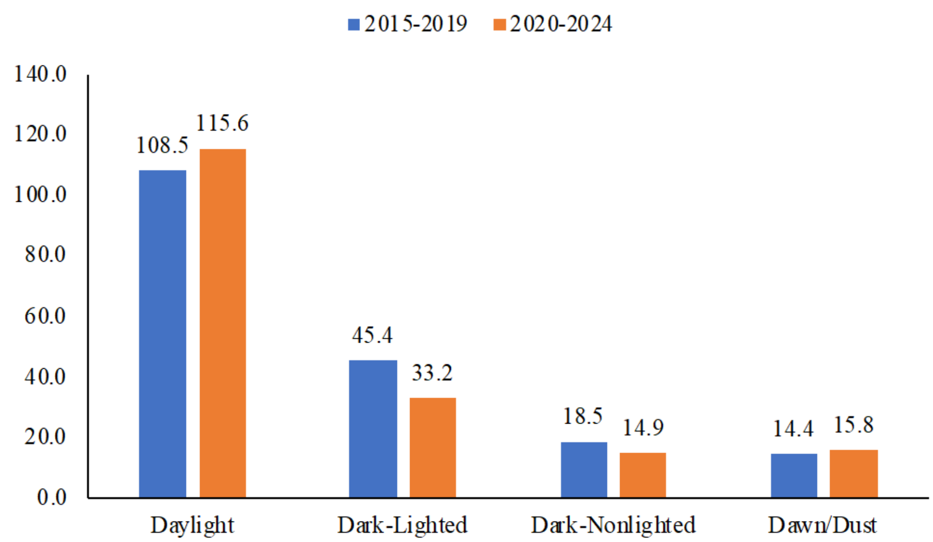


Figure A-21. Comparison in KA crash rate per million Vehicle Miles Traveled (MVMT) by lighting conditions in Lake-Sumter among 2015-2019 and 2020-2024.

Notably, the KA crash rate under daylight conditions increased from 108.5 to 115.6, indicating a modest but notable upward trend in crash severity or frequency during the most active traffic hours. This trend may be influenced by growing vehicle miles traveled, higher traffic densities, or increased instances of distracted driving, high speeds, underscoring the need for daytime safety countermeasures despite favorable visibility.

Conversely, crash rates during dark-lighted conditions declined from 45.4 to 33.2, suggesting a potential improvement in nighttime roadway safety where artificial lighting is present.

This decrease may be attributed to enhanced roadway illumination, improved signal visibility, or increased driver caution in lit nighttime environments. A similar decline was observed under dark-non-lighted conditions, with rates dropping from 18.5 to 14.9. This downward trend may result from rural road safety improvements, such as upgraded signage, delineation enhancements, and traffic calming efforts in unlit zones. In contrast, dawn and dusk conditions saw a slight increase in crash rates from 14.4 to 15.8. The transitional lighting and potential for visual misjudgment during these periods may contribute to this rise, indicating a need for targeted visibility interventions and awareness campaigns.

Poisson rate ratio tests were performed to assess whether changes in crash rates per million vehicle miles traveled (MVMT) under different lighting conditions were statistically significant between 2015–2019 and 2020–2024. Despite observable shifts—such as a notable decline in crash rates under dark-nonlighted conditions and an increase during daylight hours—none of the differences were found to be statistically significant (all $p > 0.05$).

As shown in **Figure A-22**, KA crash rates per million vehicle miles traveled (MVMT) varied across weather conditions between the two periods. Crash rates under clear weather conditions increased from 136.9 to 143.2, indicating a continued concentration of severe crashes during optimal driving conditions. This trend may be attributed to higher traffic volumes, increased travel speeds, or driver overconfidence when weather conditions appear ideal. In contrast, crash rates during cloudy weather showed a noticeable decline, dropping from 37.1 to 26.2. Similarly, rainy conditions exhibited a modest reduction, with crash rates decreasing from 10.5 to 8.3. These downward trends may reflect more cautious driver behavior, lower exposure, or the increased effectiveness of weather-related warning systems and roadway friction treatments. Overall, while adverse weather conditions are traditionally associated with elevated crash risks, this analysis suggests that clear weather still accounts for the majority of severe crashes, likely due to greater exposure and behavioral complacency. These findings highlight the importance of maintaining safety vigilance even under favorable weather conditions and may support efforts to address risk compensation and speed management on clear days.

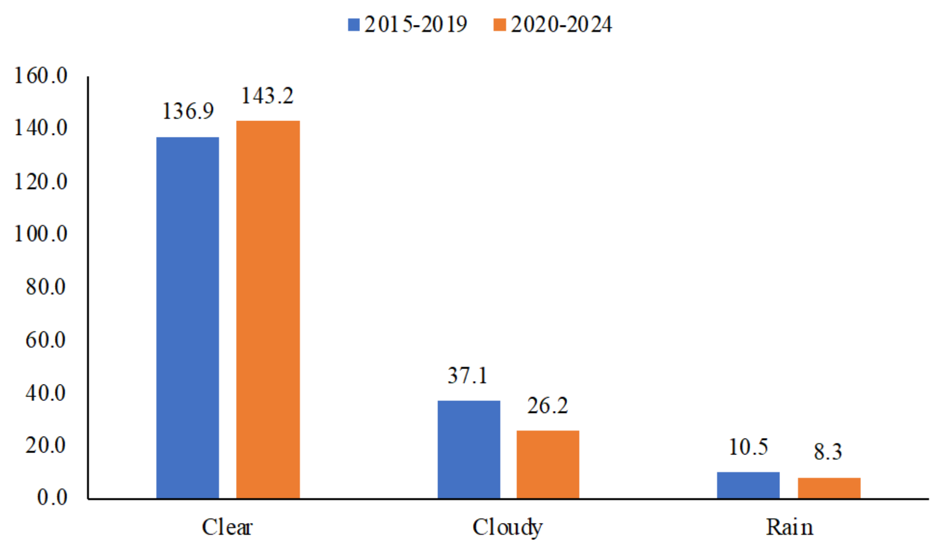


Figure A-22. Comparison of crash rate per million Vehicle Miles Traveled by weather condition in Lake-Sumter Counties among 2015-2019 and 2020-2024.

Poisson rate ratio tests revealed that the observed changes in crash rates under different weather conditions were not statistically significant (all $p > 0.05$). Although KA crash rates increased during clear weather and decreased under cloudy and rainy conditions, these variations did not reach the threshold for statistical significance. The results suggest that weather-related fluctuations in crash severity risk may be influenced by compensatory driving behaviors or stable exposure levels across time.

AI.9.5. Crash type

As illustrated in **Figure A-23**, KA crash rates per million vehicle miles traveled (MVMT) varied by crash types between the two periods.

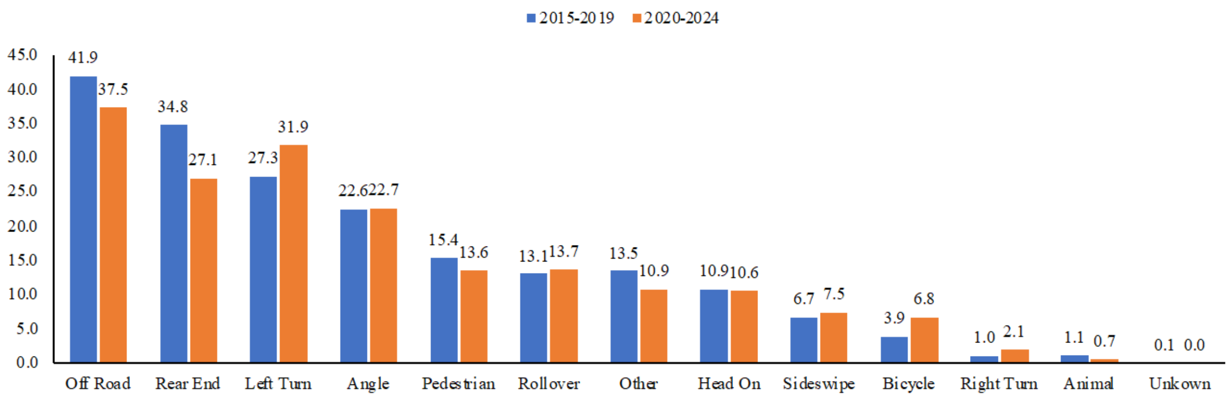


Figure A-23. Comparison of crash rate per million Vehicle Miles Traveled by crash types in Lake-Sumter Counties among 2015-2019 and 2020-2024.

The comparison of KA crash rates by collision type between 2015–2019 and 2020–2024 reveals generally consistent patterns across most major crash categories. Off-road crashes remained the most prevalent contributor to fatal and severe injury outcomes, despite a modest decline from 41.9 to 37.5, highlighting the continued importance of roadway departure mitigation. Rear-end crashes, while still significant, decreased from 34.8 to 27.1, and left-turn crashes remained high, with a slight increase from 27.1 to 31.9, underscoring persistent risks at intersections and high-conflict locations. Angle crashes held steady (22.6 to 22.7), while pedestrian-involved crashes showed a marginal decrease (15.4 to 13.6), suggesting some improvement in pedestrian safety. In contrast, several crash types saw increases. Bicycle-related crashes rose from 3.9 to 6.8, and sideswipe crashes increased from 6.7 to 7.5, reflecting growing interaction complexity on shared roadways and multilane facilities. Right-turn crashes also more than doubled (from 1.0 to 2.1), though their overall share remains small. Rollover, head-on, and animal-related crashes remained relatively stable, while “other” crashes showed a modest rise (10.9 to 13.5), indicating a potential shift in crash typologies or reporting categories. These evolving patterns suggest the need for targeted interventions: enhanced roadside safety features to reduce off-road crash severity, intersection redesign to manage left-turn and right-turn conflicts, and improved infrastructure and protections for vulnerable road users in multimodal environments.

Poisson rate ratio tests were applied to compare crash involvement rates across various collision types between 2015–2019 and 2020–2024. Despite minor fluctuations in rates—such as a slight decrease in off-road, rear-end, pedestrian and head on crashes, or a modest increase in left-turn incidents—none of the changes were found to be statistically significant (all $p > 0.30$). These results suggest that the distribution of KA crash severity across collision types has remained relatively stable over time, highlighting the persistent nature of key risk patterns.

AI.10. Conclusions

To summarize, **Table A-3** presents the main findings for the KA crashes that have occurred in Lake-Sumer Counties for 2015-2024.

Table A-3. Main findings regarding KA crashes in Lake and Sumter Counties for 2015-2024.

<table>
<tr><th>No</th><th colspan="2">Main findings</th></tr>
<tr><td>1)</td><td colspan="2">4539 KA crashes (fatal (K) and incapacitating injury (A)) crashes took place in Lake-Sumter Counties from 2015-2024.</td></tr>
<tr><td>2)</td><td colspan="2">Seven typical crash types including off-road/roll over (28.1%), left-turn/angle (27.8%), rear-end (16.3%), and pedestrian/bicycle (10.5%) crashes, accounted for about 84.9% of the total KA crashes between 2015 and 2024</td></tr>
<tr><td>3)</td><td colspan="2">The peak period of KA crashes is at 15:00-16:00 (6.5%) and 16:00-17:00 (6.4%); on Fridays (15.5%); in December (9.3%).</td></tr>
<tr><td>4)</td><td colspan="2">65.6% of drivers and 67.6% of non-motorists are male, 69.3% and 26.2% of non-motorists are pedestrians and bicyclists, respectively.</td></tr>
<tr><td>5)</td><td colspan="2">62.0% of KA crashes happened on roadways, 54.4% occurred in rural areas.</td></tr>
<tr><td>6)</td><td>Trends of KA crashes between 2015-2019 and 2020-2024</td><td>Between 2015–2019 and 2020–2024, several consistent patterns and notable shifts were observed in KA crash characteristics within the Lake-Sumter Counties region.

Older drivers (aged 65+) exhibited a marked increase in crash involvement.

Passenger cars consistently contributed the highest number of KA crashes, despite a slight downward trend.

Most KA crashes occurred at non-signalized non-controlled and stop sign-controlled intersections.

Daylight and clear weather conditions remained the predominant settings, with significant growth in crash rates per MVMT.

Off-road KA crashes continued to be the most common crash type across both periods, also experiencing a slight decrease growth in crash rates per MVMT.</td></tr>
</table>

It should be noted that severe crash rate (including fatality and incapacitating injury crashes) has a decreasing trend in Florida, while Lake-Sumter Counties has been increasing especially in 2023. Across all the 10 years analyzed, the KA crash rate in Lake–Sumter exceeded both the statewide average and the average for Florida excluding Lake–Sumter Counties. For the 2015–2019 and 2020–2024 time period, the Poisson rate ratio analysis revealed mostly no statistically significant variations across demographic, vehicle, roadway, environmental, or crash-type categories.

Moreover, off-road, left-turn, rear-end and angle crashes have also been found particularly concerning. The two-way, two-lane undivided roads exhibit the highest crash rates per MVMT among all the roadway types.

AII. In-Depth Crash Analysis

AII.1. Introduction

This chapter provides a detailed assessment of severe (KA) crashes in Lake and Sumter Counties over the five-year period (2020–2024), with a focus on the distribution and characteristics of different crash types. Since different factors can vary substantially by each crash type, analyzing severe crashes is essential to understanding where and why they occur, and to identify opportunities for targeted safety improvements. **Figure A-24** presents the overall distribution of KA crashes by crash type in Lake and Sumter Counties between 2020 and 2024. The most frequent crash types are left turn/angle, off road/rollover, rear end and pedestrian/bicycle crashes, which together account for 85% of all severe crashes.

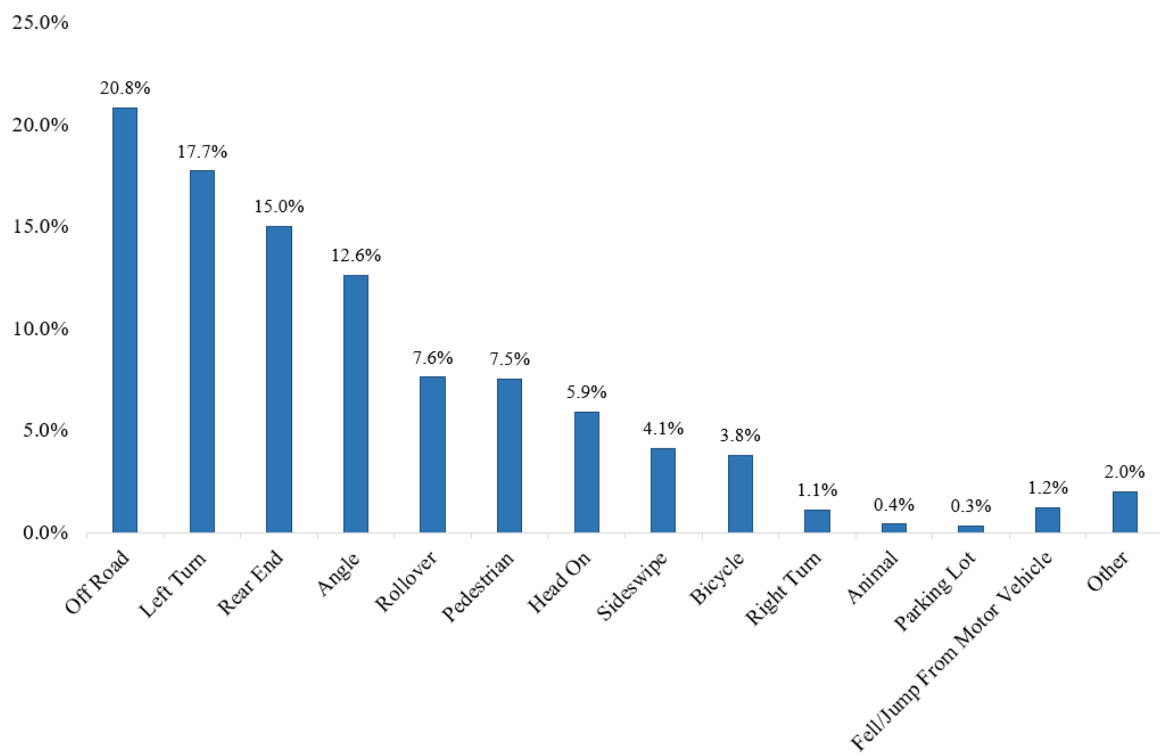


Figure A-24. Distribution of crash types of total KA crashes between 2020 and 2024

The subsequent sections provide an in-depth analysis of the major crash types, examining their characteristics, control conditions, crash patterns (by time of day, day of week, and month), driver demographics, and vehicle involvement. This structured approach highlights key differences across crash types and establishes a foundation for identifying tailored countermeasures.

AII.2. Crash Type Analysis

AII.2.1. Left Turn/Angle KA Crashes

In Lake and Sumter Counties, left turn/angle crashes were the leading contributor to severe crash outcomes. Over the past five years (2020–2024), a total of 717 left turn/angle KA crashes were recorded, accounting for 30.3% of all KA crashes and representing the most prevalent severe crash type. The following discussion highlights the main characteristics of these crashes.

AII.2.1.1. Crash Location

Analysis of left turn/angle KA crash locations in Lake and Sumter Counties reveals that the majority occurred at intersections. As illustrated in **Figure A-25**, 83.4% of left turn/angle KA crashes were concentrated at intersections, both signalized and un-signalized, while only 16.6% took place along roadway segments.

This distribution reveals that left turn/angle maneuvers took place mainly at intersections where vehicle conflict points are higher. The high share of left turn/angle crashes at intersection underscores the importance of intersection safety measures, such as improved signal phasing, dedicated left turn lanes, and enhanced visibility, to reduce the severity and frequency of these crashes.

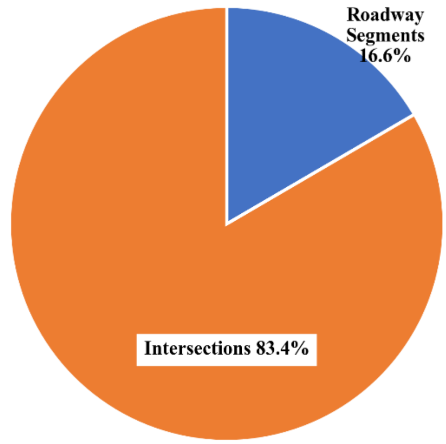


Figure A-15. Left turn/angle KA crashes between 2020 and 2024 by intersections and roadway segments

Furthermore, the analysis of signal control type indicates that unsignalized intersections (e.g., stop-controlled, yield-controlled, and non-controlled intersections) accounted for 71.7% of all intersection-related left-turn/angle KA crashes, followed by signalized intersections (27.2%), as shown in **Figure A-26.**

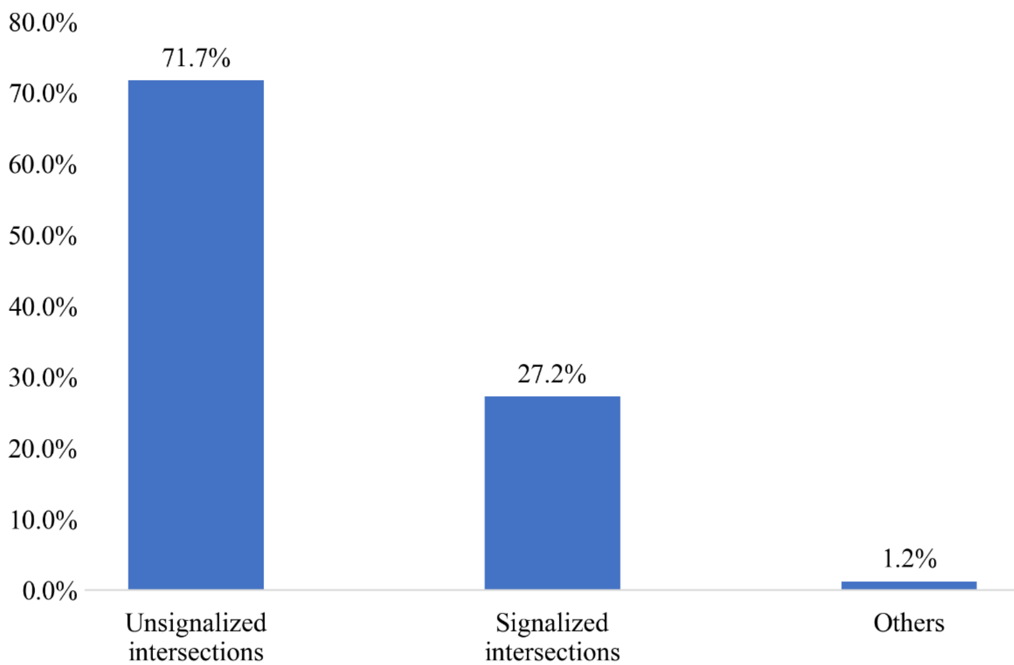


Figure A-26. Left turn/angle KA crashes between 2020 and 2024 by signal control types

The intersection geometry type in **Figure A-27** indicates that among intersection locations, four-way intersections (54.3%) and T-intersections (42.9%) together accounted for the overwhelming majority of left turn/angle KA crashes.

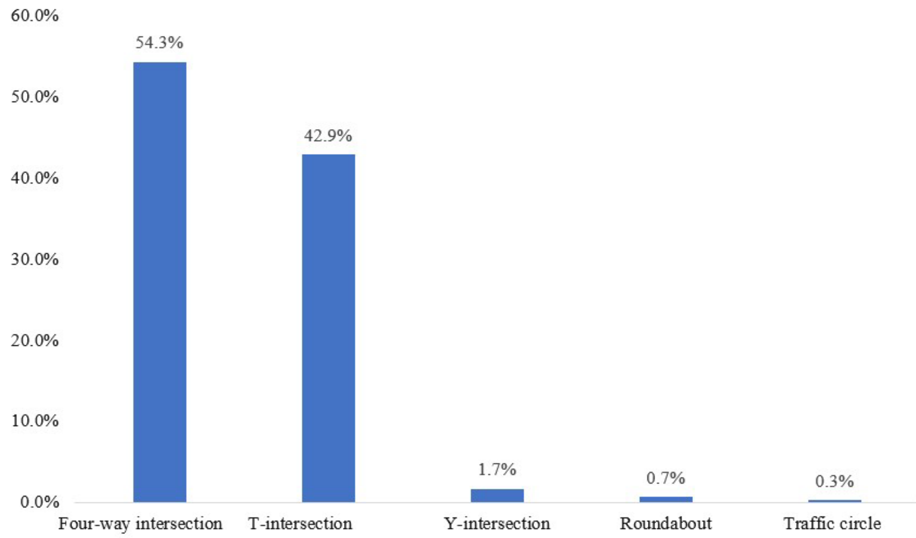


Figure A-27. Left turn/angle KA crashes between 2020 and 2024 by intersection types

As shown in **Figure A-28**, among the remaining 16.6% of left turn/angle KA crashes that occurred on roadway segments, 53.8% took place on two-way, two-lane undivided roads, followed by 25.6% on two-way divided roads with median barriers.

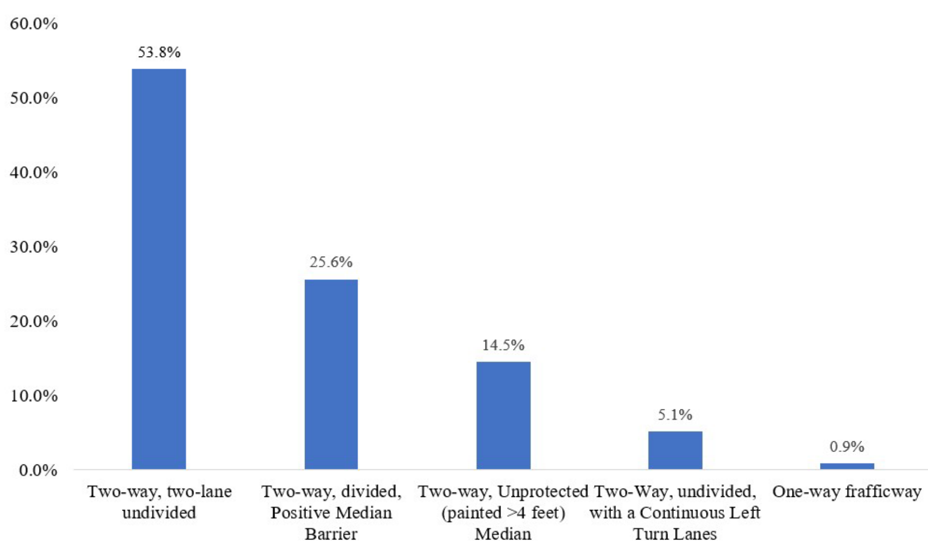


Figure A-28. Left turn/angle KA crashes between 2020 and 2024 by the type of roadway

Figure A-29 illustrates the distribution of left turn/angle KA crashes by rural and urban settings. A total of 410 crashes (57.2%) occurred in urban areas, while 307 crashes (42.8%) occurred in rural areas. Within the urban areas, 47.6% of overall KA crashes occurred at intersections and 9.6% along roadway segments. In rural areas, 36.1% were at intersection and 6.7% occurred on roadway segments. These findings indicate that, although left turn/angle KA crashes were more frequent in urban areas overall, intersection locations dominated in both rural and urban contexts. This emphasizes the importance of intersection focused countermeasures in both urban and rural roadway networks particularly managing left turn maneuvers.

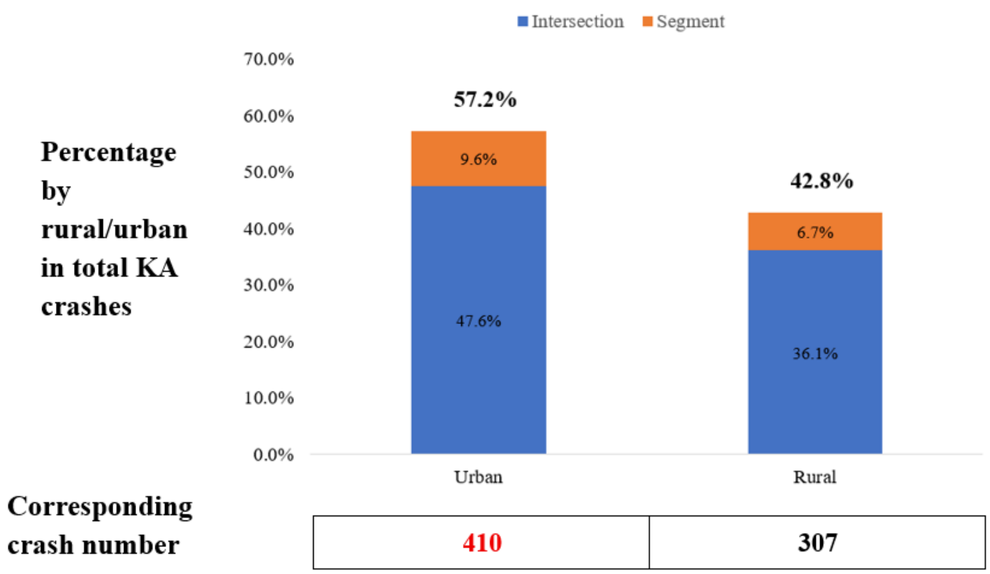


Figure A-29. Left turn/angle KA crashes between 2020 and 2024 by rural and urban areas

AII.2.1.2. Lighting Condition

Figure A-30 illustrates the distribution of left turn/angle KA crashes under various lighting conditions.

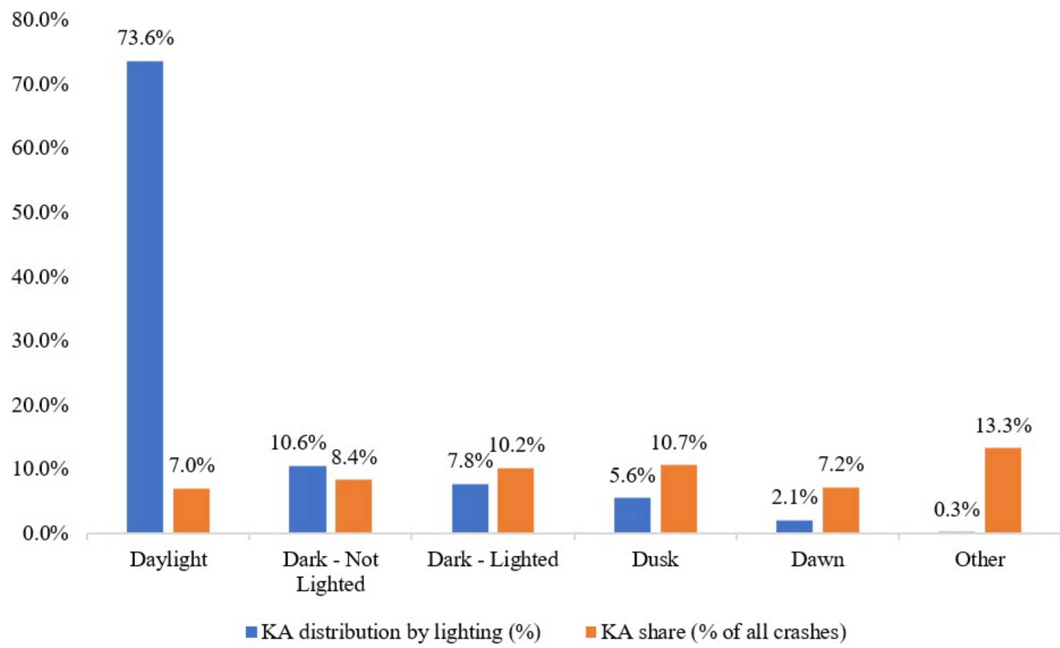


Figure A-30. Left turn/angle KA crashes between 2020 and 2024 by lighting conditions

The majority (73.6%) of left turn/angle KA crashes occurred during daylight hours, while 10.6% took place in dark-not lighted condition.. These results indicated that while most left turn/angle KA crashes occurred during the day, limited visibility periods, particularly dark-not lighted conditions, still contributed meaningfully to crash risk and may warrant focused lighting improvements at some critical locations. Also, relative to daylight condition the proportion of KA crashes out of total left turn/angle crashes was higher in dark – not lighted (8.4%), dark – lighted (10.2%), dusk (10.7%) and dawn (7.2%).

AII.2.1.3. Crash Time

AII.2.1.3.1. Time of the day

Figure A-31 shows the hourly distribution of left turn/angle KA crashes. These crashes peaked in the afternoon, with the highest share at 16:00 (9.9%) and another peak at 14:00 (9.1%). Elevated levels were observed between 13:00 and 18:00, while crash occurrence was lowest during the early morning hours (00:00–06:00)

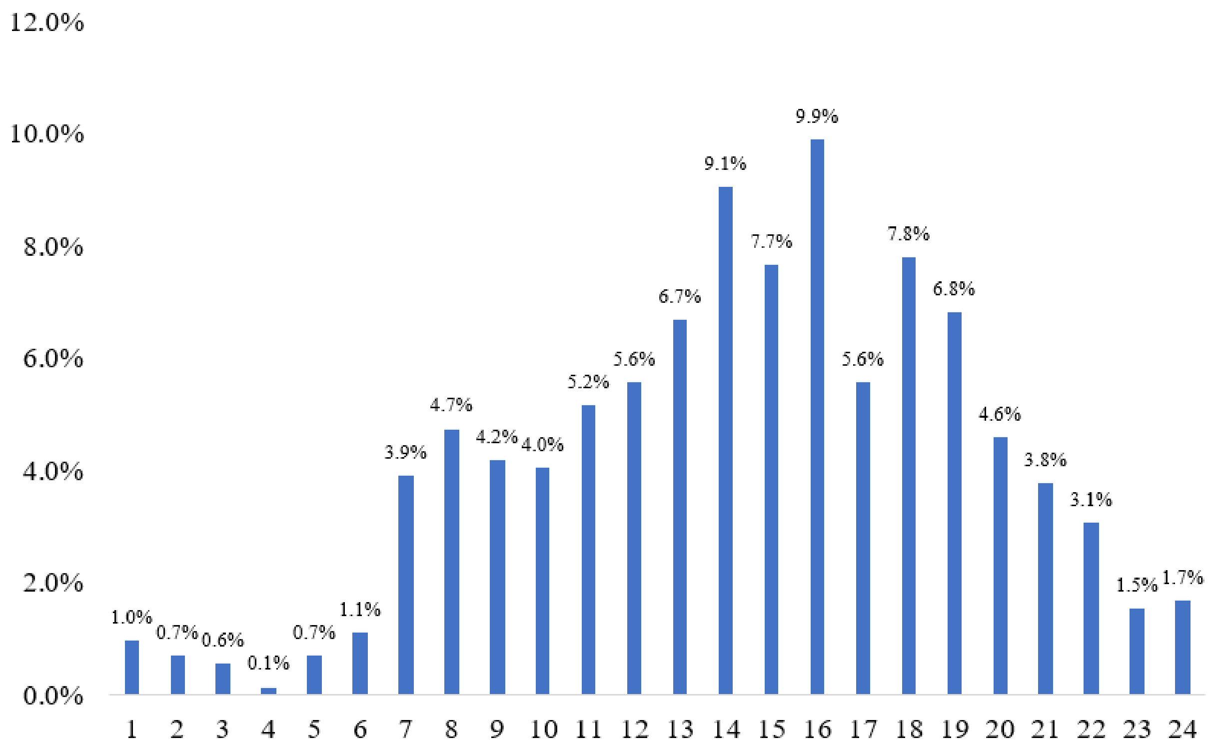
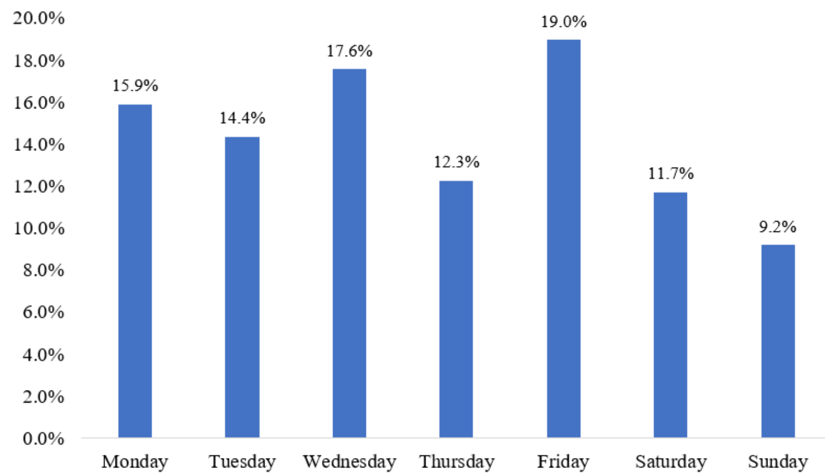


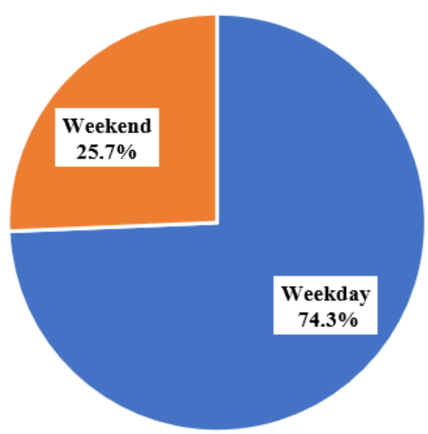
Figure A-31. Left turn/angle KA crashes between 2020 and 2024 by the hour of the day

AII.2.1.3.2. Day of the week

Figure A-32 shows the distribution of left turn/angle KA crashes by day of the week. Crashes were highest on Friday (19.0%) and Wednesday (17.6%), followed by Monday (15.9%). The lowest frequencies occurred on Sunday (9.2%) and Saturday (11.7%). Aggregated by weekday and weekend (including Friday evening), 74.3% of crashes occurred on weekdays, while 25.7% happened during weekends, suggesting a higher risk during regular weekday travel.



a) Day of the week



b) Weekday and weekend (including Friday evening)

Figure A-32. Left turn/angle KA crashes between 2020 and 2024 by day of the week

AII.2.1.3.3. Month of the year

The distribution from **Figure A-33** shows that left turn/angle KA crashes peaked in December (11.0%), followed by November (9.6%) and April/October (9.5% each). The lowest crash frequencies occurred in July (6.6%) and August (6.4%).

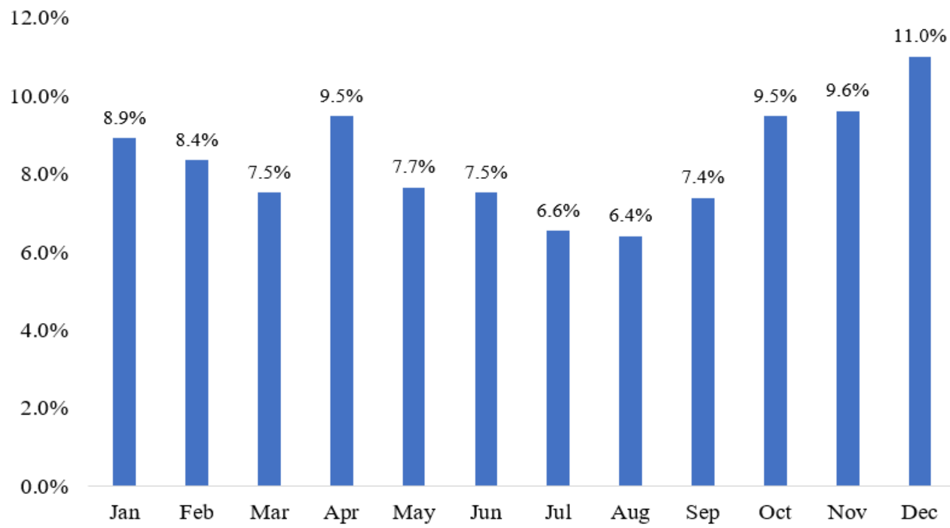


Figure A-33. Left turn/angle KA crashes between 2020 and 2024 by month of the year

It is important to note that during daylight saving time, the period between October and April experiences shorter daylight hours. A seasonal comparison between the shorter daylight months (October–April) and the longer daylight months (May–September) shows a clear difference of lighting conditions in crash occurrences. As shown in **Figure A-34**, 20.2% of severe (KA) crashes occurred under low-light conditions (dark-not lighted, dusk, or dawn) during October–April, compared to 15% during May–September.

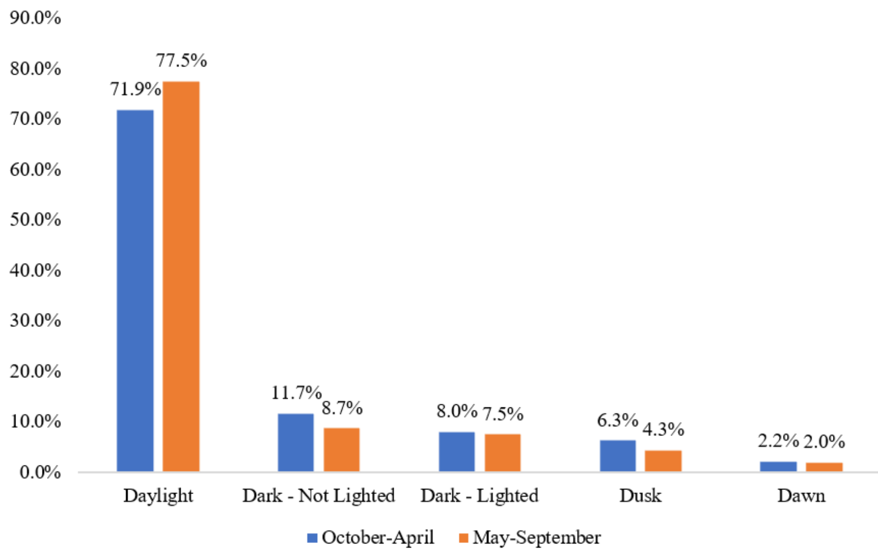


Figure A-34. Comparison of Left Turn/Angle KA crashes by lighting condition between October–April and May–September periods

AII.2.2. Off Road/Rollover Crashes

In Lake and Sumter Counties, off road/rollover crashes were notable contributors to severe crash outcomes, following left turn/angle crashes. Over the past five years (2020–2024), a total of 673 off road/rollover KA crashes were recorded, accounting for 28.4% of all KA crashes and representing the second most prevalent severe crash type. The following discussion focuses on off-road/rollover KA crashes.

AII.2.2.1. Crash Location

For the analysis of crash locations, roadway facilities were also categorized here into intersections and segments. As shown in **Figure A-35**, 84.3% of these KA crashes occurred at roadway segments and 15.7% at intersections.

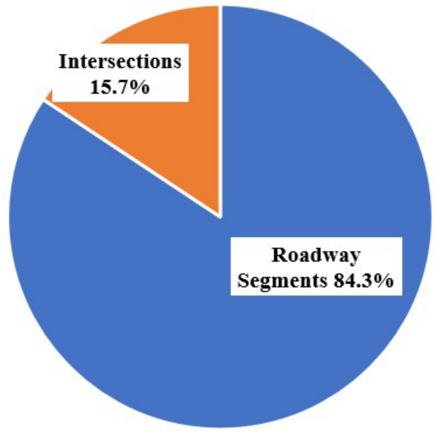


Figure A-35. Off road/rollover KA crashes between 2020 and 2024 by intersections and segments

For the severe off road/rollover type segment crashes, the majority of crashes (75.9%) occurred on two-way, two-lane undivided roads, followed by two-way divided roads with median barriers (11.9%), as shown in **Figure A-36**. Other roadway types, including those with two-way unprotected (painted >4 feet) medians or one-way trafficways, each accounted for less than 10% of the total off road/rollover segment crashes.

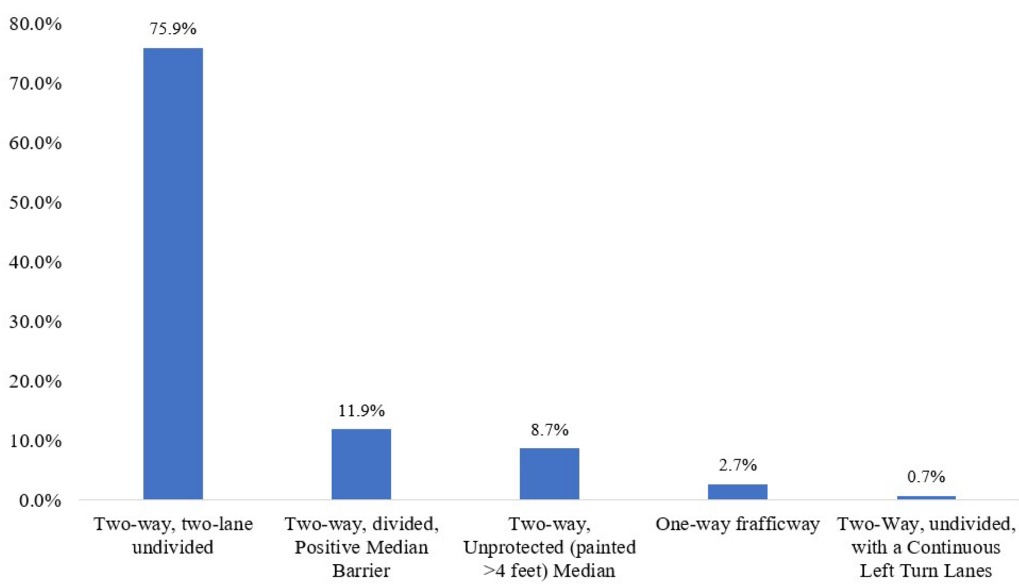


Figure A-36. Off road/rollover KA crashes between 2020 and 2024 by the type of roadway

Among the intersection related crashes, **Figure A-37** illustrates that unsignalized intersections (e.g., non-controlled, stop-controlled, yield-controlled) accounted for the highest proportion of off-road/rollover KA crashes (85.8%), followed by signalized intersections (11.3%).

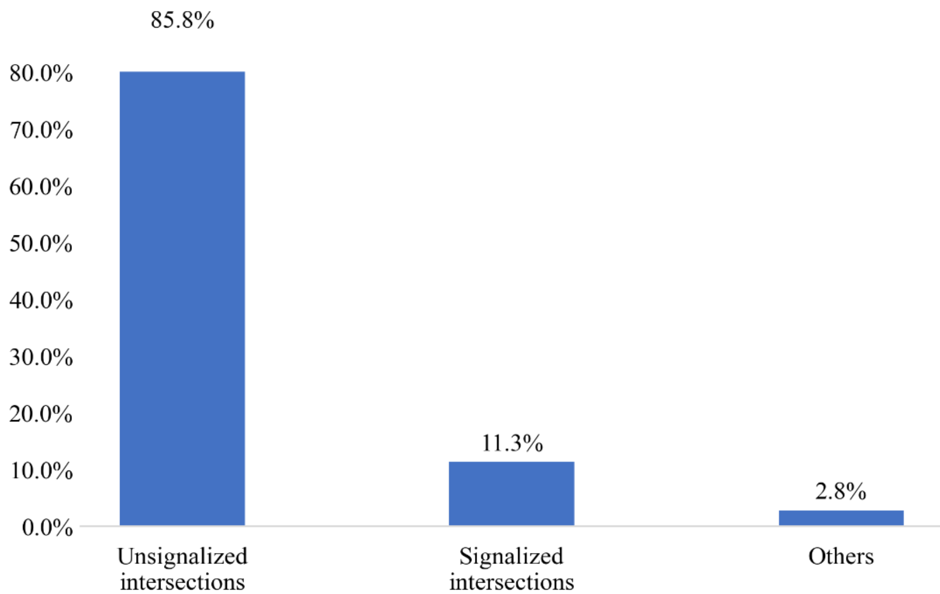


Figure A-37. Off road/rollover KA crashes between 2020 and 2024 by intersection control

Further the intersection geometry from **Figure A-38** indicates that T-intersections comprise the overwhelming majority of off road/rollover KA crashes (71.3%) followed by four-way intersection (23%).

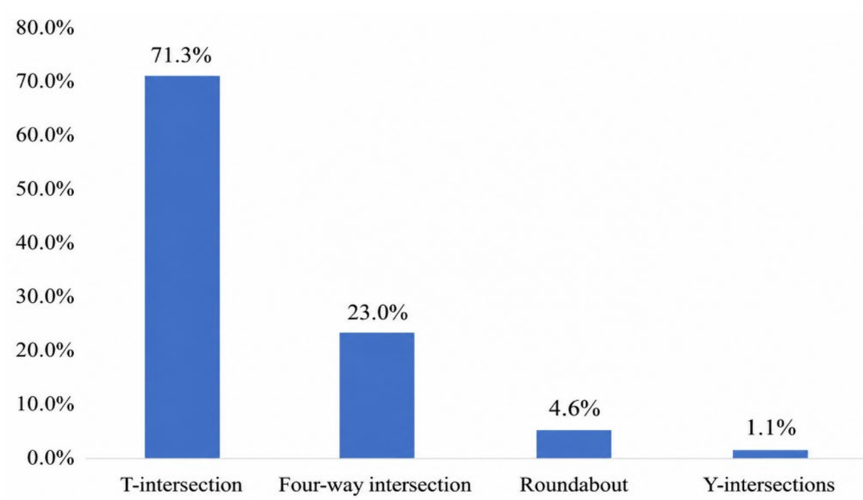
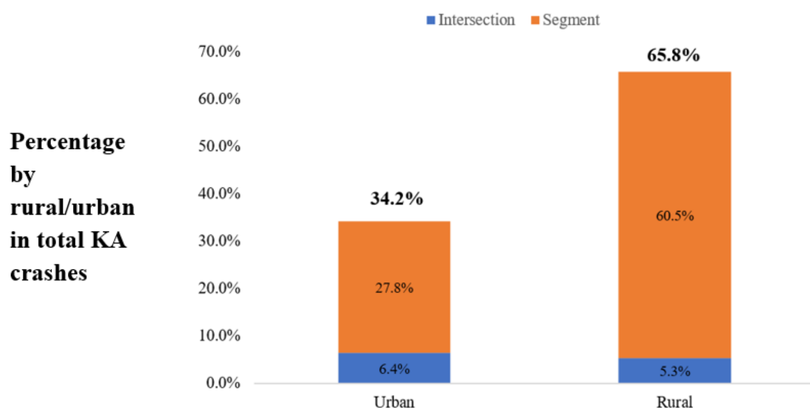


Figure A-38. Off road/rollover KA crashes between 2020 and 2024 by intersection types

As illustrated in **Figure A-39**, rural areas account for nearly two-thirds (65.8%) of all off road/rollover KA crashes, with the vast majority (60.5%) occurring along segments rather than intersections. In contrast, urban areas contributed a smaller share (34.2%), with most crashes also concentrated on segments (27.8%).



Corresponding crash number	236	436

Figure A-39. Off road/rollover KA crashes between 2020 and 2024 by rural and urban areas

AII.2.2.2. Lighting Condition

Figure A-40 illustrates the distribution of off road/rollover crashes under various lighting conditions. The majority of off road KA crashes occurred during daylight conditions, accounting for 54.1% of all cases. This is followed by dark-non lighted environments, which contributed notably to 26.7% of the crashes. Crashes occurring in dark-lighted conditions and during dawn/dusk were relatively similar, comprising 9.4% and 9.2%, respectively.

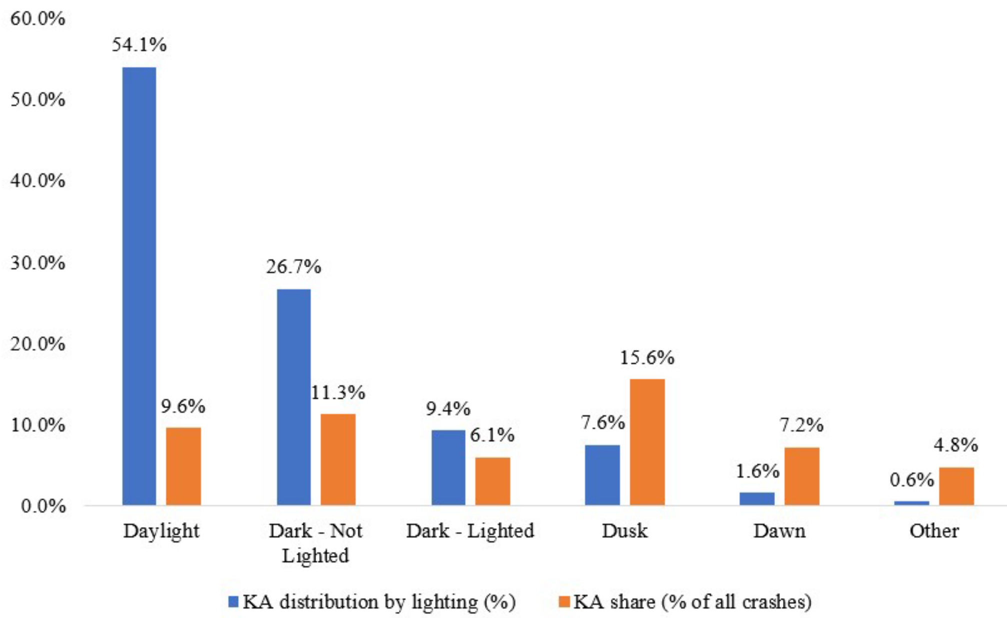


Figure A-40. Off road/rollover KA crashes between 2020 and 2024 by lighting conditions

This distribution highlighted that off road/rollover crashes were not only confined to low-visibility periods; in fact, over half occurred in daylight, suggesting that other factors may have played a more prominent role than visibility alone in these incidents. The notable share of crashes in dark-not lighted (26.7%) environments underscored the need to evaluate the adequacy of roadway lighting. Additionally, the proportion of KA crashes over total off road/rollover crashes was higher under dark-not lighted condition (11.3%) and limited light condition particularly during dusk (15.6%) compared to daylight condition.

AII.2.2.3. Crash Time

AII.2.2.3.1. Time of day

Figure A-41 illustrates the percentage of off road/rollover KA crashes by hour of the day. Crash frequency began to rise after 14:00, peaking between 17:00–18:00 (7.9%) and 16:00–17:00 (6.8%), before declining in the evening.

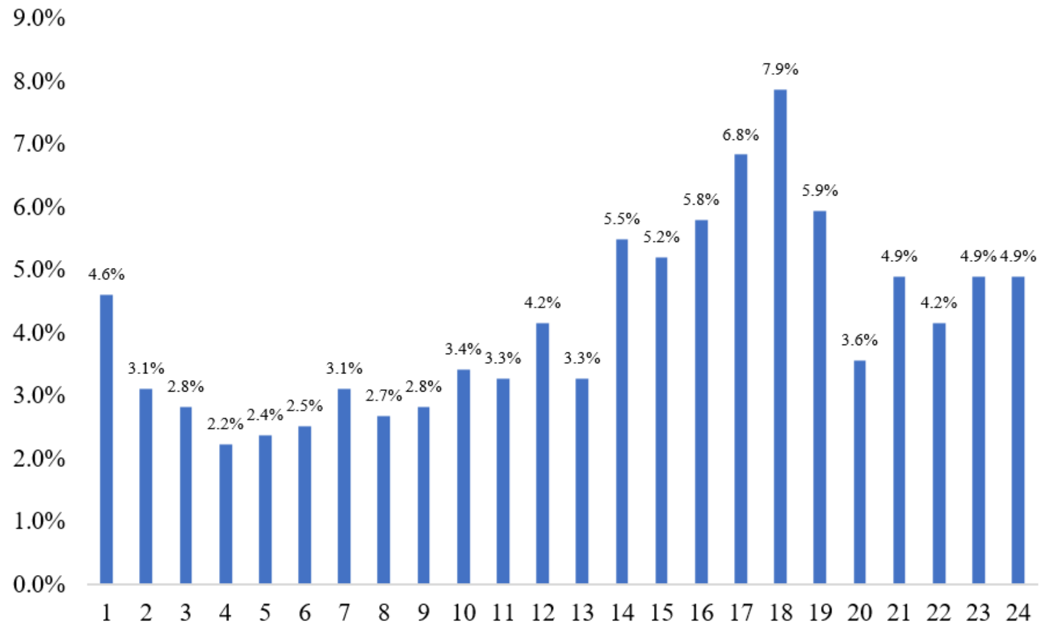
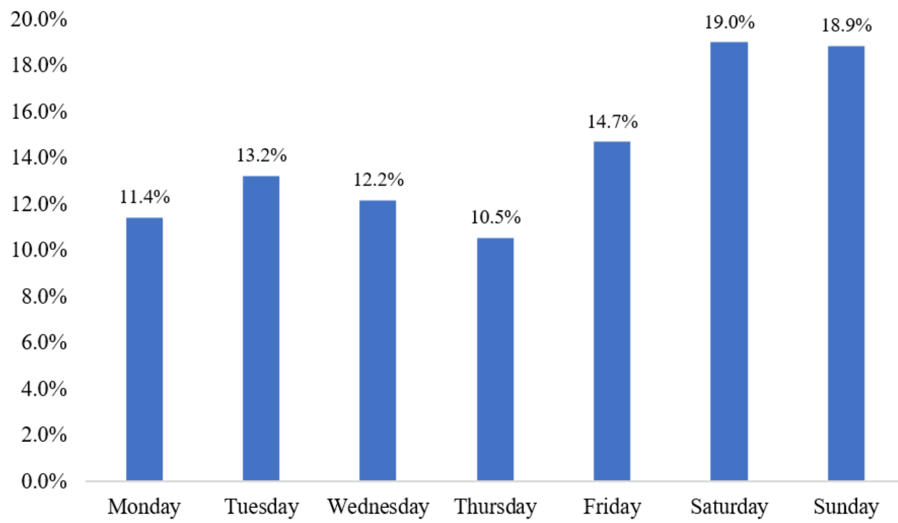


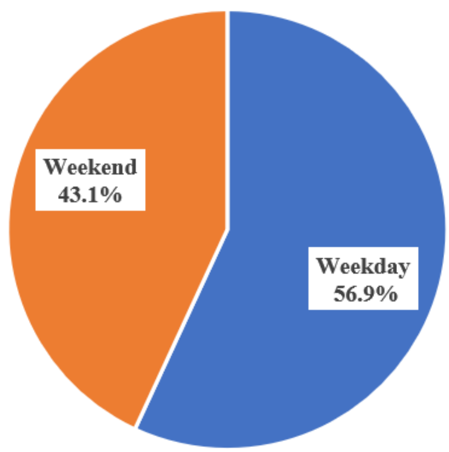
Figure A-41. Off road/rollover KA crashes between 2020 and 2024 by the hour of the day

AII.2.2.3.2. Day of the week

Off road/rollover KA crashes were analyzed by day of the week and month of the year. As shown in **Figure A-42 (a)**, the highest proportions occurred during Sunday (18.9%) and Saturday (19.0%)**.** Although weekends account for only Friday evening through Sunday, 43.1% of total off road/rollover crashes occurred during this period (**Figure A-42 (b)**), indicating that severe crashes occurred disproportionately more often during weekends.



a) Day of the week



b) Weekday and weekend (including Friday evening)

Figure A-42. Off road/rollover KA crashes between 2020 and 2024 by day of the week

AII.2.2.3.3. Month of the year

Regarding month of year, April had the highest number of off road/rollover KA crashes (10.3%). Moreover, May and July both had 10% of off road KA crashes, as shown in **Figure A-43**.

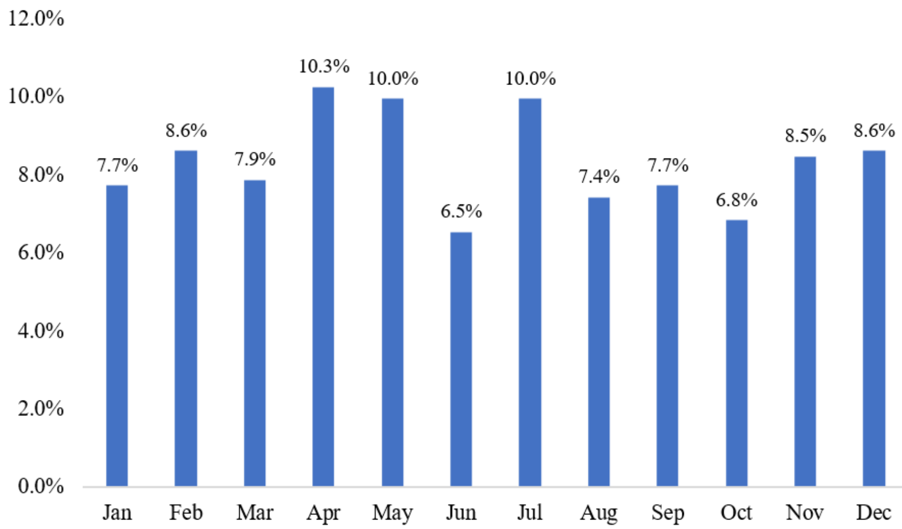


Figure A-43. Off road/rollover KA crashes between 2020 and 2024 by month of the year

From **Figure A-44**, it is also observed that off road/rollover crashes do not exhibit a strong difference in the daylight-saving season. The proportion of crashes occurring under different low-light conditions remains relatively consistent between October-April and May-September.

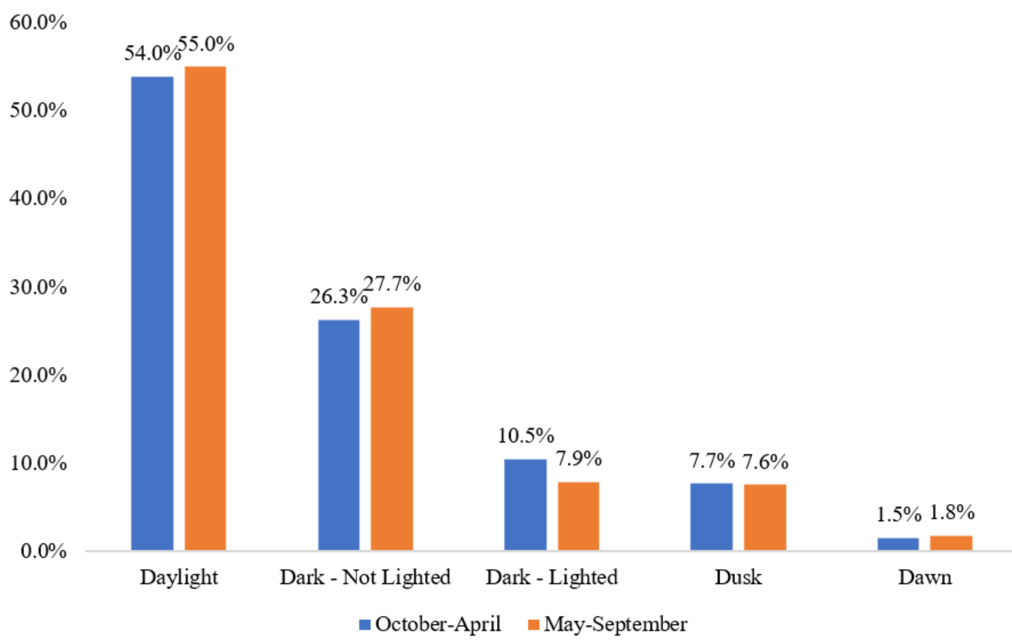


Figure A-44. Comparison of off road/rollover KA crashes by lighting condition between October–April and May–September periods

AII.2.3. Rear end KA Crashes

Rear end crashes are the third most common type of severe (KA) crashes in Lake and Sumter Counties. Between 2020 and 2024, a total of 356 rear end KA crashes were reported, accounting for 15.0% of all KA crashes. Given their potential for serious outcomes, these crashes warrant focused analysis. This section presents a detailed examination of rear end KA crash patterns.

AII.2.3.1. Crash Location

In Lake and Sumter Counties, rear end KA crashes occurred at a higher rate along roadway segments than at intersections. As depicted in **Figure A-45**, 62.9% of rear end KA crashes occurred on roadway segments, while 37.1% took place at intersections.

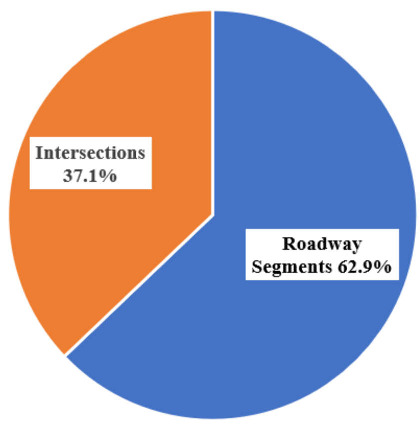


Figure A-45. Rear end KA crashes between 2020 and 2024 by intersections and roadway segments

Further, analysis of roadway segment types from **Figure A-46** indicates that the largest share of rear end KA crashes on segments occurred on two-way, two-lane undivided roads (44.6%), followed by two-way, divided roads with median barriers (35.1%). Crashes were less frequent on segments with two-way, unprotected medians (14.9%) and two-way, undivided with continuous left turn lanes (4.1%).

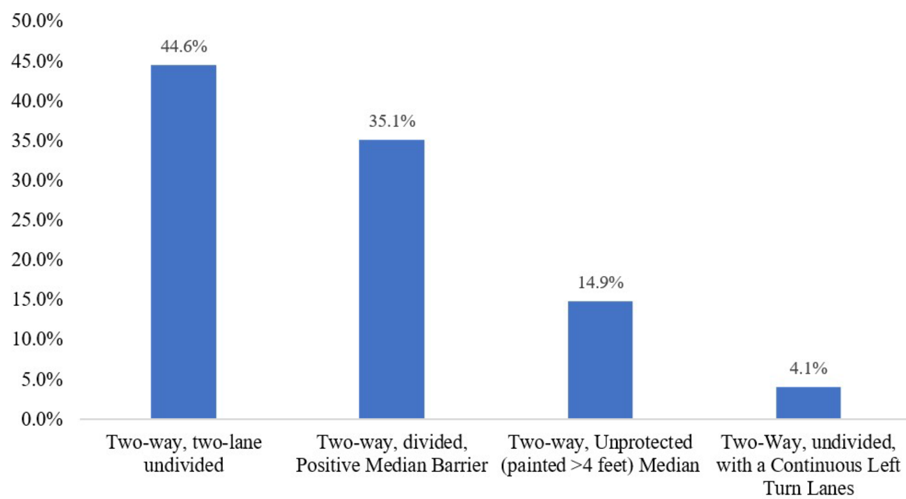


Figure A-46. Rear end KA crashes between 2020 and 2024 by the type of roadway

From **Figure A-47**, it is observed that, among the 37.1% of rear-end KA crashes that occurred at intersections, unsignalized intersections (e.g., including non-controlled, stop-controlled, yield-controlled) accounted for the highest proportion (56.4%), followed by signalized intersections (42.9%). This indicates that rear-end crashes at intersections were more common at unsignalized locations; however, a substantial proportion also occurred at signalized intersections, suggesting that rear-end crash risk exists both where traffic control is absent and where drivers respond to traffic signals.

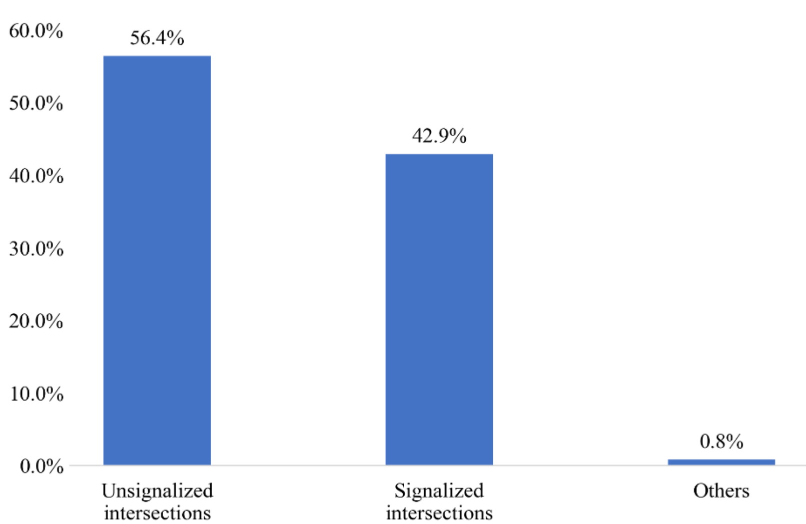


Figure A-47. Rear end KA crashes between 2020 and 2024 by signal control types

Figure A-48 shows the distribution of rear end KA crashes by intersection type. Among intersection related crashes, 49.6% occurred at four-way intersections, followed closely by 47.8% at T-intersections. Only a small proportion took place at roundabouts (1.7%) and Y-intersections (0.9%).

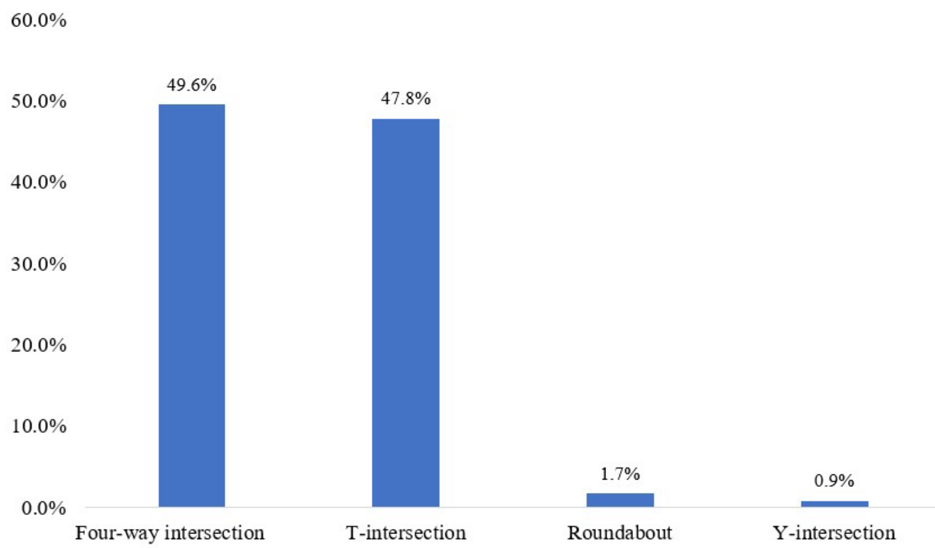


Figure A-48. Rear end KA crashes between 2020 and 2024 by intersection types

Figure A-49 presents the rural-urban distribution of rear end KA crashes in Lake and Sumter Counties. A larger share of crashes occurred in urban areas (61.5%), compared to 38.5% in rural areas. Notably, urban roadway segments alone accounted for over one-third of all rear end KA crashes (35.5%), while rural segments contributed 27.0%. Consistent with overall patterns, urban intersections (26.1%) recorded substantially more crashes than rural intersections (11.5%).

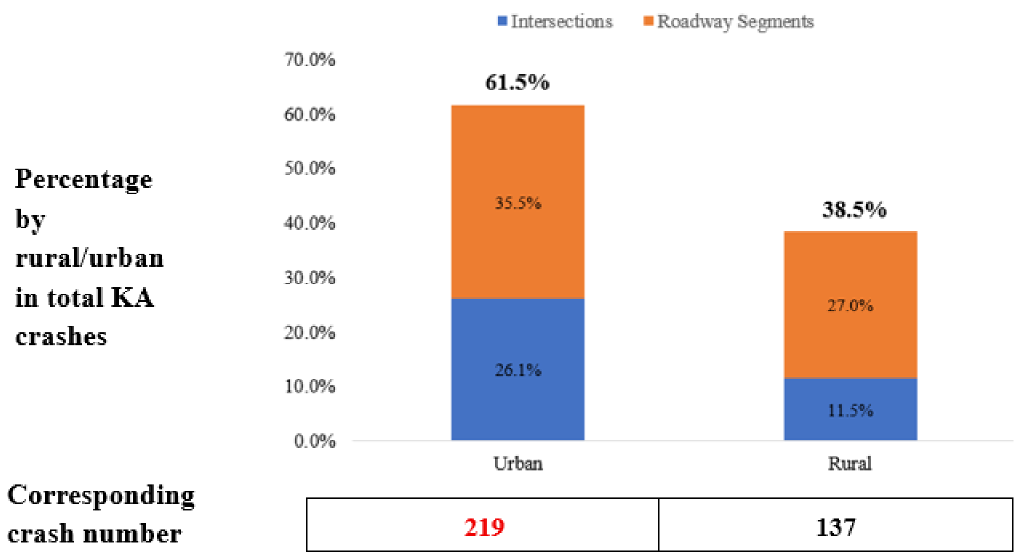


Figure A-49. Rear end KA crashes between 2020 and 2024 by rural and urban areas.

These findings suggest that while rural areas still present notable crash risk, particularly along roadway segments, urban traffic environments may pose an even greater concern for both segment and intersection locations.

AII.2.3.2. Lighting Condition

Figure A-50 illustrates the distribution of rear end KA crashes by lighting condition. The majority of crashes (74.4%) occurred during daylight, while the remaining 25.6% took place under no light or limited lighting conditions. Among the non-daylight crashes, 12.1% occurred in the dark-not lighted condition, and 7.0% in dark-lighted conditions. The KA crash proportion in dark-not lighted (3.5%) of total rear end crashes also shows elevated risk of crash severity in low visibility during nighttime.

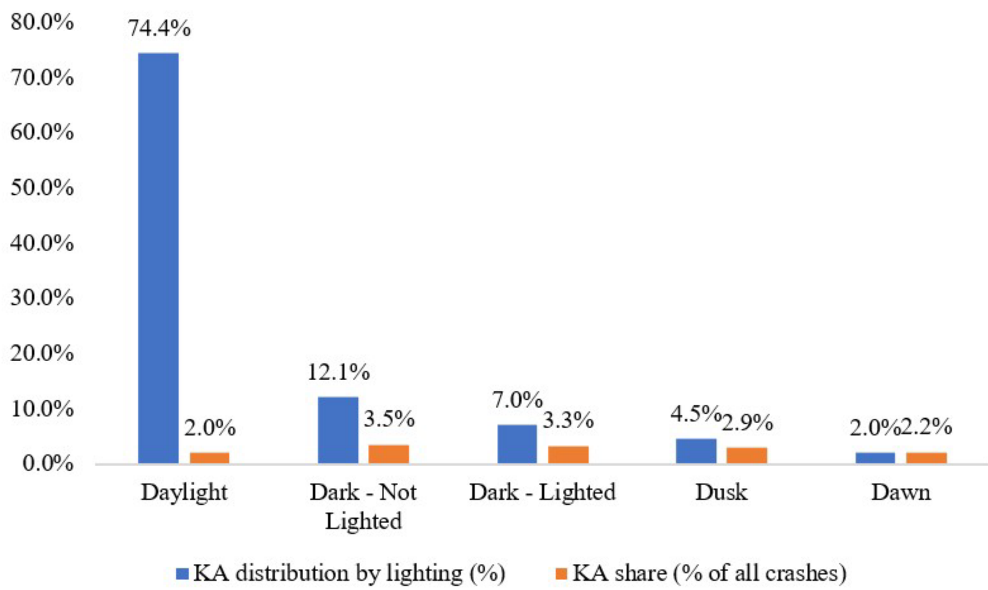


Figure A-50. Rear end KA crashes between 2020 and 2024 by lighting conditions

This distribution shows that while most rear end crashes happened during the day, a meaningful portion still occurs in no-light to limited-light environments, which may warrant improved lighting condition in the road network. As the majority of crashes are not limited by lighting conditions, other contributing factors such as driver behavior, and roadway or signal design need to be carefully evaluated to effectively reduce rear end KA crashes.

AII.2.3.3. Crash Time

AII.2.3.3.1. Time of the day

The distribution of time of the day for rear end crash from **Figure A-51** shows that the peak (11.0%) occurred at 16:00. Crashes steadily increased from morning, peaking between 14:00 and 18:00, likely, reflecting elevated traffic volumes during commute times. Early morning and late-night hours show significantly lower crash shares.

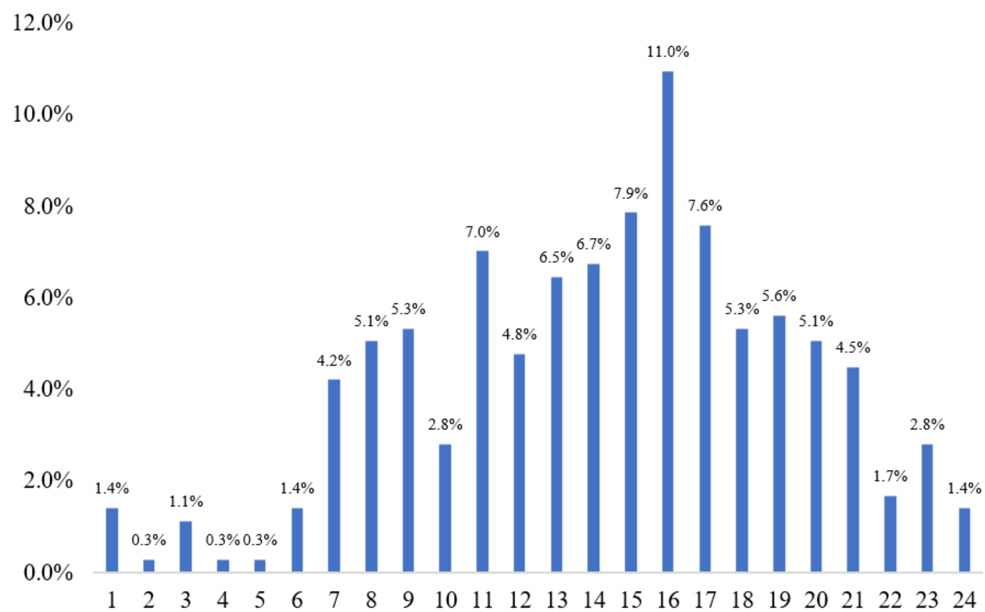
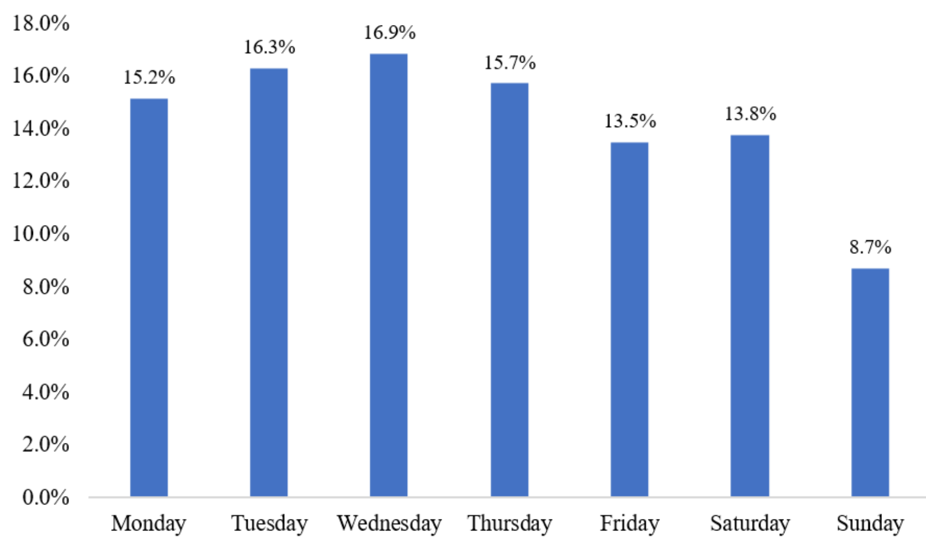


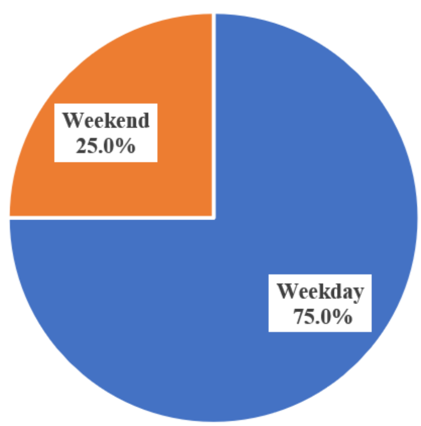
Figure A-51. Rear end KA crashes between 2020 and 2024 by the hour of the day

AII.2.3.3.2. Day of the week

Rear end KA crashes were predominantly concentrated on weekdays, making up 75% of all cases as shown in **Figure A-52**, Wednesday records the highest share (16.9%), followed by Tuesday and Thursday. In contrast, Sunday had the lowest proportion at 8.7%.



a) Day of the week



b) Weekday and weekend (including Friday evening)

Figure A-52. Rear end KA crashes between 2020 and 2024 by day of the week

AII.2.3.3.3. Month of the year

Monthly variation in rear end KA crashes from **Figure A-53** reveals peak in March (12.9%) and a secondary high in October (10.1%). In contrast, August records the lowest share at 4.5%. Most other months maintain a relatively even distribution around 7–9%, indicating a moderate fluctuation in crash occurrences throughout the year.

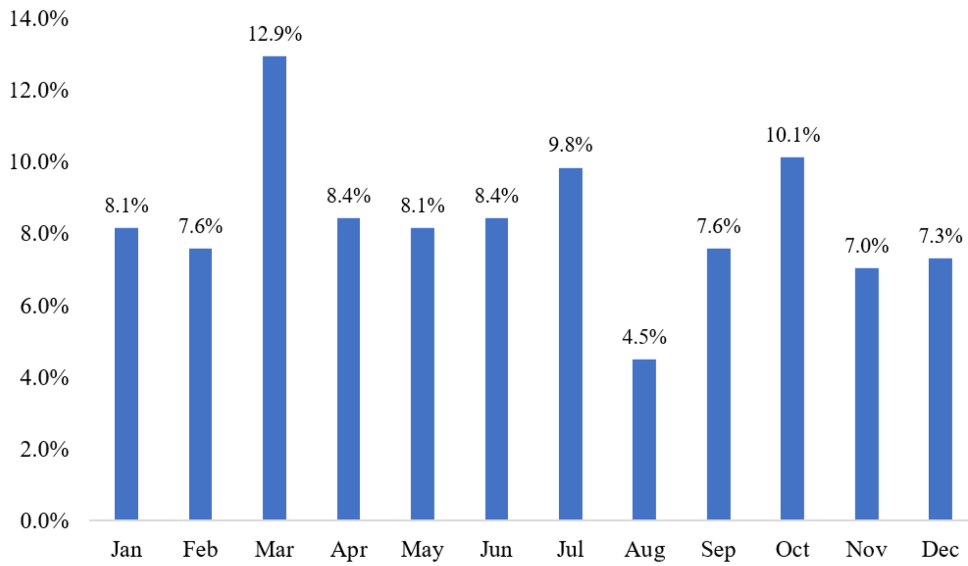


Figure A-53. Rear end KA crashes between 2020 and 2024 by month of the year

From **Figure A-54,** no notable differences are observed between the daylight-saving months and the other months, as crash occurrences under different lighting conditions remain consistent between October-April and May-September.

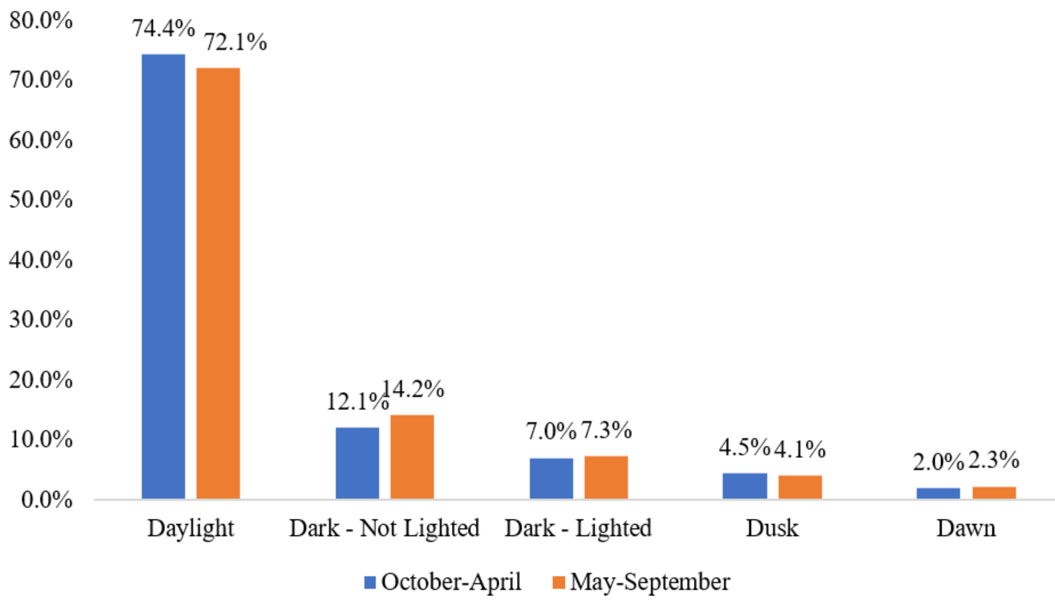


Figure A-54. Comparison of off rear end KA crashes by lighting condition between October–April and May–September period

AII.2.4. Pedestrian/Bicyclist Involved KA Crashes

Pedestrians and bicyclists represent a critical subset of vulnerable users in the transportation network due to their unprotected exposure to vehicle impacts. Over the last 5 years (2020-2024), a total of 268 severe (KA) crashes involving pedestrian/bicyclist were recorded, accounting for approximately 11.3% of all KA crashes. Of these, 179 were pedestrian-related and 89 involved bicyclists, representing 7.5% and 3.8% of the total KA crashes, respectively. Given their heightened injury risk and the critical implications for roadway safety planning, this section provides a detailed examination of crash patterns associated with pedestrian and bicyclist involved KA crashes.

AII.2.4.1. Crash Location

The distribution of pedestrian/bicyclist-involved KA crashes by location type, as shown in **Figure A-55,** indicates that a significant majority (71.2%) occurred along roadway segments, while 28.8% were located at intersections.

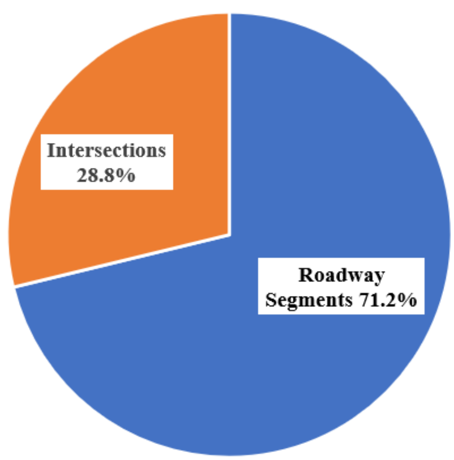


Figure A-55. Pedestrian/bicyclist involved KA crashes between 2020 and 2024 by intersections and roadway segments

The concentration of severe crashes along segments underscores the need to evaluate pedestrian and bicyclist safety infrastructure and identify opportunities for improvements beyond intersection focused countermeasures. The distribution of pedestrian/bicyclist involved KA crashes by roadway type, as shown in **Figure A-56**, indicates that the majority (58.4%) of segment crashes occurred on two-way, two-lane undivided roads. This is followed by 20% on two-way, divided roads with median barriers and 12.4% on two-way roads with unprotected painted medians. The predominance on undivided two-lane roads underscores the elevated vulnerability of non-motorized users on these facilities, warranting further investigation to identify specific high-risk locations and determine appropriate, location-specific safety countermeasures for pedestrians/bicyclists.

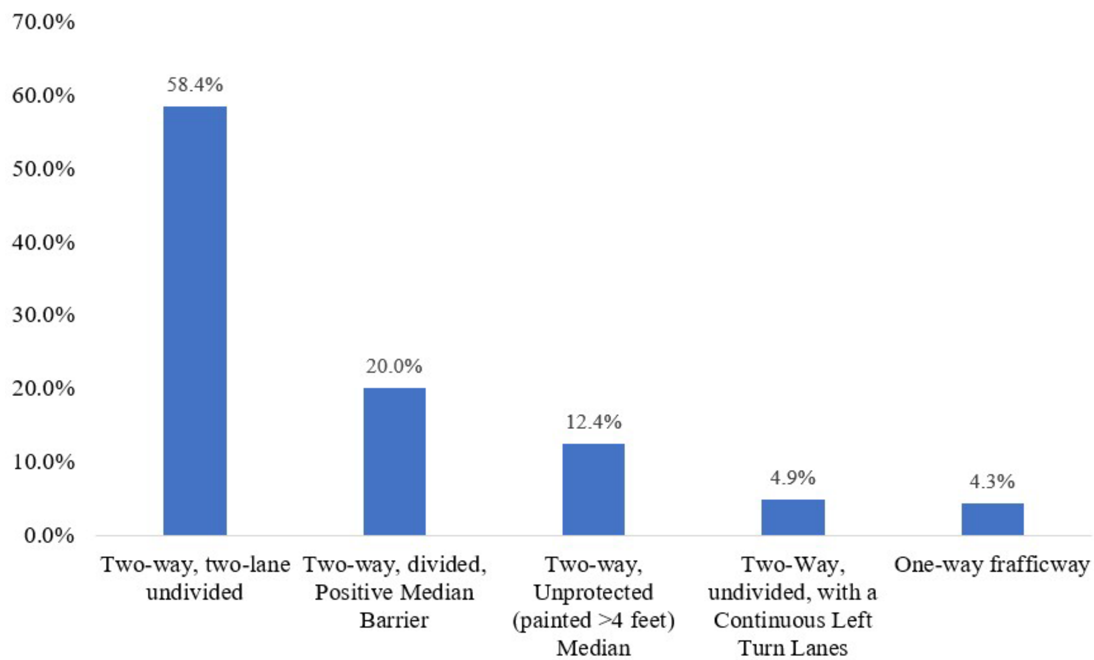


Figure A-56. Pedestrian/bicycle involved KA crashes between 2020 and 2024 by the type of roadway

Although intersections may offer some form of crossing infrastructure for pedestrians and bicyclists, a substantial portion of KA crashes still occurred at these locations. As illustrated in

Figure A-57, among the 28.8% of pedestrian- and bicyclist-involved KA crashes that occurred at intersections, unsignalized intersections (including non-controlled, stop-controlled, and yield-controlled intersections) accounted for the highest proportion (76.4%), followed by signalized intersections (21.1%). This pattern suggests that the absence of traffic control, or potentially limited crossing infrastructure at some unsignalized intersections, may contribute to elevated safety risks for vulnerable road users. Nevertheless, the substantial proportion of crashes at signalized intersections highlights the need for detailed, location-specific evaluations to identify underlying contributing factors and opportunities to improve pedestrian and bicyclist safety.

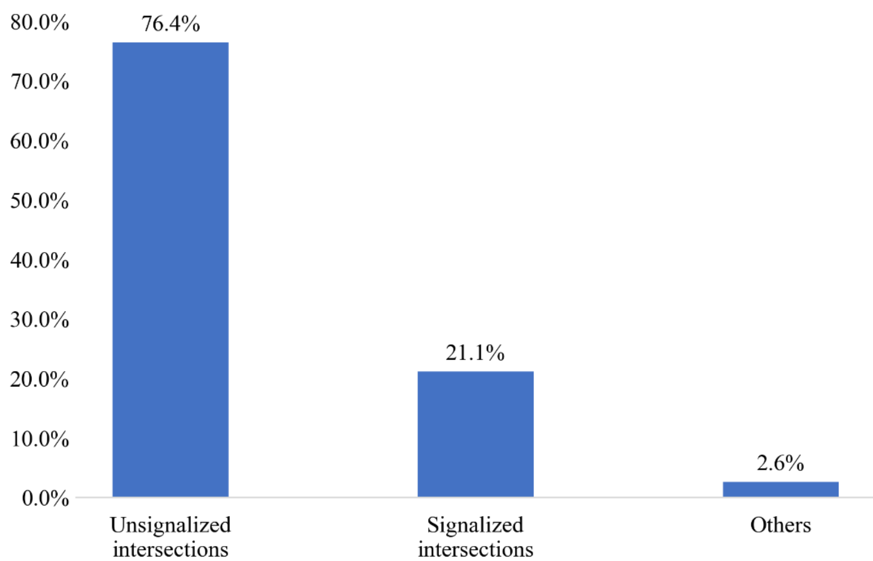


Figure A-57. Pedestrian/bicyclist involved KA crashes between 2020 and 2024 by signal control types

The distribution for intersection types as shown in **Figure A-58,** indicates that nearly half of the pedestrian/bicyclist involved KA crashes related to intersections occurred at T-intersections (47.4%), followed closely by four-way intersections (40.8%).

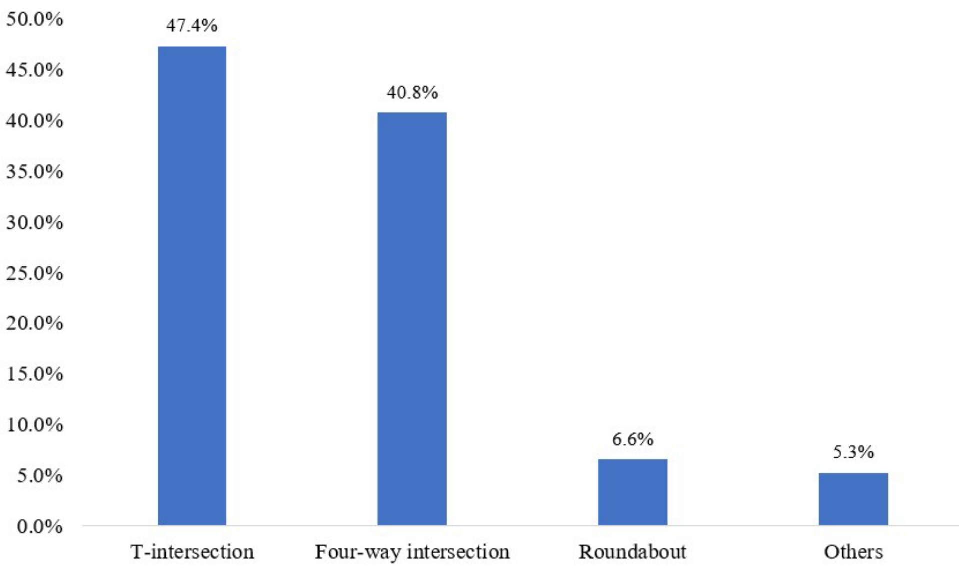


Figure A-58. Pedestrian/bicycle involved KA crashes between 2020 and 2024 by intersection types

Further, the distribution of pedestrian/bicyclist involved KA crashes differs noticeably between rural and urban areas. **Figure A-59** shows that greater share of crashes occurred in urban areas (57.4%) compared to rural areas (42.5%).

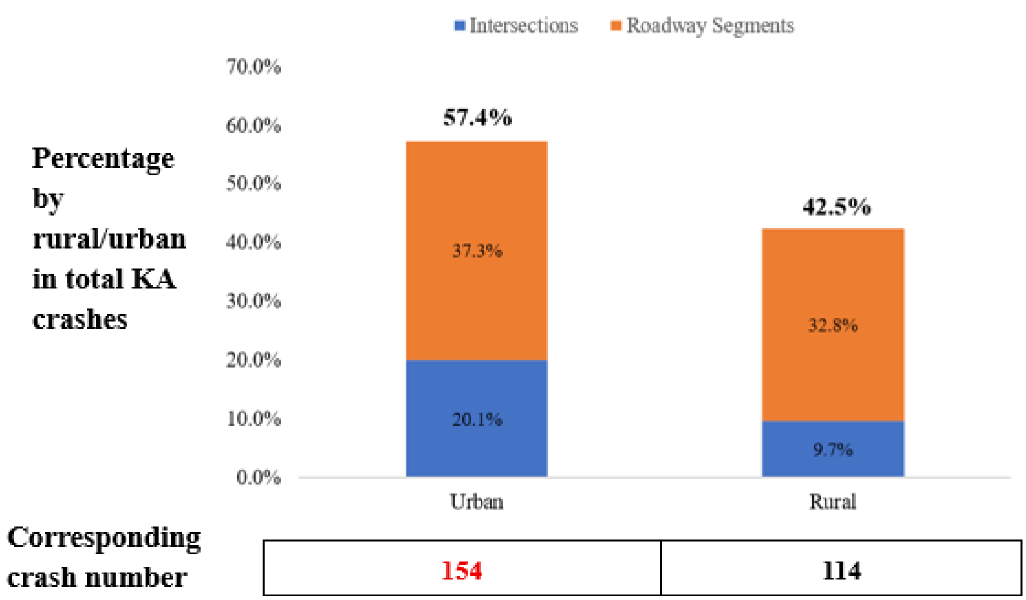


Figure A-59. Pedestrian/bicycle involved KA crashes between 2020 and 2024 by rural and urban areas

Within rural environments, roadway segments account for a disproportionately high 32.8% of all pedestrian/bicyclist involved KA crashes which is more than three times the rural intersection share (9.7%). In urban areas, while segment-related crashes still dominate (37.3%), the share of intersection-related crashes (20.1%) is notably higher than in rural areas.

AII.2.4.2. Lighting condition

Lighting conditions play a critical role in pedestrian and bicyclist crashes, particularly during nighttime, when reduced visibility makes it more difficult for drivers to detect non-motorized road users. As shown in **Figure A-60**, nearly half (48.1%) of the pedestrian/bicyclist-involved KA crashes occurred during daylight, while the remaining majority were distributed across various low-light conditions. Notably, 26.1% of crashes occurred in dark, not lighted conditions, followed by 14.2% under dark but lighted conditions. Dusk and dawn each accounted for 5.2% of crashes. Considering the proportion of KA crashes over total pedestrian/bicyclist involved crashes, severity was very high under low-visibility settings: dark – not lighted 40.0%, dark – lighted 28.4%, compared with daylight (17.1%). The relatively high share of crash frequency and severity in unlighted environments underscores the importance of adequate roadway lighting, especially in areas with pedestrian or bicycle activity during low-visibility periods.

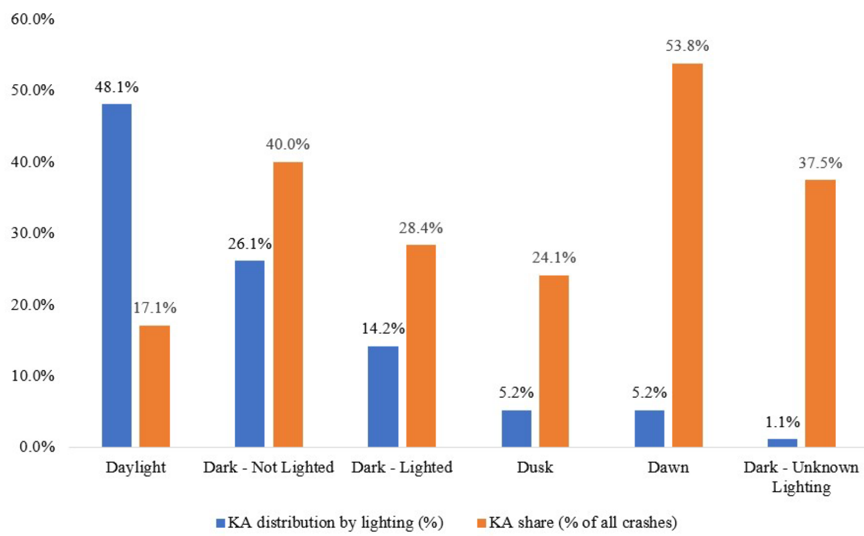


Figure A-60. Pedestrian/bicyclist involved KA crashes between 2020 and 2024 by lighting conditions

AII.2.4.3. Crash Time

AII.2.4.3.1. Time of the day

The distribution of pedestrian/bicyclist involved KA crashes from **Figure A-61** highlights clear variations in crash occurrences over a 24-hour period. During the morning hours, with a visible rise starting around 6:00 and peaking at 11:00 (7.5%). Although there was a slight dip around midday, another surge is observed between 20:00 and 22:00, with the highest hourly share recorded at 22:00 (7.8%). These elevated crashes during late morning, evening and night hours may reflect increased exposure related to commuting, recreational activity, or reduced visibility during nighttime travel. and night hours may reflect increased exposure related to commuting, recreational activity, or reduced visibility during nighttime travel.

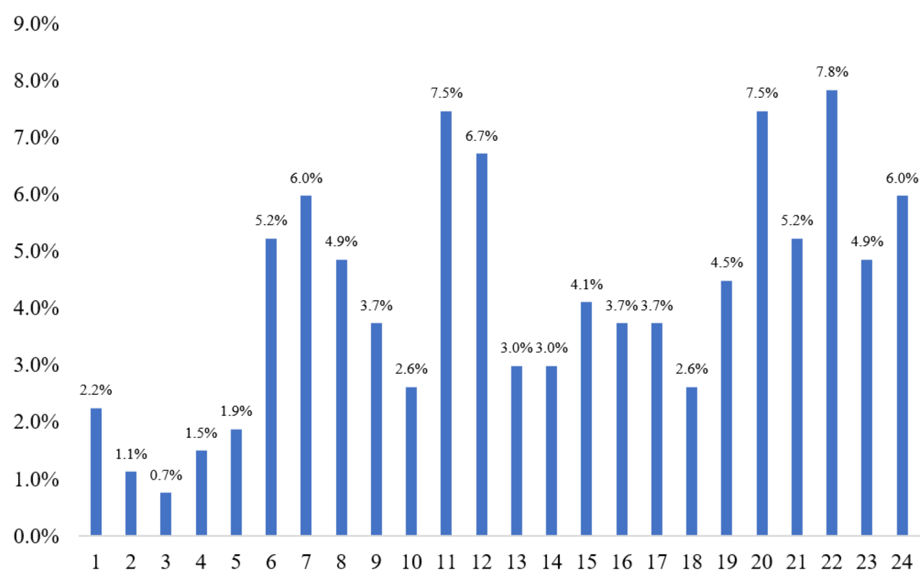
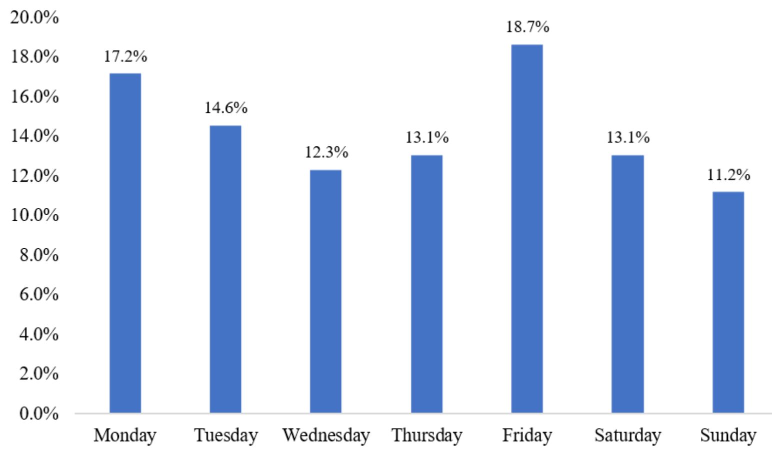


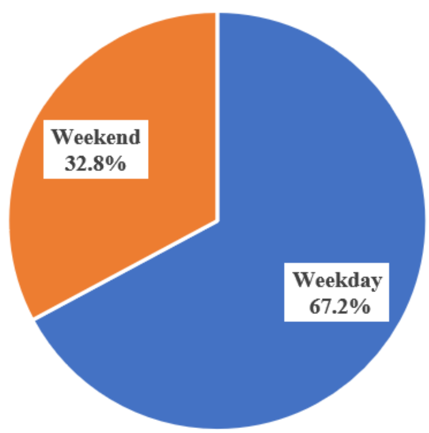
Figure A-61. Pedestrian/bicyclist involved KA crashes between 2020 and 2024 by the hour of the day

AII.2.4.3.2. Day of the week

As shown in **Figure A-62,** pedestrian/bicyclist involved KA crashes peaked on Friday (18.7%) and Monday (17.2%). While the majority (67.2%) occurred on weekdays, a substantial share (32.8%) took place over the weekend (including Friday evening), indicating elevated risk during both the start and end of the typical workweek, as well as during weekend mobility.



a) Day of the week



b) Weekday and weekend (including Friday evening)

Figure A-62. Pedestrian/bicycle involved KA crashes between 2020 and 2024 by day of the week

AII.2.4.3.3. Month of the year

The monthly distribution from **Figure A-63** shows that the highest number of pedestrian/bicyclist involved KA crashes occurred in October (10.8%) and December (10.1%). In contrast, July had the lowest share (3.4%), indicating fewer severe crashes during the summer months.

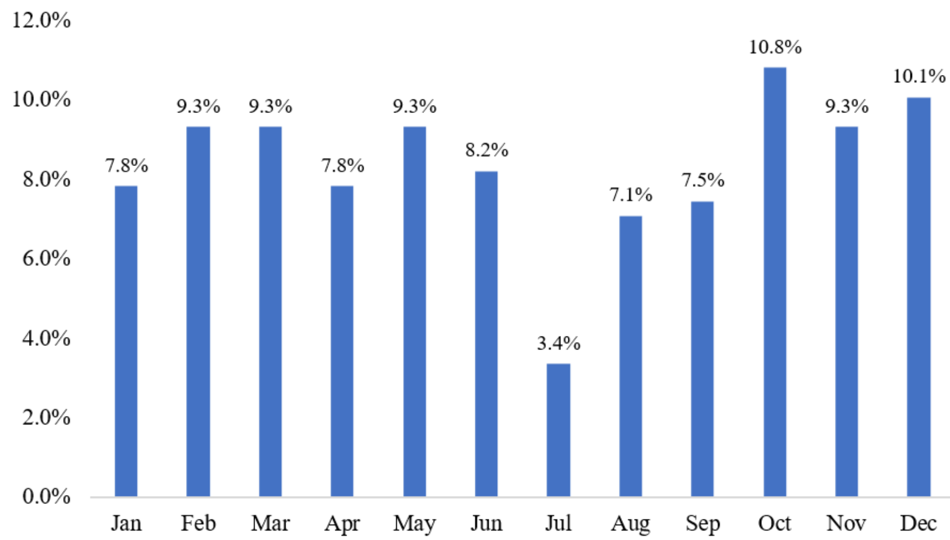


Figure A-63. Pedestrian/bicyclist involved KA crashes between 2020 and 2024 by month of the year

As shown in **Figure A-64**, pedestrian and bicyclist KA crashes exhibit some variation in lighting conditions between shorter daylight months and the rest of the year. During October–April, 28.1% of crashes occurred under dark–not-lighted conditions, compared to 23.4% during May–September.

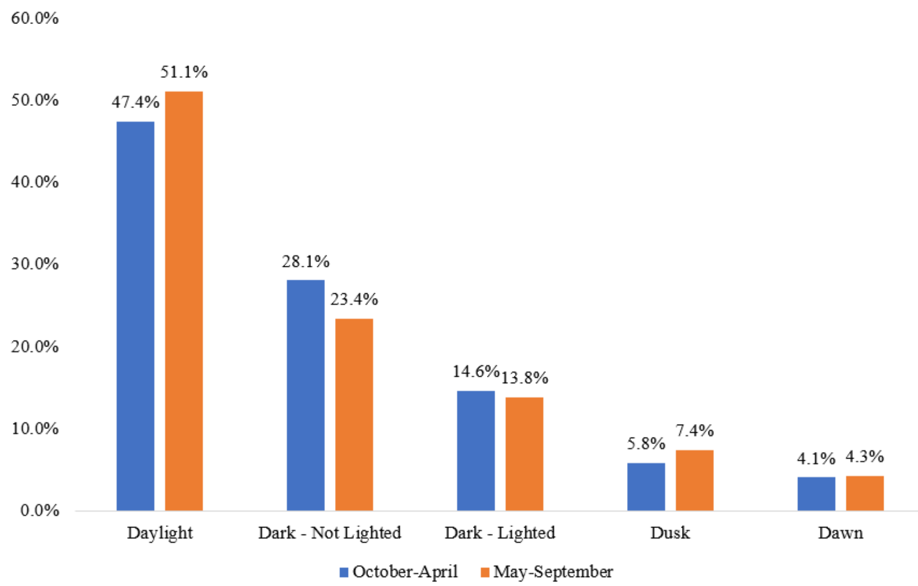
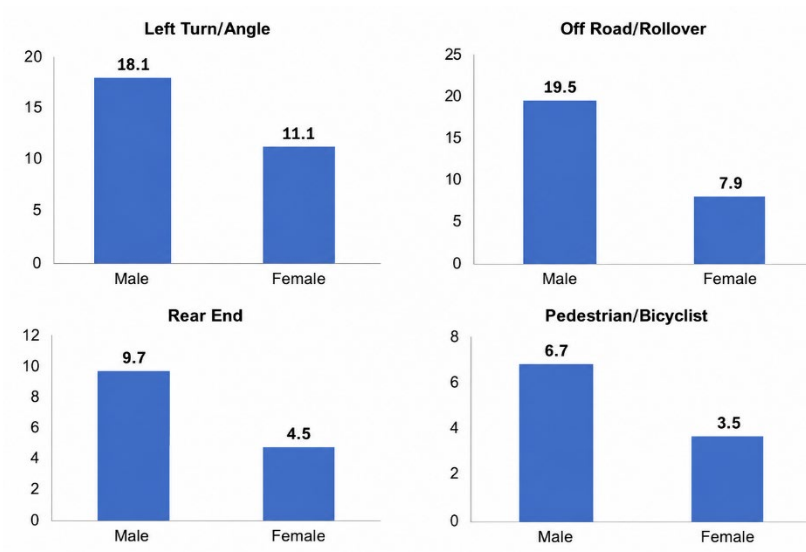


Figure A-64. Comparison of off pedestrian/bicycle KA crashes by lighting condition between October–April and May–September period

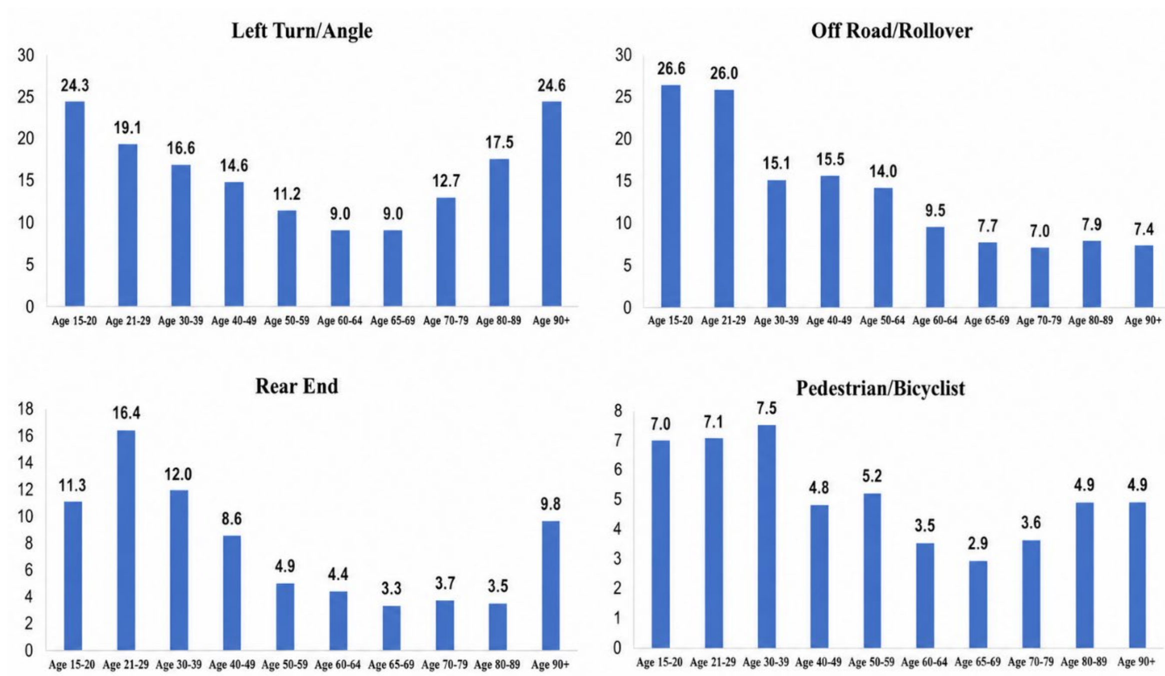
AII.3. Common Trend Across Crash Types

AII.3.1. Overall Demographics

According to the Annual Licensed Driver report published by the Florida Department of Highway Safety and Motor Vehicles (FLHSMV, 2025), the number of licensed drivers by age group was used to calculate KA crash frequencies per 10,000 licensed drivers disaggregated by gender and age group. As shown in **Figure A-65**, male drivers consistently exhibited higher KA crash frequencies across all crash types compared to females. Again, drivers' age trends followed a U-shaped pattern, with the highest crash frequencies observed among young drivers (ages 15–29) and older drivers (≥70).



a) Gender distribution of drivers across crash type



b) Age distribution of drivers across crash type

Figure A-65. KA crash frequency by crash type per 10,000 licensed drivers between 2020 and 2024, disaggregated by driver age

These patterns suggest that both inexperience and age-related factors contributed significantly to severe crash risk in Lake and Sumter Counties, highlighting the need for targeted safety education programs for younger drivers and awareness campaigns tailored to older adults.

AII.3.2. Weather Condition

As shown in **Figure A-66**, the majority of KA crashes across all crash types occurred during clear weather, with shares ranging from 72.8% (off road/rollover) to 82.4% (left turn/angle). Cloudy conditions accounted for a smaller portion, between 8.4% (pedestrian/bicyclist) and 18.9% (off road/rollover). During rain only a minor share of KA crashes, peaking at 6.5% for off road/rollover. However, when expressed as the proportion of crashes within each weather category that were KA, Pedestrian/Bicycle crashes show an elevated KA share under rain (33.3%), even though rain accounts for only 3.7% of pedestrian/bicyclist KA crashes overall relative to clear conditions. Overall, KA crashes were predominantly reported under clear weather, with cloudy and rainy conditions representing smaller shares across crash type, highlighting the need for the safety measures that address everyday driving environments.

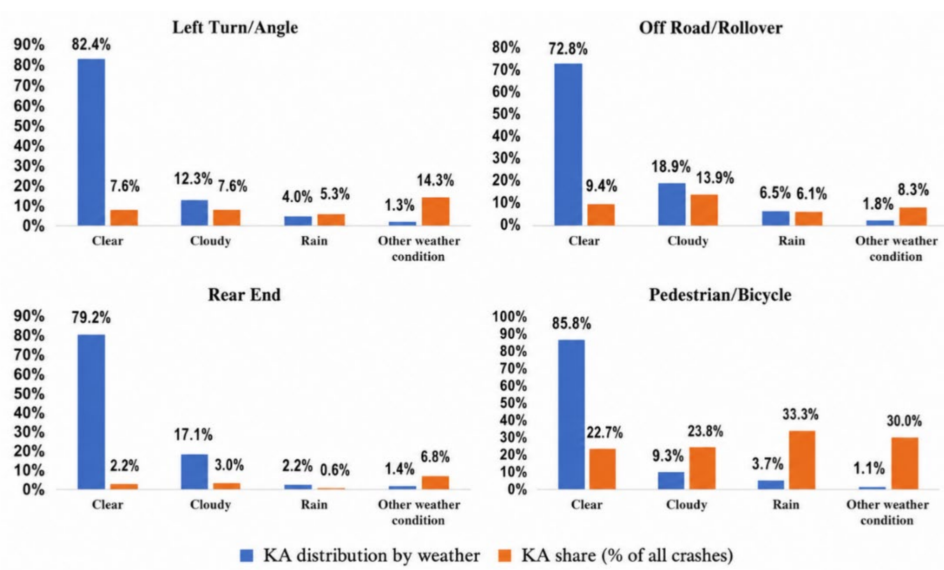


Figure A-66. KA crashes by crash type and weather conditions between 2020 and 2024

Figure A-67 further illustrates the year-wise variation in weather conditions and KA crashes across different crash types. Overall, the percentage of hours under each weather condition and the percentage of KA crashes remain relatively similar, indicating that most severe crashes occur roughly in proportion to exposure. However, across crash types, the proportion of KA crashes (i.e., KA crashes per total hours for each weather condition) tends to be slightly higher under adverse weather conditions, particularly during overcast or rainy periods.

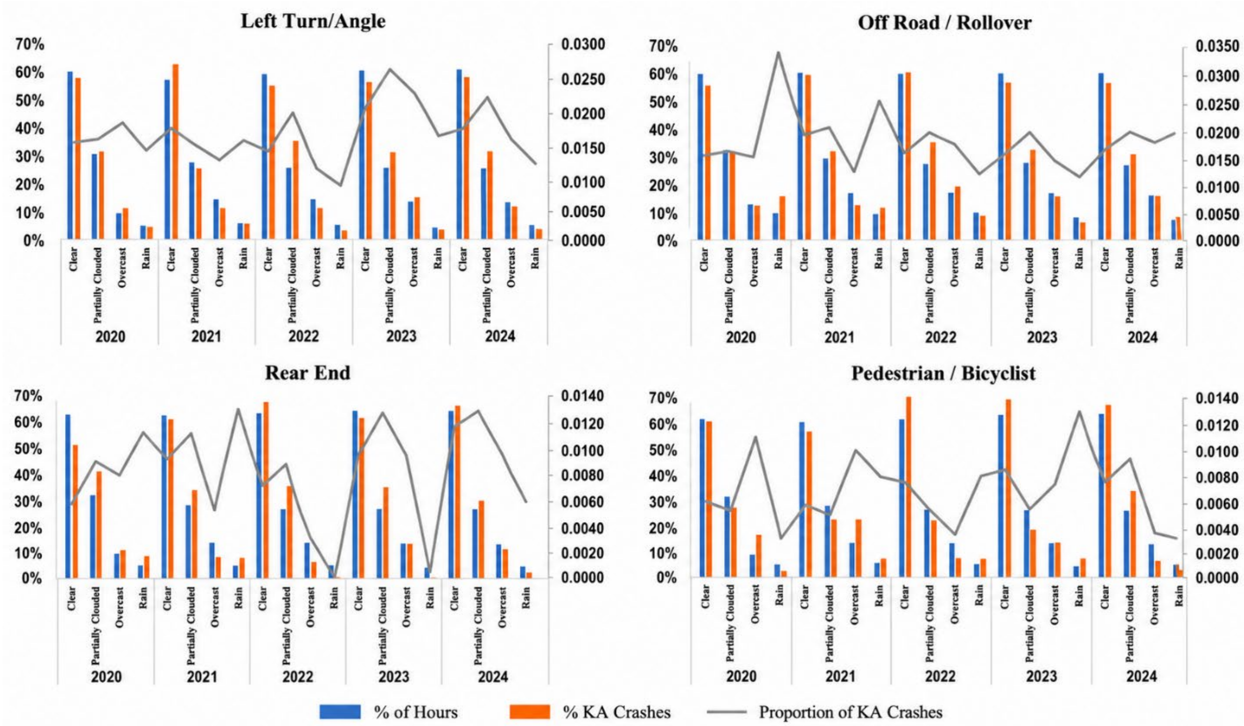


Figure A-67. Comparison of KA Crashes and Exposure by Weather Condition (2020–2024)

AII.3.3. Vehicle Type

As illustrated in **Figure A-68,** passenger cars, SUVs, and pickups made up the majority of vehicles involved in KA crashes. Passenger cars had the largest share across most crash types, followed by SUVs and pickups. A notable portion of motorcycles (16.8%) was observed in off road/rollover crashes, while other vehicle types each represented relatively small shares across crash categories.

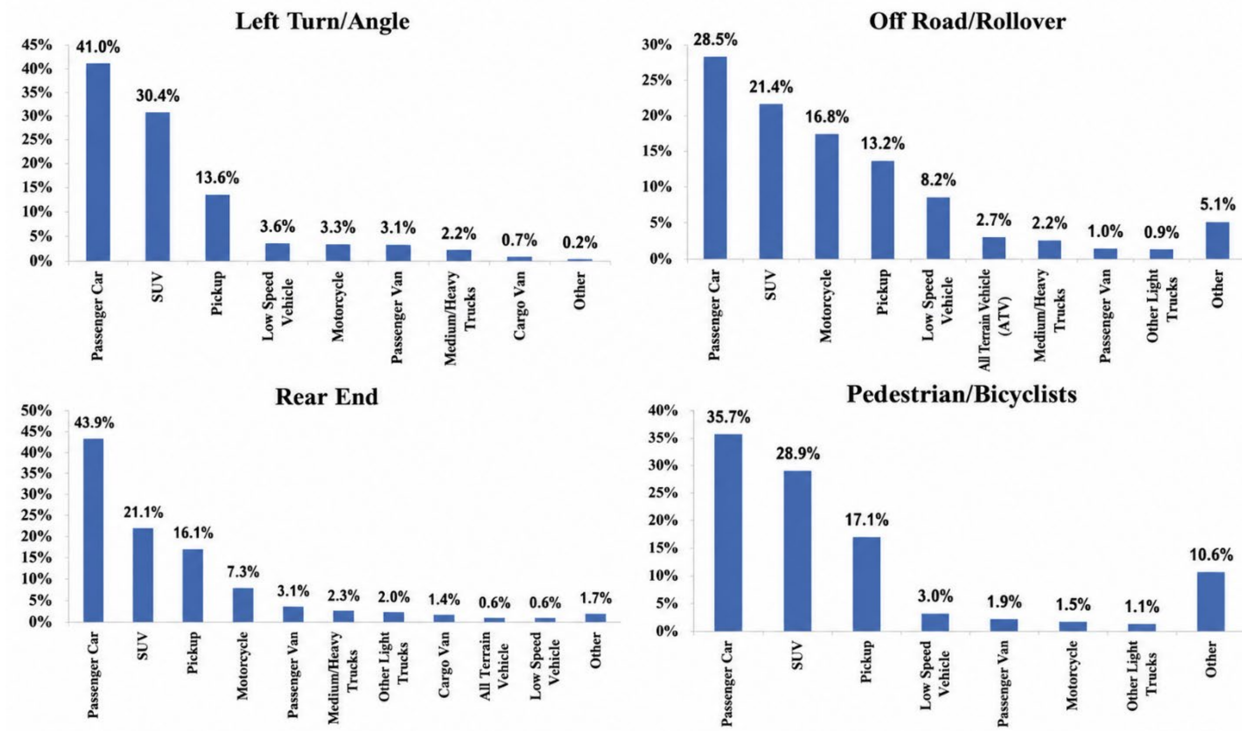


Figure A-68. KA crashes by crash type and vehicle type between 2020 and 2024

AII.4. Conclusions

The analysis of KA crashes in Lake and Sumter Counties (2020–2024) revealed distinct distributional patterns across crash types. Left turn/angle crashes were the leading crash type, with most crashes occurring at intersections. The most critical locations were unsignalized intersection (e.g., non-controlled, stop-controlled, and yield-controlled) locations. Off road/rollover crashes ranked second, concentrated on rural roadway segments, particularly two-way, two-lane undivided facilities, with a substantial share occurring in dark–not lighted conditions. Rear end crashes were also segment-dominated, especially in urban areas, while their intersection share was concentrated both at unsignalized and signalized intersections; these peaked during the afternoon commuting period. Finally, pedestrian/bicyclist crashes were predominantly located on two-way, two-lane undivided segments and unsignalized intersections, with a considerable portion occurring under low-light conditions. Across all crash types, crashes occurred primarily in clear weather and daylight, with passenger cars, SUVs, and pickups constituting the majority of involved vehicles, while motorcycles share was notably higher in off road/rollover crashes.

Across crash types, dusk stands out as one of the critical visibility periods, with a total of 121 severe (KA) crashes occurring during this time. Although dusk represents roughly one hour of the day, it accounts for a noticeably high share of severe (KA) crashes. For example, 5.6% of left-turn/angle, 7.6% off-road/rollover crashes, 4.5% of rear end and 5.2% of pedestrian and bicyclist severe crashes occurred during dusk. When compared to total crashes, the proportion of KA crashes at night is also higher than during daylight, suggesting that crash severity increases as visibility decreases. These findings indicate a need to assess roadway lighting adequacy and if required, consider activating streetlights earlier in the evening to improve driver and pedestrian visibility during dusk.

In summary, **Table A-4** presents the main findings for KA crashes by crash type in Lake and Sumter Counties during the period 2020-2024.

Table A-4. Main findings regarding KA crashes by different crash type in Lake-Sumter Counties for 2020-2024

Crash Type	Crash Location	Lighting Condition and Weather Type	Time of Day	Vehicle Type
Left turn/angle	Intersections 83.4% of total; Within intersections: **Unsignalized intersections 72.5%**	Daylight 73.6%; Dark–not lighted 10.6%; Clear weather 82.4%	Elevated 13:00–18:00; **Peaks at 16:00 (9.9%)**	Passenger car 41.6%, SUV 30.4%, Pickup 13.6%.
Off road/rollover	Segments 84.3% of total; Within segments: **two-way, two-lane undivided 75.9%; Rural 65.8%.**	Daylight 54.1%; **Dark-not lighted 26.7%**; Clear weather 72.8%	Increases after 14:00; Peaks 17:00 (7.9%)	Passenger car 28.5%, SUV 21.4%, Pickup 13.2%; **Motorcycle 16.8%**
Rear end	Segments 62.9% of total; Within segments: **two-way, two-lane undivided 44.6%, divided**. Intersections 37.1% of total; Within intersections: **Unsignalized intersections 56.4%; Signalized intersections 42.9%**	Daylight 74.4%; Dark–not lighted 12.1%; Clear weather 79.2%.	Elevated 14:00–18:00; Peaks at 16:00 11.0%	Passenger car 43.9%, SUV 21.1%, Pickup 16.1%
Pedestrian/ bicyclist	**Segments 71.2%;** Within segments**: two-way, two-lane undivided 57.4%;** Intersections 28.8%; Within intersections: **Unsignalized intersections 76.4%; Signalized intersections 21.1%**	Daylight 48.1%; **Dark–not lighted 26.1%; Dark–lighted 14.2%;** Clear weather 85.8%	Peaks 11:00 (7.5%) and 22:00 (7.8%)	Passenger cars 35.7%; SUVs 28.9%; Pickups 17.1%

AIII. Risk Analysis

AIII.1. Introduction

Understanding where severe crashes occur is only one part of building an effective Vision Zero strategy. To prevent future crashes, it is equally important to understand the driving behaviors and roadway conditions that contribute to risk before a crash happens. Connected Vehicle (CV) data provides an opportunity to observe driver behavior at a scale not possible through traditional crash reports alone. By examining patterns such as hard braking, hard acceleration, hard turning, and speeding, agencies can identify roadway segments where risky behavior is common, even if frequent serious crashes have not yet occurred. Integrating these insights with the High Injury Network (HIN) strengthens the ability of the Lake-Sumter MPO to pinpoint emerging safety concerns, prioritize proactive interventions, and better support enforcement and education strategies within the Vision Zero framework.

AIII.2. Data Description

Two complementary datasets are used in this chapter. Crash outcomes (KA) and the identification of the High Injury Network (HIN) are drawn from the project's HIN analysis (crash-based), while risky-driving behavior metrics (hard acceleration/braking/turning and speeding indicators) are derived from connected vehicle (CV) data. Throughout this chapter, crash-based metrics are used to define HIN priority locations, and CV-based metrics are used to characterize operational risk within those locations.

AIII.2.1. Connected vehicle (CV) data

In this study, CV data purchased from Streetlight were collected for Lake and Sumter counties covering a 14-day period from May 1-7, 2024, and February 1-7, 2025. Each CV data point contains a journey identifier, timestamp, GPS coordinates (latitude and longitude), heading, and speed information. On average, the dataset has almost 8.9 million trajectory points per day from 845,911 individual trips. As the data points are primarily sourced from non-commercial vehicles, the dataset achieves a market penetration rate of approximately 4-5%, offering a representative sample of vehicles operating on the road network.

AIII.2.2. Performance Measures

Four indicators were extracted from CV trajectories to represent risky driving behavior including: Hard Acceleration (HA), Hard Braking (HB), Hard Turns (HT) and Speeding Behavior.

The first three maneuvers (HA, HB, HT) were identified using a dynamic threshold approach based on the mean and standard deviation of longitudinal and lateral acceleration within each speed range (Han and Abdel-Aty, 2025). A dynamic threshold approach is adopted to identify the hard acceleration and hard brake (Arvin et al., 2019; Kamrani et al., 2017). Initially, different speed bins m (i.e., 0-5mph, 5-10mph, …70-75mph) were defined, with each bin having its own upper bound.

Therefore, the linear acceleration of CV trajectories is first calculated:

$$a_{x/r} = \frac{\Delta v}{\Delta t} = \frac{v_i - v_{i-1}}{t_i - t_{i-1}} \tag{1}$$

For each speed bin m, HA events are identified when $a_x > \mu_{x,m} + 3 * \sigma_{x,m}$, HB events when $a_x < \mu_{x,m} - 3 * \sigma_{x,m}$, and HT events when $a_r > \mu_{r,m} + 3 * \sigma_{r,m}$, Where $\mu_{x,m}$ and $\sigma_{x,m}$ (respectively, $\mu_{r,m}$ and $\sigma_{r,m}$) are the mean and standard deviation of longitudinal acceleration a_x (respectively, radial acceleration a_r) computed from all CV observations within speed bin m.

Speeding is defined as operating speed exceeding by more than 10 mph the context-based target speed designated for each roadway segment. According to Mahmoud et al. (2022), target speed represents the intended safe operating speed that reflects the roadway's design intent and surrounding context, distinct from the design or posted speed. Target speeds were determined according to the FDOT Design Manual (FDOT, 2022) and FDOT Context Classification (FDOT, 2023) as summarized in **Table A-5**.

Table A-5 Context-based Target Speeds based on FDOT Design Manual Table 201.5.1 (FDOT, 2026).

Context Classification	Target Speed (mph)
C1–C2 (Natural/Rural)	55–70
C2T (Rural Town)	25–45
C3 (Suburban)	35–55
C4 (Urban General)	25–45
C5 (Urban Center)	25–35
C6 (Urban Core)	25–30

To quantify this behavior, Target GAP was introduced as the difference between the 85th-percentile operating speed (V_{85}) and the target speed (V_{target}) defined for each roadway segment:

$$\text{Taget GAP} = V_{85} - V_{target} \tag{2}$$

The definitions of all extracted metrics are summarized in **Table A-6**.

Table A-6 Description of measures extracted from CV data.

Category	Indicator	Description	Formula / Definition
Risky driving behavior	HA	Number of CV points identified as hard acceleration events	$a_x > \mu_{x,m} + 3 * \sigma_{x,m}$
	HB	Number of CV points identified as hard braking events	$a_x < \mu_{x,m} - 3 * \sigma_{x,m}$
	HT	Number of CV points identified as hard turning events	$a_r > \mu_{r,m} + 3 * \sigma_{r,m}$
Speeding Condition	Target GAP	Difference between 85th operating speed and context-based target speed for each segment	Target GAP = 85th operating speed – target speed

AIII.2.3. Data cleaning and matching

A GIS-based spatial matching process was used to link CV observations to specific roadway segments and intersections. Roadway segments were buffered by 100 feet on either side, while intersections were represented by a 250-foot circular buffer form the centroid, allowing CV trajectories within these areas to be assigned to their corresponding network units. After matching, the data was aggregated at both the segment and intersection levels, creating a dataset that supports analysis of risky driving behaviors in relation to the High Injury Network.

AIII.3. Relationship between Performance Measures and KA Crashes

Analysis of the data revealed clear patterns linking risky-driving behaviors (HA/HB/HT) with KA crash outcomes. Following the conventional interpretation (Mukaka, 2012; Evans, 1996), correlation coefficient (ρ) with values greater than 0.20 are regarded as moderate, whereas those below 0.20 are considered weak. Heatmap correlations (**Figure A-69**) indicate that several coefficients exceed the moderate threshold ($|\rho| \geq 0.20$, $p < 0.001$). Intersection KA crashes, particularly left-turn/angle collisions, show moderate linkages ($\rho \approx 0.30$ to 0.36) with all three risky-driving indicators. At the segment level, total KA crashes correlate most strongly with HA and HB (ρ = 0.30 to 0.32), confirming that abrupt acceleration and braking are key contributors to crash occurrence. Moreover, rear-end crashes are moderately associated with HA and HB (ρ = 0.21–0.22). Overall, higher frequencies of risky-driving behavior consistently correspond to increased KA crashes across intersections and roadway segments.

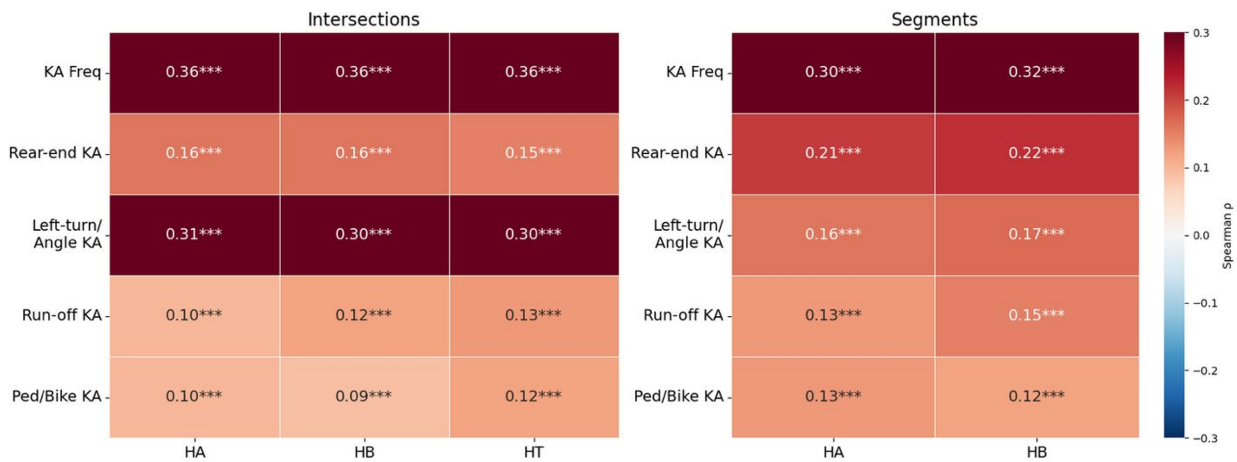


Figure A-69. Correlation between KA crashes and risky driving behavior at intersections and segments

AIII.4. Conclusions

The integration of CV data with the HIN in Lake and Sumter counties provided a detailed understanding of risky driving behaviors and their relationship to serious (KA) crashes. HA, HB, HT, and high-speeding events were found to be heterogeneously distributed but clustered at certain intersections and roadway segments, particularly along major corridors. Correlation analysis indicated that left-turn and angle crashes at intersections were associated with HA and HT, while rear-end crashes at segments were linked to HA and HB.

Overall, leveraging CV data enables a proactive, behavior-based approach to safety management, allowing targeted enforcement, education, and intersection improvements to be prioritized based on observed risky-driving patterns, thereby supporting Vision Zero and Safe System goals.

APPENDIX B

In-Depth Network Screening and HIN

APPENDIX B: In-Depth Network Screening and High Injury Network

B.1. Introduction

Over the past ten (2015-2024) years, Lake and Sumter Counties have experienced 4,539 fatal (K) and incapacitating injury (A) crashes, a concerning figure given the region's size and population. The 10-year crash trend reveals a rising number of KA crashes in recent years. In the past two years alone, a total of 1,053 KA crashes were recorded. This represents the highest number, and the second-highest proportion of KA crashes observed over the past 10 years. To address this alarming trend, the Lake-Sumter Metropolitan Planning Organization (MPO) is adopting a Vision Zero Plan aiming to eliminate fatal and serious injury crashes across the region. As part of this initiative, a network screening process is being conducted to identify the most hazardous locations.

A key component of this strategy is the development of a High Injury Network (HIN), a road safety analysis framework that highlights a subset of roadways where a disproportionate number of fatal and severe crashes occur. Identifying these high-risk segments and intersections will help to prioritize resources and implement high-impact safety improvements. The HIN framework is widely recognized and integrated into Vision Zero plans across the country.

B.2. Data Source

B.2.1. Crash Data

For network screening in Lake and Sumter Counties, the most recent five years of crash data (2020–2024) were used. This data was obtained from the Signal Four Analytics (S4A) platform, a statewide crash database developed by the University of Florida and managed in collaboration with the DHSMV. S4A provides detailed, geo-referenced crash data, including severity levels, locations, and various crash attributes. The dataset was filtered to include only crashes occurring within the geographical boundaries of Lake and Sumter Counties and excluding freeways (I-75 and the Florida Turnpike/S.R. 91).

During this period, a total of 2,372 fatal (K) and incapacitating injury (A) crashes were recorded across the two counties. These KA crashes are of particular concern due to their high human and societal costs and were the primary focus for developing HIN.

B.2.2. Road Data

The road network, intersection locations, and traffic data used in this analysis were obtained from shapefiles available through the Florida Department of Transportation (FDOT) Roadway Characteristics Inventory (RCI) open-source data platform. These shapefiles provide detailed information about different roads, including the road name, length, number of lanes, functional classification, speed limits. These details are essential for analyzing how roadway design and classification are related to crash patterns. In addition to roadway characteristics, the RCI database also includes Annual Average Daily Traffic (AADT) data which is used as traffic volume data. Historical AADT data is available from the year 2011 onward. For this analysis, the last five years of AADT data were collected, averaged and used to normalize the number of crashes by traffic volume.

B.3. Methodology

In this section the detailed methodology of network screening process is discussed. The screening process includes three parts:

(a) Identifying High Injury Corridors (HIC) that account for all segments, intersections and intersection-related crashes (within 250ft of the stop line);

(b) Identifying High Injury Segments (HIS) based only on segment crashes; and

(c) Identifying High Injury Intersections (HII).

Within a corridor, certain roadway segment(s) or intersection(s) can serve as critical hot spots that disproportionately contribute to the corridor's overall crash numbers. The corridor level analysis might not include some critical hotspots, therefore, after identifying High Injury Corridors (HIC), separate lists of High Injury Segments (HIS) and High Injury Intersections (HII) were developed. A finalized High Injury Network (HIN) was then created by integrating the results from corridor, segment, and intersection screenings (**Figure B-1**). The three sub-sections below elaborate on the step-by-step methodology to identify high risk locations for corridors, segments and intersections.

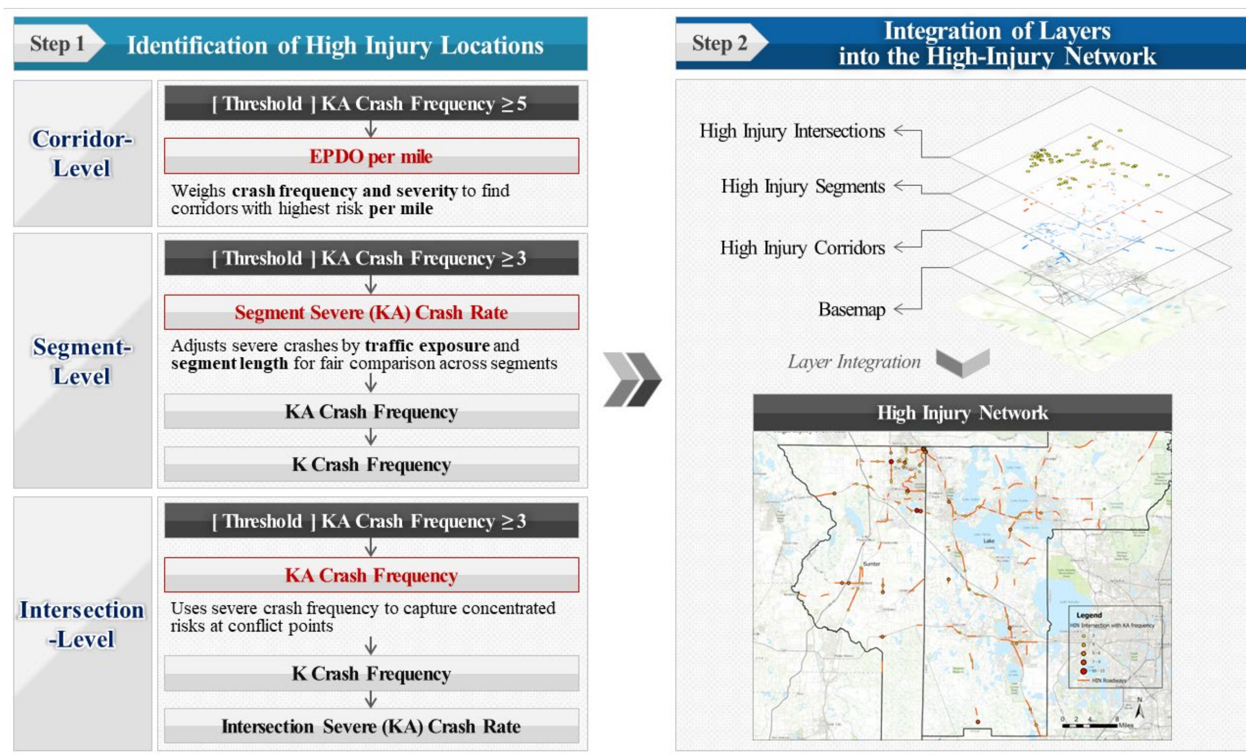


Figure B-1. Flowchart of High Injury Network Development

This systematic screening is not only a technical exercise but also directly reflects the guiding principle of Vision Zero within the Safe System approach, which emphasizes that traffic-related fatalities are both preventable and unacceptable, while also recognizing that human error is inevitable. Building on this principle, the Lake-Sumter MPO Vision Zero Plan aims to eliminate all fatal and serious injury crashes within the two counties.

B.3.1. Corridor-Level Screening

In the Highway Safety Manual (AASHTO), three network screening methods are discussed: the sliding window method, simple ranking, and peak search. Among these, the sliding window method is the most appropriate for identifying HIC, given the nature of the two counties, where crashes are more dispersed rather than concentrated at specific locations. Several Vision Zero plans across Florida have also adopted this method (Safety Action Plan Appendix, 2024). In this approach, a window of a certain length is moved along a roadway from one end to the other at a specified increment. **Figure B-2** shows an example of conducting the sliding window method using a window length of 1 mile and an increment distance of 0.1 mile. At each window, the total number of KA crashes within the window is calculated. After all windows are analyzed, overlapping windows that meet the crash threshold (5 KA crashes) are merged into a single continuous corridor. The identified corridor is then adjusted so that its start and end points coincide with the nearest intersection. Crashes that appear in multiple overlapping windows are counted only once in the continuous corridor, ensuring no duplication in the final High Injury Corridor. As shown in **Figure 3-2**, from Window W1 to W6 the number of KA crashes ranges between 5 and 7, which meets the crash threshold criterion. These overlapping windows are then merged into one continuous High Injury Corridor, with a total of 10 KA crashes.

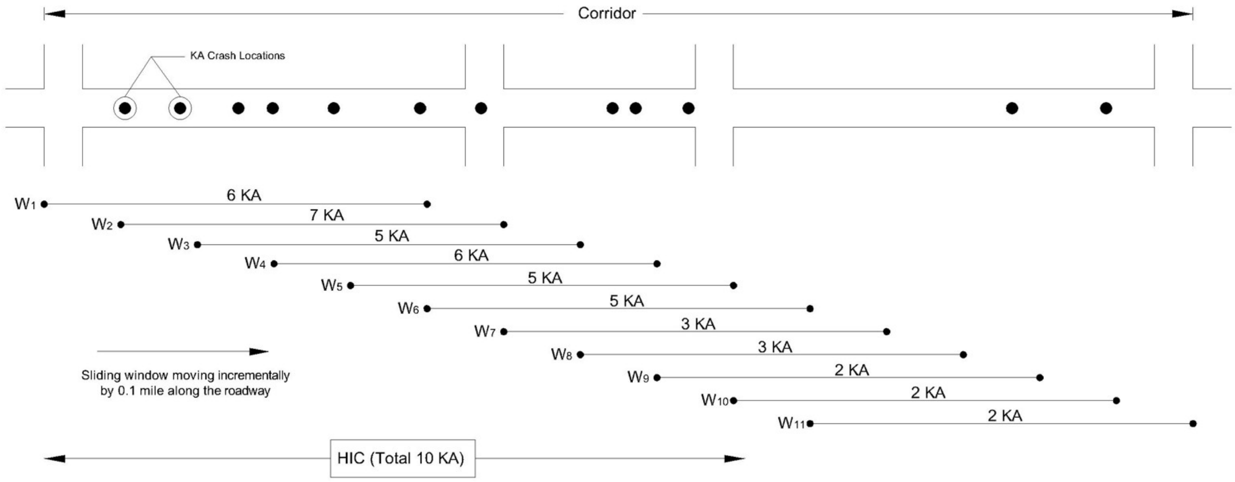


Figure B-2. Sliding Window Method

After identifying the corridors, crash weighting system was applied using Equivalent Property Damage Only (EPDO) as documented in HSM. In this method, weighting factors are assigned to crashes based on their severity and the associated societal costs of fatal, different injury levels, and property damage-only crashes, typically calculated over a three- to five-year period at a given location. These weights are then used to calculate an EPDO score. Locations are ranked from highest to lowest EPDO score, allowing for comparison of the most critical sites.

Table B-1 presents the FDOT KABCO crash costs as outlined in the 2025 edition of the FDOT Design Manual. The severity weighting factors are derived as a function of the cost of Property Damage Only (PDO) crashes, allowing for a consistent basis to compare crashes of varying severities. The EPDO weighting factor is calculated as follows:

$$\text{Crash Weighting Factor} = \frac{\text{"X" Severity Crash Cost}}{\text{PDO Crash Cost}};\ X = \text{KABC}$$

Table B-1. FDOT KABCO Crash Costs

Crash Severity	Comprehensive Crash Cost	Crash Weighting Factor
Fatal (K)	$10,890,000	1,414
Severe Injury (A)	$888,030	115
Moderate Injury (B)	$180,180	23
Minor Injury (C)	$103,950	14
Property Damage Only (O)	$7,700	1

Note:(1) Source: Florida Department of Transportation State Safety Office's Crash Analysis Reporting (CAR) System, analysis years 2015 through 2019. Published by FDOT State Safety Office on 2/23/2022.

The EPDO score for each corridor was calculated based on the crash severity weighting factors shown in **Table B-1**. For example, if a corridor experienced 20 crashes, including 2 fatal, 3 incapacitating injuries, 5 non-incapacitating injury, 4 possible injuries and 6 property damage crashes, the EPDO score would be calculated as: $(2 \times 1{,}414) + (3 \times 115) + (5 \times 23) + (4 \times 14) + (6 \times 1) = 3{,}350$. This score accounts for both the frequency and severity of crashes at the location. A high EPDO score indicates that the location has experienced a high number of severe crashes, while a low score reflects fewer or less severe crashes. A score of zero means no history of crashes occurred at that location during the study period. However, interpreting these scores requires caution. For example, a segment with a single fatal crash would receive a score of 1,414, while a segment with ten incapacitating crashes would score 1,150. It means that the score may not fully reflect the actual number of crashes at location. In addition, corridor length must also be considered, since a high score on a very short segment may indicate a more concentrated risk. Therefore, EPDO per mile was considered to rank the corridors.

B.3.2. Segment-Level Screening

Segment-level analysis begins by filtering locations with at least 3 KA crashes over the study period. Thus, locations with only one or two crashes within a five-year period are not considered sufficient to demonstrate a recurring safety problem. By requiring a minimum threshold, the analysis focuses locations with a consistent pattern of severe crashes, under the assumption that roadway characteristics remained relatively unchanged throughout the study period.

After this initial filtering, the identification of High-Injury Segments (HIS) were ranked based on the severe crash rate. Unlike corridors, where dispersed crashes are better captured through the sliding window technique, segment-level crashes are more localized and can be effectively assessed using direct ranking. In this approach, roadway segments were ranked based on the severe (KA) crash rate, which was calculated by incorporating traffic volume (AADT) as the exposure measure and segment length to avoid bias from using only KA crash counts.

The exposure measure for each segment is the total number of vehicles traveling on the road segment during the specific time period. This is called vehicle miles travel (VMT). VMT is usually expressed as Million Vehicle Miles (MVM). The equation for crash rate per MVM is:

$$\text{MVM} = \frac{\text{AADT} \times \text{segment length} \times 365 \times \text{number of years}}{1{,}000{,}000}$$

$$\text{Segment Severe Crash Rate} = \frac{\text{Number of Severe(KA) Crashes in n Year Period}}{\text{MVM for the n Year Period}}$$

This rate represents the number of KA crashes per million vehicle miles and allows for consistent comparison across segments with varying lengths and traffic volumes. Furthermore, in cases where multiple segments exhibited the same severe crash rate, KA crash frequency was used as a secondary criterion, and if still tied, K crash frequency was considered to further differentiate between them.

B.3.3. Intersection-Level Screening

To ensure that identified intersections represent locations with meaningful pattern of severe crashes, a minimum threshold of at least 3 KA crashes during the five-year period was applied. Similar to segment-level screening, this threshold reduces the influence of random or isolated events and highlights intersections with recurring safety concerns, thereby providing a more stable basis for ranking.

After applying this threshold, the identification of High-Injury Intersections (HII) ranking was based on KA crash frequency. Given that crashes at intersections are naturally concentrated at distinct conflict points, simple ranking is well suited for identifying these locations. In cases where intersections had the same number of KA crashes, those with more fatal (K) crashes were ranked higher. If intersections were still tied, the KA crash rate was used as the final tiebreaker.

To calculate intersection KA crash rate, the measure of exposure is calculated as the total number of vehicles entering the intersection during the specified time period. The total number of vehicles entering the intersection is called Total Entering Vehicles (TEV). For calculating TEV, if the AADT of the minor road is not available in some cases (for both signalized and unsignalized intersections), it is considered negligible compared to the major road, and only the major road AADT is used. TEV is usually expressed as Million Entering Vehicles (MEV). MEV is used as a scaling factor and is calculated by dividing the total number of vehicles per day per year by 1,000,000.

$$\text{MEV} = \frac{\text{TEV per day} \times 365 \times \text{number of years}}{1{,}000{,}000}$$

$$\text{Intersection Severe crash rate} = \frac{\text{Number of Severe(KA) Crashes in n Year Period}}{\text{MEV for the n Year Period}}$$

B.4. High Injury Corridors

After the network screening process, a total of 106 High Injury Corridors were identified across Lake and Sumter Counties using the sliding window method and established threshold criteria. **Figure B-3** displays the locations of these corridors within the two counties. These corridors collectively account for 1,145 KA crashes which are 48.3% of total KA crashes over the five-year analysis period, representing a significant concentration of severe crash activity within a limited portion of the overall roadway network. From **Table B-2**, the cumulative length of the identified corridors is approximately 156.48 miles, which is 13.8% of the analyzed roadways, with an average corridor length of 1.48 miles. The average number of KA crashes per corridor is 10.8, with the highest observed being 45 KA crashes and the lowest 4 KA crashes within the defined corridor.

Table B-2. HIN Corridor Statistics

	Analyzed Centerline miles	All crashes	Total KA crashes	Total K crashes	Total A crashes	Pedestrian involved KA	Bicycle involved KA	Motorcycle involved KA
All roads	1,133.10	53,522	**2,372**	376	1,996	180	100	350
HIN Corridors	156.48	18,570	**1,145**	177	968	74	51	172
HIN % All Roads	13.8%	34.7%	**48.3%**	47.1%	48.5%	41.1%	51.0%	49.1%

Out of the 106 High Injury Corridors, 58 are located in Lake County, accounting for 630 KA crashes across approximately 98.10 miles of roadways. The remaining 48 corridors are in Sumter County, encompassing 515 KA crashes over 58.38 miles.

Among the identified High Injury Corridors, several stand out due to the significant number of severe crashes they experienced during the study period. Along US 301 from CR 466 to NE 120 recorded 15 KA crashes over a short distance of 0.26 miles, making it one of the most critical locations in the region. US 27/441 from the Marion County Line to Morse Boulevard had the highest number of KA crashes, with 45 incidents occurring over 1.01 miles. Another notable corridor is SR 44 from Morse Boulevard to Vivienne Drive, which experienced 23 KA crashes within 0.56 miles. A detailed list and summary of all 106 high injury corridors are presented in **Table B-3**. The following sections provide focused analyses for the identification of High Injury Segments and High Injury Intersections. Rather than extracting problematic segments or intersections from within the identified corridors, these analyses were conducted independently. Afterward, the resulting High Injury Segments and Intersections were compared and combined with the corridors.

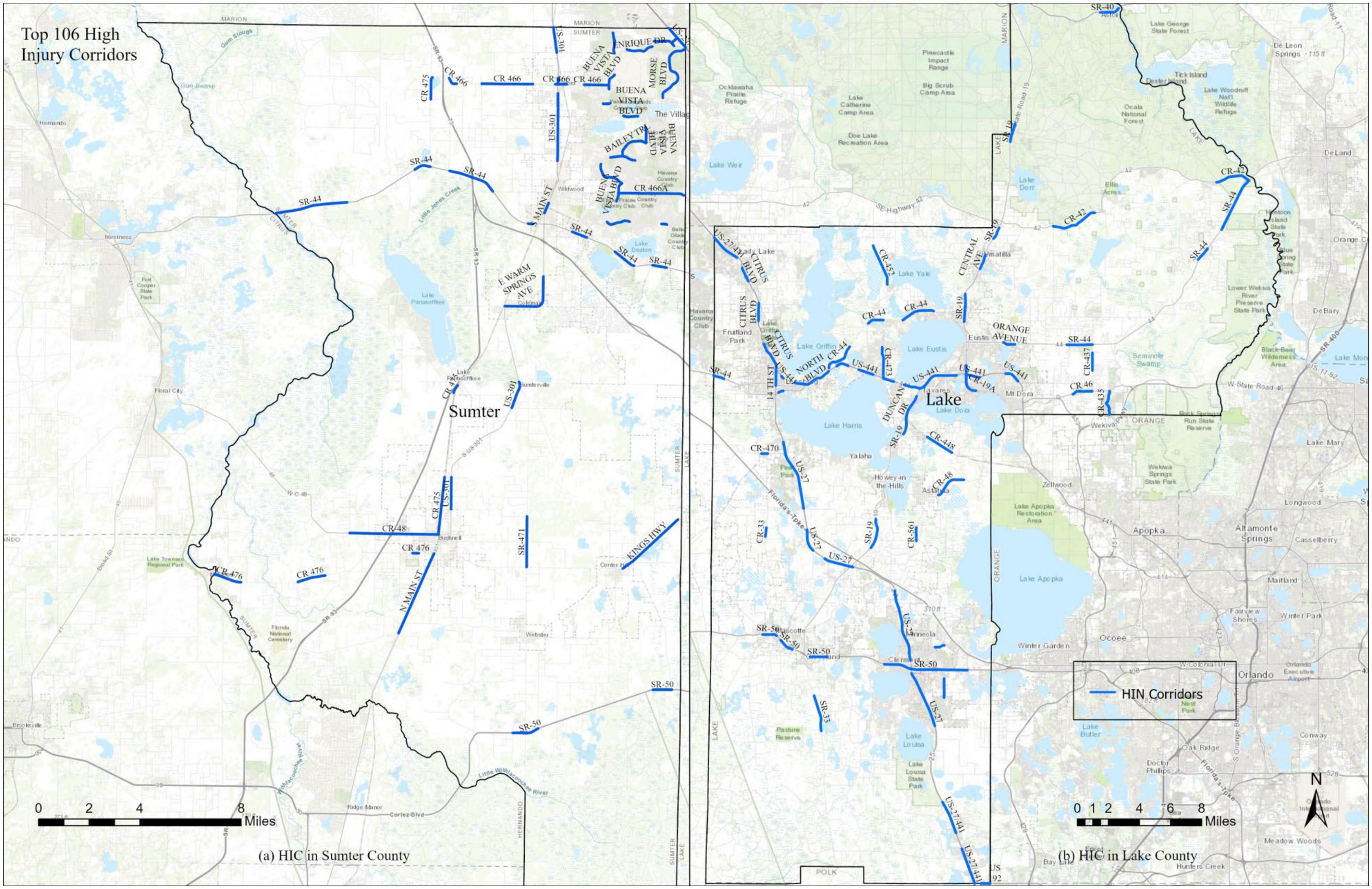


Figure B-3. Top 106 High Injury Corridors: (a) Sumter County and (b) Lake County

Table B-3. Top 106 High Injury Corridors

No	Name	County	From Intersecting Road	To Intersecting Road	All Crashes (KABCO)	Total Severe Crashes (KA)	Total Pedestrian Involved KA Crashes	Total Bicyclist Involved KA Crashes	Total motorcycle involved KA	EPDO (per mile)	Length (Miles)
1	S.R. 44	Sumter	MORSE BLVD	VIVIENNE DR	177	24	0	0	3	13638	0.6
2	U.S. 192	Lake	KERSEY ST	OUTDOOR RV RESORTS	278	14	6	0	2	12467	0.6
3	U.S. 301	Sumter	NE 120 XING	C.R. 466	198	15	0	0	0	10262	0.3
4	C.R. 475	Sumter	RAMP 18130016	RAMP 18130020	50	6	0	0	0	10238	0.3
5	S.R. 44 (DIXIE AVE)	Lake	MCKENZIE ST	S 9TH ST	71	5	1	0	3	9911	0.4
6	U.S. 27/441	Sumter	MARION CNTY LINE	MORSE BLVD	434	46	1	0	2	9652	1.0
7	C.R. 33	Lake	AUSTIN MERRITT RD	CHARTER LN	62	7	0	0	0	9091	0.6
8	S.R. 44	Sumter	POWELL RD	BUENA VISTA BLVD	123	6	1	0	0	8616	0.6
9	S.R. 44	Lake	SPRUCE DR	RORY LN	35	7	1	1	1	8153	0.9
10	U.S. 27/441	Lake	PALM ST	GRAFFIN RD	679	23	5	1	2	7525	1.7
11	U.S. 27 (14 TH ST)	Lake	C.R. 44A/GRIFFIN RD	W MAIN ST	486	10	1	3	2	7390	1.2
12	BUENA VISTA BLVD	Sumter	ST CHARLES PL	PINELLAS PL	155	17	0	1	1	6515	0.8
13	C.R. 19A	Lake	W CHARLOTTE AVE	OLD U.S. 441	381	18	4	3	5	5818	2.0
14	U.S. 441	Lake	RAMP 11010005 WB OFF	SPRING HARBOR BLVD	261	8	0	0	0	5679	0.8
15	BUENA VISTA BLVD	Sumter	SOUTHERN TRCE	PARR DR	118	16	0	2	1	5539	0.7
16	U.S. 441	Lake	N LAKE ST	C.R. 44	788	22	1	1	7	5465	2.5
17	S.R. 44	Sumter	C.R. 231	C.R. 44A	321	23	4	1	1	5418	2.0
18	S.R. 50	Lake	PEARL ST	VILLA CITY RD	134	6	0	2	1	5354	1.0
19	U.S. 441	Lake	FROM PERKINS ST	LEE ST	94	4	0	1	0	5340	0.2
20	C.R. 470	Lake	PALMETTO AVE	C.R. 33	48	5	0	0	2	5080	0.4
21	U.S. 441	Lake	PROFESSIONAL DR	TAVARES AVE	92	5	1	0	2	4620	0.8
22	S.R. 19	Lake	C.R. 561	PROGRESSIVE AERODYNE	111	12	0	0	3	4528	1.3
23	S.R. 50	Lake	WEST AVE	C.R. 455	1777	31	5	2	6	4430	5.4
24	U.S. 441	Lake	HILLTOP RD	DILLARD RD	829	30	2	1	11	4379	3.8
25	C.R. 466	Sumter	C.R. 201	C.R. 106	237	8	0	0	0	4168	0.5
26	U.S. 27/441	Lake	GOLDEN EAGLE BLVD	POLK CNTY LINE	505	21	1	3	3	4054	2.4

No	Name	County	From Intersecting Road	To Intersecting Road	All Crashes (KABCO)	Total Severe Crashes (KA)	Total Pedestrian Involved KA Crashes	Total Bicyclist Involved KA Crashes	Total motorcycle involved KA	EPDO (per mile)	Length (Miles)
27	U.S. 27	Lake	HAWTHORNE BLVD	DEWEY ROBBINS RD	368	26	1	2	4	4035	4.6
28	MORSE BLVD	Sumter	EL CAMINO REAL	C.R. 466	299	25	0	2	0	3935	2.8
29	U.S. 27/441	Lake	FRANK JARRELL RD	HOLLY GROVE BLVD	148	19	1	1	3	3887	2.2
30	HILLSBOROUGH TRL	Sumter	ENTERPRISE DR	MORSE BLVD	55	6	0	2	0	3843	0.2
31	S.R. 50	Lake	TAYLOR AVE	TIMBER VILLAGE RD	170	7	1	0	1	3838	1.1
32	U.S. 27	Lake	HOOKS ST	HIDDEN CT	877	23	3	1	5	3819	3.7
33	S.R. 44	Sumter	C.R. 243	C.R. 475	49	7	0	0	2	3613	0.7
34	C.R. 42	Lake	TENTH ST	S.R. 44	54	10	0	0	2	3565	2.3
35	S.R. 44	Sumter	INDUSTRIAL DR	RAMP 18070002 EB OFF	24	5	0	0	0	3465	0.2
36	U.S. 301	Sumter	OXFORD OAKS LN	C.R. 462 E	265	21	1	0	2	3418	2.7
37	C.R. 466	Sumter	BUFFALO TRL	BUENA VISTA BLVD	241	8	0	0	0	3321	1.0
38	C.R. 44	Lake	HICKORY HOLLOW RD	FOREST DR	153	7	1	0	1	3089	1.1
39	OLD HIGHWAY 50	Lake	N HANCOCK RD	BLACK STILL LAKE RD	25	4	0	1	0	3086	0.6
40	S.R. 19	Lake	MAIN ST	C.R. 561	244	11	2	0	3	2973	1.4
41	C.R. 44	Lake	1ST BAPTIST CHURCH	S.R. 44	70	6	0	0	1	2969	0.8
42	U.S. 27	Lake	HERITAGE DR	RAMP 11200030 NB OFF	262	14	0	1	0	2968	1.9
43	U.S. 27/441	Lake	LAKE ELLA RD	REGISTER RD	179	10	1	1	3	2959	1.1
44	U.S. 441	Lake	COLLEGE DR	BEACH PARK RD	212	6	1	1	3	2931	1.0
45	S.R. 19	Lake	SPANISH OAK DR	ARROWTREE BLVD	72	10	0	0	1	2929	2.0
46	S.R. 50	Sumter	C.R. 737	C.R. 727	78	10	0	0	1	2814	1.0
47	S.R. 50	Sumter	SE 80TH ST	C.R. 469	33	5	0	0	0	2804	0.8
48	C.R. 44	Lake	CLARK ST	LEESBURG MOB CITY RD	72	12	0	0	4	2774	2.1
49	EL CAMINO REAL	Sumter	CAZARAS AVE	BANDEROS AVE	52	7	1	0	0	2715	0.9
50	S.R. 44	Lake	C.R. 42	FOREST RIDGE RD	94	18	1	0	3	2548	3.6
51	C.R. 473	Lake	PINE ST	U.S. 441	171	11	3	1	1	2506	2.0
52	U.S. 301	Sumter	C.R. 102	C.R. 104	68	7	2	0	0	2480	1.0
53	S.R. 35	Sumter	CHAIRS ST	JOHNSON ST	92	5	0	0	1	2470	0.4

No	Name	County	From Intersecting Road	To Intersecting Road	All Crashes (KABCO)	Total Severe Crashes (KA)	Total Pedestrian Involved KA Crashes	Total Bicyclist Involved KA Crashes	Total motorcycle involved KA	EPDO (per mile)	Length (Miles)
54	C.R. 48	Sumter	C.R. 317	S.R. 33	81	9	0	0	1	2459	1.6
55	S.R. 19	Lake	CLARK RD	BEACH ST	22	4	0	0	0	2435	0.8
56	S.R. 19	Lake	WHISTLING PINES RD	COUNTRY CLUB BLVD	227	15	0	0	7	2373	1.8
57	U.S. 27/441	Lake	MORSE BLVD	WATER OAK BLVD	857	9	1	0	3	2351	2.0
58	C.R. 476	Sumter	SUMTER COUNTY LINE	C.R. 635	34	9	0	0	2	2316	1.1
59	BUENOS AIRES BLVD	Sumter	U.S. 441	EL CAMINO REAL	105	4	0	0	0	2299	0.3
60	U.S. 441	Lake	DONNELLY ST	ACCESS RD	371	7	1	0	2	2281	1.0
61	BELVEDERE BLVD	Sumter	LYNNHAVEN LN	CASTLEBERRY CIR	15	5	0	1	0	2271	0.3
62	BUENA VISTA BLVD	Sumter	AVALOS DR	TALLEY RIDGE DR	182	12	0	1	0	2226	0.9
63	S.R. 471	Sumter	C.R. 48	C.R. 564	75	13	0	0	2	2219	2.0
64	U.S. 301	Sumter	NE 41 LN	S COMMERCIAL ST	157	20	0	1	2	2202	2.6
65	U.S. 27	Lake	RAMP 11470041 OFF	C.R. 565	94	11	0	0	0	2201	1.5
66	C.R. 44	Lake	HARBOR SHORES RD	SPARROW LN	97	13	1	1	2	2193	2.2
67	U.S. 27	Lake	C.R. 561	MONTROSE ST	580	31	2	3	9	2158	4.6
68	C.R. 466	Sumter	C.R. 475	N MAIN ST	33	6	0	0	0	2141	0.4
69	S.R. 40	Lake	RIVER RD	HOLIDAY RD	56	9	1	1	2	2135	1.3
70	HILLSBOROUGH TRL	Sumter	BUENA VISTA BLVD	INVERARY AVE	24	5	0	3	0	2126	1.0
71	HANCOCK RD	Lake	GREATER PINES BLVD	HANCOCK REC AREA	96	6	0	1	3	2113	1.2
72	C.R. 476	Sumter	C.R. 607	BATLE FLD DR/C.R. 603	8	4	0	0	0	2025	0.3
73	U.S. 27/441	Lake	C.R. 25/TEAGUE TRL	GRIFFIN VIEW DR	317	6	0	0	2	1982	1.0
74	BUENA VISTA BLVD	Sumter	STILLWATER TRL	BAILEY TRL	76	9	1	0	1	1969	0.6
75	U.S. 441	Lake	C.R. 473	PALM GARDEN ST	79	7	0	0	3	1879	0.7
76	U.S. 301	Sumter	C.R. 470 E	C.R. 526	142	11	0	0	1	1856	1.1
77	C.R. 476	Sumter	C.R. 476B	C.R. 629A	19	5	0	0	0	1814	1.1
78	S.R. 44	Sumter	C.R. 169	CONTINENTAL BLVD	56	11	0	0	1	1680	0.9
79	C.R. 475	Sumter	C.R. 312	S.R. 48/BELT AVE	71	7	0	0	0	1670	2.3
80	S.R. 44	Sumter	SUMTER COUNTY LINE	C.R. 470	121	14	0	0	2	1668	2.9

No	Name	County	From Intersecting Road	To Intersecting Road	All Crashes (KABCO)	Total Severe Crashes (KA)	Total Pedestrian Involved KA Crashes	Total Bicyclist Involved KA Crashes	Total motorcycle involved KA	EPDO (per mile)	Length (Miles)
81	S.R. 19	Lake	FOX DEN LN	DEER CROSSING RD	18	5	0	1	0	1662	1.2
82	S.R. 44	Lake	VALLEY HILL LN	C.R. 437	68	8	1	0	1	1593	1.7
83	C.R. 48	Lake	SPLENDID MEADOW CT	RANCH RD	19	6	0	0	0	1587	2.1
84	C.R. 48	Sumter	S.R. 33	N MAIN ST	188	18	3	1	0	1495	1.9
85	C.R. 435	Lake	C.R. 46	ORANGE COUNTY LINE	77	6	0	0	4	1489	1.7
86	C.R. 466	Sumter	C.R. 229	C.R. 209	59	9	1	0	1	1370	2.0
87	S.R. 50	Lake	TUSCANOOGA RD	C.R. 33	108	5	1	0	1	1301	0.9
88	C.R. 46	Lake	HOBDY RD	C.R. 437	106	8	1	0	2	1222	1.3
89	C.R. 448	Lake	LAKE INDUSTRIAL BV	SHIRLEY SHORES RD	26	6	0	0	1	1153	1.9
90	BUENA VISTA BLVD	Sumter	LAKE MONA DR	TERNBERRY FOREST DR	42	4	0	0	1	1083	0.6
91	S.R. 33	Lake	GROVENLAND FARMS RD	SWAMP DR	44	8	0	0	0	1044	2.3
92	S.R. 19	Lake	PALM ST	TURTLE RUN	116	4	1	0	1	1042	1.0
93	S.R. 44	Lake	SUMTER LINE RD	UNSIGNED	21	5	0	0	2	1037	0.7
94	C.R. 466A	Sumter	BUENA VISTA BLVD	FARNER PL	249	12	0	0	2	1017	2.6
95	U.S. 301	Sumter	SEMINOLE AVE	C.R. 673	94	14	0	0	0	1009	3.4
96	ST CHARLES PL	Sumter	BUTTONWOOD RUN	BUENA VISTA BLVD	59	9	2	2	1	996	1.3
97	C.R. 452	Lake	EMERALDA ISLAND RD	FELKINS RD	72	10	0	0	2	959	3.2
98	C.R. 42	Lake	C.R. 439	CLEARWATER LAKE REC	63	9	0	0	2	938	3.0
99	BAILEY TRL	Sumter	BUENA VISTA BLVD	ST CHARLES PL	50	7	0	0	0	902	1.3
100	C.R. 561	Lake	DOUBLE RUN RD	C.R. 455	24	5	1	0	0	838	0.9
101	C.R. 48	Sumter	C.R. 469	C.R. 558	39	8	0	1	2	822	2.9
102	U.S. 301	Sumter	C.R. 532 E	C.R. 542 W	24	7	0	0	2	710	1.3
103	ENRIQUE DR	Sumter	CARVELLO DR	CAZARAS AVE	14	6	0	0	0	704	1.1
104	ST CHARLES PL	Sumter	PENNECAMP DR	DARLINGTON DR	18	5	2	0	0	684	1.0
105	C.R. 475	Sumter	C.R. 245E	NW 111 LN	14	4	0	0	1	596	0.9
106	C.R. 437	Lake	MARBELLA DR	PALAMINO TL	16	5	0	0	0	553	1.1

Note: The EPDO values reported in the table are normalized per mile to account for corridor length. The order is based on these per mile EPDO.

B.5. High Injury Segments

The identification and characterization of High Injury Segments provide critical insights into where the most severe crash outcomes are concentrated within the roadway system. This section summarizes the spatial and functional distribution of the segments designated as part of the HIN based on KA crash frequency and rates. By isolating the segments with concentrated KA risk, the analysis supports targeting resources where the greatest safety impact can be achieved. Across the two counties, 1,133 miles of roadway were analyzed, and each segment was evaluated using a standardized KA crash rate.

Building upon the screening methodology described earlier, a total of 40 segments were identified as High Injury Segments within the study area. Summary statistics for the identified High Injury Segments are presented in **Table B-4**. Together, these 40 segments span approximately 30 miles, constituting only 2.6% of the total roadway miles analyzed. Despite this limited coverage, they are associated with 146 KA crashes accounting for 10.8% of all segment level KA crashes observed during the study period.

Table B-4. HIN Segment Statistics

	Analyzed Centerline miles	All segment crashes	Total KA crashes	Total K crashes	Total A crashes	Pedestrian involved KA	Bicycle involved KA	Motorcycle involved KA
All roads	1,133.1	32,696	1,353	228	1,125	138	58	207
HIN Segment	30	1,092	146	23	123	8	3	25
HIN % All Roads	2.6%	3.3%	10.8%	10.1%	10.9%	5.8%	5.2%	12.1%

The selected segments vary in length, location, and functional classification, reflecting a mix of both arterial corridors and collector roads. **Figure B-4** shows the spatial distribution of the 40 High Injury Segments across the study area. **Table B-5** provides a detailed summary of these segments, including the number of lanes per direction, speed limit, functional classification, context classification, KA and total crash counts, and KA crash rate.

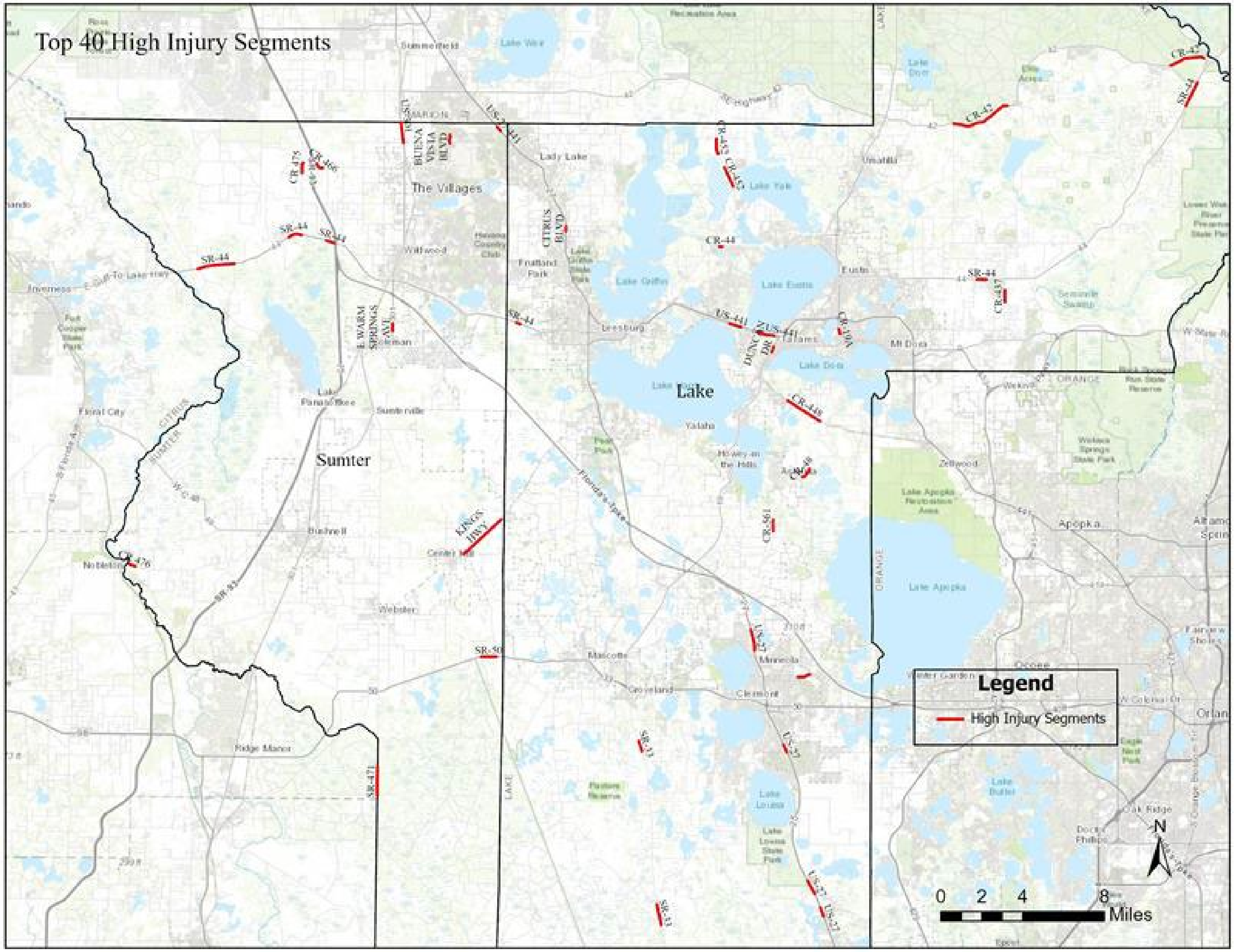


Figure B-4. Top 40 High Injury Segments (Lake and Sumter Counties)

Table B-5. Top 40 High Injury Segments

No	Roadway Name	County	From Intersecting Road	To Intersecting Road	Functional Class	Context Classification	Lane Per Direction	Speed (mph)	Total KA	All crashes (KABCO	KA Crash Rate	Length (mile)
1	C.R. 476	Sumter	C.R. 647	C.R. 659	Rural Major Collector		1	45	3	16	1.27	0.3
2	C.R. 44	Lake	EMERALDA AVE	RHETT RD	Urban Major Collector	C3R	1	40	3	12	1.06	0.1
3	U.S. 27/441	Sumter	NE 138TH	LOWES	Urban Principal Arterial–Other	C3C	3	45	8	43	0.78	0.1
4	C.R. 42	Lake	TENTH ST	RIVER FOREST BLVD	Rural Major Collector		1	55	8	24	0.70	1.7
5	C.R. 19A	Lake	BAY RD	DODSON CUTOFF	Urban Minor Arterial	C3C	1	45	3	23	0.65	0.2
6	C.R. 475	Sumter	C.R. 245E	C.R. 246 S	Rural Major Collector		1	45	3	6	0.63	0.5
7	S.R. 44	Sumter	C.R. 231	RAMP 18120021 SB ON	Rural Principal Arterial–Other	C3C	2	45	5	73	0.59	0.4
8	C.R. 561	Lake	DOUBLE RUN RD	WHITE CYPRESS RD	Rural Major Collector	C2	1	50	4	7	0.50	0.6
9	C.R. 48	Lake	LAYLAINE DR	RANCH RD	Rural Major Collector		1	55	3	10	0.50	0.6
10	U.S. 301	Sumter	NE 41 LN	NE 37 PL	Urban Principal Arterial–Other	C2	1	55	5	13	0.48	0.4
11	S.R. 44	Lake	FOREST DR	TOMAHAWK TRL	Rural Principal Arterial–Other	C2	1	55	3	8	0.47	0.4
12	C.R. 466	Sumter	C.R. 475	N MAIN ST	Rural Major Collector		1	45	3	16	0.47	0.4
13	C.R. 42	Lake	C.R. 439	CLEARWATER LAKE REC	Rural Major Collector		1	55	7	40	0.36	3.0
14	S.R. 44	Lake	COUNTRYSIDE BLVD	UNSIGNED	Urban Principal Arterial-Other	C3R	2	55	3	8	0.353	0.21
15	OLD HIGHWAY 50	Lake	N HANCOCK RD	BLACK STILL LAKE RD	Urban Major Collector		1	35	3	16	0.31	0.6
16	S.R. 33	Lake	GROVENLAND FARMS RD	MCGILL RD	Rural Minor Arterial	C2	1	60	3	10	0.31	0.5
17	U.S. 27/441	Sumter	Lowe's Driveway	NE 136TH	Urban Principal Arterial–Other	C3C	3	45	3	52	0.31	0.1
18	S.R. 44	Sumter	C.R. 243	C.R. 475	Rural Principal Arterial–Other	C2	2	60	4	18	0.31	0.7
19	C.R. 48 (KINGS HWY)	Sumter	C.R. 702	C.R. 558	Rural Minor Collector		1	45	5	22	0.30	2.5
20	S.R. 471	Sumter	S CARTER RD	N GRADE RD	Rural Minor Arterial		1	60	3	6	0.27	1.4
21	BUENA VISTA BLVD	Sumter	EL CAMINO REAL	TALLEY RIDGE DR	Urban Major Collector		2	35	3	6	0.27	0.4
22	S.R. 44	Lake	LINDEN LN	LA PLACE CT	Urban Principal Arterial–Other	C2	1	55	3	9	0.27	0.5
23	C.R. 452	Lake	EMERALDA ISLAND RD	LITTLE HORSE DR	Rural Major Collector		1	55	3	16	0.26	0.7
24	S.R. 50	Sumter	SE 80TH ST	C.R. 469	Rural Principal Arterial–Other	C1	1	55	3	16	0.24	0.8
25	U.S. 27/441	Lake	EAGLES NEST RD	SHADOW HILL DR	Urban Minor Collector	C3C	2	50	3	40	0.23	0.2
26	C.R. 437	Lake	MARBELLA DR	SALINERO AVE	Urban Major Collector		1	45	3	5	0.23	0.6

No	Roadway Name	County	From Intersecting Road	To Intersecting Road	Functional Class	Context Classification	Lane Per Direction	Speed (mph)	Total KA	All crashes (KABCO	KA Crash Rate	Length (mile)
27	S.R. 44	Lake	PONDEROSA AVE	TOMAHAWK TRL	Rural Principal Arterial–Other	C2	1	55	3	15	0.22	0.9
28	C.R. 452	Lake	YALE COVE RD	LAKE YALE BAPTIST ASSEMBLY RD	Rural Major Collector		1	55	3	15	0.19	1.0
29	U.S. 27	Lake	MARQUAX DR	N BOGGY MARSH RD	Urban Minor Collector	C2	3	60	4	36	0.18	0.5
30	S.R. 19 (DUNCAN DR)	Lake	MAIN ST	DEAD RIVER RD	Urban Minor Arterial	C3C	2	45	3	48	0.17	0.3
31	U.S. 27	Lake	SOUTH GRASSY LAKE RD	LK MINNEOLA SHR	Urban Principal Arterial–Other	C2	3	50	3	64	0.16	0.3
32	S.R. 33	Lake	OFF ROAD REVOLUTION	OIL WELL RD	Rural Minor Arterial	C2	1	60	3	19	0.13	1.0
33	C.R. 448	Lake	LAKE INDUSTRIAL BV	SHIRLEY SHORES RD	Rural Minor Collector		1	55	4	20	0.10	1.9
34	U.S. 27	Lake	HAMMOCK RIDGE RD	BELLA LAGO DR	Urban Major Collector	C3C	3	55	3	55	0.10	0.4
35	U.S. 27	Lake	FRANK JARRELL RD	HARVEST BLVD	Urban Principal Arterial–Other	C2	3	65	3	22	0.09	0.7
36	U.S. 441	Lake	C.R. 473	7 TH SUNFISH ST	Urban Principal Arterial–Other	C3C	3	50	4	55	0.08	0.6
37	U.S. 301	Sumter	C.R. 102	C.R. 202	Urban Principal Arterial–Other	C2	2	55	3	30	0.07	1.0
38	S.R. 44	Sumter	C.R. 251	C.R. 470	Rural Principal Arterial–Other	C2	2	60	3	53	0.06	1.8
39	U.S. 27	Lake	OAK VALLEY BLVD	LK MINNEOLA SHR	Urban Local	C2	2	55	3	107	0.06	0.8
40	U.S. 441	Lake	HILLTOP RD	LK SHORE BLVD	Urban Principal Arterial–Other	C3C	3	50	4	59	0.05	0.9

B.5.1. Roadway Characteristics of High Injury Segments

Figure B-5 presents the functional class distribution of the High Injury Segments, based on both mileage and associated KA crashes. Principal Arterial (excluding freeways) make up 33.1% of the roadway mileage, which accounts for 42% of KA crashes within the High Injury Segments. This concentration can be attributed to the design and operation of these segments, which often include higher speeds, multiple lanes, and greater traffic volume, factors that increase both the likelihood and severity of crashes. Minor Arterials, in comparison, comprise 11.8% of the High Injury Segments mileage and contribute 10.5% of KA crashes. Major Collectors account for the highest 37.7% of the total mileage and 36.4% of KA crashes, while Minor Collectors make up 17.5% of the mileage and 11.2% of crashes within the High Injury Segments.

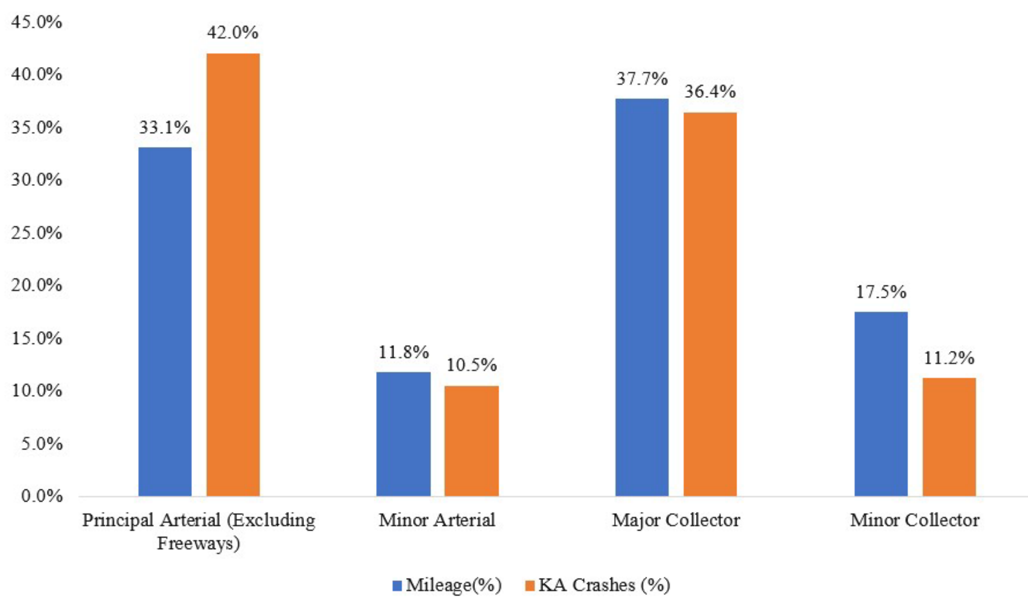


Figure B-5 Comparison of Mileage and KA Crash distribution by Functional Classification

In terms of road type, the High Injury Segments include both rural and urban roadways. As shown in **Figure B-6**, urban roads constitute the majority of the network, accounting for 70.3% of the total mileage and 52.1% of the KA crashes. In contrast, rural roads make up only 29.7% of the total mileage but are associated with 47.9% of KA crashes which indicates an over-representation of severe crash rates on rural High Injury Segments.

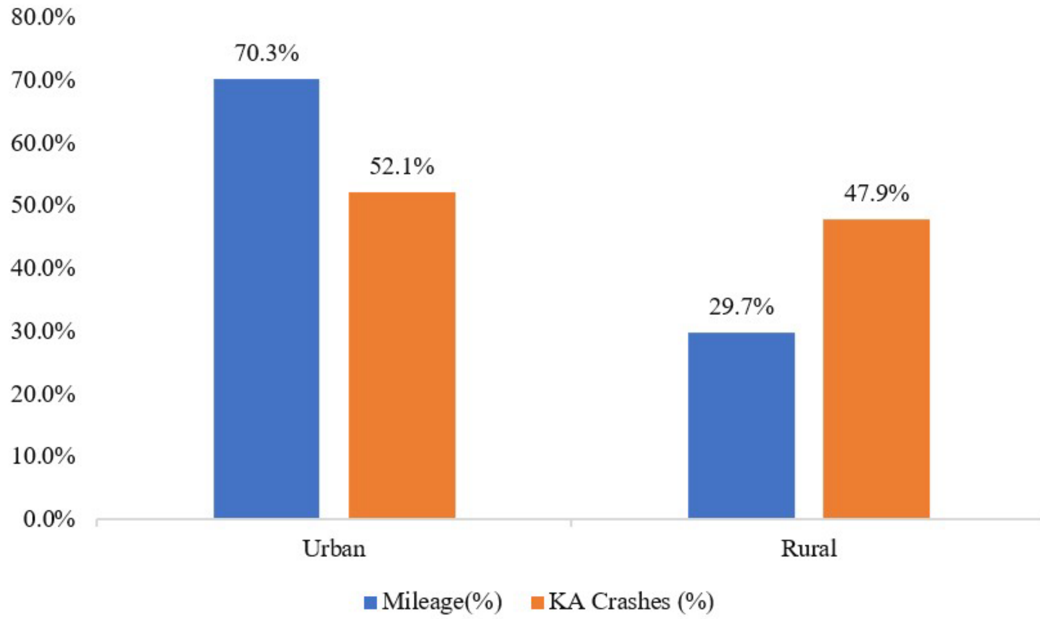


Figure B-6. Comparison of Mileage and KA Crash Distribution by Road Type

Lane configuration within the High Injury Segments is shown in **Figure B-7**. Segments with only 1 lane per direction make up 68.6% of the mileage and also associated with a higher 57.5% of KA crashes. These segments are typically part of rural collector roads or minor arterials that are two-way, two-lane roads and have lower traffic volumes. In contrast, multilane (2-3 lanes per direction) segments are over-represented with severe crash rates with only 31.4% mileage accounting for 42.4% of KA crashes. These segments are predominantly principal arterials, which generally serve higher traffic volumes and facilitate higher posted speed limits.

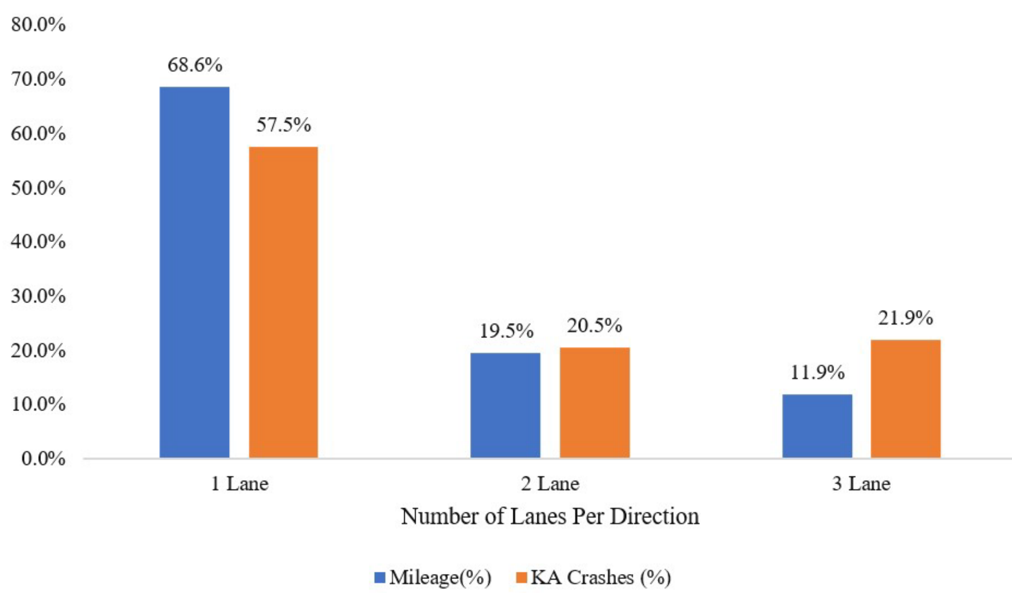


Figure B-7. Comparison of Mileage and KA Crash Distribution by Number of Lanes Per Direction

The distribution of mileage and KA crashes by speed limit (**Figure B-8**) indicates that the majority of High Injury Segments are within the roadways with posted speed limit of 55 mph, accounting for 47.2% of the mileage and 39% of KA crashes.

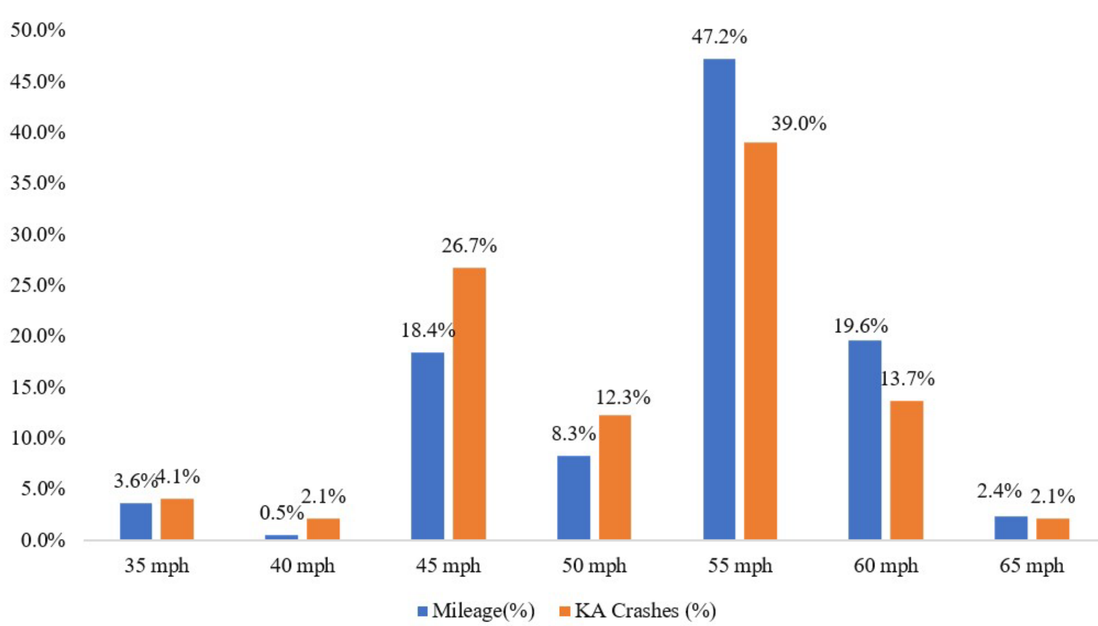


Figure B-8. Comparison of Mileage and KA Crash Distribution by Speed Limit

B.5.2. Crash Characteristics of High Injury Segments

The crash characteristics within the High Injury Segments provide insight into the most common types of severe crashes. As shown in **Figure B-9**, off road (29.9%) and rollover (10.2%) crashes are the most frequent, accounting for total 40.1% of all KA crashes. Other major crash types include rear end (24.5%) and head on (11.6%). Pedestrian (5.4%) and bicycle (2%) crashes also contribute a combined 7.4% of KA crashes, indicating a meaningful level of risk to vulnerable road users along the segments.

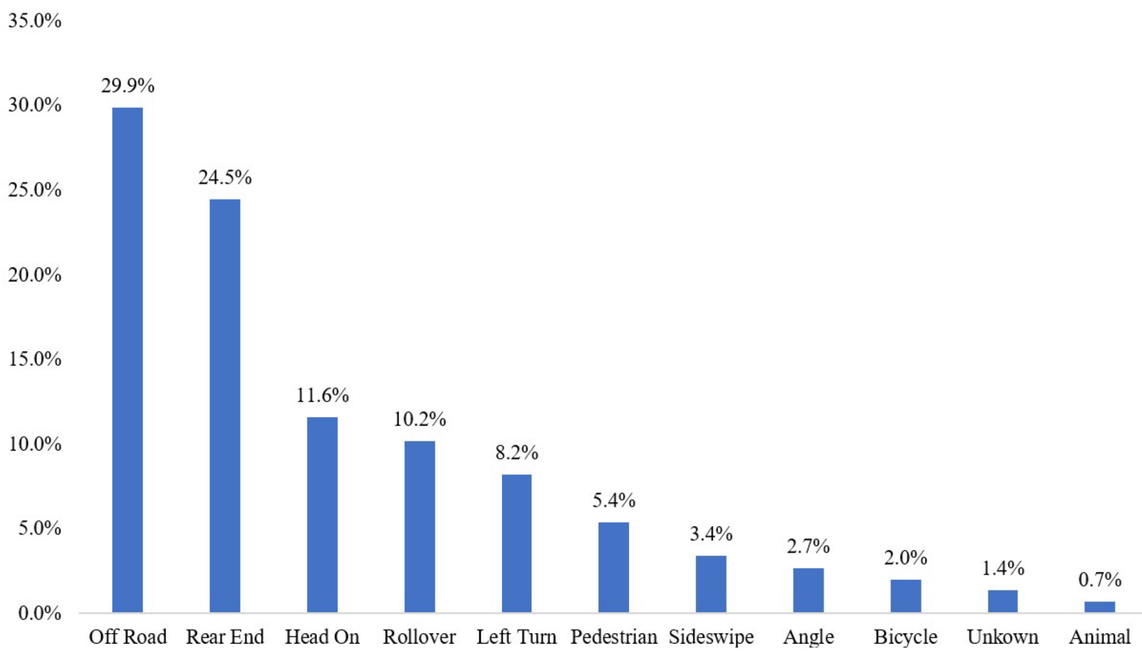


Figure B-9. Distribution of KA Crashes within the High Injury Segments

Lighting conditions are also an important factor in crash occurrences. From **Figure B-10**, it is observed that while 59.9% of KA crashes in the selected High Injury Segments occurred during daylight, a substantial 24.5% took place under dark–not lighted conditions. Further investigation is needed to identify specific segment locations with potential lighting deficiencies.

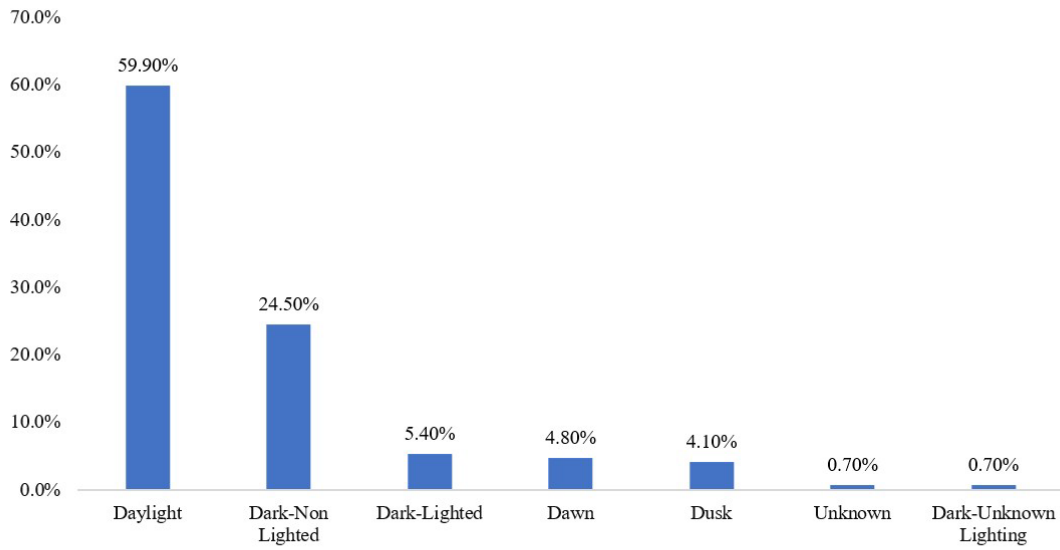


Figure B-10. Distribution of KA Crashes by Light Condition

In accordance with Signal Four Analytics (S4A) database, lane departure-related crashes were identified not only through vehicle harmful events but also by examining specific driver actions at the time of the crash. A crash was classified as lane departure-related if the recorded driver action included any of the following: improper passing, wrong side or wrong way driving, failure to keep in proper lane, ran off roadway, over-correcting or over-steering, or swerving/avoiding. The presence of any of these actions indicates a deviation from the intended travel path, thereby contributing to lane departure behavior. As shown in **Figure B-11**, 65.1% of all crashes were classified as lane departure related in the selected High Injury Segments.

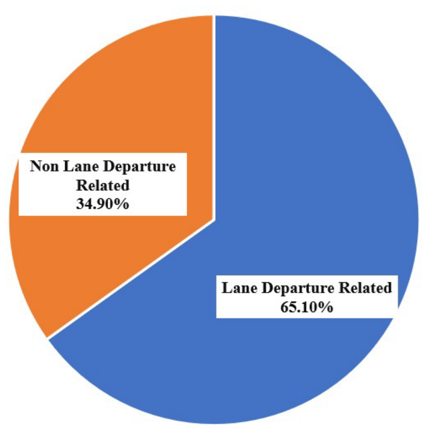


Figure B-11. Distribution of Lane Departure Related Crashes at HIN Segments

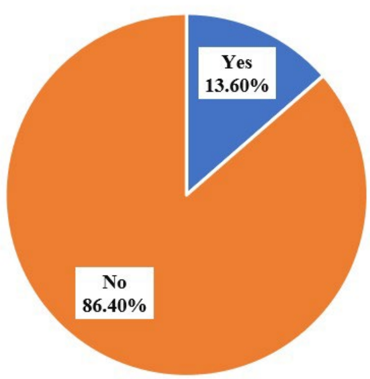
Furthermore, **Table B-6** shows the relationship between lane configuration and lane departure crashes on High Injury Segments. Nearly half of all lane departure crashes (45.9%) occurred on segments with one lane per direction, indicating that these two-way, two-lane roadways represent the majority of severe lane departure events.

Table B-6. Distribution of Lane Departure Crashes by Number of Lanes

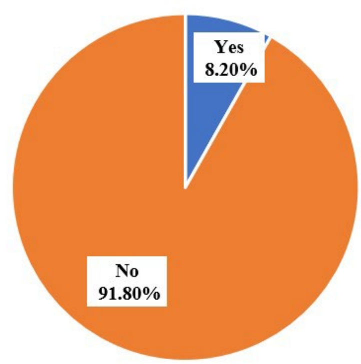
Lanes per Direction	Non-Lane Departure Related	Lane Departure Related
1 lane	18 (12.3%)	67 (45.9%)
2 lanes	18 (12.3%)	12 (8.2%)
3 lanes	16 (11.0%)	15 (10.3%)

Note: % based on the total KA crash on High Injury Segments

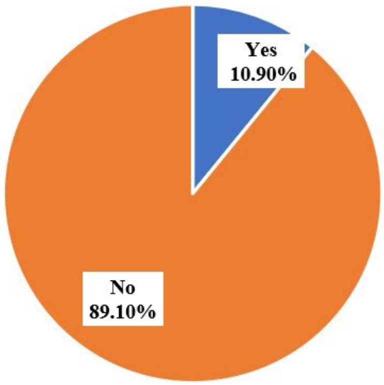
Figure B-12 presents the distribution of different behavioral factors associated with crashes. Among the cases analyzed, DUI was the most commonly identified contributing factor, accounting for 13.6% of crashes within High Injury Segments. This was followed by distracted driving (12.2%), aggressive driving (10.9%), and speeding (8.2%). Although each of these behaviors represent a relatively small proportion individually, their presence reflects high risk driving patterns that contribute to crash occurrence and severity.

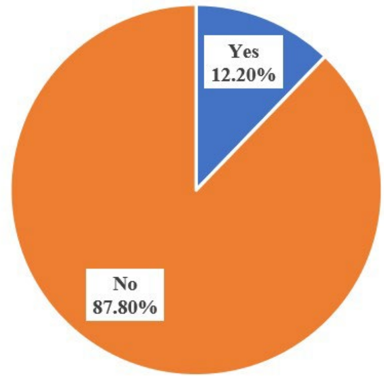


a) DUI



b) Speeding





c) Aggressive Driving

d) Distracted Driving

Figure B-12. Distribution of Behavioral Factors Contributing to Crashes in the High Injury Segments

Furthermore, **Figure B-13** shows that 19% of crashes involved one risky behavior (DUI, speeding, aggressive driving or distracted driving), while an additional 10.6% of crashes involved multiple risky behaviors. This indicates that nearly one-third (29.6%) of KA crashes on High Injury Segments were associated with at least one high-risk behavior. This distinction is important, as it demonstrates that a subset of severe crashes results from the compounding effect of multiple dangerous actions, indicating the need for multifaceted behavioral interventions.

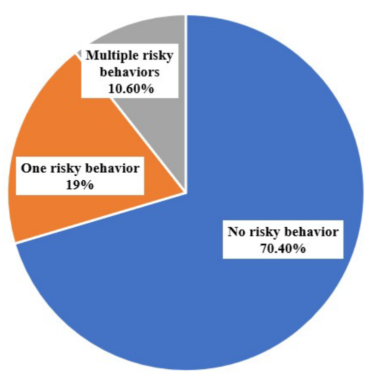
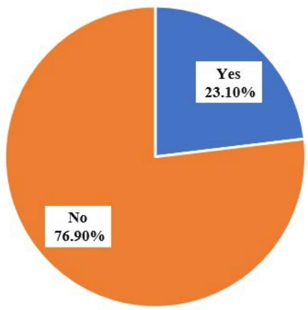
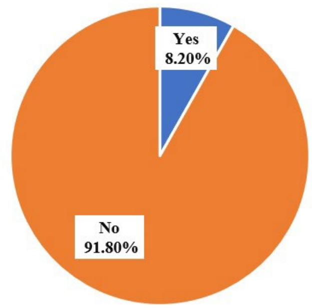


Figure B-13. Distribution of Overall Risky Behavior on High Injury Segments

Figure B-14 illustrates the involvement of aging (65 and over) and teenage (15-19) drivers in crashes. Aging drivers were involved in 23.1% of the total crashes, whereas teenage drivers accounted for 8.2% within the selected High Injury Segments.



a) Aging Driver Involvement



b) Teen Driver Involvement

Figure B-14. Driver Age Group Involvement in Crashes

Hourly distribution in **Figure B-15** shows that crash occurrences increase notably during the afternoon and evening hours, with a peak at 15:00–16:00 (11.6%). Crash percentages remain relatively high from 13:00 to 17:00 and again at night around midnight (24:00, 8.2%). In contrast, the early morning hours (1:00–5:00) show the lowest crash frequencies, likely due to reduced traffic volumes during those times.

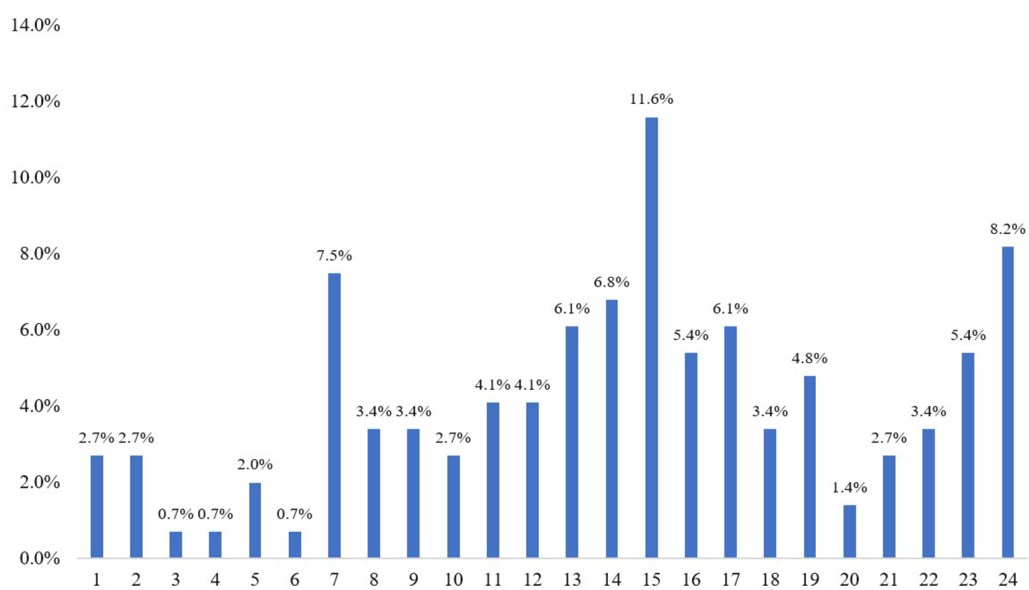


Figure B-15. Crash Distribution per Hour of The Day in the High Injury Segments

B.6. High Injury Intersections

Intersections often exhibit different crash dynamics than mid-block segments due to multiple conflict locations from crossing and turning traffic. This section summarizes intersections within the study area that demonstrate a high concentration of fatal and serious injury (KA) crashes. Based on the methodology described earlier, intersections were evaluated using three key metrics: total KA crash frequency, K crash frequency, and KA crash rate. Intersections with more than three KA crashes over the past five years were considered for analysis.

A total of 70 intersections were identified as High Injury Intersections as shown in **Figure B-16**. Summary statistics for the High Injury Intersections are presented in **Table B-7**. These 70 intersections account for 295 KA crashes, which is 29% of the total intersection and intersection related (within 250 ft of stop bar) KA crashes. To ensure more meaningful comparisons, the selected intersections were divided into signalized and unsignalized groups. Of the total, 44 are located in Sumter County (20 signalized and 24 unsignalized), while 26 are in Lake County (12 signalized and 14 unsignalized). **Table B-8** and **Table B-9** present detailed summaries for these two groups. The KA crash rate is shown in **Table B-8**: It is noteworthy to mention that the intersection at Wedgewood Lane and Buffalo Trail is an unsignalized junction with no available traffic volume data. Despite being a meeting point of two local roads, it recorded 4 KA crashes, including 1 fatal crash, over the 5-year study period, making it one of the critical locations. Based solely on KA crash frequency and the presence of a fatal crash, it ranks 13th in the list shown in **Table B-8.**

Table B-7 High Injury Intersection Statistics

	All intersection crashes	Total KA crashes	Total K crashes	Total A crashes	Pedestrian involved KA	Bicycle involved KA	Motorcycle involved KA
All Intersections	20,812	1,015	148	867	42	43	144
HII	2,933	296	37	259	9	12	31
HII % All Intersections	14.1%	29%	25%	30%	21.4%	27.9%	21.5%

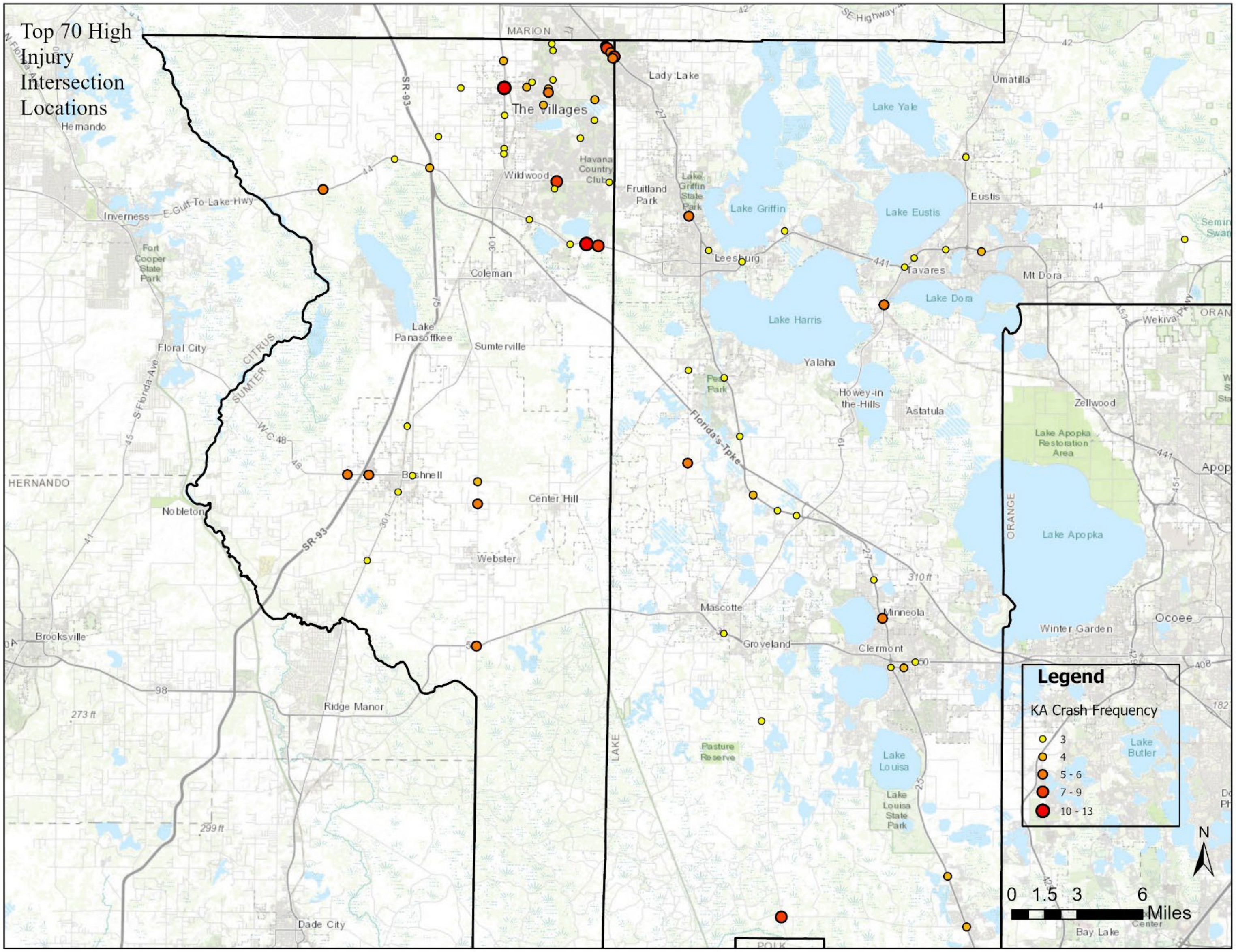


Figure B-16. Top 70 High Injury Intersections (Lake and Sumter)

Table B-8. Top 38 Unsignalized High Injury Intersections

No	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
1	Lake	Rural	T Intersection	S.R. 33	C.R. 474	9	1	35	0.291
2	Sumter	Urban	T Intersection	S.R. 44	Vivienne Dr	8	1	27	0.191
3	Lake	Urban	Four Way Intersection	C.R. 33	BRIDGES RD	6	2	46	0.414
4	Lake	Urban	Four Way Intersection	S.R. 19	C.R. 561	6	2	24	0.102
5	Sumter	Rural	T Intersection	S.R. 44	C.R. 470	6	0	25	0.184
6	Sumter	Rural	T Intersection	C.R. 48	C.R. 616	5	2	11	0.495
7	Sumter	Urban	Roundabout	MORSE BLVD	EL CAMINO REAL	5	1	104	0.082
8	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	Parr Dr	5	0	14	0.226
9	Sumter	Urban	T Intersection/Access point	U.S. 27/441	NE 86TH DR	5	0	16	0.070
10	Sumter	Rural	Four Way Intersection	S.R. 471	C.R. 476 E	4	2	6	0.209
11	Sumter	Urban	Four Way Intersection	WEDGEWOOD LN	BUFFALO TRL	4	1	22	-
12	Lake	Urban	T Intersection	HOOKS ST	Sandhill View Blvd	4	0	12	0.317
13	Sumter	Urban	T Intersection	BELVEDERE BLVD	LYNNHAVEN LN	4	0	7	0.206
14	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 209	4	0	32	0.082
15	Lake	Urban	T Intersection	U.S. 27	C.R. 565	4	0	14	0.063
16	Sumter	Rural	Four Way Intersection	U.S. 301	E BELT AVE	3	2	4	0.180
17	Lake	Urban	Four Way Intersection	U.S. 27	DEWEY ROBBINS RD	3	2	4	0.056
18	Sumter	Urban	Four Way Intersection	C.R. 209	WOODRIDGE DR	3	1	20	0.443
19	Sumter	Rural	Four Way Intersection	C.R. 466	CR 223	3	1	3	0.189
20	Lake	Urban	T Intersection	C.R. 33	C.R. 48	3	1	6	0.160
21	Lake	Urban	Four Way Intersection	C.R. 44	C.R. 44 LEG A	3	1	6	0.136
22	Lake	Urban	Four Way Intersection	U.S. 27	LEGACY BLVD	3	1	6	0.057
23	Lake	Urban	Four Way Intersection	U.S. 27	O'BRIEN RD	3	1	31	0.056
24	Sumter	Rural	Four Way Intersection	C.R. 462	C.R. 229	3	0	19	0.541
25	Lake	Urban	T Intersection	C.R. 46A	DROTY SPRING LN	3	0	9	0.263
26	Sumter	Rural	Four Way Intersection	C.R. 475	C.R. 312	3	0	3	0.230
27	Sumter	Rural	Y Intersection	N MAIN ST	C.R. 673	3	0	7	0.202
28	Lake	Rural	T Intersection	S.R. 33	PINE ISLAND RD	3	0	9	0.156

No	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
29	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	AVALOS DR	3	0	17	0.120
30	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	BAILEY TRL	3	0	31	0.094
31	Lake	Urban	Y Intersection	S.R. 19	C.R. 19A	3	0	24	0.087
32	Sumter	Rural	T Intersection	S.R. 44	C.R. 475	3	0	30	0.086
33	Sumter	Urban	Four Way Intersection	MORSE BLVD	STILLWATER TRL	3	0	92	0.076
34	Sumter	Urban	T Intersection	S.R. 44	CONTINENTAL BLVD	3	0	8	0.071
35	Sumter	Urban	Four Way Intersection	PINELLAS PL	BUENA VISTA BLVD	3	0	17	0.070
36	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 462	3	0	44	0.058
37	Sumter	Urban	Four Way Intersection	EL CAMINO REAL	BUENA VISTA BLVD	3	0	141	0.057
38	Lake	Urban	T Intersection	U.S. 27	INDEPENDENCE BLVD	3	0	17	0.056

Table B-9. Top 32 Signalized High Injury Intersections

No	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
1	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 466	13	0	167	0.225
2	Sumter	Urban	Four Way Intersection	S.R. 44	MORSE BLVD	11	1	96	0.172
3	Sumter	Urban	Four Way Intersection	C.R. 466A	BUENA VISTA BLVD	8	1	71	0.151
4	Sumter	Urban	Four Way Intersection	U.S. 27/441	MORSE BLVD	8	0	75	0.081
5	Sumter	Urban	Four Way Intersection	U.S. 27/441	NE 136TH AVE	7	0	91	0.098
6	Sumter	Rural	Four Way Intersection	S.R. 50	S.R. 471	6	1	27	0.220
7	Sumter	Rural	T Intersection	C.R. 48	Lowery St	6	0	30	0.593
8	Sumter	Urban	Four Way Intersection	CITRUS BLVD	DR MLK JR BLVD	5	1	44	0.060
9	Sumter	Rural	Four Way Intersection	S.R. 471	E SOUTHLAND AVE	5	0	20	0.186
10	Sumter	Urban	Four Way Intersection	U.S. 27/441	Bella Cruz Dr	5	0	38	0.070
11	Lake	Urban	Four Way Intersection	U.S. 27	WASHINGTON ST	5	0	35	0.065
12	Sumter	Rural	Four Way Intersection	S.R. 44	S.R. 44 TO I75 SB	4	1	55	0.099
13	Sumter	Urban	Four Way Intersection	C.R. 466	BUENA VISTA BLVD	4	1	59	0.069
14	Lake	Urban	Four Way Intersection	U.S. 27	SAWGRASS BAY BLVD	4	1	36	0.068
15	Sumter	Urban	Four Way Intersection	MORSE BLVD	C.R. 466	4	0	73	0.060
16	Lake	Urban	Four Way Intersection	U.S. 27	C.R. 474	4	0	54	0.045
17	Lake	Urban	Four Way Intersection	U.S. 441	EUDORA RD	4	0	69	0.041
18	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 472	3	2	34	0.048
19	Sumter	Urban	Four Way Intersection	S.R. 44	BUENA VISTA BLVD	3	2	28	0.048
20	Sumter	Urban	Four Way Intersection	S.R. 50	VILLA CITY RD	3	1	56	0.051
21	Lake	Urban	Four Way Intersection	U.S. 27	HOOKS ST	3	1	67	0.037
22	Lake	Urban	Four Way Intersection	U.S. 441	DAVID WALKER RD	3	1	68	0.030
23	Lake	Urban	Four Way Intersection	S.R. 50	CITRUS TOWER BLVD	3	1	67	0.026
24	Sumter	Rural	Four Way Intersection	N MAIN ST	SEMINOLE AVE	3	0	17	0.130
25	Sumter	Urban	Four Way Intersection	C.R. 466A	HEALD WAY	3	0	26	0.097
26	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	SOUTHERN TRACE	3	0	16	0.093
27	Lake	Urban	T Intersection	U.S. 441	PERKINS ST	3	0	23	0.049
28	Lake	Urban	Four Way Intersection	U.S. 27	CITRUS GROVE RD	3	0	39	0.047

No	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate
29	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 462	3	0	25	0.047
30	Lake	Urban	Four Way Intersection	U.S. 441	ST CLAIR ABRAMS AV	3	0	33	0.029
31	Lake	Urban	Four Way Intersection	NORTH BLVD	DIXIE AVE	3	0	59	0.027
32	Lake	Urban	Four Way Intersection	U.S. 441	DUNCAN DR	3	0	79	0.023

B.6.1. Roadway Characteristics of High Injury Intersections

The distribution of 70 intersections based on signal control is shown in **Figure B-17**. Unsignalized intersections accounted for 47.1% (33 intersections), followed closely by signalized intersections at 45.7% (32 intersections), while roundabouts represented the remaining 7.1% (5 intersections).

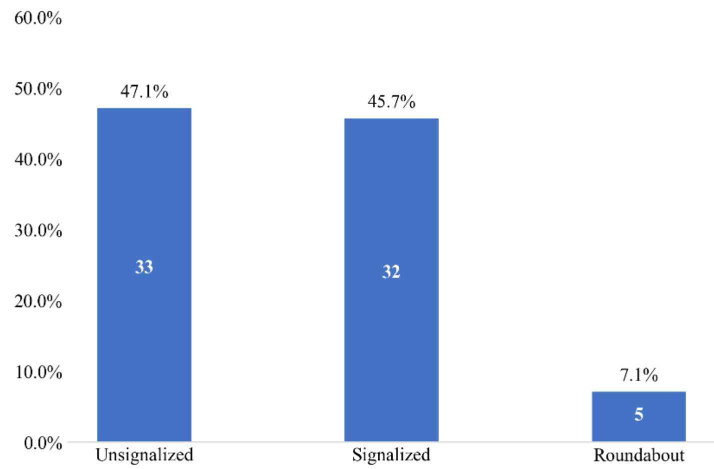


Figure B-17. Distribution of Signal Type of the Selected High Injury Intersections

The distribution of intersection types in **Figure B-18** illustrates that the majority of the selected intersections are four-way configurations (72.9%), while the remainder consists primarily of three-way intersections, including both T- and Y-types (22.9% and 4.3% respectively).

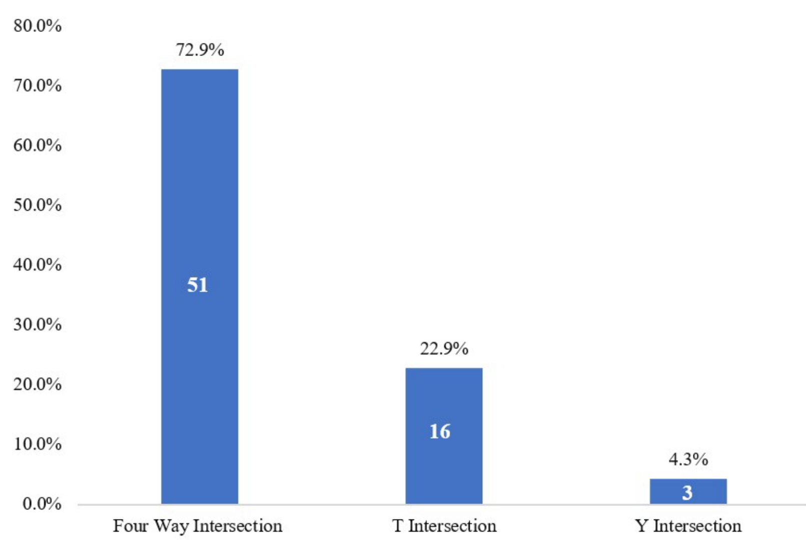


Figure B-18. Distribution of Intersection Type of the Selected High Injury Intersections

B.6.2. Crash Characteristics of High Injury Intersections

The distribution of crash types at the selected High Injury Intersections, shown in **Figure B-19**, indicates that left-turn and angle crashes collectively account for the largest proportion of KA crashes at both unsignalized (75.7%) and signalized (60.7%) intersections. Rear-end crashes represent the second most common crash type and are substantially more prevalent at signalized intersections (21.3%) than at unsignalized intersections (6.6%). This higher proportion at signalized locations is likely associated with the dilemma zone, where drivers face uncertainty about whether to stop or proceed during the yellow phase. Off-road crashes account for 6.6% of KA crashes at unsignalized intersections but were not observed at the selected signalized intersections. Pedestrian- and bicycle-involved crashes together represent 3.3% of KA crashes at unsignalized intersections and 6.0% at signalized intersections, suggesting relatively greater exposure of vulnerable road users at signalized intersections. Overall, left-turn/angle and rear-end crashes constitute the majority of KA crashes across the selected High Injury Intersections.

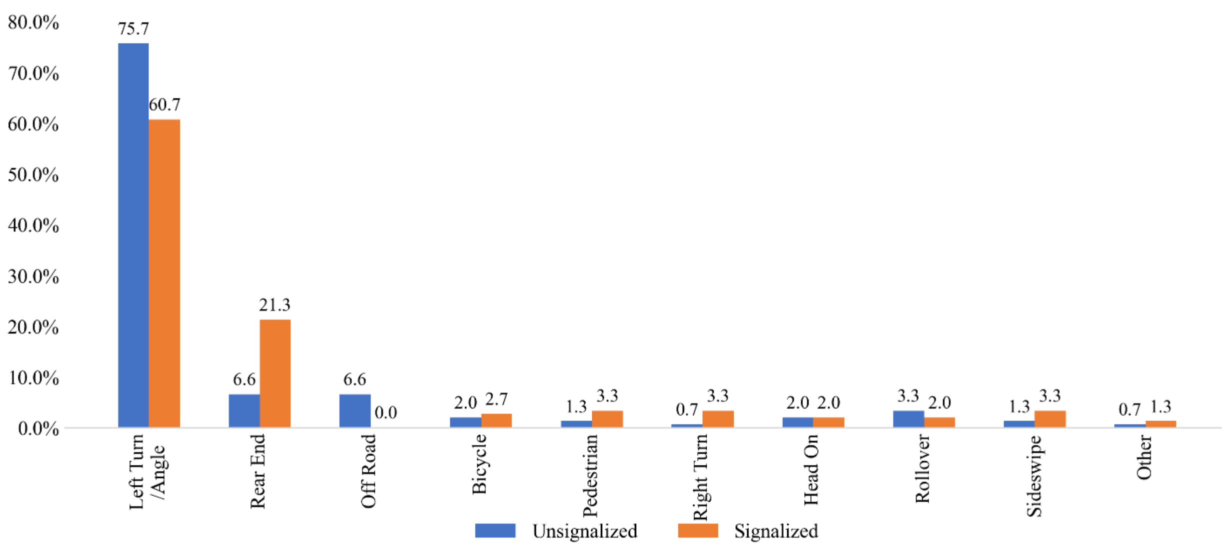


Figure B-19. Distribution of Crash Type of the Selected High Injury Intersections

Figure B-20 shows the distribution of KA crashes at high injury intersections by light condition. Though the majority of crashes (73.2%) occurred during daylight, a notable portion (14.1%) occurred under dark not lighted conditions, suggesting potential lighting deficiencies at some intersection locations.

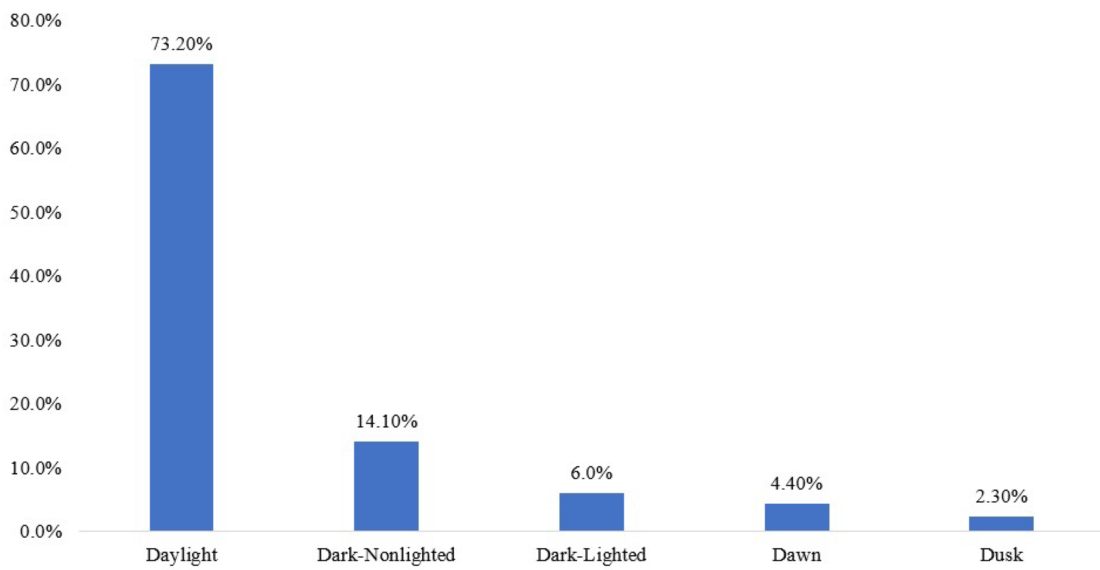
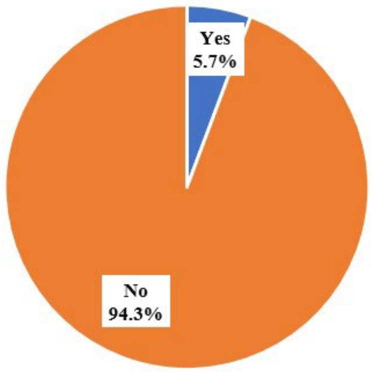
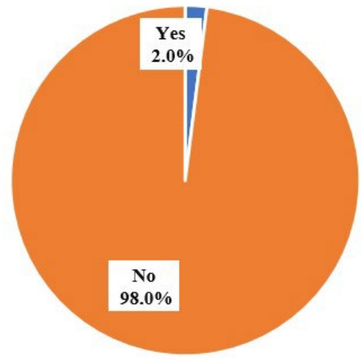


Figure B-20. Distribution of KA Crashes at the Selected Intersections by Light Condition

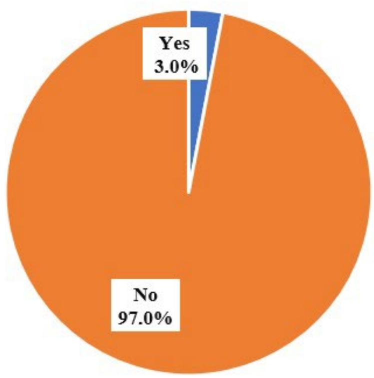
Figure B-21 summarizes driver-related contributing factors in KA crashes at high injury intersections. Among the four total behaviors shown, distracted driving was the most frequently reported (18.5% of the cases). Other contributing behaviors such as DUI (5.7%), aggressive driving (3%), and speeding (2%) were observed at much lower rates. These results suggest that while most severe intersection crashes are not officially linked to risky driving behaviors, distraction remains a notable factor. These factors are recorded by responding officers to the crash site following the crash.



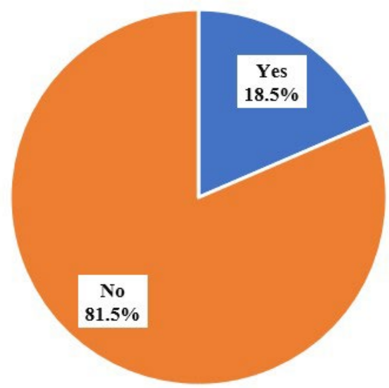
a) DUI



b) Speeding



c) Aggressive Driving



d) Distracted Driving

Figure B-21. Distribution of Behavioral Factors Contributing to Crashes in the High Injury Intersections

However, as shown in **Figure B-22**, in the overall distribution, only 3.4% of severe intersection crashes involved multiple risky behaviors, and 21.5% involved a single risky behavior.

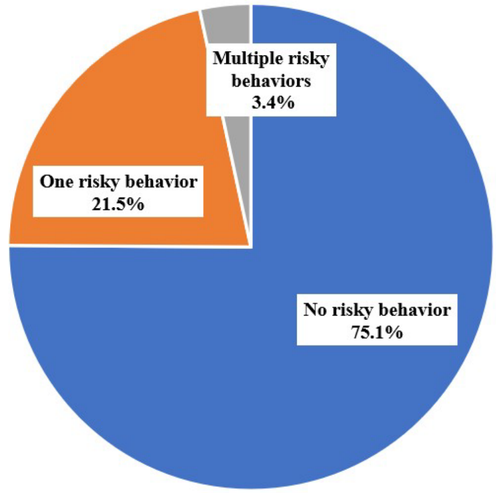
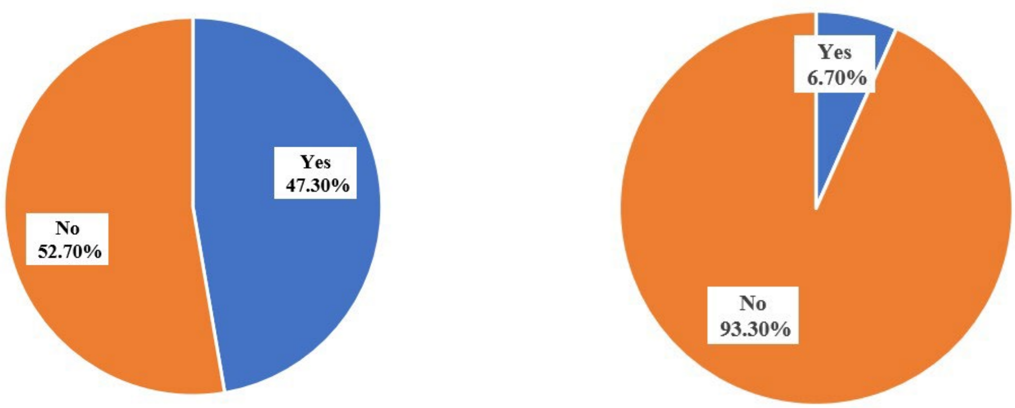


Figure B-22. Distribution of Overall Risky Behavior on High Injury Intersections

The driver age group involvement in KA crashes at high injury intersections in **Figure B-23** illustrates that aging drivers (age 65 and older) were involved in 47.3% of these crashes. In contrast, teen drivers were involved in only 6.7% of KA crashes at the selected intersections.



a) Aging Driver Involvement b) Teen Driver Involvement

Figure B-23. Driver Age Group Involvement in KA Crashes at Selected High Injury Intersections

Figure B-24 shows that KA crashes at high injury intersections peak during the afternoon hours, with the highest share (10.7%) occurring at 16:00-17:00. KA crash frequency remains elevated at the selected intersections between 11:00-15:00.

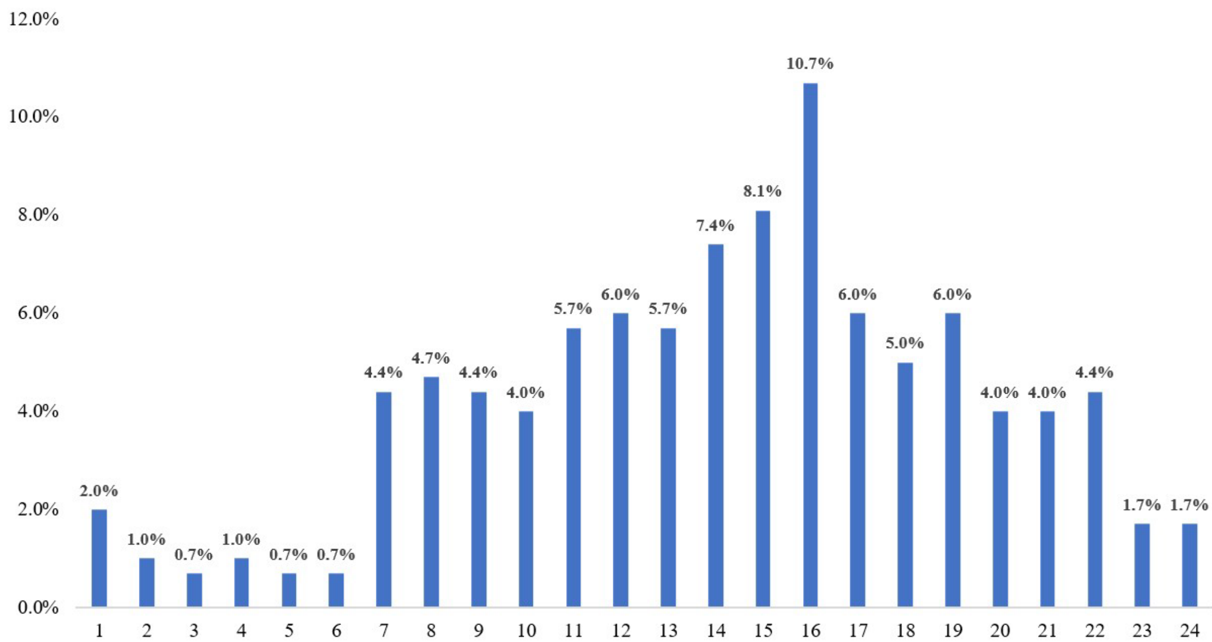


Figure B-24. Crash Distribution for the Hour of the Day in the Selected Intersections

B.7. Locations in HIN with elevated risky driving events

Following the risk analysis in Chapter 2, the resulting locations of high-risk intersections and segments are illustrated in **Figure B-25** and **Figure B-26**, respectively.

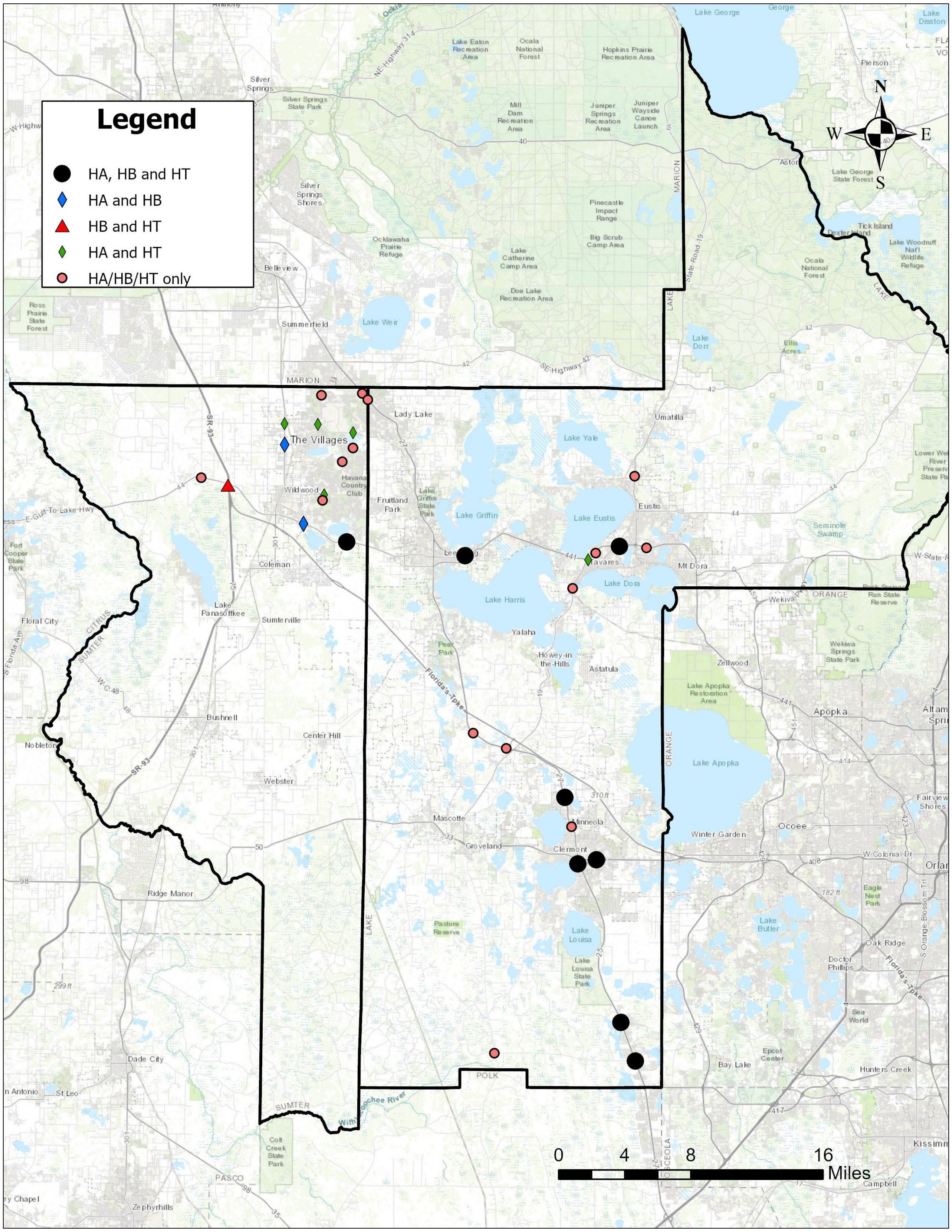


Figure B-25. Overlap between risky driving behavior and KA crashes at intersections

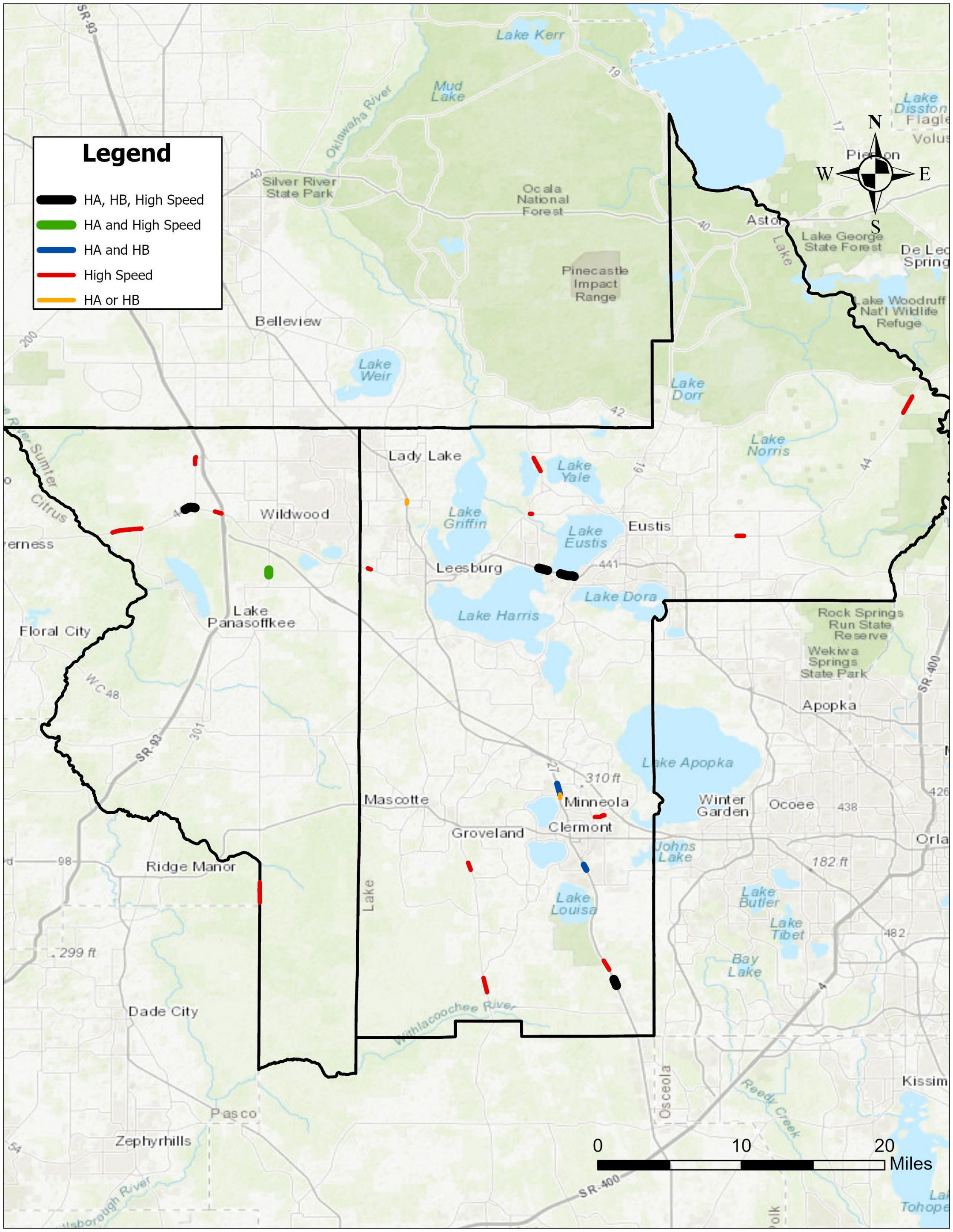


Figure B-26. Overlap between risky driving behavior and KA crashes at segments

Across high injury intersections, HA, HB and HT events exhibit heterogeneous but spatially clustered patterns. **Figure B-25** shows that intersections along the HIN that also show elevated risky driving events. Eight intersections display elevated levels of all three event types (HA, HB, and HT), whereas other intersections show elevated levels in only one or two of these measures. The complete list is shown in **Table B-11** and **Table B-12** for signalized and unsignalized intersections respectively.

Furthermore, an analysis was carried out to examine how events were temporally concentrated at each intersection. Each day of the week was divided into four intervals: AM peak, PM peak, off-peak and nighttime (**Table B-10**). The different events frequencies were associated with the time periods, and the critical time period was identified. These results are also shown in **Table B-11** and **Table B-12**. Out of 70 high injury intersections, 31 showed abnormal levels of HA, HB and HT. There were more signalized intersections than unsignalized intersections, 18 compared to 13. Overall, critical periods for risky-driving events were most commonly identified during weekday peak windows (WD_AM and WD_PM). However, among the highest-ranked signalized high-injury intersections (**Table B-11**), critical periods were frequently observed during the weekday midday/off-peak period (WD_MD), indicating that elevated risk at major signalized locations is not confined to commuter peaks.

Table B-10 Time period classification for event analysis

Weekday/Weekend	Time Period	Time Range	Time Period Code
Weekday (WD)	AM Peak	06:00–09:00	WD_AM
	Midday/Off Peak	09:00–15:00	WD_MD
	PM Peak	15:00–18:00	WD_PM
	Nighttime	18:00–06:00	WD_NT
Weekend (WE)	AM Peak	06:00–12:00	WE_AM
	Midday/Off Peak	12:00–18:00	WE_MD
	PM Peak	18:00–22:00	WE_PM
	Nighttime	22:00–06:00	WE_NT

Table B-11. Top 27 Signalized high injury with elevated risky driving frequencies

NO	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate	Summary	Critical period for HA	Critical period for HB	Critical period for HT
1	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 466	13	0	167	0.23	High HA and HT	WD_MD	-	WD_MD
2	Sumter	Urban	Four Way Intersection	S.R. 44	MORSE BLVD	11	1	96	0.17	High HA, HB, and HT	WD_MD	WD_MD	WD_MD
3	Sumter	Urban	Four Way Intersection	U.S. 27/441	MORSE BLVD	8	0	75	0.08	High HA	WD_MD	-	-
4	Sumter	Urban	Four Way Intersection	U.S. 27/441	NE 136TH AVE	7	0	91	0.1	High HA	WD_MD	-	-
5	Sumter	Rural	Four Way Intersection	S.R. 50	S.R. 471	6	1	27	0.22	-[a]	-	-	-
6	Sumter	Rural	T Intersection	CR 48	Lowery St	6	0	30	0.59	-	-	-	-
7	Sumter	Urban	Four Way Intersection	CITRUS BLVD	DR MLK JR BLVD	5	1	44	0.06	-	-	-	-
8	Sumter	Rural	Four Way Intersection	S.R. 471	E SOUTHLAND AVE	5	0	20	0.19	-	-	-	-
9	Sumter	Urban	Four Way Intersection	U.S. 27/441	Bella Cruz Dr	5	0	38	0.07	-	-	-	-
10	Lake	Urban	Four Way Intersection	U.S. 27	WASHINGTON ST	5	0	35	0.06	High HA	WD_MD	-	-
11	Sumter	Rural	Four Way Intersection	S.R. 44	S.R. 44 TO I75 SB	4	1	55	0.1	High HB and HT	-	WD_PM	WD_PM
12	Lake	Urban	Four Way Intersection	U.S. 27	SAWGRASS BAY BLVD	4	1	36	0.07	High HA, HB, and HT	WD_AM	WD_PM	WD_PM
13	Lake	Urban	Four Way Intersection	U.S. 27	C.R. 474	4	0	54	0.05	High HA, HB, and HT	WD_AM	WD_MD	WD_PM
14	Lake	Urban	Four Way Intersection	U.S. 441	EUDORA RD	4	0	69	0.04	High HA	WD_MD	-	-
15	Sumter	Urban	Four Way Intersection	S.R. 44	BUENA VISTA BLVD	3	2	28	0.05	High HA and HB	WD_MD	WD_MD	-
16	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 472	3	2	34	0.05	High HA and HB	WD_PM	WD_AM	-
17	Sumter	Urban	Four Way Intersection	S.R. 50	VILLA CITY RD	3	1	56	0.05	-	-	-	-
18	Lake	Urban	Four Way Intersection	U.S. 27	HOOKS ST	3	1	67	0.04	High HA, HB, and HT	WD_PM	WD_AM	WD_PM
19	Lake	Urban	Four Way Intersection	U.S. 441	DAVID WALKER RD	3	1	68	0.03	High HA, HB, and HT	WD_AM	WD_MD	WD_MD
20	Lake	Urban	Four Way Intersection	S.R. 50	CITRUS TOWER BLVD	3	1	67	0.03	High HA, HB, and HT	WD_PM	WD_MD	WD_MD
21	Sumter	Rural	Four Way Intersection	N MAIN ST	SEMINOLE AVE	3	0	17	0.13	-	-	-	-
22	Lake	Urban	Four Way Intersection	U.S. 27	CITRUS GROVE RD	3	0	39	0.05	High HA, HB, and HT	WD_PM	WD_AM	WD_PM
23	Lake	Urban	T Intersection	U.S. 441	PERKINS ST	3	0	23	0.05	-	-	-	-
24	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 462	3	0	25	0.05	-	-	-	-
25	Lake	Urban	Four Way Intersection	NORTH BLVD	DIXIE AVE	3	0	59	0.03	High HA, HB, and HT	WD_PM	WD_AM	WD_PM
26	Lake	Urban	Four Way Intersection	U.S. 441	ST CLAIR ABRAMS AV	3	0	33	0.03	High HA	WD_AM	-	
27	Lake	Urban	Four Way Intersection	U.S. 441	DUNCAN DR	3	0	79	0.02	High HA and HT	WD_PM	-	WD_AM

[a] Note: – indicates that no statistically significant critical period was identified for the corresponding risky driving behavior at that intersection.

Table B-12. Top 43 Unsignalized high injury intersections with elevated risky driving frequencies

NO	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate	Summary	Critical period for HA	Critical period for HB	Critical period for HT
1	Lake	Rural	T Intersection	S.R. 33	C.R. 474	9	1	35	0.291	High HB	-	WD_PM	-
2	Sumter	Urban	T Intersection	S.R. 44	Vivienne Dr	8	1	27	0.191	-[a]	-	-	-
3	Sumter	Urban	Four Way Intersection	CR 466A	BUENA VISTA BLVD	8	1	71	0.151	High HA and HT	WD_MD	-	WD_MD
4	Lake	Urban	Four Way Intersection	CR 33	BRIDGES RD	6	2	46	0.414	-	-	-	-
5	Lake	Urban	Four Way Intersection	S.R. 19	C.R. 561	6	2	24	0.102	High HT	-	-	WD_PM
6	Sumter	Rural	T Intersection	S.R. 44	C.R. 470	6	0	25	0.184	-	-	-	-
7	Sumter	Rural	T Intersection	CR 48	C.R. 616	5	2	11	0.495	-	-	-	-
8	Sumter	Urban	Roundabout	MORSE BLVD	EL CAMINO REAL	5	1	104	0.082	-	-	-	-
9	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	Parr Dr	5	0	14	0.226	-	-	-	-
10	Sumter	Urban	T Intersection/Access point	US 27/441		5	0	16	0.07	-	-	-	-
11	Sumter	Rural	Four Way Intersection	S.R. 471	C.R. 476 E	4	2	6	0.209	-	-	-	-
12	Sumter	Urban	Four Way Intersection	WEDGEWOOD LN	BUFFALO TRL	4	1	22	-	-	-	-	-
13	Sumter	Urban	Four Way Intersection	CR 466	BUENA VISTA BLVD	4	1	59	0.069	High HA and HT	WD_MD		WD_MD
14	Lake	Urban	T Intersection	HOOKS ST	SANDHILLE VIEW BLVD	4	0	12	0.317	-	-	-	-
15	Sumter	Urban	T Intersection	BELVEDERE BLVD	LYNNHAVEN LN	4	0	7	0.206	-	-	-	-
16	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 209	4	0	32	0.082	-	-	-	-
17	Lake	Urban	T Intersection	U.S. 27	C.R. 565	4	0	14	0.063	High HB		WD_PM	
18	Sumter	Urban	Four Way Intersection	MORSE BLVD	C.R. 466	4	0	73	0.06	High HA and HT	WD_MD	-	WD_MD
19	Sumter	Rural	Four Way Intersection	U.S.301	E BELT AVE	3	2	4	0.18	-	-	-	-
20	Lake	Urban	Four Way Intersection	U.S. 27	DEWEY ROBBINS RD	3	2	4	0.056	-	-	-	-
21	Sumter	Urban	Four Way Intersection	C.R. 209	WOODRIDGE DR	3	1	20	0.443	-	-	-	-
22	Sumter	Rural	Four Way Intersection	C.R. 466	C.R. 223	3	1	3	0.189	-	-	-	-
23	Lake	Urban	T Intersection	C.R. 33	C.R. 48	3	1	6	0.16	-	-	-	-
24	Lake	Urban	Four Way Intersection	CR-44	CR-44 LEG A	3	1	6	0.136	-	-	-	-
25	Lake	Urban	Four Way Intersection	U.S. 27	LEGACY BLVD	3	1	6	0.057	-	-	-	-
26	Lake	Urban	Four Way Intersection	U.S. 27	O'BRIEN RD	3	1	31	0.056	High HB	-	WD_AM	
27	Sumter	Rural	Four Way Intersection	C.R. 462	C.R. 229	3	0	19	0.541	-	-	-	-
28	Lake	Urban	T Intersection	C.R. 46A	DROTY SPRING LN	3	0	9	0.263	-	-	-	-
29	Sumter	Rural	Four Way Intersection	C.R. 475	C.R. 312	3	0	3	0.23	-	-	-	-
30	Sumter	Rural	Y Intersection	N MAIN ST	C.R. 673	3	0	7	0.202	-	-	-	-
31	Lake	Rural	T Intersection	S.R. 33	PINE ISLAND RD	3	0	9	0.156	-	-	-	-

NO	County	Area	Intersection Type	Major Roadway	Minor Roadway	KA	K	BCO	KA Crash Rate	Summary	Critical period for HA	Critical period for HB	Critical period for HT
32	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	AVALOS DR	3	0	17	0.12	-	-	-	-
33	Sumter	Urban	Four Way Intersection	C.R. 466A	HEALD WAY	3	0	26	0.097	-	-	-	-
34	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	BAILEY TRL	3	0	31	0.094	High HT			WD_MD
35	Sumter	Urban	Four Way Intersection	BUENA VISTA BLVD	SOUTHERN TRACE	3	0	16	0.093	-	-	-	-
36	Lake	Urban	Y Intersection	S.R. 19	C.R. 19A	3	0	24	0.087	High HB	-	WD_AM	-
37	Sumter	Rural	T Intersection	S.R. 44	C.R. 475	3	0	30	0.086	High HB	-	WD_PM	-
38	Sumter	Urban	Four Way Intersection	MORSE BLVD	STILLWATER TRL	3	0	92	0.076	High HT	-	-	WD_MD
39	Sumter	Urban	T Intersection	S.R. 44	CONTINENTAL BLVD	3	0	8	0.071	-	-	-	-
40	Sumter	Urban	Four Way Intersection	PINELLAS PL	BUENA VISTA BLVD	3	0	17	0.07	High HT	-	-	WD_MD
41	Sumter	Urban	Four Way Intersection	U.S. 301	C.R. 462	3	0	44	0.058	-	-	-	-
42	Sumter	Urban	Four Way Intersection	EL CAMINO REAL	BUENA VISTA BLVD	3	0	141	0.057	High HT			WD_PM
43	Lake	Urban	T Intersection	U.S. 27	INDEPENDENCE BLVD	3	0	17	0.056	-	-	-	-

[a] **Note:** – indicates that no statistically significant critical period was identified for the corresponding risky driving behavior at that intersection.

For high injury segments (**Figure B-26**), HA and HB events are distributed along major corridors. High speeding segments, defined by Target GAP values over 10 mph, are also largely aligned with major arterials. Few segments exhibit elevated values for all three types of events (HA, HB and over speeding) while showing elevated values in one or two categories. The complete list of segments is shown in **Table B-13**. Out of 40 high injury segments based on HIN analysis, 23 were also associated with elevated levels of risky events from CA data analysis.

Similar to intersections, temporal analysis was also conducted to identify critical time period for each event. While HA and HB were mostly observed during weekday peak periods (WD_AM and WD_PM), speeding was observed during weekend nighttime period (WE_NT).

For segments within the HIN, critical speeding periods were distributed across both peak and non-peak hours. Among the 23 segments evaluated, approximately 35% exhibited critical speeding during weekend nighttime (WE_NT), while about 30% occurred during the weekday AM peak (WD_AM). This pattern indicates that speeding-related risk is not confined to a single time window and may require time-of-day–specific strategies, with particular attention to weekend nighttime enforcement and weekday morning commuting periods.

To improve interpretability, Table 6 also reports Speed Delta (operating minus target speed) as a corridor-level indicator of speed exceedance, complementing the crash-based HIN prioritization.

Table B-13. Segments within HIN with elevated risky driving frequencies

NO	Roadway Name	County	From Intersecting Road	To Intersecting Road	Functional Class	Context Classification	Lane Per Direction	KA	Total BCO	KA Crash Rate	Length (mile)	Posted speed limit (mph)	85th Operating speed	Target speed	Speed Delta: Operating minus Target	Summary	Critical period for HA	Critical period for HB	Critical period for speed
1	C.R. 476	Sumter	C.R. 647	C.R. 659	Rural Major Collector	-	1	3	16	1.274	0.31	45	55	45	10				
2	C.R. 44	Lake	EMERALDA AVE	RHETT RD	Urban Major Collector	C3R	1	3	12	1.062	0.14	40	49	35	14	High speeding			WE_PM
3	U.S. 27/441	Sumter	NE 138TH	LOWES	Urban Principal Arterial-Other	C3C	3	8	43	0.782	0.14	45	40	45	-5				
4	C.R. 42	Lake	TENTH ST	RIVER FOREST BLVD	Rural Major Collector	-	1	8	24	0.699	1.73	55	62	55	7				
5	C.R. 19A	Lake	BAY RD	DODSON CUTOFF	Urban Minor Arterial	C3C	1	3	23	0.651	0.23	45	44	35	9				
6	C.R. 475	Sumter	C.R. 245E	C.R. 246 S	Rural Major Collector	-	1	3	6	0.626	0.52	50	60	50	10	High speeding			WE_AM
7	S.R. 44	Sumter	C.R. 231	RAMP 18120021 SB ON	Rural Principal Arterial-Other	C3C	2	5	73	0.59	0.43	45	49	35	14	High speeding			WD_AM
8	C.R. 561	Lake	DOUBLE RUN RD	WHITE CYPRESS RD	Rural Major Collector	C2	1	4	7	0.498	0.56	50	54	45	9				
9	C.R. 48	Lake	LAYLAINE DR	RANCH RD	Rural Major Collector	-	1	3	10	0.498	0.57	55	59	55	4				
10	E WARM SPRINGS AVE	Sumter	NE 41 LN	NE 37 PL	Urban Principal Arterial-Other	C2	1	5	13	0.478	0.35	55	64	50	14	High HA and speeding	WD_PM		WD_AM
11	S.R. 44	Lake	FOREST DR	TOMAHAWK TRL	Rural Principal Arterial-Other	C2	1	3	8	0.474	0.4	55	66	55	11	High speeding			WE_NT
12	C.R. 466	Sumter	C.R. 475	N MAIN ST	Rural Major Collector	-	1	3	16	0.465	0.41	45	53	45	8				
13	C.R. 42	Lake	C.R. 439	CLEARWATER LAKE REC	Rural Major Collector	-	1	7	40	0.357	2.97	55	60	55	5				
14	U.S. 441	Lake	COUNTRYSIDE BLVD	UNSIGNED	Urban Principal Arterial-Other	C3R	2	3	8	0.353	0.21	55	66	40	26	High speeding			WD_AM
15	OLD HIGHWAY 50	Lake	N HANCOCK RD	BLACK STILL LAKE RD	Urban Major Collector	-	1	3	16	0.314	0.63	35	47	35	12	High speeding			WE_NT
16	S.R. 33	Lake	GROVENLAND FARMS RD	MCGILL RD	Urban Principal Arterial-Other	C2	1	3	10	0.31	0.53	60	63	50	13	High speeding			WE_NT
17	U.S. 27/441	Sumter	Lowe's Driveway	NE 136TH	Rural Minor Arterial	C3C	3	3	52	0.31	0.14	45	35	45	-5				
18	S.R. 44	Sumter	C.R. 243	C.R. 475	Rural Principal Arterial-Other	C2	2	4	18	0.309	0.66	60	69	55	14	High HA, HB and speeding	WD_PM	WD_AM	WD_AM
19	KINGS HWY	Sumter	C.R. 702	C.R. 558	Rural Minor Collector	-	1	5	22	0.3	2.51	55	64	55	9				
20	S.R. 471	Sumter	S CARTER RD	N GRADE RD	Rural Minor Arterial	-	1	3	6	0.273	1.41	60	74	60	14	High speeding			WD_NT
21	BUENA VISTA BLVD	Sumter	EL CAMINO REAL	TALLEY RIDGE DR	Urban Major Collector	-	2	3	6	0.272	0.44	35	44	35	9				
22	S.R. 44	Lake	LINDEN LN	LA PLACE CT	Urban Principal Arterial-Other	C2	1	3	9	0.27	0.46	55	62	50	12	High speeding			WE_NT
23	C.R. 452	Lake	EMERALDA ISLAND RD	LITTLE HORSE DR	Rural Major Collector	-	1	3	16	0.256	0.75	55	63	55	8				

NO	Roadway Name	County	From Intersecting Road	To Intersecting Road	Functional Class	Context Classification	Lane Per Direction	KA	Total BCO	KA Crash Rate	Length (mile)	Posted speed limit (mph)	85th Operating speed	Target speed	Speed Delta: Operating minus Target	Summary	Critical period for HA	Critical period for HB	Critical period for speed
24	S.R. 50	Sumter	SE 80TH ST	C.R. 469	Rural Principal Arterial-Other	C1	1	3	16	0.244	0.76	55	64	55	9				
25	CITRUS BLVD	Lake	EAGLES NEST RD	SHADOW HILL DR	Urban Minor Collector	C3C	2	3	40	0.228	0.25	50	54	45	9	High HB		WD_MD	
26	C.R. 437	Lake	MARBELLA DR	SALINERO AVE	Urban Major Collector	-	1	3	5	0.226	0.59	45	54	45	9				
27	S.R. 44	Lake	PONDEROSA AVE	TOMAHAWK TRL	Rural Principal Arterial-Other	C2	1	3	15	0.218	0.87	55	67	55	12	High speeding			WE_NT
28	C.R. 452	Lake	YALE COVE RD	LAKE YALE BAPTIST ASSEMBLY RD	Rural Major Collector	-	1	3	15	0.188	1.02	55	62	55	7	High speeding			WE_AM
29	U.S. 27	Lake	MARQUAX DR	N BOGGY MARSH RD	Urban Minor Collector	C2	3	4	36	0.183	0.47	65	62	50	12	High HA, HB and speeding	WD_PM	WD_AM	WE_NT
30	DUNCAN DR	Lake	MAIN ST	DEAD RIVER RD	Urban Minor Arterial	C3C	2	3	48	0.167	0.27	45	43	45	-2				
31	U.S. 27	Lake	SOUTH GRASSY LAKE RD	LK MINNEOLA SHR	Urban Principal Arterial-Other	C2	3	3	64	0.164	0.26	50	45	50	-5	High HA	WD_PM		
32	S.R. 33	Lake	OFF ROAD REVOLUTION	OIL WELL RD	Rural Minor Arterial	C2	1	3	19	0.127	1.02	60	64	50	14	High speeding			WE_NT
33	C.R. 448	Lake	LAKE INDUSTRIAL BV	SHIRLEY SHORES RD	Rural Minor Collector	-	1	4	20	0.104	1.89	55	59	55	4				
34	U.S. 27	Lake	HAMMOCK RIDGE RD	BELLA LAGO DR	Urban Major Collector	C3C	3	3	55	0.102	0.4	55	54	55	-1	High HA and HB	WD_PM	WD_AM	
35	U.S. 27	Lake	FRANK JARRELL RD	HARVEST BLVD	Urban Principal Arterial-Other	C2	3	3	22	0.088	0.73	65	67	50	17	High speeding			WE_NT
36	U.S. 441	Lake	C.R. 473	7TH SUNFISH ST	Urban Principal Arterial-Other	C3C	3	4	55	0.083	0.58	50	57	45	12	High HA, HB and speeding	WD_PM	WD_PM	WD_AM
37	U.S. 301	Sumter	C.R. 102	C.R. 202	Urban Principal Arterial-Other	C2	2	3	30	0.071	1.01	55	54	50	4				
38	S.R. 44	Sumter	C.R. 251	C.R. 470	Rural Principal Arterial-Other	C2	2	3	53	0.065	1.8	60	71	55	16	High speeding			WD_AM
39	U.S. 27	Lake	OAK VALLEY BLVD	LK MINNEOLA SHR	Urban Local	C2	2	3	107	0.061	0.78	55	54	50	4	High HA and HB	WD_PM	WD_AM	
40	U.S. 441	Lake	HILLTOP RD	LK SHORE BLVD	Urban Principal Arterial-Other	C3C	3	4	59	0.055	0.87	50	57	45	12	High HA, HB and speeding	WD_PM	WD_PM	WD_AM

B.8. Locations outside HIN with elevated risky driving events

The analysis additionally identified several locations outside the current HIN that exhibit elevated frequencies of risky driving behavior. Twelve such intersections (two unsignalized, 10 signalized) were identified, as shown in **Figure B-27** and summarized in **Table B-14**. All identified intersections are located within Sumter County. Of these, three are situated along U.S 441 and three along U.S. 27. Four locations reported no KA crashes, while the remaining intersections recorded one to two such crashes. Despite not being part of HIN, all intersections demonstrated elevated levels of risky driving events. Proactive safety interventions at these locations are warranted to mitigate risk and prevent their future inclusion in the HIN. It is noteworthy to mention that no segments with elevated frequencies were found outside the HIN.

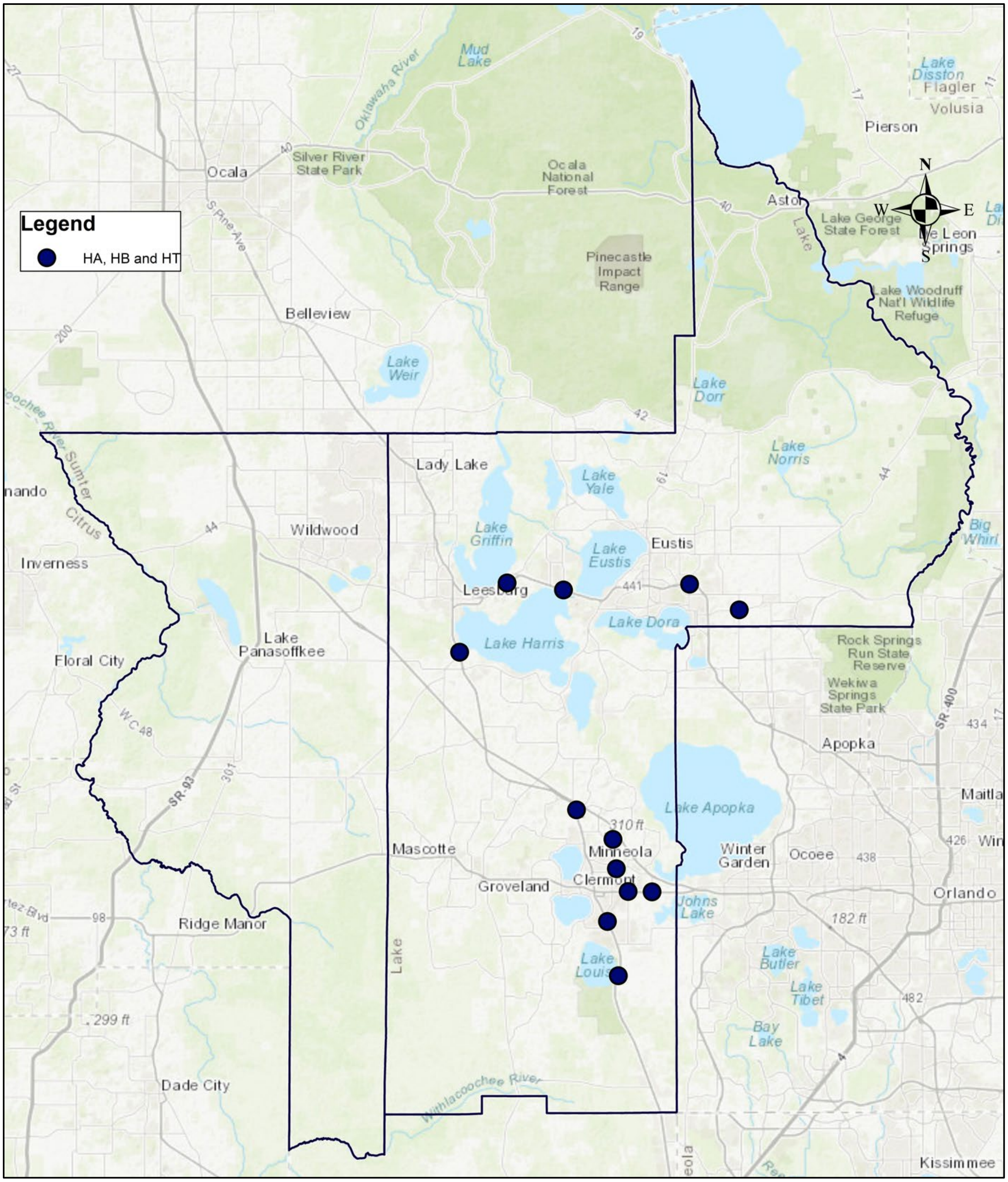


Figure B-27. Intersections outside the HIN with risky driving events

Table B-14 Intersections outside the HIN with elevated risky driving trends

NO	County	Signal Type	Intersection Type	Major Roadway	Minor Roadway	KA	Summary	Critical period for HA	Critical period for HB	Critical period for HT
1	Sumter	Signalized	Four Way	U.S. 441	C.R. 44	1	High HA, HB and HT	WD_PM	WD_MD	WD_AM
2	Sumter	Signalized	Four Way	U.S. 441	C.R. 473	1	High HA, HB and HT	WD_AM	WD_AM	WD_AM
3	Sumter	Signalized	Four Way	U.S. 441	S.R. 44B	2	High HA, HB and HT	WD_PM	WD_AM	WD_PM
4	Sumter	Signalized	Three Way	U.S. 27	C.R. 33	1	High HA, HB and HT	WD_PM	WD_MD	WD_PM
5	Sumter	Unsignalized	Three Way	U.S. 27	SCHOFIELD R	1	High HA, HB and HT	WD_PM	WD_MD	WD_PM
6	Sumter	Signalized	Four Way	E HWY 50	HANCOCK RD	1	High HA, HB and HT	WD_MD	WD_AM	WD_MD
7	Sumter	Signalized	Four Way	CITRUS TOWER BLVD	CITRUS TOWER BLVD	1	High HA, HB and HT	WD_PM	WD_MD	WD_PM
8	Sumter	Unsignalized	Three Way	CITRUS GROVE RD	CITRUS GROVE RD	1	High HA, HB and HT	WD_PM	WD_AM	WD_PM
9	Sumter	Signalized	Four Way	U.S. 27	BISHOPS PT	0	High HA, HB and HT	WD_PM	WD_AM	WD_PM
10	Sumter	Signalized	Four Way	S.R. 50	C.R. 455	0	High HA, HB and HT	WD_PM	WD_PM	WD_PM
11	Sumter	Signalized	Four Way	S.R. 46	ROUND LAKE RD	0	High HA, HB and HT	WD_PM	WD_PM	WD_AM
12	Sumter	Signalized	Four Way	N HANCOCK RD	OLD HWY 50	0	High HA, HB and HT	WD_PM	WD_MD	WD_PM

B.9. Conclusion

This chapter presented a comprehensive safety screening of roadway corridors, segments, and intersections for the two counties, focusing on high-risk locations identified through crash severity, frequency, severity weighting, and KA crash rates. Using the sliding window method with EPDO weighting, corridors that exceeded KA crash frequency thresholds were designated as High Injury Corridors (HIC). Separately, High Injury Segments (HIS) were identified based on both KA crash rate (expressed per million vehicle miles (MVM) per mile) and a minimum KA crash frequency. Intersection screening was conducted using KA crash frequency, fatal (K) crash frequency, and KA crash rate per million entering vehicles (MEV).

A total of 106 High Injury Corridors, 40 High Injury Segments, and 70 High Injury Intersections (HII) were identified in the study area. These three layers were overlaid on the entire roadway network to construct the finalized High Injury Network (HIN). Within this framework, HIS were derived from the segment-level analysis and were mostly contained within the identified corridors (38 of 40). Similarly, the majority of HII (61 of 70) also overlapped with the corridor layer, while 9 intersections were located outside. Thus, the HIN is not separate lists of corridors, segments, and intersections, but rather a combination. In this way, the finalized HIN reflects a multi-layered and unified representation of the Lake-Sumter Counties' most critical safety priorities. The HIN consists of 106 corridors, including 40 segments and 70 intersections are included. This includes 2 segments and 9 intersections outside the corridor layer (HIC), as illustrated in **Figure B-28**.

The High Injury Corridors comprise 13.9% of the centerline miles of the analyzed roadways and accounted for 48.5% of total KA crashes. The 40 High Injury Segments representing 2.6% of the analyzed roadway mileage, account for 10.8% of all segment level KA crashes. These segments consist of mostly a mix of principal arterials and collector roads, predominantly featuring one lane per direction, are urban, and have a posted speed of 45 mph or higher. Over half of all severe crashes were off-road or rear- end crashes.. Additionally, 70 High Injury Intersections were identified, accounting for 29% of total intersection-related KA crashes. Most of these intersections were unsignalized and four-legged, with left turn and angle crashes being the most common. Aging driver involvement was reported in nearly half (47%) of the KA crashes at intersections, and distracted driving emerged as the most frequent behavioral factor within 18% of crashes. **Table B-15** represents the overall HIN crash summary. Overall, the HIN contains 50% of the KA crashes within about 14% of the total roadway mileage.

Table B-15. High Injury Network Crash Summary

	All crashes	Total KA crashes	Total K crashes	Total A crashes	Pedestrian involved KA	Bicycle involved KA	Motorcycle involved KA
All roads	53,522	2,372	376	1,996	180	100	350
HIN	18,849	1,186	185	1,001	74	52	180
HIN % All Roads	35.2%	50.0%	49.2%	50.2%	41.1%	52.0%	51.4%

Note: All roads excluding the excluding freeways (I-75, FL-91, SR-91)

Segments with Target GAP values exceeding 10 mph were also identified as high-risk locations. Further analysis also revealed the critical periods for each event. While HA, HB and HT were more prevalent during weekday peak periods, speeding was common for weekend nighttime periods.

In addition, several intersections outside the current HIN exhibited elevated risky-driving events. Among the 12 identified intersections, eight recorded 1-2 KA crashes, while the remaining locations had none. Proactive interventions at these sites could prevent future severe crashes and reduce their potential inclusion in the HIN. Overall, leveraging CV data enables a proactive, behavior-based approach to safety management, allowing targeted enforcement, education, and intersection improvements to be prioritized based on observed risky-driving patterns, thereby supporting Vision Zero and Safe System goals.

By combining crash frequency, severity weighting (EPDO), and exposure measures, this analysis highlights a subset of roadways that disproportionately contribute to severe crash outcomes. These findings provide a basis for prioritizing future evaluation, systemic countermeasure selection, and investment in roadway safety improvements.

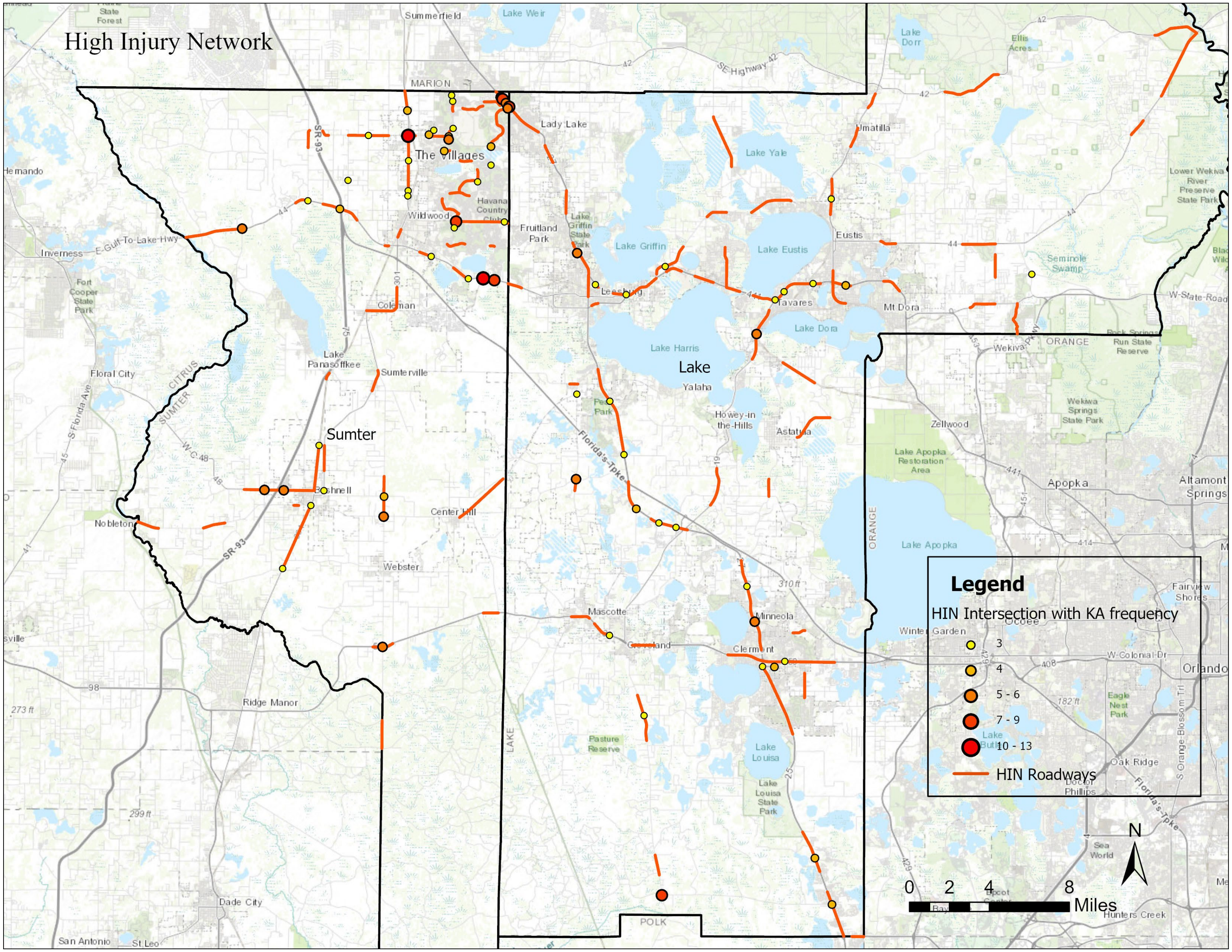


Figure B-28. High Injury Network (Lake and Sumter)

APPENDIX C

In-Depth Engagement and Collaboration

APPENDIX C: In-Depth Engagement and Collaboration

C.1. Introduction

Public engagement was conducted to better understand the local citizens' perception of transportation safety issues in Lake and Sumter Counties and to gather community feedback that can support future planning and safety countermeasure strategies. A presentation was conducted to the MPO's Community Advisory Committee (CAC) and Technical Advisory Committee (TAC) across four meetings, including both in-person and virtual sessions.

An online survey was also made available to residents, commuters, and road users from October 2 to December 11, 2025, to collect comments regarding safety concerns, and potential solutions (**Figure C-1**). A total of 43 respondents participated in the survey, providing 183 comments and feedback, as summarized in **Figure C-2**.

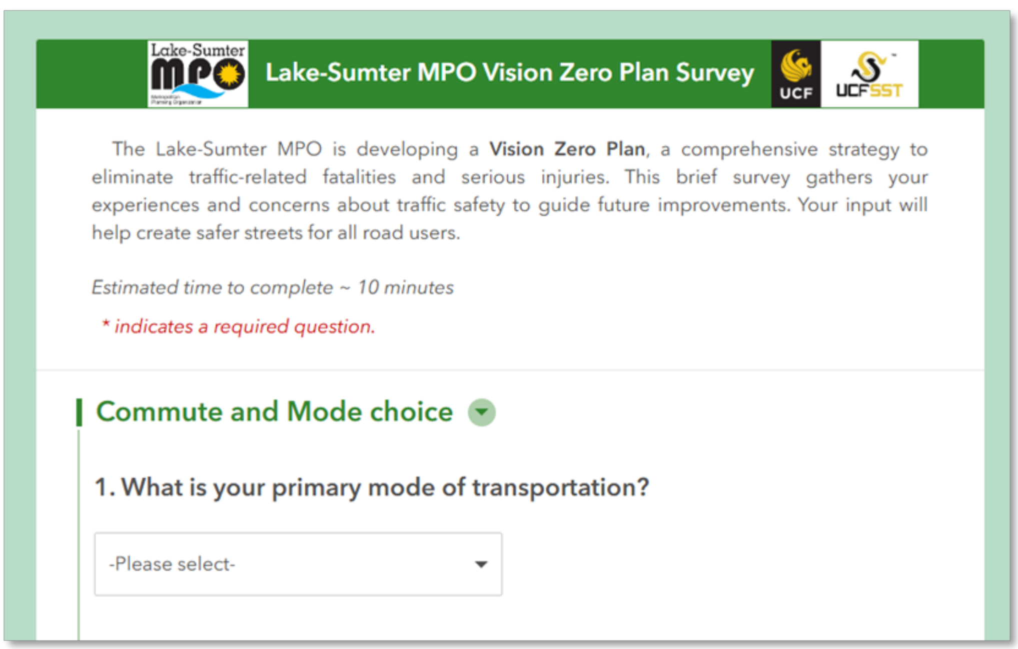


Figure C-1. Online Survey

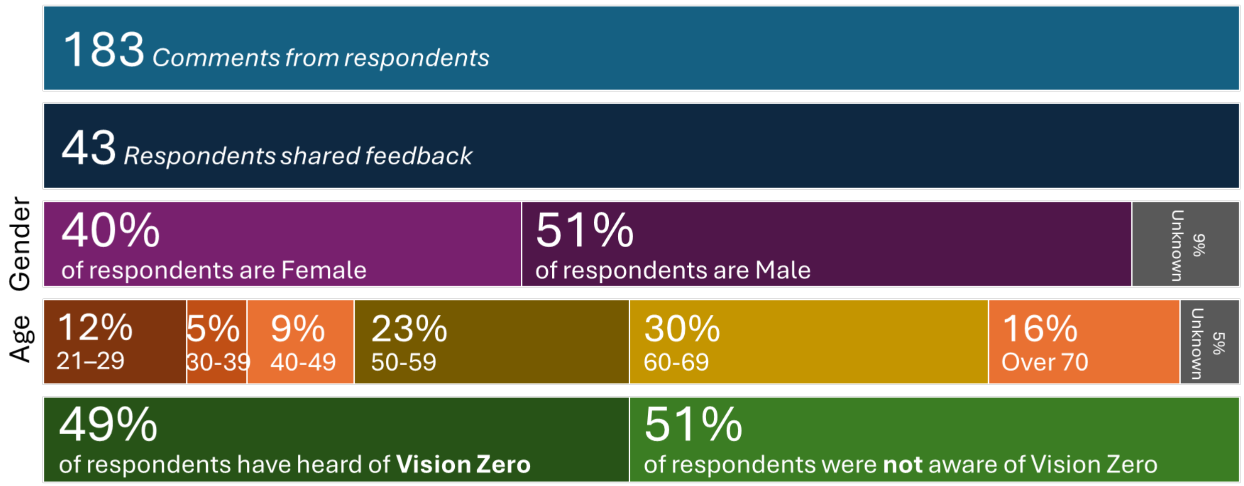


Figure C-2. Summary of Survey Respondents' Demographics

C.2. Lake-Sumter County Public Engagement

C.2.1. Respondents' Profile & Travel Characteristics

Before presenting the results of the respondents' input, it is helpful to understand the characteristics of survey participants. This section summarizes respondents' demographic information, commute patterns, and involvement in local decision-making, which provide context for interpreting the survey results.

As shown in **Figure C-2**, 40% of respondents identified as female and 51% as male. Age distribution skewed toward older adults, with 46% of respondents aged 60 or above, while 23% were between 50–59, and smaller proportions fell within younger age groups.

Survey participants represented a range of backgrounds and affiliations within Lake and Sumter Counties. As shown in **Figure C-3**, when asked about their connection to the counties, 56% of respondents reported residing in Lake County, followed by 16% who visit occasionally, and smaller shares who work, study, or commute in the area. In comparison, 33% indicated residency in Sumter County, with additional representation from commuters (23%), occasional visitors (19%), and local workers or business owners (9%).

Involvement in local decision-making varied, with a meaningful portion of respondents identifying as government staff or agency employees (37%) and elected officials (26%), along with participation from community members (16%). Regarding committee participation, 9% of respondents reported serving on the Technical Advisory Committee (TAC), while 7% were members of the Community Advisory Committee (CAC).

Travel behavior results show that all respondents (100%) reported using a personal car, truck, or SUV as their primary mode of transportation, indicating that transit, walking, bicycling, or other modes are not used as routine travel modes. Occasional use of these alternative modes was reported at a low level. Active transportation use was limited, with 81% reporting that they never walk or bicycle to commute, and only 2-7% do so occasionally. Similarly, public transit usage was low, with 88% reporting no transit use and 9% using transit less than once a month.

Most participants work outside the home (67%), while 12% mainly work from home, and 7% reported hybrid arrangements. Commute duration was generally short to moderate, with 33% traveling less than 15 minutes and 30% commuting 15-29 minutes, while only a small number reported longer travel times (7% commuting for more than 45 minutes).

These findings suggest that the safety perceptions expressed throughout the survey are primarily shaped from the perspective of drivers rather than frequent walkers, bicyclists, or transit users, an important context when interpreting the results presented in the following sections.

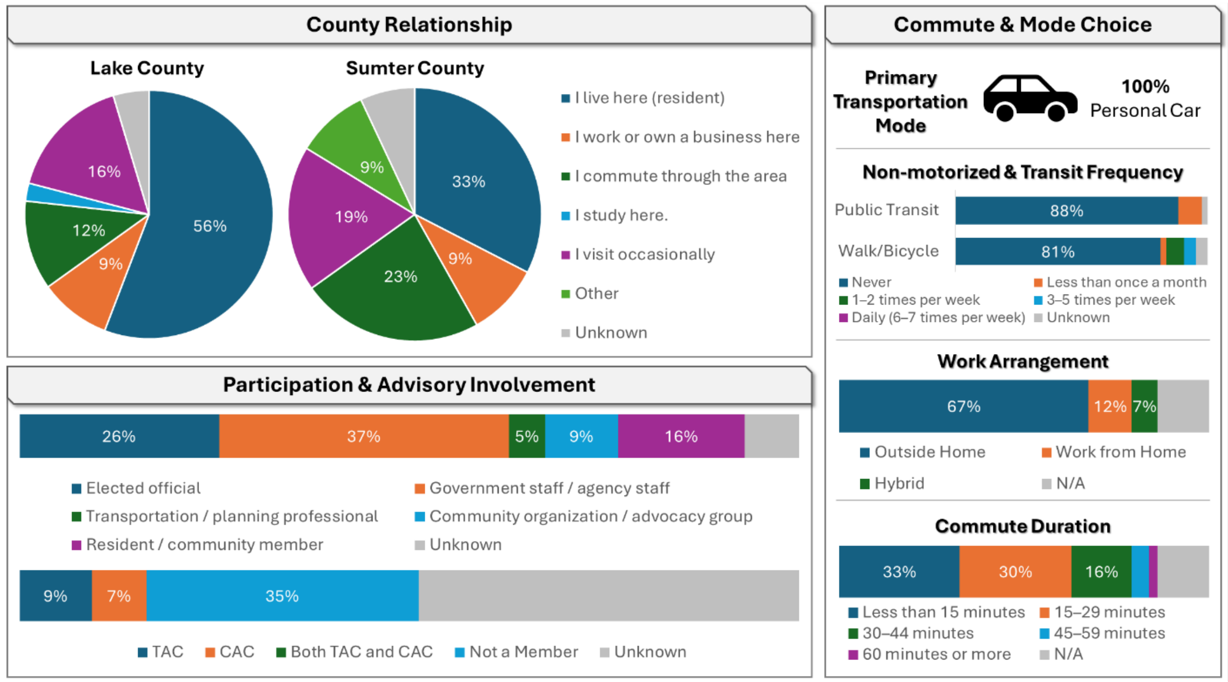
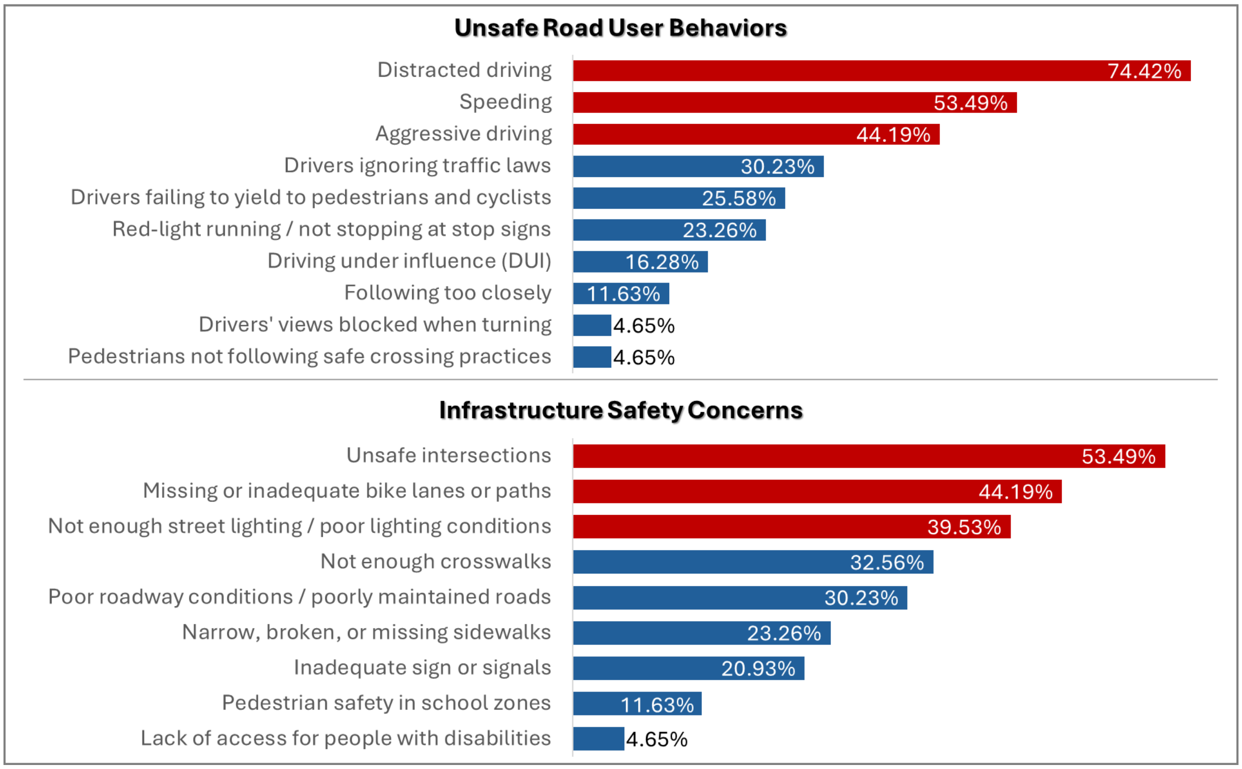


Figure C-3. Respondent Demographics & Travel Characteristics

C.2.2. Key Safety Concerns Identified by the Public

Survey respondents identified several key factors that contribute to perceived roadway safety issues in Lake and Sumter Counties. Respondents could select up to three options. Distracted driving was the most frequently cited perceived unsafe behavior (74.4%), followed by speeding (53.5%) and aggressive driving (44.2%) (**Figure C-4**). Other behaviors such as ignoring traffic laws (30.2%), failing to yield to pedestrians and cyclists (25.6%), and red-light running (23.3%) were also commonly recognized, indicating that risky driver actions are perceived as a major concern in the region.



Note: Red bars indicate the top three items in each category.

Figure C-4. Key Safety Concerns Identified by Respondents

In terms of infrastructure-related safety concerns (**Figure C-4**), respondents most frequently selected unsafe intersections (53.5%), inadequate or missing bike lanes or paths (44.2%), and poor street lighting or low visibility at night (39.5%). Additional issues included a lack of crosswalks (32.6%), poor roadway conditions (30.2%), and narrow or missing sidewalks (23.3%). The responses reflect a strong emphasis on improvements to pedestrian and bicyclist facilities, nighttime visibility, and intersection safety.

C.2.3. Perceptions of Unsafe Locations

Survey participants provided location-based input to identify areas within Lake and Sumter Counties that they perceived as unsafe. Responses were collected under two categories: (1) unsafe locations while driving; and (2) unsafe locations for walking, bicycling, or crossing roads. A total of 48 driving-related responses were submitted by 36 individuals, and 40 walking/biking/crossing-related responses were submitted by 35 individuals, with multiple selections allowed per respondent.

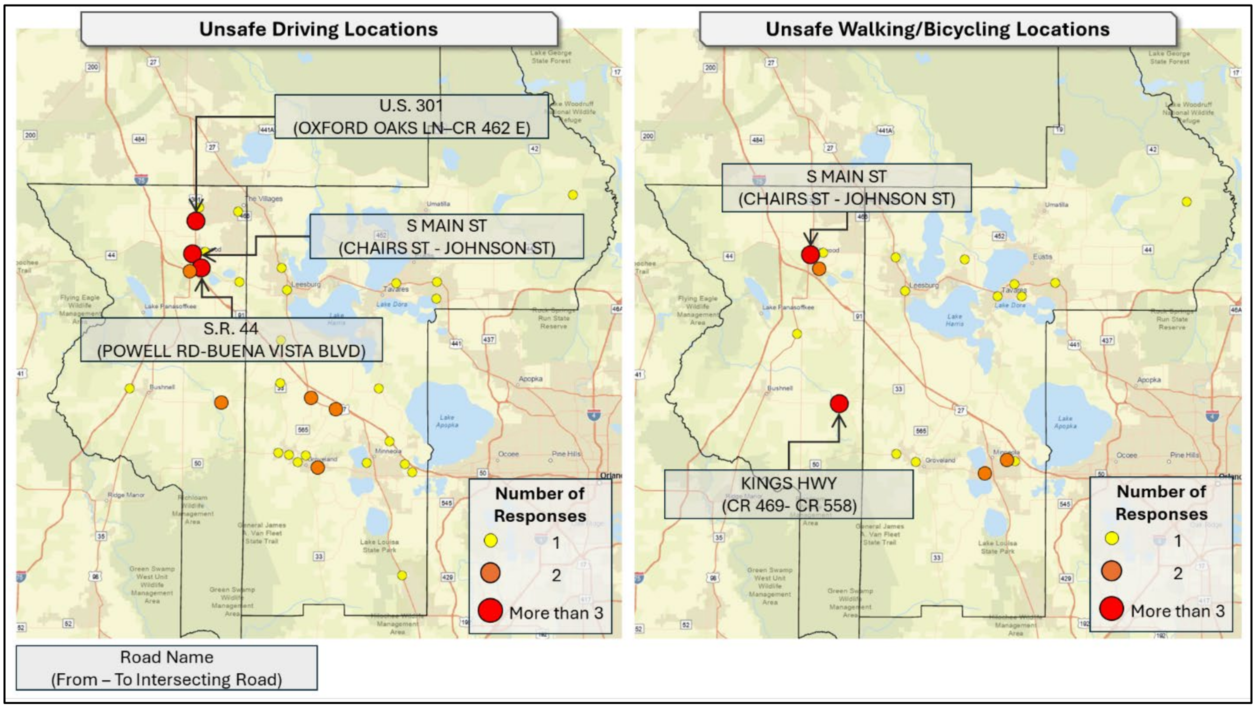


Figure C-5. Survey-Identified Unsafe Locations

As illustrated in **Figure C-5**, reported unsafe driving locations formed noticeable hotspots along major regional corridors, particularly S.R. 44, U.S. 441, and S.R. 50, whereas walking and bicycling concerns were more concentrated near commercial areas, and multi-lane crossings.

C.2.3.1. Unsafe Driving Locations

To further understand the nature of driving-related safety concerns, the locations reported for driving were analyzed in relation to the High-Injury Network (HIN). This comparison helps determine whether public perception aligns with high-risk corridors previously identified through crash data analysis. As a result, approximately 64.6% of the reported unsafe locations corresponded to HIN-designated segments, while 22.9% fell outside the HIN network, suggesting potential areas for further investigation. The remaining 12.5% of responses represented general safety concerns without a specific location. These responses corresponded to cases in which participants provided narrative comments describing perceived safety issues but did not select a specific location. A review of these open-ended responses indicated recurring issues, including heavy semi-truck volumes on narrow corridors, inadequate signal timing, insufficient protected left-turn phases, and lane weaving behaviors.

Given this high degree of overlap between survey-identified locations and the HIN, **Table C-1** summarizes which HIN corridors received comments and how those comments were characterized. Because HIN corridors inherently include intersections along the corridor, the identified issues reflect both corridor-level and intersection-related safety concerns. Therefore, from the set of responses that were matched to HIN corridors, comments that could be specifically associated with designated HIN intersections were further identified and summarized in **Table C-2**. Across these locations, the primary issues reported by participants involved inadequate traffic signal operations, difficult turning movements, and poor intersection design.

Table C-1. HIN Corridors Identified as Unsafe Driving Locations by Survey withSummary of Respondent Comments

HIC* Rank	Corridor Name	County	From Intersecting Road	To Intersecting Road	Number of Responses	Comment Category	Summary of Survey Comments
1	S.R. 44	Sumter	MORSE BLVD	VIVIENNE DR	1	Turning Movement & Access Safety Issues	Frequent crashes caused by plaza traffic entering the highway, with safety concerns for elderly drivers and a need for a traffic signal.
7	C.R. 33	Lake	AUSTIN MERRITT RD	CHARTER LN	1	Turning Movement & Access Safety Issues	Difficult turning movements onto a busy road with high truck volumes and speeding vehicles.
8	S.R. 44	Sumter	POWELL RD	BUENA VISTA BLVD	3	Pedestrian & Bicycle Infrastructure Deficiency	Absence of sidewalks along major roads, creating unsafe conditions for pedestrians.
10	U.S. 27/441	Lake	PALM ST	GRAFFIN RD	1	Speeding & Aggressive Driving Behavior	Aggressive driving behaviors and dangerous conditions at a major intersection near a school crossing.
11	U.S. 27 (14TH ST)	Lake	C.R. 44A/GRIFFIN RD	W MAIN ST	1	Roadway Capacity & Condition Deficiency	General safety concern along a bypass route.
18	S.R 50	Lake	PEARL ST	VILLA CITY RD	1	Turning Movement & Access Safety Issues	Unsafe and difficult left turns onto a high-speed, high-volume roadway.
24	U.S. 441	Lake	HILLTOP RD	DILLARD RD	1	Pedestrian & Bicycle Infrastructure Deficiency	High volume of senior and disabled pedestrians, highlighting the need for a pedestrian bridge near medical facilities.
25	C.R. 466	Sumter	C.R. 201	C.R. 106	1	Intersection Design & Operations Deficiency	Poor landscaping placement creates visibility issues and blind spots at stop-controlled intersections.
28	MORSE BLVD	Sumter	EL CAMINO REAL	C.R. 466	1	Speeding & Aggressive Driving Behavior	Excessive speeding and conflicts between vehicles and carts, requiring enforcement and physical barriers.
29	U.S. 27/ S.R. 441	Lake	FRANK JARRELL RD	HOLLY GROVE BLVD	1	Intersection Design & Operations Deficiency	Intersection is challenging and unsafe for crossing movements.
31	S.R. 50	Lake	TAYLOR AVE	TIMBER VILLAGE RD	2	Intersection Design & Operations Deficiency	Severely under designed intersections operating under high-speed and rapidly increasing traffic volumes.

HIC* Rank	Corridor Name	County	From Intersecting Road	To Intersecting Road	Number of Responses	Comment Category	Summary of Survey Comments
36	U.S. 301	Sumter	OXFORD OAKS LN	CR-462 E	3	Intersection Design & Operations Deficiency	Speeding and inattention combined with construction hazards and poor left-turn lane design causing visibility conflicts.
42	U.S. 27	Lake	HERITAGE DR	11200030 NB OFF	2	Intersection Design & Operations Deficiency	Multiple poorly designed and undersized intersections creating risky maneuvers and driver confusion.
53	S.R. 35 (S MAIN ST)	Sumter	CHAIRS ST	JOHNSON ST	3	Traffic Signal & Control Issues	Traffic signal timing prioritizes turnpike traffic and causes unnecessary congestion on connecting roads.
60	U.S. 441	Lake	DONNELLY ST	ACCESS RD	1	Roadway Capacity & Condition Deficiency	Insufficient roadway capacity, indicating the need for an additional travel lane.
65	U.S. 27	Lake	Turnpike (NB OFF Ramp 11470041)	CR-565	2	Roadway Capacity & Condition Deficiency	Poor road conditions, heavy truck traffic, and unsafe turning movements on an increasingly congested corridor.
84	C.R. 48	Sumter	S.R. 33	N MAIN ST	1	Traffic Signal & Control Issues	High-risk turning movements from interstate traffic requiring signalization.
87	S.R. 50	Lake	TUSCANOOGA RD	CR-33	1	Pedestrian & Bicycle Infrastructure Deficiency	Conflicting pedestrian crossings and turning movements due to inadequate intersection design.
100	CR-561	Lake	DOUBLE RUN RD	C.R. 455	1	Pedestrian & Bicycle Infrastructure Deficiency	High-speed roadways lack pedestrian and bicycle infrastructure, increasing safety risks.
101	C.R. 48 (KINGS HWY)	Sumter	C.R. 469	C.R. 558	2	Pedestrian & Bicycle Infrastructure Deficiency	Unsafe pedestrian crossings and stop-sign violations requiring crosswalks, signage, and enhanced traffic control.

** HIC: High Injury Corridors designated as part of the HIN*

Note: Yellow highlights indicate the most frequently selected locations.

Table C-2. HIN Intersections Identified as Unsafe Driving by Survey and Summary of Respondent Comments

HII* Rank	Signal Type	County	Major Road	Minor Road	Number of Responses	Comment Category	Summary of Survey Comments
Unsignalized Intersections							
2	Unsignalized	Sumter	S.R. 44	Vivienne Dr	1	Traffic Signal & Control Issues	Inadequate traffic control (no traffic signal) at a commercial access point on a high-speed roadway, contributing to frequent crashes.
3	Unsignalized	Lake	C.R. 33	BRIDGES RD	1	Traffic Signal & Control Issues	Aggressive driving behaviors and signal violations at a high-speed corridor create dangerous conditions at a school crossing.
15	Unsignalized	Lake	U.S. 27	C.R. 565	2	Turning Movement & Access Safety Issues	Difficult and unsafe turning movements onto a high-volume, high-speed roadway.
20	Unsignalized	Lake	C.R. 33	C.R. 48	1	Turning Movement & Access Safety Issues	Unsafe and difficult turning and crossing movements at a high-volume roadway with heavy truck traffic.
Signalized Intersections							
8	Signalized	Sumter	CITRUS BLVD	DR MLK JR BLVD	1	Intersection Design & Operations Deficiency	Difficult and unsafe crossing conditions at an intersection.
14	Signalized	Lake	U.S. 27	SAWGRASS BAY BLVD	1	Turning Movement & Access Safety Issues	Difficult and unsafe left-turn movements onto a high-volume, high-speed roadway.
18	Signalized	Sumter	U.S. 301	C.R. 472	1	Roadway Capacity & Condition Deficiency	Lack of roadway lighting creates unsafe conditions.
19	Signalized	Sumter	S.R. 44	BUENA VISTA BLVD	1	Intersection Design & Operations Deficiency	Hazardous conditions caused by roadway construction and suboptimal opposing left-turn lane design that create visibility conflicts.
20	Signalized	Sumter	S.R. 50	VILLA CITY RD	1	Pedestrian & Bicycle Infrastructure Deficiency	Lack of sidewalks creates unsafe conditions for pedestrians.

** HII: High Injury Intersections designated as part of the HIN*

C.2.3.2. Unsafe Walking/Biking/Crossing Locations

Independently, to examine perceptions of unsafe locations for walking, bicycling, or crossing roads, survey-reported locations were independently analyzed in relation to HIN. Approximately 52.5% of identified locations overlapped with HIN, indicating a moderate consistency between community perception and crash history. An additional 22.5% of responses were outside the HIN, potentially representing emerging areas of concern. The remaining 25.0% of responses consisted of general safety statements rather than specific locations, frequently referencing visibility challenges on high-speed roadways, lack of sidewalks or bike paths, limited crossing opportunities, and concerns about bicyclists not obeying traffic laws.

Table C-3 summarizes the HIN corridors that received public comments related to walking/bicycling/crossing and the nature of those concerns. Most issues were linked to the lack of sidewalks, crosswalks, and bicycle infrastructure along high-speed, and multi-lane corridors, where exposure risk for vulnerable users increases significantly. Especially, among the responses matched with the HIN, “S.R. 35 (S MAIN ST)” was the most frequently cited location, accounting for 28.6% of HIN matched responses, indicating a concentrated hotspot for pedestrian and bicycle conflicts.

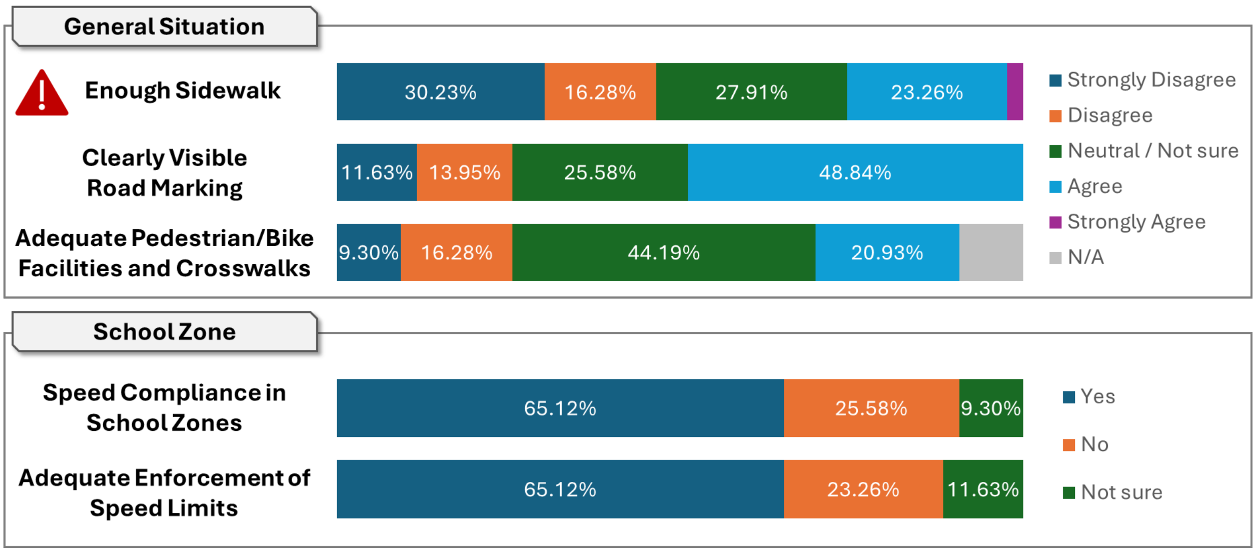
Table C-3. HIN Corridors Identified as Unsafe Walking/Biking/Crossing by Survey and Summary of Respondent Comments

HIC Rank	Name	County	From Intersecting Road	To Intersecting Road	Number of Responses	Comment Category	Summary of Survey Comments
8	S.R. 44	Sumter	POWELL RD	BUENA VISTA BLVD	2	Pedestrian & Bicycle Infrastructure Deficiency	Lack of sidewalks along major corridors creates unsafe conditions for pedestrians.
9	S.R. 44	Lake	SPRUCE DR	RORY LN	1	Pedestrian & Bicycle Infrastructure Deficiency	High levels of pedestrian and bicycle activity along the roadway increase exposure to traffic risks.
11	U.S. 27 (14 TH ST)	Lake	C.R. 44A/GRIFFIN RD	W MAIN ST	1	Pedestrian & Bicycle Infrastructure Deficiency	Wide, multi-lane highways make pedestrian crossings difficult and unsafe.
23	S.R. 50	Lake	WEST AVE	C.R. 455	2	Pedestrian & Bicycle Infrastructure Deficiency	Pedestrian crossings along major corridors are extremely challenging, forcing residents to drive short distances.
24	U.S. 441	Lake	HILLTOP RD	DILLARD RD	1	Traffic Signal & Control Issues	Drivers frequently run red lights despite existing signalization.
39	OLD HIGHWAY 50	Lake	N HANCOCK RD	BLACK STILL LAKE RD	1	Pedestrian & Bicycle Infrastructure Deficiency	Safe crossings are limited, making it difficult for children to bike to nearby schools.
53	S.R. 35 (S MAIN ST)	Sumter	CHAIRS ST	JOHNSON ST	6	Pedestrian & Bicycle Infrastructure Deficiency	Pedestrians and bicyclists face severe difficulties crossing high-speed roadways due to speeding vehicles, and lack of crosswalks
60	U.S. 441	Lake	DONNELLY ST	ACCESS RD	1	Traffic Signal & Control Issues	Left-turn movements lack protected signal phases, increasing crash risk.
76	U.S. 301	Sumter	C.R. 470 E	C.R. 526	1	Pedestrian & Bicycle Infrastructure Deficiency	Roadway conditions are unsafe for bicyclists due to lack of dedicated facilities.
87	S.R. 50	Lake	TUSCANOOGA RD	C.R. 33	1	Pedestrian & Bicycle Infrastructure Deficiency	Heavy pedestrian and bicyclist activity requires crosswalks, sidewalks, lighting, and "Share the Road" signage to improve safety.
101	C.R. 48 (KINGS HWY)	Sumter	C.R. 469	C.R. 558	4	Pedestrian & Bicycle Infrastructure Deficiency	Lack of sidewalks along major corridors creates unsafe conditions for pedestrians.

Note: Yellow highlights indicate the most frequently selected locations.

C.2.4. Perceptions of Transportation Safety Infrastructure and Operations

Survey responses regarding transportation safety infrastructure and operations indicate mixed levels of satisfaction across sidewalk availability, clarity of roadway markings, pedestrian/bicyclist facility adequacy, and school zone safety (**Figure C-6**).



Note: The red warning icon highlights items where a relatively high proportion of respondents expressed concern or disagreement.

Figure C-6. Perceptions of Transportation Safety Infrastructure and Operations

Sidewalk availability stood out as a notable infrastructure concern, with 46% of respondents disagreeing or strongly disagreeing that sidewalks are sufficient. However, roadway signs and markings were viewed relatively positively, with 49% of respondents agreeing that markings are clearly visible, indicating fewer concerns related to sign and marking visibility compared to other infrastructure elements. In contrast, perceptions toward pedestrian and bicycle infrastructure were more varied, with 44.2% selecting Neutral/Not Sure and 16.3% expressing disagreement regarding the adequacy of pedestrian/bike facilities near transit stops. It indicates that while concerns exist, many respondents remain uncertain rather than strongly dissatisfied with pedestrian/bike facilities. Additionally, school zone safety responses reflected a comparatively positive outlook. 65% of respondents reported that drivers adhere to posted school zone speed limits, and 65% also felt that enforcement is adequate. These findings imply that, among infrastructure-related topics, school zones are generally considered to be operating reasonably, though continued monitoring and localized improvements may still benefit safety.

To further examine sidewalk-related concerns, respondents who disagreed or strongly disagreed with sidewalk sufficiency were invited to identify specific locations where sidewalks are lacking. A total of 16 location reports were submitted by 12 individuals, indicating multiple areas with limited pedestrian facilities. Approximately 68.8% of these locations overlapped with the HIN network, suggesting that sidewalk improvements may be particularly impactful along these corridors (**Table C-4**). Notably, C.R. 48 (KINGS HWY) received the highest number of responses, identifying it as a priority corridor for future pedestrian infrastructure enhancements.

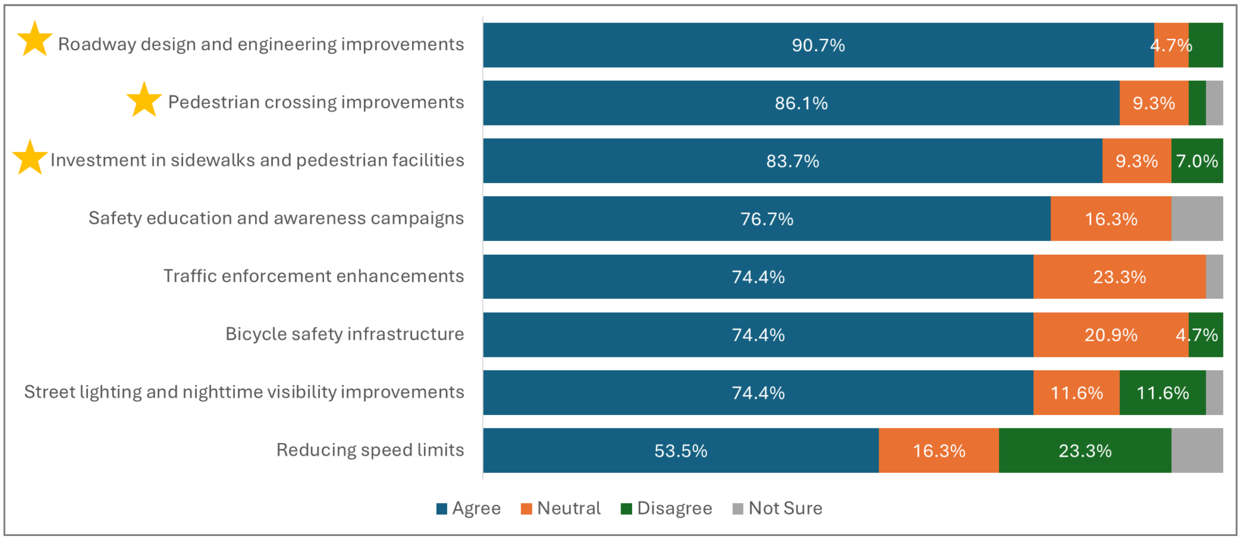
Table C-4. Key HIN Corridors Identified as Lacking Pedestrian Facilities

HIC Rank	Name	County	From Intersecting Road	To Intersecting Road	Number of Responses
8	S.R. 44	Sumter	POWELL RD	BUENA VISTA BLVD	1
9	S.R. 44	Lake	SPRUCE DR	RORY LN	1
13	C.R. 19A	Lake	W CHARLOTTE AVE	OLD U.S. 441	1
53	S.R. 35 (S MAIN ST)	Sumter	CHAIRS ST	JOHNSON ST	3
101	C.R. 48 (KINGS HWY)	Sumter	C.R. 469	C.R. 558	5

Note: Yellow highlights indicate the most frequently selected locations.

C.2.5. Public Support and Feedback on Transportation Safety Strategies

Survey participants were also asked about their support for various transportation safety strategies. As shown in **Figure C-7**, the highest levels of agreement were recorded for roadway design improvements (91%), improvements to pedestrian crossings (86%), and investments in sidewalks and pedestrian facilities (84%), indicating clear public prioritization of safer infrastructure for non-motorized users. Support was also high for protected bike lanes (74%), street lighting enhancements (74%), traffic enforcement (74%), and education and awareness initiatives (77%), suggesting a community preference for combined infrastructural and behavioral approaches to safety improvement. Additionally, respondents further highlighted the importance of speed management, intersection control, and roadway maintenance.



Note: Yellow star icons indicate the top three strategies receiving the highest level of public support.

Figure C-7. Public Support for Transportation Safety Strategies

Furthermore, open-ended feedback provided additional context to these results, with 22 comments highlighting recurring categories in transportation safety concerns (**Table C-5**). Pedestrian and bicycle safety emerged as the most prominent topic, with respondents noting insufficient walkability and difficulty crossing along high-speed corridors. Concerns about speeding and aggressive driving behavior were frequently mentioned, particularly in areas with vulnerable road users (e.g., pedestrian and bicyclists). Respondents also stressed the importance of roadway design and growth management, advocating for infrastructure planned with safety, land use, and multimodal mobility in mind rather than continued roadway expansion for vehicle throughput alone. Comments additionally emphasized the need for public education, particularly regarding pedestrian/bicyclist safety and shared responsibility on the roadway. Finally, several responses noted the importance of interagency coordination and funding support, highlighting the need for collaborative planning and resources to sustain safety improvements.

Table C-5. Summary of Public Comments on Safety Improvements

Category	Summary of Comments
Pedestrian & Bicycle Safety	Widespread concerns about unsafe pedestrian crossings, lack of walkability, and poor bicycle infrastructure, particularly along major corridors such as U.S. 301, U.S. 27, and S.R. 50.
Speeding & Aggressive Driving	Excessive speeding, tailgating, road rage, and general disregard for pedestrians, bicyclists, and golf carts were frequently reported.
Roadway Design & Growth Management	Respondents emphasized that wider and faster roads are not a sustainable solution, calling instead for complete streets, calmer road designs, and better integration of roadway planning with growth and land-use planning.
Enforcement & Accountability	Strong support for increased law enforcement presence, speed monitoring, citation enforcement, and the use of technology (e.g., cameras) to improve compliance and accountability.
Education & Public Awareness	Respondents highlighted the need for stronger driver education, particularly regarding pedestrian and bicyclist safety, and targeted education programs tied to violations or license suspensions.
Agency Coordination & Funding	Comments stressed the need for better coordination among state, county, and municipal agencies, transparency through reporting (e.g., Vision Zero efforts), and dedicated funding mechanisms to support safety improvements.

C.3. In Person Engagement

The Project Team was responsible for leading the development of the Safety Action Plan, coordinating technical analyses, facilitating stakeholder engagement, and synthesizing findings into implementable strategies. The team worked collaboratively with MPO staff and regional partners to ensure that the planning process remained data-driven, transparent, and aligned with regional transportation goals.

As part of this effort, the Project Team actively engaged with the MPO’s CAC and TAC to gather technical guidance and community perspectives. Feedback from these committees helped validate analytical findings, identify priority concerns, and refine the proposed strategies and implementation considerations.

A total of four meetings were conducted, including both in-person and virtual sessions (**Table C-6**). During these meetings, the project team presented findings related to transportation safety conditions, identified priority concerns, and proposed countermeasure strategies. Committee members provided feedback that informed subsequent refinements to the planning framework and implementation considerations. Through this collaborative process, the CAC and TAC played an important role in ensuring that the proposed strategies aligned with local priorities, technical feasibility, and broader regional transportation objectives.

Table C-6. MPO Committee Meetings Summary

Meeting	Date	Summary of Discussion
Meeting 1	Oct 22, 2025	Introduction to the project scope, overview of Vision Zero principles, and presentation of the overall project approach.
Meeting 2	Nov 21, 2025	Review of crash trends and in-depth crash analysis, discussion of the High Injury Network (HIN), and update on public engagement activities.
Meeting 3 & 4	Feb 11, 2026	Updates on public engagement efforts, review of proposed countermeasures, and presentation of the draft Vision Zero Dashboard.

C.4. Summary

Public engagement findings highlight that most respondents primarily rely on personal vehicles, with limited use of transit, bicycling, or walking. Perceptions of safety concerns were strongly oriented toward driver behavior, particularly distracted driving, speeding, and aggressive driving, while infrastructure-related issues focused on unsafe intersections, insufficient pedestrian and bicycle facilities, poor street lighting, and a lack of pedestrian and bicycle crossings. For both driving- and walking-related unsafe locations, more than half of the reported sites overlapped with the High-Injury Network (HIN), indicating strong alignment between community perception and crash-based analysis. This suggests that safety strategies and countermeasures implemented along

HIN corridors may be strengthened by incorporating the community-identified concerns captured through this survey.

Survey responses also conveyed support for strategies that prioritize infrastructure improvements. **The strongest public preference was shown for roadway design, pedestrian crossing enhancements, and expanded sidewalk, followed by protected bike facilities, safety education, and enforcement initiatives.** Notably, sidewalk availability emerged as one of the most persistent concerns, reinforced by mapped feedback from respondents. Collectively, these findings indicate that improving pedestrian facilities, enhancing intersection and corridor design, and maintaining adequate visibility and enforcement are likely to meaningfully advance safety improvement in Lake and Sumter Counties.

APPENDIX D

In-Depth Strategies, Prioritization, and Project Selections

APPENDIX D: In-Depth Strategies, Prioritization & Project Selection

D.1 Introduction

The preceding chapters examined ten years of crash trends (2015–2024), conducted an in-depth analysis of recent crashes (2020–2024), identified the High Injury Network across the two counties, and performed data-driven risk assessment to understand the patterns contributing to severe and recurring safety concerns. This chapter transitions from diagnosis to implementation. It presents a comprehensive set of strategies designed to reduce crash frequency and severity while advancing the Vision Zero goal of eliminating traffic fatalities and serious injuries. The strategies outlined herein incorporate both engineering and other countermeasures to address infrastructure-related deficiencies and behavioral risk factors consistent with the Safe System approach.

Recommended countermeasures were selected based on nationally recognized, evidence-based safety resources to ensure technical credibility and demonstrated effectiveness. Infrastructure and operational treatments are aligned with the **Proven Safety Countermeasures** published by the Federal Highway Administration (**FHWA, 2025**). Quantitative estimates of expected crash reduction are supported by documented Crash Modification Factors (CMFs) obtained from the **CMF Clearinghouse** (**CMF Clearinghouse, 2025**). In addition, behavioral, enforcement, and policy-related strategies are informed by **Countermeasures That Work (Kirley et al., 2023)** by the National Highway Traffic Safety Administration. Collectively, these nationally recognized references provide an evidence-based foundation to ensure that proposed interventions are consistent with current transportation safety research and best practices.

The chapter is organized to first present the major safety challenges and targeted responses. It then outlines a project prioritization framework and concludes with corridor-specific countermeasure recommendations for the Top 30 High Injury Corridors.

D.2 Guiding Framework: Vision Zero & Safe System Approach

The strategies presented in this chapter are guided by the core elements of the Safe System framework as shown in **Figure D-1**. Within this approach, emphasis is placed on Safe Roads and Safe Speeds through engineering design and policy measures that reduce crash likelihood and, more importantly, minimize crash severity when collisions occur. Safe Road Users are supported through complementary enforcement, education, and policy initiatives. Vehicle safety considerations and post-crash response coordination are also recognized as important components of a comprehensive safety strategy. The framework reinforces shared responsibility among transportation agencies, policymakers, enforcement partners, and the community in advancing roadway safety.

Figure D-1. Safe System Approach Framework (FHWA)

D.3 Major Safety Challenges and Targeted Responses

Crash analyses identified several dominant safety challenges contributing to fatal and severe injury crashes across the network. The following subsections outline these key safety challenges and the targeted strategies to address them.

D.3.1 Engineering Countermeasures

D.3.1.1 Left-Turn and Angle Crashes at Intersections

The left-turn and angle collisions represent the most dominant severe crash patterns in Lake and Sumter Counties. Between 2020 and 2024, 717 KA crashes were attributed to left-turn and angle crashes, representing approximately 30.3% of all severe crashes in Lake and Sumter Counties. Nearly three-quarters (73.6%) of these crashes occurred at unsignalized intersection locations. This highlights the need for the Systemic Application of Multiple Low-Cost Countermeasures at unsignalized intersections, as recommended by the Federal Highway Administration (FHWA), which have been shown to produce an average benefit-cost ratio of approximately 12:1 (FHWA). These low-cost countermeasures generally consist of the following treatments:

On the Through Approach:

- Doubled-up (left and right), oversized advance intersection warning signs, with supplemental street name plaques (can also include flashing beacon).
- Retroreflective sheeting on sign posts.
- Enhanced pavement markings that delineate through lane edge lines.

On the Stop Approach:

- Doubled-up (left and right), oversized advance "Stop Ahead" intersection warning signs (can also include flashing beacon).
- Doubled-up (left and right), oversized Stop signs.
- Retroreflective sheeting on sign posts.
- Properly placed stop bar.
- Removal of vegetation, parking, or obstructions that limit sight distance.
- Double arrow warning sign at stem of T-intersections.

Reported safety effectiveness (for concurrent implementation) includes an estimated 10% reduction in fatal and injury crashes across all locations, a 15% reduction in nighttime crashes, a 27% reduction in fatal and injury crashes at rural intersections, and a 19% reduction at two-lane by two-lane intersections (CMF=0.73-0.89). These findings indicate that targeted, low-cost intersection safety improvements may provide substantial safety benefits across the region.

The remaining 26.4% of left-turn and angle KA crashes occurred at signalized intersections. At these locations, left-turn and angle crashes are frequently associated with failure to yield to oncoming traffic during left-turn maneuvers and red-light running violations. To mitigate these risks, converting signal phasing from permissive to protected/permissive or from protected/permissive to protected-only left-turn phasing has been shown to reduce cashes (CMF=0.23-0.85). The installation of red-light cameras (CMF=0.76-0.84) and signal timing adjustments, including optimization of the yellow change interval, have been shown to reduce red-light running by as much as half, contributing to overall intersection safety improvements (CMF=0.88-0.92). Additionally, at locations where they are not currently installed, signal backplates with 1- to 3-inch yellow retroreflective borders can be added to improve the visibility and conspicuity of the illuminated signal face and enhances driver recognition, particularly for older drivers and those with color vision deficiencies (CMF=0.85).

Further improvements include install or upgrade intersection illumination (CMF=0.58-0.67), along with other systemic signing and visibility enhancements at signalized intersections such as replacement of signal heads, re-stripping of stop lines and crosswalks, upgraded pedestrian signal equipment, and installation of advance and overhead signing. When implemented comprehensively, these treatments have demonstrated measurable safety benefits (CMF=0.87)

D.3.1.2 Roadway Departure Crashes

Roadway departure crashes, including off road and rollover crashes, represent one of the most prevalent severe crash types across Lake and Sumter Counties accounting for 673 KA crashes (28.3%). Most of these crashes (84.3%) occurred along roadway segments and of those segment crashes, approximately 75.9% took place on two-way, two-lane undivided roads. One of the most effective countermeasures for roadway departure crashes is the installation of longitudinal rumble strips. Rumble strips are grooves placed on the pavement surface to alert drivers through vibration and audible warning when their vehicle departs from the travel lane. They may be installed along the shoulder, edge line, or at or near the centerline of undivided roadways. Rumble strips are considered a relatively low-cost countermeasure, with reported benefit/cost ratios exceeding 100:1 (FHWA). Centerline rumble strips have demonstrated a 44-64% reduction in head-on fatal and injury crashes on two-lane rural roads, while shoulder rumble strips have shown a 13-51% reduction in single-vehicle run-off-road fatal and injury crashes on similar facilities (CMF=0.36-0.87).

Another low-cost countermeasure is the installation of wider edge lines to enhance the visibility of travel lane boundaries. Wider edge lines have demonstrated a reported benefit-cost ratio of approximately 25:1 (FHWA) and have been associated with reductions in fatal and injury crashes on rural two-lane roads of up to 37% (CMF=0.63).

At locations with horizontal curves, upgrading longitudinal pavement markings and roadway delineation such as installing retroreflective strips on signposts, enhanced delineators (CMF=0.82), and sequential dynamic chevron alignment signs (CMF=0.40) can further improve driver guidance and reduce roadway departure crashes. In locations with embankments or fixed-object hazards, installation of guardrail systems (CMF=0.74) or replacing existing rigid barriers with less rigid systems to reduce crash severity (CMF=0.59-0.68) may provide additional protection.

For future resurfacing or overlay projects, incorporate safety edge treatment which has been shown to reduce fatal and injury crashes by approximately 11-15% and run-off-road crashes by approximately 21% (CMF=0.79-0.89). Reported benefit-cost ratios range from approximately 700:1 to 1500:1 (**FHWA**). Improving pavement friction through the application of High Friction Surface Treatment (HFST) is also an effective countermeasure for roadway departure crashes on both rural and urban roadways, particularly at horizontal curves, interchange ramps, downgrades, and locations with a history of wet-weather crashes (CMF=0.45-0.64).

In cases where roadway departure crashes are associated with speeding in urban roadways, automated speed enforcement cameras such as fixed units (CMF=0.46-0.52) or point-to-point (P2P) systems (CMF=0.63) may contribute to reductions in speed-related crash types, including run-off-road crashes.

D.3.1.3 Rear End Crashes on Segments and Intersection

Rear end crashes represent a significant share of severe crashes across Lake and Sumter Counties, with 356 KA crashes reported between 2020 and 2024, accounting for 15.0% of all KA crashes. Of these, 62.9% occurred on roadway segments and 37.1% at intersections. On roadway segments, rear end crashes are primarily associated with speed variation, congestion, and sudden stopping. At intersections, these crashes frequently occur within dilemma zones or are related to driver inattention.

To mitigate rear end crashes at segments, one of the key strategies is the adaptation of context based appropriate target speed consistent with surrounding land use and roadway users. Establishing appropriate operating speeds is a fundamental element of the Safe System approach, as lower speeds reduce stopping distance, minimize speed differentials, and decrease crash severity. The implementation of speed management measures includes revising posted speed limits where appropriate, applying traffic calming treatments, and enhancing speed enforcement to reduce rear-end crashes. The Federal Highway Administration (FHWA) also recommends considering the use of Variable Speed Limits (VSLs) on high-speed arterials with posted speed limits greater than 40 mph. When integrated with Active Traffic Management (ATM), VSLs can mitigate rear-end, sideswipe, and other crash types on high-speed roadways (FHWA). Additional strategies include installing dynamic "Queue Ahead" warning signs (CMF=0.84) or active close-following warning systems (CMF=0.94) to alert drivers to downstream congestion. Based on context and feasibility, lane width reductions may also be considered, which have been associated with reductions in rear-end crashes (CMF=0.51-0.72) and may provide opportunities for reallocating roadway space to bicycle facilities. The Federal Highway Administration (FHWA) also recommends improve pavement frictions such as using High Friction Surface Treatment to locations with a history of rear-end and wet-weather crashes (CMF=0.33-0.48).

A key strategy to reduce rear-end crashes at signalized intersections is signal timing modification, including optimization of the yellow change interval (CMF=0.80-0.93), extension of the all-red clearance interval, or adjustment of the total change interval (CMF=0.64-0.84). The installation of Dynamic Signal Warning Flashers (DSWF) can also provide advance notification of impending signal phase changes. DSWFs are linked to the traffic signal and are activated when the indication is about to transition from green to yellow, helping drivers anticipate deceleration and reduce rear-end crash risk (CMF=0.79). Improving pavement friction through targeted surface treatments may further reduce crashes, including rear-end collisions, at both rural and urban intersections (CMF=0.58-0.79). In addition to the systemic application of multiple low-cost countermeasures at unsignalized intersections recommended by the Federal Highway Administration (FHWA), installation of transverse rumble strips on stop-controlled rural approaches has demonstrated significant reductions in severe rear end crashes (CMF=0.40) .

D.3.1.4 Pedestrian/Bicyclist Crashes

Pedestrian and bicyclist safety are a critical component of ensuring safe mobility for all road users. Lake and Sumter Counties continue to experience significant safety concerns involving vulnerable road users, with 268 KA crashes accounting for 11.3% of total KA crashes between 2020 and 2024. The majority of pedestrian and bicycle crashes occur along roadway segments in the two counties (71.2% of the total pedestrian/bicycle crashes). To reduce midblock pedestrian-vehicle crashes, the installation of midblock crossing treatments such as Pedestrian Hybrid Beacons (PHBs) (CMF=0.45-0.75), Rectangular Rapid Flashing Beacons (RRFBs) (CMF=0.52), and Midblock Pedestrian Signals (MPS) (CMF=0.55) has demonstrated substantial crash reductions while significantly increasing motorist yielding rate. . In both urban and rural areas where pedestrians regularly use roadways without dedicated sidewalk facilities, installing sidewalks on both sides of the roadway can significantly reduce pedestrian crashes associated with walking along or crossing the roadway (CMF=0.59). In urban areas, prioritizing sidewalk installation near school zones, transit stops, and activity centers is particularly important.

One of the key contributing factors to pedestrian and bicyclist crashes is inadequate lighting at both roadway segments and intersection locations. Installing new lighting or upgrading existing intersection and roadway lighting systems can significantly improve nighttime visibility and has been associated with reductions in nighttime pedestrian crashes of up to 42% at intersections and 28% on rural and urban roadways (CMF=0.58-0.72). Another effective strategy is the installation of high-visibility crosswalk markings designed to enhance driver awareness of pedestrian crossings at intersections. Use of highly visible pavement marking patterns has been associated with reductions in pedestrian crashes of up to 40% (CMF=0.60).

At signalized intersections, signal phasing can be modified by implementing a Leading Pedestrian Interval (LPI), which allows pedestrians to enter the crosswalk 3-7 seconds before vehicles receive a green indication. LPIs have been associated with approximately a 13% reduction in pedestrian-vehicle crashes at intersections (CMF=0.87). Additional strategies include installing advance yield or stop markings and signs 20 to 50 feet in advance of marked crosswalks (CMF=0.75), constructing pedestrian refuge islands on approaches to multilane intersections and midblock crossings, particularly near transit stops and other pedestrian-concentrated areas (CMF=0.54), and installing pedestrian countdown signal heads (CMF=0.30). In rural areas, the installation of transverse rumble strips in advance of pedestrian crossings may further enhance driver alertness and reduce crash risk (CMF=0.76).

To address bicycle crashes, the installation of dedicated bicycle lanes particularly traditional buffered lanes or converting them to separated facilities with flexible delineator posts can reduce vehicle-bicycle conflicts and has been associated with crash reductions of up to 53% for bicycle-vehicle crashes (CMF=0.46). On urban undivided roadways, adding bicycle lanes has demonstrated reductions in total crashes of up to 30% on two-lane collectors (CMF=0.69) .

D.3.2 Other Engineering Countermeasures

In addition to engineering treatments, behavioral and policy-based strategies are critical components of a comprehensive safety program. Other engineering countermeasures address driver behavior, enforcement, education, and policy measures to reduce crash risk among high-risk user groups. More details are presented in **Appendix F**.

D.4 Project Prioritization Framework

Following the identification of High Injury Corridors/Segments/Intersections, a structured prioritization framework need to be established to guide implementation sequencing. While all locations included in this plan demonstrate elevated crash risk, resource constraints require a systematic approach to determine which improvements should be advanced first. The prioritization framework developed for this Vision Zero Action Plan is data-driven. It emphasizes crash severity, expected safety effectiveness of proposed countermeasures, relative implementation cost, and project readiness. The purpose of this prioritization process is to:

- Ensure that locations with the greatest safety need receive highest attention,
- Prioritize treatments with demonstrated crash reduction effectiveness,
- Consider implementation feasibility and relative cost, and
- Provide a transparent and replicable scoring methodology.

The total prioritization score is calculated out of 100 points, distributed across four categories, as shown in **Table D-1.** For each facility type (corridor, segment, and intersection), locations are ranked based on their previously calculated safety scores defined in Chapter 3 (section 3.3-3.6). The High Injury Corridors are ranked using the EPDO per mile score, while High Injury Segments and High Injury Intersections are ranked based on KA crash frequency and KA crash rate. To ensure consistent comparison within each facility type, locations are divided into four equal quartiles based on their ranking positions. The highest 25 percent (first quartile) are assigned a scoring multiplier of 1.00, followed by multipliers of 0.75, 0.50, and 0.25 for the second, third, and fourth quartiles, respectively.

The Safety Benefit category reflects the expected crash reduction associated with the proposed countermeasures. Expected Total Crash Reduction (ETCR) was estimated using Crash Modification Factors (CMFs) obtained from CMF Clearinghouse. For example, a CMF of 0.80 corresponds to a Crash Reduction Factor (CRF) of 0.20 ($1 - 0.80$), indicating a 20% crash reduction. Crash-type or severity specific CMFs are applied to the corresponding crash frequencies, and the reductions were aggregated to estimate the total expected crash reduction at each location. In cases where multiple treatments target the same crash type, the multiplicative method are applied to estimate the combined effect, which is identified in Highway Safety Manual (HSM). The following is an example of the multiplicative method:

$$CMF_{Combined} = CMF_1 \times CMF_2 \times CMF_3$$

Based on the resulting percentage reduction, projects were classified as High (ETCR ≥ 25%), Moderate (15–25%), or Low (<15%). Safety Benefit, with scoring multipliers assigned accordingly.

The Relative Cost Category is assigned based on the scale and complexity of proposed countermeasures at a planning level. Low-cost projects include operational and quick-build improvements (typically, $10,000 or less); moderate-cost projects involve installation or localized upgrades without major reconstruction (typically, $10,000 to 100,000); and high-cost projects require substantial geometric redesign, widening, or right-of-way acquisition (typically, $100,000+). The Timeline for Implementation category is assigned based on the anticipated delivery timeframe at a planning level.

Short Time Period: Projects are expected to be implemented typically within 1 year

Moderate Time Period: Typically, within 1 to 3 years

Moderate Time Period: Typically, it requires 3 to 5 years for design, funding and construction

Table D-1. Prioritization Scoring Framework

Category	Description	Project Level		Scoring Factor	Weight
Safety Risk Score	Reflects crash severity and overall safety burden on the corridor	Corridors	$Rank\ 1-27$	1.00	50%
			$Rank\ 28-53$	0.75	
			$Rank\ 54-79$	0.5	
			$Rank\ 80-106$	0.25	
		Segments	$Rank\ 1-10$	1.00	
			$Rank\ 11-20$	0.75	
			$Rank\ 21-30$	0.5	
			$Rank\ 31-40$	0.25	
		Intersections	$Rank\ 1-18$	1.00	
			$Rank\ 19-35$	0.75	
			$Rank\ 36-53$	0.5	
			$Rank\ 54-70$	0.25	
Safety Benefit	Reflects expected crash reduction based on CMFs from the treatments	High ($ETCR \geq 25\%$)		1.00	25%
		Moderate ($ETCR = 15-25\%$)		0.75	
		Low ($ETCR < 15\%$)		0.50	
Relative Cost Category	Reflects expected order-of-magnitude implementation cost	Low Cost		1.00	15%
		Moderate Cost		0.75	
		High Cost		0.5	
Timeline for Implementation	Reflects project complexity and expected delivery timeframe	Short Time Period		1.00	10%
		Moderate Time Period		0.75	
		Long Time Period		0.5	

Note: ETCR = Expected Total Crash Reduction.

Example Corridor Project

The corridor S.R. 44 from Morse Boulevard to Vivienne Drive has the highest EPDO per mile score (13,638) among all evaluated corridors. Accordingly, a scoring multiplier of 1.00 was assigned for the Safety Risk Score component.

$$Safety\ Risk\ Score = 1.00 \times 50 = 50$$

The expected crash reduction for selected high injury corridor was estimated using Crash Modification Factors (CMFs), as shown in **Table D-2**.

Table D-2. Estimated Expected Crash Reduction for Selected Corridor

Treatment Location	**Crash Type**	**KA Crash Frequency**	**Treatments**	$CMF_{combined}$	$ETCR = N \times (1 - CMF_{combined})$
Intersection at S.R. 44 & Morse Blvd	Left turn/angle	5	Signal time modification; Protected left turn phase	0.21	4.0
	Right turn	0	-	-	-
	Rear end	5	Signal time modification; dynamic signal warning flasher; high friction surface treatment	0.60	2.0
Intersection at S.R. 44 & John Michael Ct	Left turn/angle	1	High friction surface treatment	0.8	0.2
	Right turn	2	Vehicle entering when flashing (VEWF) system; Oversized warning sign on both major and minor approaches; high friction surface treatment	0.4	1.2
	Rear end	0	-	-	-
Intersection at S.R. 44 & Vivienne DR	Left turn/angle	6	Oversized warning sign on both major and minor approaches; high friction surface treatment	0.58	2.5
	Right turn	1	Oversized warning sign on both major and minor approaches; high friction surface treatment	0.58	0.4
	Rear end	1	Oversized warning sign on both major and minor approaches; high friction surface treatment	0.58	0.4

Total expected crash reduction, $ETCR = \sum N_i \times (1 - CMF_i)$

$$= 4 + 2 + 0.2 + 1.2 + 2.5 + 0.4 + 0.4$$

$$= 10.7$$

$$\text{Percent Reduction} = \frac{\text{Total ETCR}}{\text{Total Crash}} \times 100 = \frac{10.7}{21} = 51\%$$

It is important to note that the estimates presented in **Table D-2** are based only on treatments for which reliable CMFs were available. Not all proposed countermeasures were included in this calculation. In addition, the estimated crash reduction reflects only the specific crash types and severity evaluated in the table and does not represent a full assessment of all crashes occurring at the locations. The resulting estimated total crash reduction of approximately 51% represents a planning-level approximation intended for prioritization purposes. Actual crash reduction may vary depending on site-specific conditions, implementation quality, and interaction among treatments.

Since the estimated reduction exceeds 25%, the corridor is classified under the High Safety Benefit category and assigned a scoring multiplier of 1.00.

$$Safety\ Benefit\ Score = 1.00 \times 25 = 25$$

These countermeasures do not involve major geometric reconstruction or roadway widening; however, they require installation, signal hardware modifications, and coordination across multiple approaches. Based on the order-of-magnitude planning-level assessment, the project is classified as Moderate Cost, corresponding to a scoring multiplier of 0.75.

$$Relative\ Cost\ Score = 0.75 \times 15 = 11.25$$

The majority of the proposed treatments are considered operational or quick-build safety strategies. Accordingly, the project is classified under the Short Time Period category, with a scoring multiplier of 1.00.

$$Implimentation\, Timeline\ \ Score = 1.00 \times 10 = 10$$

Total Prioritization Score

$$Total\ \ Score = 50 + 25 + 11.25 + 10 = 96.25$$

D.5 Corridor Safety Profiles and Targeted Countermeasures

The following section presents the process of developing High Injury Corridor (HIN) profiles for the top 30 corridors and the corresponding countermeasures proposed for each prioritized corridor. Building upon the network screening and corridor ranking described in previous sections, the focus here shifts from identifying high-risk locations to outlining practical, location-specific safety improvements. By strategically concentrating on corridors with the highest concentration of severe crashes, resources can be directed where they have the greatest potential to reduce fatal and incapacitating injury crashes. For each HIN corridor, a standardized fact sheet was developed to summarize roadway characteristics, crash patterns, contributing factors, and proposed countermeasures. The intent is to clearly connect documented safety issues with targeted improvement strategies. Organized in this format, the corridor safety profiles function as both a technical reference and an implementation guide.

D.5.1 Development of Countermeasures for Corridor Level

The development of corridor-level countermeasures followed a structured, multi-step review process, as illustrated in **Figure D-2**. For this first, detailed crash narrative form police report for each severe or fatal crash were reviewed to understand how severe crashes occurred within each corridor. This step went beyond summary statistics and focused on identifying the sequence of events contributing to repeated crashes. Second, recurring crash patterns were synthesized to determine the underlying safety issues, such as failure to yield during left-turn movements, red-light running, or speed-related issues at specific locations. Finally, candidate countermeasures were identified and screened using the CMF Clearinghouse, FHWA Proven Safety Countermeasures, and NHTSA guidance. Context-appropriate treatments were then selected to directly address the documented crash mechanisms. This step-by-step process ensured that the proposed improvements are directly tied to observed safety problems and are supported by established safety evidence.

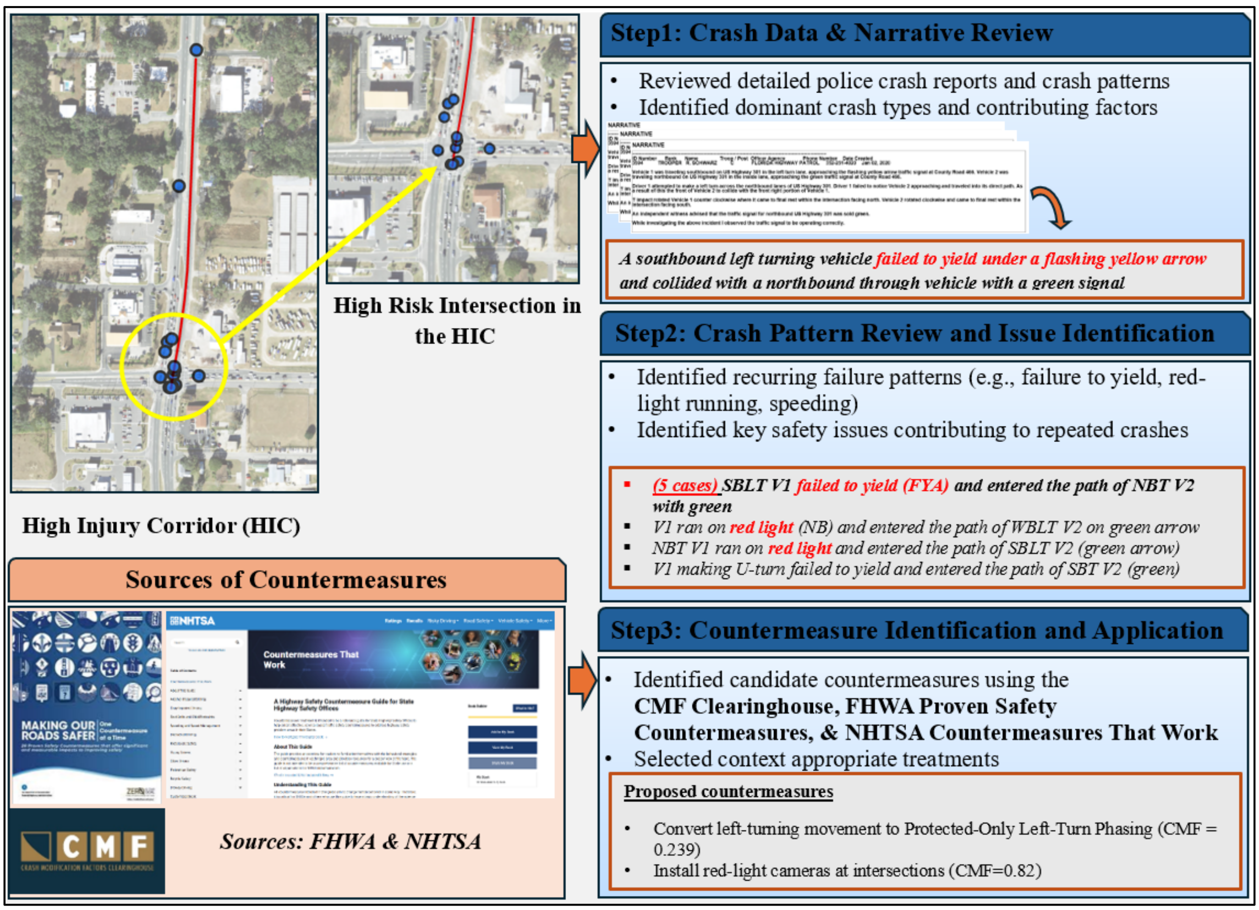
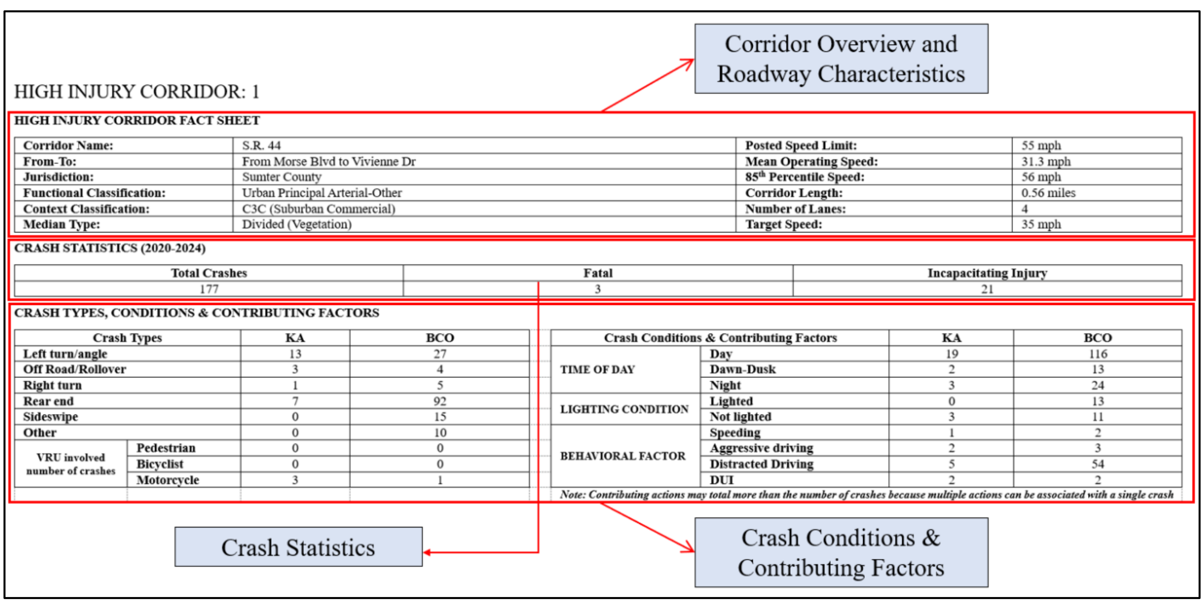


Figure D-2. Development of Safety Countermeasure Strategies

D.5.2 High Injury Corridor Fact Sheets

Each corridor fact sheet includes the following components:

The structure of a typical High Injury Corridor fact sheet is illustrated in. The first section presents the Corridor Overview and Roadway Characteristics, including corridor limits, functional classification, context classification, median type, number of lanes, and speed information (posted, mean operating, 85th percentile and target speeds). This information establishes the physical and operational context of the corridor and helps explain how roadway design and speed environment may influence crash occurrence. The second section summarizes Crash Statistics from 2020 to 2024, including total crashes and the number of fatal and incapacitating injury crashes over the study period. The third section presents Crash Types, Conditions, and Contributing Factors, including the distribution of crash types (e.g., left-turn/angle, rear-end, off-road), vulnerable road user involvement, time of day, lighting conditions, and behavioral factors. This breakdown helps identify recurring crash mechanisms and highlights the primary safety concerns that the proposed countermeasures aim to address.



HIGH INJURY CORRIDOR: 1

HIGH INJURY CORRIDOR FACT SHEET

Corridor Name:	S.R. 44	**Posted Speed Limit:**	55 mph
From-To:	From Morse Blvd to Vivienne Dr	**Mean Operating Speed:**	31.3 mph
Jurisdiction:	Sumter County	**85th Percentile Speed:**	56 mph
Functional Classification:	Urban Principal Arterial-Other	**Corridor Length:**	0.56 miles
Context Classification:	C3C (Suburban Commercial)	**Number of Lanes:**	4
Median Type:	Divided (Vegetation)	**Target Speed:**	35 mph

CRASH STATISTICS (2020-2024)

Total Crashes	Fatal	Incapacitating Injury
177	3	21

CRASH TYPES, CONDITIONS & CONTRIBUTING FACTORS

Crash Types		KA	BCO
Left turn/angle		13	27
Off Road/Rollover		3	4
Right turn		1	5
Rear end		7	92
Sideswipe		0	15
Other		0	10
VRU involved number of crashes	Pedestrian	0	0
	Bicyclist	0	0
	Motorcycle	3	1

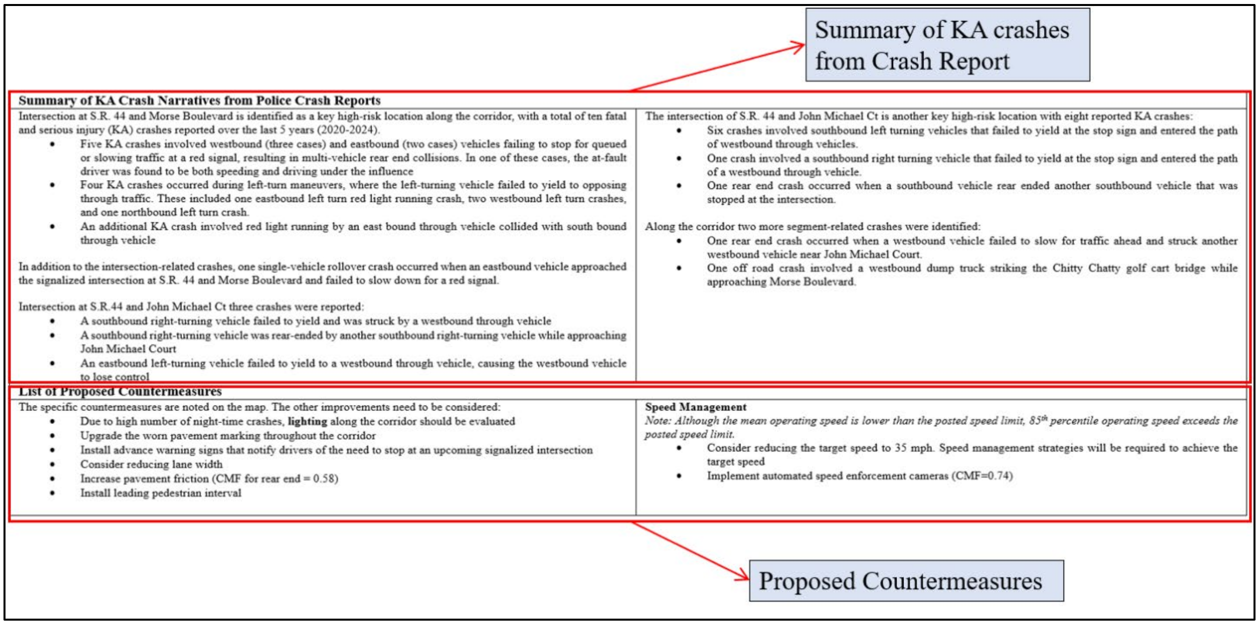
Crash Conditions & Contributing Factors		KA	BCO
TIME OF DAY	Day	19	116
	Dawn-Dusk	2	13
	Night	3	24
LIGHTING CONDITION	Lighted	0	13
	Not lighted	3	11
BEHAVIORAL FACTOR	Speeding	1	2
	Aggressive driving	2	3
	Distracted Driving	5	54
	DUI	2	2

Note: Contributing actions may total more than the number of crashes because multiple actions can be associated with a single crash

Figure D-3. High Injury Corridor Fact Sheet: Corridor Overview, Crash Statistics, and Contributing Factors

The fourth section presents a Summary of KA Crash Narratives from Police Crash Reports. While the crash statistics identify the frequency and type of severe crashes, the narrative review provides additional insight into the specific circumstances under which those crashes occurred. Detailed police reports for each fatal and incapacitating injury crashes were examined to better understand driver actions, signal compliance, turning movements, and other contributing conditions. For instance, although left-turn crashes may appear as a dominant crash type in the data, the narratives reveal more specific contributing factors, such as failure to yield during flashing yellow arrow operations, or red-light running at signalized intersections. This level of detail helps clarify the underlying safety issues that may not be fully captured by crash type classifications alone. Rather than listing individual crash descriptions, the narratives are synthesized to identify recurring patterns and common contributing behaviors across the corridor. This qualitative review strengthens the connection between observed crash patterns and the selection of appropriate countermeasures, ensuring that the recommended improvements address the root causes of severe crashes.

The fact sheet also includes a summary of the Proposed Countermeasures for each corridor at a general level. These recommendations are informed by the identified crash patterns, roadway characteristics, and observed safety concerns. This section outlines the overall strategies intended to address corridor-wide issues.



Summary of KA crashes from Crash Report

Summary of KA Crash Narratives from Police Crash Reports

Intersection at S.R. 44 and Morse Boulevard is identified as a key high-risk location along the corridor, with a total of ten fatal and serious injury (KA) crashes reported over the last 5 years (2020-2024).

- Five KA crashes involved westbound (three cases) and eastbound (two cases) vehicles failing to stop for queued or slowing traffic at a red signal, resulting in multi-vehicle rear end collisions. In one of these cases, the at-fault driver was found to be both speeding and driving under the influence
- Four KA crashes occurred during left-turn maneuvers, where the left-turning vehicle failed to yield to opposing through traffic. These included one eastbound left turn red light running crash, two westbound left turn crashes, and one northbound left turn crash.
- An additional KA crash involved red light running by an east bound through vehicle collided with south bound through vehicle

In addition to the intersection-related crashes, one single-vehicle rollover crash occurred when an eastbound vehicle approached the signalized intersection at S.R. 44 and Morse Boulevard and failed to slow down for a red signal.

Intersection at S.R.44 and John Michael Ct three crashes were reported:

- A southbound right-turning vehicle failed to yield and was struck by a westbound through vehicle
- A southbound right-turning vehicle was rear-ended by another southbound right-turning vehicle while approaching John Michael Court
- An eastbound left-turning vehicle failed to yield to a westbound through vehicle, causing the westbound vehicle to lose control

The intersection of S.R. 44 and John Michael Ct is another key high-risk location with eight reported KA crashes:

- Six crashes involved southbound left turning vehicles that failed to yield at the stop sign and entered the path of westbound through vehicles.
- One crash involved a southbound right turning vehicle that failed to yield at the stop sign and entered the path of a westbound through vehicle.
- One rear end crash occurred when a southbound vehicle rear ended another southbound vehicle that was stopped at the intersection.

Along the corridor two more segment-related crashes were identified:

- One rear end crash occurred when a westbound vehicle failed to slow for traffic ahead and struck another westbound vehicle near John Michael Court.
- One off road crash involved a westbound dump truck striking the Chitty Chatty golf cart bridge while approaching Morse Boulevard.

List of Proposed Countermeasures

The specific countermeasures are noted on the map. The other improvements need to be considered:

- Due to high number of night-time crashes, **lighting** along the corridor should be evaluated
- Upgrade the worn pavement marking throughout the corridor
- Install advance warning signs that notify drivers of the need to stop at an upcoming signalized intersection
- Consider reducing lane width
- Increase pavement friction (CMF for rear end = 0.58)
- Install leading pedestrian interval

Speed Management

Note: Although the mean operating speed is lower than the posted speed limit, 85th percentile operating speed exceeds the posted speed limit.

- Consider reducing the target speed to 35 mph. Speed management strategies will be required to achieve the target speed
- Implement automated speed enforcement cameras (CMF=0.74)

Proposed Countermeasures

Figure D-4. High Injury Corridor Fact Sheet-KA Crash Narrative Summary and Proposed Countermeasures

The final component presents the Location-Specific Countermeasures on Map as shown in **Figure D-5**. This map visually identifies high-risk intersections and segment-level crash concentrations and shows the corresponding treatments at their specific locations along the corridor.

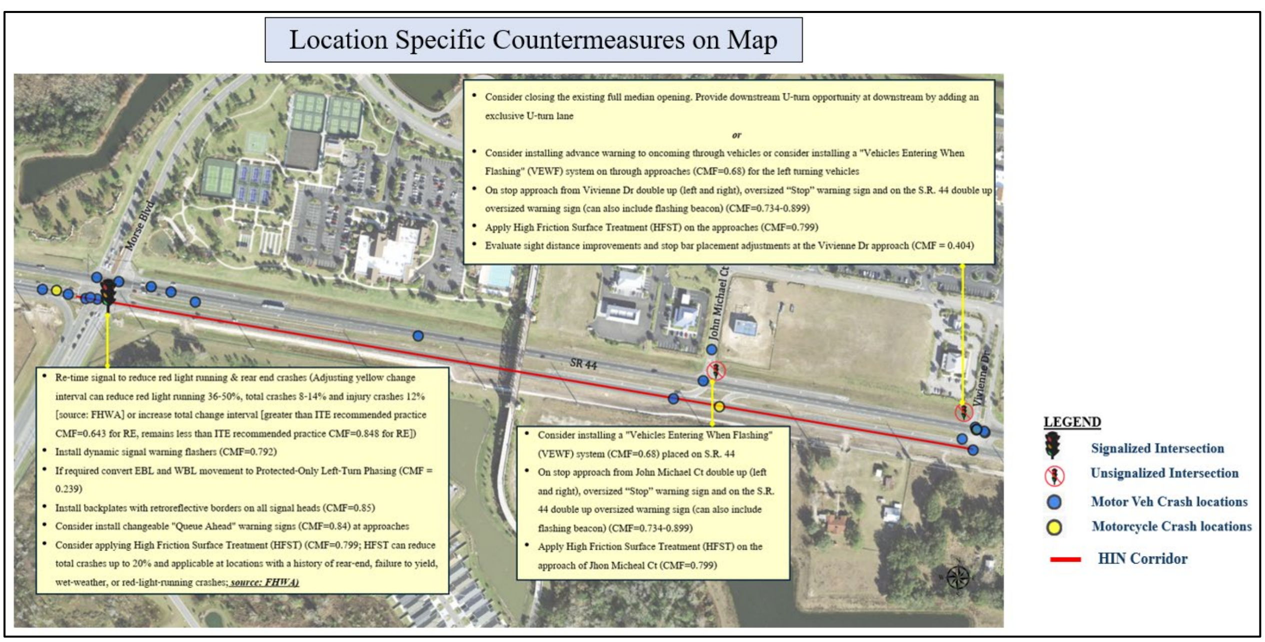


Figure D-5. Location specific countermeasures with map

An example HIN fact sheet is presented at the end of this section for illustration. The remaining 29 corridor fact sheets are provided in Appendix E. Network-wide systemic safety strategies aligned with the five pillars of the Safe System Approach are provided in Appendix F.

HIGH INJURY CORRIDOR: 1

HIGH INJURY CORRIDOR FACT SHEET

Corridor Name:	S.R. 44	**Posted Speed Limit:**	55 mph
From-To:	From Morse Blvd to Vivienne Dr	**Mean Operating Speed:**	31.3 mph
Jurisdiction:	Sumter County	**85th Percentile Speed:**	56 mph
Functional Classification:	Urban Principal Arterial-Other	**Corridor Length:**	0.56 miles
Context Classification:	C3C (Suburban Commercial)	**Number of Lanes:**	4
Median Type:	Divided (Vegetation)	**Target Speed:**	35 mph

CRASH STATISTICS (2020-2024)

Total Crashes	Fatal	Incapacitating Injury
177	3	21

CRASH TYPES, CONDITIONS & CONTRIBUTING FACTORS

Crash Types		KA	BCO
Left turn/angle		13	27
Off Road/Rollover		3	4
Right turn		1	5
Rear end		7	92
Sideswipe		0	15
Other		0	10
VRU involved number of crashes	**Pedestrian**	0	0
	Bicyclist	0	0
	Motorcycle	3	1

Crash Conditions & Contributing Factors		KA	BCO
TIME OF DAY	**Day**	19	116
	Dawn-Dusk	2	13
	Night	3	24
LIGHTING CONDITION	**Lighted**	0	13
	Not lighted	3	11
BEHAVIORAL FACTOR	**Speeding**	1	2
	Aggressive driving	2	3
	Distracted Driving	5	54
	DUI	2	2

Note: Contributing actions may total more than the number of crashes because multiple actions can be associated with a single crash

Summary of KA Crash Narratives from Police Crash Reports

Intersection at S.R. 44 and Morse Boulevard is identified as a key high-risk location along the corridor, with a total of ten fatal and serious injury (KA) crashes reported over the last 5 years (2020-2024).

- Five KA crashes involved westbound (three cases) and eastbound (two cases) vehicles failing to stop for queued or slowing traffic at a red signal, resulting in multi-vehicle rear end collisions. In one of these cases, the at-fault driver was found to be both speeding and driving under the influence
- Four KA crashes occurred during left-turn maneuvers, where the left-turning vehicle failed to yield to opposing through traffic. These included one eastbound left turn red light running crash, two westbound left turn crashes, and one northbound left turn crash.
- An additional KA crash involved red light running by an east bound through vehicle collided with south bound through vehicle

In addition to the intersection-related crashes, one single-vehicle rollover crash occurred when an eastbound vehicle approached the signalized intersection at S.R. 44 and Morse Boulevard and failed to slow down for a red signal.

Intersection at S.R.44 and John Michael Ct three crashes were reported:

- A southbound right-turning vehicle failed to yield and was struck by a westbound through vehicle
- A southbound right-turning vehicle was rear-ended by another southbound right-turning vehicle while approaching John Michael Court
- An eastbound left-turning vehicle failed to yield to a westbound through vehicle, causing the westbound vehicle to lose control

The intersection of S.R. 44 and John Michael Ct is another key high-risk location with eight reported KA crashes:

- Six crashes involved southbound left turning vehicles that failed to yield at the stop sign and entered the path of westbound through vehicles.
- One crash involved a southbound right turning vehicle that failed to yield at the stop sign and entered the path of a westbound through vehicle.
- One rear end crash occurred when a southbound vehicle rear ended another southbound vehicle that was stopped at the intersection.

Along the corridor two more segment-related crashes were identified:

- One rear end crash occurred when a westbound vehicle failed to slow down for traffic ahead and struck another westbound vehicle near John Michael Court.
- One off road crash involved a westbound dump truck striking the Chitty Chatty golf cart bridge while approaching Morse Boulevard.

List of Proposed Countermeasures

The specific countermeasures are noted on the map. The other improvements need to be considered:

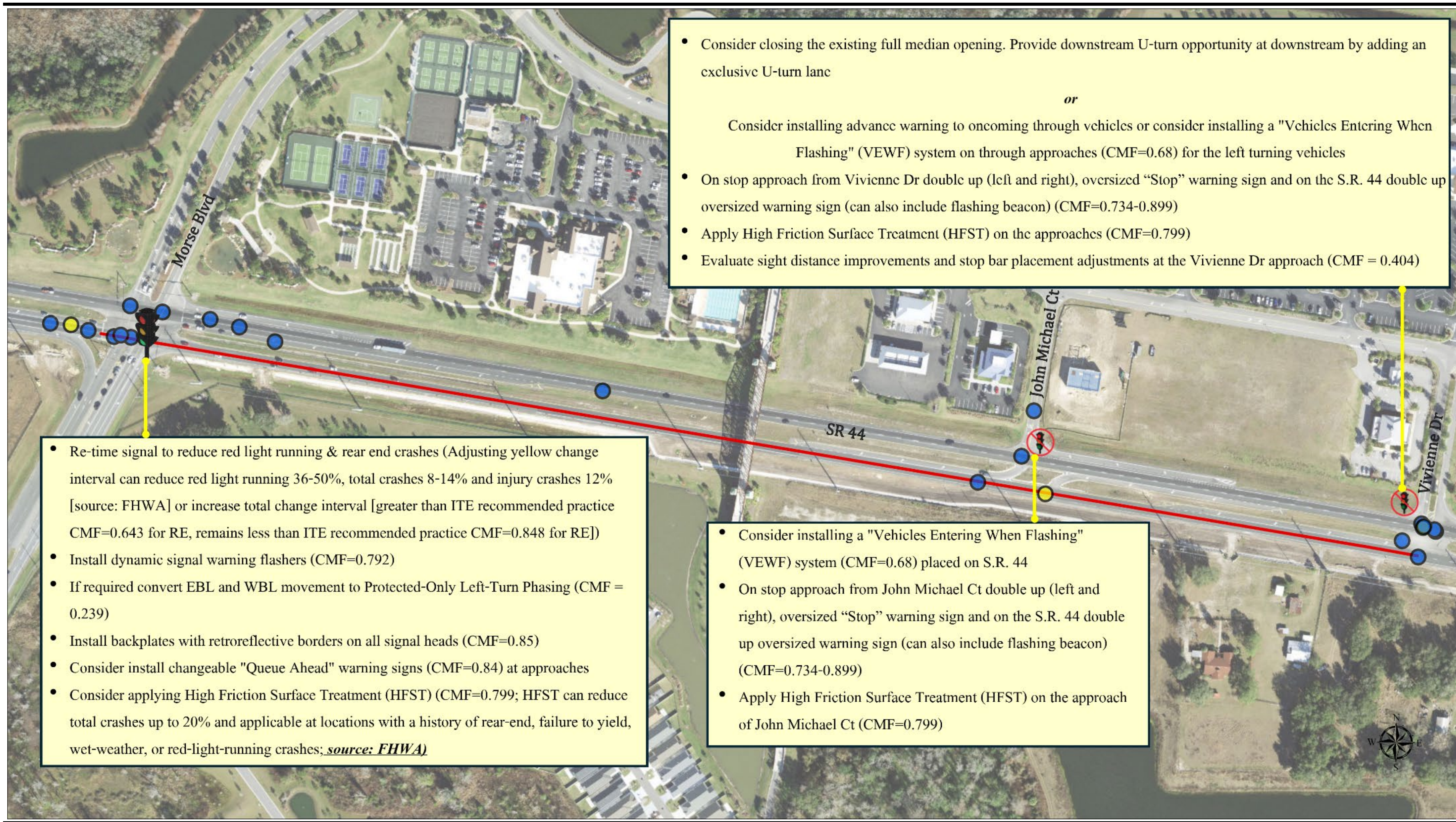
- Due to high number of night-time crashes, **lighting** along the corridor should be evaluated
- Upgrade the worn down pavement marking throughout the corridor
- Install advance warning signs that notify drivers of the need to stop at an upcoming signalized intersection
- Consider reducing lane width (12ft to 9ft CMF = 0.57 for all crashes, CMF = 0.72 for RE)
- Increase pavement friction (CMF for rear end = 0.58)
- Install leading pedestrian interval at the signalized intersection locations (CMF = 0.87)

Speed Management

Note: Although the mean operating speed is lower than the posted speed limit, 85th percentile operating speed exceeds the posted speed limit.

- Consider the target speed of 35 mph.
- Consider installing automated speed enforcement cameras (CMF=0.46-0.52 for fixed units; CMF=0.632 for point to point units).

HIGH INJURY CORRIDOR: 1
S.R. 44
From Morse Blvd to Vivian Dr



Note: The map presents multiple potential countermeasure options for each location; one or a combination of these solutions may be selected based on site-specific conditions and feasibility. All projects will require more detailed planning and engineering analysis, along with community engagement and coordination among the agencies responsible for the roadway and the jurisdiction it traverses

LEGEND

- Signalized Intersection
- Unsignalized Intersection
- Motor Veh Crash locations
- Motorcycle Crash locations
- HIN Corridor

D.6 Conclusion

This chapter presents targeted safety strategies and a implementation framework based on the crash analysis and High Injury Network identification. Building upon the diagnostic work presented in earlier chapters, this section focuses on defining evidence-based countermeasures designed to reduce crash frequency and severity. Both Engineering and complementary other engineering strategies are proposed using nationally recognized safety guidance to ensure technical credibility and consistency with current best practices.

A data-driven prioritization framework was developed to systematically evaluate safety risk, expected safety benefit, relative cost, and implementation timeline. This approach provides a transparent and replicable method for sequencing projects based on both safety need and feasibility.

The chapter also presented detailed methodology for corridor safety profiles for the Top 30 High Injury Corridors, incorporating crash statistics, contributing factors, narrative-based crash pattern analysis, and both corridor-level and location-specific countermeasures. Countermeasures were selected through a structured review process that examined detailed crash narratives, identified recurring crash mechanisms, and screened candidate treatments to ensure context-appropriate and evidence-based recommendations. Collectively, the strategies, prioritization framework, and corridor-specific profiles establish a comprehensive and actionable safety improvement plan for the Lake and Sumter Counties.

APPENDIX E

Top 30 Corridors Detailed Safety Information and Countermeasures

APPENDIX F :
Additional Safety Countermeasures Data

F.1 Other Engineering Countermeasures

F.1.1 Older Drivers

For older drivers (ages 65 and above) exhibit elevated KA crash rates per 10,000 licensed drivers for across all crash type. This increased risk is often associated with age-related changes in vision, cognition, reaction time, and physical flexibility. The following evidence-based strategies, consistent with NHTSA guidance, are presented to review and strengthen existing efforts supporting older driver safety in **Table F- 2.**

Table F-1. Older Driver Countermeasures

Countermeasure	Strategic Emphasis for this Plan	Effectiveness
Licensing Agency & Medical Referrals for At-Risk Older Drivers	Strengthen coordination among law enforcement, healthcare providers, and FLHSMV to improve identification and referral of medically at-risk older drivers	★★★★
License Restrictions for Medically At-Risk Older Drivers	Support coordination with FLHSMV to promote appropriate restricted licenses (e.g., geographic limits, speed limits, or daylight-only driving) for medically at-risk older drivers	★★★★
In-Person Renewal and Vision Screening	Maintain compliance with Florida's in-person renewal and vision test requirements for drivers age 80 and older and periodically review screening outcomes to identify medically at-risk drivers.	★★
Formal Refresher Courses for Older Drivers (Classroom + On-Road Feedback)	Encourage voluntary participation in mature driver refresher programs that combine classroom education with individualized on-road feedback to improve hazard recognition and vehicle technology adaptation.	★★★★

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

In addition to the strategies summarized in **Table 5-2**, these measures should continue to be coordinated with existing Florida renewal and vision screening requirements and strengthened referral mechanisms for medically at-risk drivers. Where appropriate, partnerships among

FLHSMV, healthcare providers, and law enforcement can enhance identification and management of functional impairments. Voluntary refresher training programs that combine classroom education with individualized on-road feedback may further support safe mobility among older drivers. Together, these approaches emphasize screening, targeted restriction, and education.

F.1.2 Young Drivers

Young drivers (ages 15-20) experience higher rates of KA crashes per 10,000 licensed drivers across several major crash types such as left turn/angle, off road/rollover and pedestrian/bicycle related crashes. This disproportionate involvement in severe crashes is often associated with inexperience, speeding behavior, nighttime driving exposure, distraction, and peer passenger influence. The following evidence-based non-engineering strategies in **Table F-1**, consistent with NHTSA guidance, are presented for review to ensure existing policies and programs remain aligned with best practices and to identify any potential gaps.

Other strategies such as parent engagement programs, electronic monitoring/feedback systems, and hazard perception training can also be considered to complement existing GDL provisions and strengthen young driver safety

Other strategies such as parent engagement programs, electronic monitoring/feedback systems, and hazard perception training can also be considered to complement existing GDL provisions and strengthen young driver safety

Table F-2. Young Driver Countermeasures

Countermeasure	Strategic Emphasis for this Plan	Effectiveness
Graduated Driver Licensing (GDL) System	Maintain strong compliance with Florida's 3-phase licensing system and support public awareness of its safety purpose.	★★★★★
Learner's Permit Holding Period Requirements	Reinforce supervised driving requirements during the learner's permit phase through parent engagement and coordinated awareness efforts with schools.	★★★★★
GDL Nighttime Driving Restrictions	Support strong compliance with graduated driver licensing (GDL) nighttime restrictions by enhancing parent and teen awareness and coordinating targeted enforcement during high-risk late evening and overnight hours.	★★★★★
GDL Passenger Restrictions	Increase awareness that crash risk rises significantly when teen drivers carry same-age peer passengers, particularly during the first months of independent driving	★★★★★
Enforcement of GDL Provisions	Coordinate targeted enforcement near schools and high-injury corridors to improve compliance	★★
Electronic Monitoring / Parent Feedback Systems	Encourage voluntary use of vehicle or smartphone-based monitoring tools during early independent driving	★★★
Programs Assisting Parents/Guardians	Promote parent-teen driving agreements and structured supervision programs	★★
Hazard Perception Training	Encourage supplemental hazard awareness training to improve novice driver anticipation skills	★★

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

F.1.3 Driving Under Influence

Impaired driving remains a significant safety concern within the counties, particularly in High Injury Segments, where 13.6% of crashes were identified as DUI-related. Crashes involving impaired driving are extremely severe, frequently resulting in fatal or serious injuries. Addressing impaired driving in Lake and Sumter Counties requires a balanced strategy that integrates enforcement, prevention, and safe alternative transportation options. Some strategies are presented in **Table F- 3.**

Table F-3. Drug-Impaired Driving Countermeasures

Countermeasure	Strategic Emphasis for This Plan	Effectiveness
High-Visibility Enforcement and Deterrence	Support coordinated, high-visibility enforcement efforts focused on impaired driving, particularly during high-risk periods (weekends, holidays, major events). Public awareness campaigns should accompany enforcement to reinforce perceived risk of detection.	
Drug-Impaired Driving Enforcement Training (ARIDE/DRE)	Support continued training for officers in drug recognition and roadside detection to improve identification of drug-impaired drivers	★★★
Prevention & Community Education	Expand public education on alcohol, cannabis, prescription medication impairment, and poly-substance risks through schools, healthcare providers, and media outreach.	
Safe Ride & Alternative Transportation Partnerships	Partner with local organizations, hospitality venues, and rideshare providers to promote ride-home programs during major events and holidays.	
Data Coordination & Reporting Improvements	Improve crash reporting consistency and distinction between alcohol- and drug-impaired cases to better target enforcement and prevention efforts	

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

F.1.4 Distracted Driving

Distracted driving remains a significant contributor to severe crashes within the High Injury Network, accounting for 12.2% of crashes in High Injury Segments and 18.5% of crashes in High Injury Intersections. By impairing drivers' visual, manual, and cognitive attention, distracted driving increases the likelihood of serious crashes. In Florida, the Wireless Communications While Driving Law prohibits texting while driving and restricts handheld device use in school and work zones. Consistent with NHTSA guidance, the following strategies are presented in **Table F- 4** to support enforcement, training, and coordinated program efforts related to distracted driving.

Table F-4. Distracted Driving Countermeasures

Countermeasure	Strategic Emphasis for This Plan	Effectiveness
High-Visibility Cell Phone Enforcement (HVE)	Support coordinated enforcement waves targeting handheld phone use and texting, paired with paid and earned media to increase the perceived risk of citation.	★★★★
Officer Training & Enforcement Support	Provide continued training for law enforcement on recognizing signs of distracted driving and consistent application of distracted driving laws.	
Communications & Outreach on Distracted Driving	Support targeted public education efforts that reinforce distracted driving laws and specific high-risk behaviors (e.g., handheld phone use), recognizing that communications alone are unlikely to reduce crashes.	

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490)

F.2 Network-Wide Systemic Safety Strategies

F.2.1 Safe Road

The Safe Road strategy emphasizes systematic roadway design and infrastructure improvements to reduce the likelihood and severity of crashes. **Table F- 5** presents the recommended engineering treatments organized by facility type, associated risk patterns, and deployment approach.

Table F-5. Engineering Strategies for Safer Roads

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Signalized Intersections	Signal Timing Optimization (Yellow & All-Red Intervals), Retroreflective Signal Backplates, Protected / Protected-Permissive Left-Turn Phasing, Red Light Camera, Dynamic Signal Warning Flasher, Prohibit Right-Turn on Red or Dynamic No Right Turn on Red Signs, Dedicated Left- and Right-Turn Lanes, High Friction Surface Treatment (HFST) at approaches, Access Management Near Intersections, Intersection Lighting Improvements, High-Visibility Crosswalk Markings, Pedestrian Push Button, Leading Pedestrian Intervals (LPI), Pedestrian Countdown Signal Heads and Roundabout Conversion (Where Feasible)	Left-turn/angle crashes, rear end crashes, red-light running crashes, failure to yield crashes and pedestrian crashes	Apply a systemic, risk-based screening process to identify signalized intersections exhibiting the target crash patterns, then select and implement context-appropriate countermeasures based on site-specific operational, geometric, and exposure characteristics.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Unsignalized Intersections	Systemic Application of Multiple Low-Cost Countermeasures that includes: On the Stop Approach doubled-up (left and right), oversized advance ”Stop Ahead“ intersection warning signs (can also include flashing beacon), doubled-up (left and right) oversized Stop signs, retroreflective sheeting on sign posts, removal of vegetation, parking, or obstructions that limit sight distance, double arrow warning sign at stem of T-intersections. On the through approach doubled-up (left and right) oversized advance intersection warning signs with supplemental street name plaques (can also include flashing beacon), retroreflective sheeting on sign posts and enhanced pavement markings that delineate through lane edge lines. Other treatments include intersection lighting improvement/installation, transverse rumble strips on approaches, high-friction surface treatment (HFST), all-wat stop control, channelization improvements, high visibility crosswalk marking, and advance yield/stop bars (20-50 ft in advance)	Angle crashes, failure-to-yield crashes at stop-controlled approaches, high-speed approach crashes, nighttime crashes related to low visibility, limited sight distance-related crashes, and pedestrian crossing crashes.	Apply a systemic, risk-based screening process to identify stop-controlled and rural or high-speed unsignalized intersections exhibiting elevated left turn/angle, rear end and failure-to-yield crash patterns. Prioritize locations with high approach speeds, limited sight distance, skewed geometry, or documented nighttime crash trends, and implement low-cost countermeasures systemically before considering higher-cost traffic signal installation or geometric modifications.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Roadway Segments	Road diets/lane reconfiguration or repurposing (where feasible), conversion of TWLTL or painted/undivided medians to raised medians, shoulder widening and paved shoulders, shoulder and centerline rumble strips (rural), enhanced pavement markings (wider edge lines, centerlines, retroreflective markings), high-friction surface treatment (HFST) (on curves, ramps, steep downgrades, and locations with a history of rear-end or wet-weather crashes), median barriers, safety edge treatments for resurfacing or overlay projects, advance and in-curve upgrades to longitudinal pavement markings and roadway delineation (e.g., retroreflective strips on sign posts, delineators, chevron signs), flexible or semi-flexible guardrails, crash attenuators and lighting improvements	Rear-end, head-on, off-road and sideswipe crashes, nighttime crashes associated with limited visibility, and weather-related crashes	Use corridor and segment-level crash screening and risk-factor analysis (e.g., lane width, traffic volume, curvature, lighting conditions) to identify high-risk locations. Apply systemic treatments at segments exhibiting similar crash patterns and roadway characteristics, prioritizing low-cost, high-benefit improvements before major capital reconstruction.
Pedestrian Facilities	Sidewalk installation on both side of the roadways and gap closures (urban and rural), midblock pedestrian crossings (including pedestrian hybrid beacons (PHBs), rectangular rapid flashing beacons (RRFBs), and midblock pedestrian signals), pedestrian refuge islands on multilane roadways, raised crosswalks, intersection and midblock lighting improvements, accessible curb ramps and ADA-compliant upgrades, enhanced pedestrian signing and pavement markings, traffic calming treatments in pedestrian-priority areas, and crossing improvements near transit stops, school zones, and activity centers.	Pedestrians walking along the roadway, midblock pedestrian crashes, multilane crossing crashes, nighttime pedestrian crashes, pedestrian-vehicle crashes near transit stops, school zones, and activity centers.	Use exposure-based and risk-based screening to identify corridors and crossings with documented pedestrian crash history, high pedestrian activity, transit proximity, school zones, multilane crossing conditions, or inadequate crossing visibility. Implement context-sensitive pedestrian treatments systemically across locations exhibiting similar risk characteristics, prioritizing low-cost visibility and crossing enhancements before major capital reconstruction.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Bicycle Facilities (Segments & Intersections)	Buffered or separated bicycle lanes (including parking-protected facilities), dedicated bicycle signal phases, two-stage turn queue boxes, mixing zones with high-visibility conflict markings, floating transit islands, high-visibility bicycle crossing markings, shared-use paths separated from high-speed traffic, shoulder widening to accommodate bicycle travel on rural roadways (with rumble strip offset), enhanced pavement markings and "Bicycles May Use Full Lane" signage, and lighting improvements along bicycle corridors.	Bicycle-vehicle crashes at intersections, bicycle crashes on high-speed segments, overtaking and sideswipe crashes, nighttime bicycle crashes, and crashes involving limited bicyclist conspicuity	Use corridor-level bicycle crash mapping and exposure analysis (e.g., traffic speed, volume, presence/absence of bike facilities, transit stops) to identify high-risk segments and intersections. Prioritize corridors with recurring bicycle crashes and apply appropriate countermeasures.
Corridor Access Management	Implement corridor-level access management strategies to reduce conflict points, including driveway closure, consolidation, or relocation; improved spacing of access points; directional median treatments; turn lane provisions; and movement restrictions (e.g., right-in/right-out) where appropriate	Left-turn and angle crashes at driveways, rear-end crashes at segments, and pedestrian/bicycle crashes near commercial access points.	Use corridor-level crash screening and access density analysis to identify segments with frequent driveway-related conflicts and closely spaced access points. Prioritize arterials with recurring left-turn, rear-end, and pedestrians/bicyclists crashes, and implement phased access management improvements in coordination with local jurisdictions and adjacent property owners.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Road Maintenance (Pavement & Roadside Asset Management)	Implement a proactive roadway maintenance and surface management program that includes routine pavement condition and skid resistance (friction) monitoring; timely pothole and surface distress repair; shoulder and edge drop-off correction; drainage improvements to reduce hydroplaning risk; vegetation management to maintain sight distance; retro reflectivity upgrades for pavement markings and signs; and maintenance-of-traffic (MOT) practices that safely accommodate pedestrians and bicyclists during construction and work zones.	Wet-weather crashes, roadway departure crashes, motorcycle crashes related to low friction, hydroplaning crashes, nighttime crashes associated with poor visibility, pedestrian trip hazards due to damaged sidewalks, and crashes related to degraded pavement markings or obscured sight lines.	Use pavement condition data, skid resistance testing, wet-weather crash screening, and nighttime crash analysis to identify priority segments for friction enhancement and surface rehabilitation. Integrate safety performance measures into resurfacing and maintenance cycles to ensure friction, marking visibility, and sight distance are systematically addressed before severe crash patterns emerge.

F.2.2 Safe Speeds

Managing speed is a core pillar of the Safe System Approach and is pivotal to achieving Vision Zero goals. Under the SS4A framework, safe speeds ensure that roadway operating speeds are aligned with the human body's tolerance to crash forces, particularly for vulnerable road users. While roadway design and enforcement play critical roles, establishing appropriate speed limit is the foundation of an effective speed management strategy. **Table F- 6** presents the recommended strategies for safer speed for all road users.

Table F-6. Strategies for Safer Speed

Speed Strategy Category	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Target Speed	Establish and adopt target speeds based on context classification (C1–C5), population density, cross-section elements (e.g., separated bike lanes, shared-use paths), and presence of vulnerable road users; align design speed, posted speed, and operating speed to support the Safe System approach.	High-severity crashes, pedestrian and bicycle fatal/serious injury crashes, speeding-related crashes	Conduct a corridor-level review to determine appropriate context classification of the roadways and evaluate roadway function, land use characteristics, multimodal activity, and the presence of vulnerable road users. Review existing posted speed limits and compare them with observed operating speeds using network-wide speed data (e.g., connected vehicle data or speed studies). Apply tools such as FHWA's USLIMITS2 to support appropriate speed setting. Compare design speed, posted speed, and operating speed, and establish a consistent target speed framework across the network.

ITS based speed management	Deploy variable speed limits (VSL), automated speed enforcement cameras (fixed or point-to-point), dynamic speed feedback signs, curve speed warning systems, and dynamic queue warning systems to improve driver compliance and reduce excessive speeds	Speed-related crashes, high-severity (KA) crashes, roadway departure crashes, rear-end crashes associated with speed differentials, crashes on horizontal curves, and corridors with documented speeding problem.	Use speed data, crash history, and roadway characteristics (e.g., curves, high-speed corridors, school zones, high pedestrian activity areas) to identify locations with recurring speed-related risk. Prioritize deployment on corridors with documented operating speeds exceeding posted speeds, high crash severity, and integrate technologies into resurfacing and corridor improvement projects where feasible.
Engineering-Based Speed Management	Implement roadway design strategies that influence operating speeds, including lane reconfiguration (road diets), lane repurposing, lane narrowing where feasible, signal coordination, raised medians, roundabouts, gateway treatments, curb extensions in pedestrian-priority areas, and traffic calming measures appropriate to roadway function.	Speed-related crashes, pedestrian and bicycle crashes on high-speed corridors, roadway departure crashes, and rear-end crashes associated with high speed variability.	Identify corridors where operating speeds consistently exceed posted speeds and where crash severity is elevated. Integrate speed-reducing design treatments into resurfacing, reconstruction, and corridor retrofit projects, prioritizing urban arterials with pedestrian activity and rural segments with documented high-speed crash history.
Enforcement & Automated Speed Compliance	Implement coordinated, data-driven speed enforcement strategies, including high-visibility enforcement operations and legally authorized automated enforcement tools (e.g., school zone speed cameras and red-light cameras). Focus enforcement efforts on corridors with documented speed-related severe crashes and recurring non-compliance.	Corridors with persistent speeding behavior, repeat speed violator locations, high proportions of speed-related fatal and serious injury crashes, and school zones or activity centers with elevated pedestrian exposure.	Use crash data and speed data to identify priority enforcement locations, particularly High Injury Network corridors and school zones. Coordinate with law enforcement agencies to conduct visible enforcement waves supported by public communication. Monitor compliance trends and adjust enforcement deployment based on documented safety outcomes and applicable state legislation.

F.2.3 Safe Road Users

F.2.3.1 Education & Public Awareness Initiatives

Behavioral safety plays a critical role in reducing fatal and serious injury crashes. Review of crash data has identified several behavioral factors associated with severe outcomes. The primary risk factors include impaired driving (alcohol and drugs), speeding and aggressive driving, distracted driving, non-use of seatbelts and motorcycle helmets, and crashes involving young drivers, older drivers, pedestrians, and bicyclists.

Education and public awareness strategies complement engineering and enforcement by addressing the high-risk behaviors identified in the Safety Analysis. These initiatives focus on reducing fatal and serious injury crashes by increasing awareness of behaviors most strongly associated with severe crash outcomes. Following are some examples of educational programs:

i) Targeted Behavioral Campaigns

Public information and social marketing campaigns should focus on specific, measurable behaviors rather than general safety messaging. Outreach may include:

- High-visibility impaired driving messaging during weekends, holidays, and nighttime hours
- Speed awareness campaigns highlighting survivability at lower speeds
- Distracted driving campaigns addressing mobile device use
- Seatbelt and helmet compliance messaging for drivers, passengers, bicyclists and motorcyclists
- Yielding and visibility messaging for pedestrian and bicycle safety

Messaging should be deployed through multiple platforms, including social media, digital advertising, transit advertising, radio, and community-based outreach.

ii) School-Based Programs and Safe Routes to School

Youth education represents a long-term strategy for improving roadway behavior. Coordination with local school districts provides an opportunity to address pedestrian, bicycle, and teen driver safety in areas where crash data indicate elevated risk near school campuses.

Safe Routes to School (SRTS) initiatives provide a structured framework to improve conditions for students walking and biking to school. These programs combine education, encouragement, and coordination with infrastructure and traffic operations to create safer access to school campuses.

In locations with identified pedestrian or bicycle crash patterns, school-based safety efforts may include:

- Student pedestrian and bicycle safety training
- Route planning and identification of safer walking and biking corridors
- School-supported walking and biking events
- Coordination with transportation and public safety agencies to address traffic concerns during school arrival and dismissal periods

Where crash data indicate elevated teen driver risk, outreach efforts may also include messaging focused on impaired driving, distracted driving, seatbelt use, speed compliance, and nighttime driving risks. Schools may also serve as effective distribution channels for safety information directed toward parents and caregivers, including messaging related to safe drop-off behavior, school zone speed compliance, and visibility practices.

Implementation should be coordinated with school districts, local governments, and public safety partners to align youth-focused safety programming with identified crash trends and available funding opportunities.

iii) Bicyclist Awareness Programs

Education efforts should reinforce drivers' understanding of bicyclists' legal rights and responsibilities on roadways, particularly on corridors without separate bicycle facilities. Awareness programs may emphasize that bicyclists are permitted to use the full travel lane where necessary for safety and visibility. Outreach may include deployment of "Bicycles May Use Full Lane" signage, coordination with pavement marking improvements, and targeted messaging explaining yielding requirements and safe passing practices.

iv) Motorcyclist Safety and Rider Responsibility

Motorcyclists face elevated risk due to limited physical protection and reduced visibility in traffic. Education strategies should address both rider responsibility and motorist awareness to reduce crash frequency and severity. These strategies are consistent with guidance from the Florida Department of Transportation (FDOT) Ride Smart Florida campaign, the National Highway Traffic Safety Administration (NHTSA), and the Motorcycle Safety Foundation (MSF).

Driver-focused messaging may emphasize:

- "Look Twice" practices at intersections and before lane changes
- Checking blind spots prior to merging or turning
- Maintaining adequate following distance
- Yielding the right-of-way where required
- Avoiding distraction in areas with high motorcycle activity

Rider-focused education may promote:

- Completion of certified motorcycle training and proper licensing endorsement
- Helmet use and protective equipment
- Riding within legal and personal limits

- Avoidance of impaired riding

v) Traffic Law Awareness and New Roadway Design Education

As roadway designs evolve to improve safety, public understanding of traffic laws and new infrastructure treatments becomes essential. Education efforts should support the proper use of safety features implemented through this Safety Action Plan. Where new roadway treatments are introduced such as roundabouts, lane reconfigurations, pedestrian refuge islands, separated bicycle facilities, or new type of midblock crossing treatment such Midblock Pedestrian Signal (MPS), public education should accompany implementation to reduce confusion and improve compliance. Education strategies may include:

- Clear explanations of right-of-way rules at roundabouts
- Guidance on yielding requirements for pedestrians and bicyclists
- Information on the purpose and use of new bicycle facilities
- Messaging on speed compliance in redesigned corridors
- Updates on changes to traffic safety laws or enforcement priorities
- Clear guidance on how to respond to Midblock Pedestrian Signals (MPS), including stopping requirements, signal indications, and pedestrian activation procedures

Temporary demonstrations, pilot projects, and pop-up installations may be supported with targeted outreach to help residents understand how the design functions and why it improves safety. The MPO can coordinate with local governments, transportation agencies, and public safety partners to ensure that educational materials are consistent with adopted roadway standards and enforcement practices.

vi) Community Partnerships and Program Delivery

Effective safety education depends on coordinated implementation across multiple agencies and community partners. Public safety agencies, local governments, public health organizations, advocacy groups, and community-based organizations play an essential role in extending the reach of safety initiatives. Partnership-based delivery may include:

- Engagement with neighborhood associations and community leaders across both counties
- Collaboration with senior centers, youth organizations, and cultural institutions to reach populations disproportionately affected by severe crashes
- Employer and fleet engagement to reinforce workplace and commuting safety practices

Community partners can also provide feedback on local safety concerns, barriers to behavior change, and communication gaps. This feedback loop supports continuous refinement of education strategies and ensures messaging remains relevant to local conditions. Annual coordination meetings and data-sharing practices may be used to align education activities with enforcement schedules, engineering improvements, and performance tracking.

F.2.3.2 Enforcement

When voluntary behavior change is insufficient, consistent and equitable enforcement of traffic safety laws becomes necessary to address behaviors linked to fatal and serious injury crashes. Enforcement efforts should concentrate on violations most associated with severe outcomes, including impaired driving, speeding, distracted driving, and failure to yield.

In some cases, enforcement activities may be paired with educational outreach, such as distributing safety information during operations focused on bicycle lighting, helmet compliance, or pedestrian right-of-way.

A data-informed approach should guide enforcement deployment by identifying corridors, locations, and time periods with elevated crash risk. This allows agencies to concentrate on limited resources along high injury corridors and other priority areas to maximize safety impact.

F.2.4 Safe Vehicle

Safe Vehicles play a critical role in reducing both crash occurrence and crash severity. Advances in vehicle technology, particularly driver assistance systems, have demonstrated measurable safety benefits by mitigating human error and protecting vulnerable road users. While vehicle safety standards are largely governed at the federal level, local and regional agencies can promote adoption through fleet policies, procurement standards, and public education efforts. Strengthening vehicle safety complements roadway and speed management strategies under the Safe System approach.

F.2.4.1 Advanced Driver Assistance Systems (ADAS)

Advancements in vehicle safety technology have significantly improved crash avoidance and injury mitigation. Systems such as Automatic Emergency Braking (AEB), Forward Collision Warning, Lane Departure Warning, Lane Keeping Assist, Blind Spot Monitoring, Rear Cross-Traffic Alert, and pedestrian detection systems help reduce crashes caused by human error. These technologies are particularly effective in mitigating rear-end crashes, lane departure crashes, and pedestrian-related collisions.

Although vehicle safety standards are primarily established at the federal level, regional agencies can promote adoption through public awareness campaigns, partnerships with dealerships and insurers, and encouragement of consumer education regarding vehicle safety ratings and crash avoidance technologies. As newer vehicles equipped with advanced driver assistance systems become more prevalent, they can contribute to measurable reductions in both crash frequency and severity across the region.

F.2.4.2 Fleet Safety Leadership (Public & Private)

Local governments, transit agencies, school districts, freight operators, and commercial fleet owners can demonstrate leadership by incorporating enhanced safety technologies into fleet procurement and replacement policies. Public fleets should prioritize vehicles equipped with advanced driver assistance systems (ADAS), telematics, speed management systems, and crash avoidance technologies. School buses and transit vehicles may incorporate enhanced visibility systems and pedestrian detection features to improve safety for vulnerable road users.

Given the severity of crashes involving heavy trucks and large commercial vehicles, fleet operators should also consider collision mitigation braking systems, blind spot detection, side guards in urban environments, enhanced mirror or camera systems, and electronic stability control. Routine safety training, driver monitoring systems, and proactive fleet management practices can further reduce crash risk. By establishing strong fleet safety standards and promoting collaboration between public and private operators, the region can accelerate the integration of safer vehicles into daily operations.

F.2.4.3 Emerging Technologies & Ongoing Policy Monitoring

Vehicle and roadway technologies continue to evolve, creating new opportunities to reduce crash frequency and severity. Connected vehicle systems and advanced crash-avoidance technologies can enable real-time communication between vehicles and infrastructure, supporting improved decision-making and enhanced traffic operations. As these systems mature, they may allow for dynamic safety applications such as adaptive signal timing, real-time speed management, and enhanced red-light running prevention. Emerging speed assistance technologies including intelligent speed assistance has been evaluated at the national level as potential tools to reduce excessive speeding and are recommended to use by the National Transportation Safety Board (NTSB). While such requirements are not currently mandated in Florida, ongoing federal research and policy discussions may influence future vehicle safety standards, particularly for high-risk vehicle classes such as heavy-duty trucks.

Regional agencies should monitor legislative developments, pilot programs, and national safety recommendations related to connected and automated vehicle technologies. Proactively preparing for integration through infrastructure readiness, data coordination, and policy alignment will position the region to adopt proven safety innovations as they become practical and widely available.

F.2.4.4 Vehicle Maintenance & Inspection Practices

Proper vehicle maintenance is a foundational component of roadway safety. Mechanical deficiencies such as worn tires, brake failure, malfunctioning lights, or improperly secured cargo can increase crash risk and severity. While vehicle inspection standards are primarily governed at the state level, local and regional partners can support education, compliance, and enforcement initiatives that promote safe vehicle operation. Public fleet operators should maintain rigorous preventive maintenance programs to ensure that vehicles meet or exceed safety standards. Coordination with law enforcement and commercial vehicle inspection programs can help identify high-risk vehicles, particularly within freight and heavy-duty fleets. Outreach efforts aimed at educating drivers about tire safety, brake maintenance, and seasonal vehicle preparation can further reduce preventable crashes. By emphasizing proper vehicle upkeep and inspection compliance, the region can reduce crash risks related to mechanical failure and strengthen overall system reliability.

F.2.5 Post-Crash Care

Post-crash care focuses on reducing the severity of injuries after a crash has occurred by ensuring rapid detection, timely emergency response, and access to appropriate trauma care. Survival outcomes are closely tied to the time between the crash event and definitive medical treatment.

The Safe System approach recognizes that preventing death and serious injury does not end at crash prevention. Coordinated emergency response, efficient traffic incident management, and continuous review of severe crashes are essential components of a comprehensive safety strategy. This section outlines strategies to strengthen interagency coordination, reduce response times, and improve system learning following serious and fatal crashes.

F.2.5.1 Emergency Medical Services (EMS) Coordination

Rapid emergency response is critical to improving survival outcomes following severe crashes. Coordination among law enforcement, fire rescue, emergency medical services (EMS), and transportation agencies plays a central role in reducing response times and ensuring safe scene management. A data-informed approach should be used to identify corridors and locations with recurring crashes to assess response coverage and potential gaps. Strategies may include improving dispatch coordination, enhancing access along high-risk corridors, supporting emergency vehicle signal preemption where appropriate, enhance the visibility of emergency vehicles (e.g., retroreflective striping and chevrons, high-visibility paint, and built-in passive lights) and ensuring clear roadway access for first responders. The MPO may support coordination efforts with public safety partners to identify operational barriers that affect response time and prioritize transportation improvements that reduce emergency response delays.

F.2.5.2 Trauma System & Hospital Access

Access to appropriate trauma care within a critical timeframe significantly influences survival and recovery outcomes following severe crashes. Coordination with regional trauma networks and healthcare providers is essential to ensure that seriously injured patients are transported to facilities equipped to provide definitive care. The MPO, in coordination with EMS and regional healthcare partners, may support efforts to strengthen trauma system capacity by identifying funding opportunities, encouraging adoption of technologies that reduce notification and triage time (such as automatic crash reporting and geolocation tools), and promoting participation in state- and federally recognized training programs.

F.2.5.3 Traffic Incident Management (TIM)

Traffic crashes increase the risk of secondary collisions and can significantly disrupt roadway operations. Effective Traffic Incident Management (TIM) focuses on coordinated detection, response, and clearance of incidents to restore traffic flow safely and reduce exposure for first responders and the traveling public.

FDOT plays a primary role in regional TIM operations through its Traffic Management Centers (TMCs), which monitor and manage traffic conditions on the state highway system. Coordination among FDOT, local jurisdictions, law enforcement, fire rescue, and towing partners is essential to reduce incident duration and improve scene safety. Continued advancement of data-driven tools, including systems that support advanced warning capabilities and predictive analysis to identify locations with elevated crash risk can further strengthen incident response and reduce secondary crash risk. While operational responsibility rests with FDOT and local agencies, the MPO may support expansion of incident management strategies to additional high-risk corridors through regional planning and project prioritization.

F.2.5.4 Fatal Crash Review & System Learning

Establish a formal Fatal Crash Review process to systematically examine every traffic fatality and identify contributing roadway, behavioral, vehicle, and environmental factors. This review should be conducted by a multidisciplinary team that may include law enforcement, transportation agencies, public health officials, emergency responders, and planning staff. The objective is not to assign fault, but to identify systemic risk factors and opportunities for prevention.

Each fatal crash review should evaluate roadway design characteristics, operating speeds, traffic control, visibility conditions, land use context, and emergency response timelines. Findings should be documented in a standardized format and used to inform engineering improvements, enforcement strategies, policy updates, and educational efforts.

Beyond individual case review, recurring themes and patterns should be tracked across cases to identify systemic deficiencies. Lessons learned should be integrated into corridor screening processes, capital project prioritization, and policy development to ensure continuous safety improvement. This structured learning approach strengthens accountability, accelerates countermeasure deployment, and supports a proactive Safe System framework.

F.2.5.5 Data Integration & Continuous Improvement

Strengthen cross-agency data integration to support coordinated safety decision-making and long-term system improvement. This includes improving the consistency, completeness, and timeliness of crash reporting, and integrating data from law enforcement, transportation agencies, emergency medical services (EMS), hospitals, and public health partners. A unified safety data framework should allow agencies to analyze crash severity, response times, injury outcomes, roadway characteristics, and behavioral factors collectively rather than in isolation. Linking crash data with EMS transport times, hospital trauma data, and roadway inventory information can provide a more comprehensive understanding of both crash causation and post-crash survivability. Data findings should be routinely reviewed and incorporated into corridor screening, capital improvement programming, enforcement planning, and public education strategies. Establishing regular interagency data review meetings and performance monitoring dashboards can support transparency and continuous evaluation of safety outcomes. By institutionalizing data sharing and performance tracking, the region can transition from reactive crash response to proactive risk management, ensuring that safety investments are guided by measurable outcomes and evolving system needs.

APPENDIX F

Additional Safety Countermeasures Data

APPENDIX F :
Additional Safety Countermeasures Data

F.1 Other Engineering Countermeasures

F.1.1 Older Drivers

For older drivers (ages 65 and above) exhibit elevated KA crash rates per 10,000 licensed drivers for across all crash type. This increased risk is often associated with age-related changes in vision, cognition, reaction time, and physical flexibility. The following evidence-based strategies, consistent with NHTSA guidance, are presented to review and strengthen existing efforts supporting older driver safety in **Table F- 2.**

Table F-1. Older Driver Countermeasures

Countermeasure	Strategic Emphasis for this Plan	Effectiveness
Licensing Agency & Medical Referrals for At-Risk Older Drivers	Strengthen coordination among law enforcement, healthcare providers, and FLHSMV to improve identification and referral of medically at-risk older drivers	★★★★
License Restrictions for Medically At-Risk Older Drivers	Support coordination with FLHSMV to promote appropriate restricted licenses (e.g., geographic limits, speed limits, or daylight-only driving) for medically at-risk older drivers	★★★★
In-Person Renewal and Vision Screening	Maintain compliance with Florida's in-person renewal and vision test requirements for drivers age 80 and older and periodically review screening outcomes to identify medically at-risk drivers.	★★
Formal Refresher Courses for Older Drivers (Classroom + On-Road Feedback)	Encourage voluntary participation in mature driver refresher programs that combine classroom education with individualized on-road feedback to improve hazard recognition and vehicle technology adaptation.	★★★★

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

In addition to the strategies summarized in **Table 5-2**, these measures should continue to be coordinated with existing Florida renewal and vision screening requirements and strengthened referral mechanisms for medically at-risk drivers. Where appropriate, partnerships among

FLHSMV, healthcare providers, and law enforcement can enhance identification and management of functional impairments. Voluntary refresher training programs that combine classroom education with individualized on-road feedback may further support safe mobility among older drivers. Together, these approaches emphasize screening, targeted restriction, and education.

F.1.2 Young Drivers

Young drivers (ages 15-20) experience higher rates of KA crashes per 10,000 licensed drivers across several major crash types such as left turn/angle, off road/rollover and pedestrian/bicycle related crashes. This disproportionate involvement in severe crashes is often associated with inexperience, speeding behavior, nighttime driving exposure, distraction, and peer passenger influence. The following evidence-based non-engineering strategies in **Table F-1**, consistent with NHTSA guidance, are presented for review to ensure existing policies and programs remain aligned with best practices and to identify any potential gaps.

Other strategies such as parent engagement programs, electronic monitoring/feedback systems, and hazard perception training can also be considered to complement existing GDL provisions and strengthen young driver safety

Other strategies such as parent engagement programs, electronic monitoring/feedback systems, and hazard perception training can also be considered to complement existing GDL provisions and strengthen young driver safety

Table F-2. Young Driver Countermeasures

Countermeasure	Strategic Emphasis for this Plan	Effectiveness
Graduated Driver Licensing (GDL) System	Maintain strong compliance with Florida’s 3-phase licensing system and support public awareness of its safety purpose.	★★★★★
Learner’s Permit Holding Period Requirements	Reinforce supervised driving requirements during the learner’s permit phase through parent engagement and coordinated awareness efforts with schools.	★★★★★
GDL Nighttime Driving Restrictions	Support strong compliance with graduated driver licensing (GDL) nighttime restrictions by enhancing parent and teen awareness and coordinating targeted enforcement during high-risk late evening and overnight hours.	★★★★★
GDL Passenger Restrictions	Increase awareness that crash risk rises significantly when teen drivers carry same-age peer passengers, particularly during the first months of independent driving	★★★★★
Enforcement of GDL Provisions	Coordinate targeted enforcement near schools and high-injury corridors to improve compliance	★★
Electronic Monitoring / Parent Feedback Systems	Encourage voluntary use of vehicle or smartphone-based monitoring tools during early independent driving	★★★
Programs Assisting Parents/Guardians	Promote parent-teen driving agreements and structured supervision programs	★★
Hazard Perception Training	Encourage supplemental hazard awareness training to improve novice driver anticipation skills	★★

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

F.1.3 Driving Under Influence

Impaired driving remains a significant safety concern within the counties, particularly in High Injury Segments, where 13.6% of crashes were identified as DUI-related. Crashes involving impaired driving are extremely severe, frequently resulting in fatal or serious injuries. Addressing impaired driving in Lake and Sumter Counties requires a balanced strategy that integrates enforcement, prevention, and safe alternative transportation options. Some strategies are presented in **Table F- 3.**

Table F-3. Drug-Impaired Driving Countermeasures

Countermeasure	Strategic Emphasis for This Plan	Effectiveness
High-Visibility Enforcement and Deterrence	Support coordinated, high-visibility enforcement efforts focused on impaired driving, particularly during high-risk periods (weekends, holidays, major events). Public awareness campaigns should accompany enforcement to reinforce perceived risk of detection.	
Drug-Impaired Driving Enforcement Training (ARIDE/DRE)	Support continued training for officers in drug recognition and roadside detection to improve identification of drug-impaired drivers	★★★
Prevention & Community Education	Expand public education on alcohol, cannabis, prescription medication impairment, and poly-substance risks through schools, healthcare providers, and media outreach.	
Safe Ride & Alternative Transportation Partnerships	Partner with local organizations, hospitality venues, and rideshare providers to promote ride-home programs during major events and holidays.	
Data Coordination & Reporting Improvements	Improve crash reporting consistency and distinction between alcohol- and drug-impaired cases to better target enforcement and prevention efforts	

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490).

F.1.4 Distracted Driving

Distracted driving remains a significant contributor to severe crashes within the High Injury Network, accounting for 12.2% of crashes in High Injury Segments and 18.5% of crashes in High Injury Intersections. By impairing drivers' visual, manual, and cognitive attention, distracted driving increases the likelihood of serious crashes. In Florida, the Wireless Communications While Driving Law prohibits texting while driving and restricts handheld device use in school and work zones. Consistent with NHTSA guidance, the following strategies are presented in **Table F- 4** to support enforcement, training, and coordinated program efforts related to distracted driving.

Table F-4. Distracted Driving Countermeasures

Countermeasure	Strategic Emphasis for This Plan	Effectiveness
High-Visibility Cell Phone Enforcement (HVE)	Support coordinated enforcement waves targeting handheld phone use and texting, paired with paid and earned media to increase the perceived risk of citation.	★★★★
Officer Training & Enforcement Support	Provide continued training for law enforcement on recognizing signs of distracted driving and consistent application of distracted driving laws.	
Communications & Outreach on Distracted Driving	Support targeted public education efforts that reinforce distracted driving laws and specific high-risk behaviors (e.g., handheld phone use), recognizing that communications alone are unlikely to reduce crashes.	

Note: Effectiveness ratings (★ to ★★★★★) reflect the strength of evidence reported by NHTSA. Source: NHTSA, *Countermeasures That Work*, 11th Ed., 2023 (DOT HS 813 490)

F.2 Network-Wide Systemic Safety Strategies

F.2.1 Safe Road

The Safe Road strategy emphasizes systematic roadway design and infrastructure improvements to reduce the likelihood and severity of crashes. **Table F- 5** presents the recommended engineering treatments organized by facility type, associated risk patterns, and deployment approach.

Table F-5. Engineering Strategies for Safer Roads

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Signalized Intersections	Signal Timing Optimization (Yellow & All-Red Intervals), Retroreflective Signal Backplates, Protected / Protected-Permissive Left-Turn Phasing, Red Light Camera, Dynamic Signal Warning Flasher, Prohibit Right-Turn on Red or Dynamic No Right Turn on Red Signs, Dedicated Left- and Right-Turn Lanes, High Friction Surface Treatment (HFST) at approaches, Access Management Near Intersections, Intersection Lighting Improvements, High-Visibility Crosswalk Markings, Pedestrian Push Button, Leading Pedestrian Intervals (LPI), Pedestrian Countdown Signal Heads and Roundabout Conversion (Where Feasible)	Left-turn/angle crashes, rear end crashes, red-light running crashes, failure to yield crashes and pedestrian crashes	Apply a systemic, risk-based screening process to identify signalized intersections exhibiting the target crash patterns, then select and implement context-appropriate countermeasures based on site-specific operational, geometric, and exposure characteristics.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Unsignalized Intersections	Systemic Application of Multiple Low-Cost Countermeasures that includes: On the Stop Approach doubled-up (left and right), oversized advance ”Stop Ahead“ intersection warning signs (can also include flashing beacon), doubled-up (left and right) oversized Stop signs, retroreflective sheeting on sign posts, removal of vegetation, parking, or obstructions that limit sight distance, double arrow warning sign at stem of T-intersections. On the through approach doubled-up (left and right) oversized advance intersection warning signs with supplemental street name plaques (can also include flashing beacon), retroreflective sheeting on sign posts and enhanced pavement markings that delineate through lane edge lines. Other treatments include intersection lighting improvement/installation, transverse rumble strips on approaches, high-friction surface treatment (HFST), all-wat stop control, channelization improvements, high visibility crosswalk marking, and advance yield/stop bars (20-50 ft in advance)	Angle crashes, failure-to-yield crashes at stop-controlled approaches, high-speed approach crashes, nighttime crashes related to low visibility, limited sight distance-related crashes, and pedestrian crossing crashes.	Apply a systemic, risk-based screening process to identify stop-controlled and rural or high-speed unsignalized intersections exhibiting elevated left turn/angle, rear end and failure-to-yield crash patterns. Prioritize locations with high approach speeds, limited sight distance, skewed geometry, or documented nighttime crash trends, and implement low-cost countermeasures systemically before considering higher-cost traffic signal installation or geometric modifications.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Roadway Segments	Road diets/lane reconfiguration or repurposing (where feasible), conversion of TWLTL or painted/undivided medians to raised medians, shoulder widening and paved shoulders, shoulder and centerline rumble strips (rural), enhanced pavement markings (wider edge lines, centerlines, retroreflective markings), high-friction surface treatment (HFST) (on curves, ramps, steep downgrades, and locations with a history of rear-end or wet-weather crashes), median barriers, safety edge treatments for resurfacing or overlay projects, advance and in-curve upgrades to longitudinal pavement markings and roadway delineation (e.g., retroreflective strips on sign posts, delineators, chevron signs), flexible or semi-flexible guardrails, crash attenuators and lighting improvements	Rear-end, head-on, off-road and sideswipe crashes, nighttime crashes associated with limited visibility, and weather-related crashes	Use corridor and segment-level crash screening and risk-factor analysis (e.g., lane width, traffic volume, curvature, lighting conditions) to identify high-risk locations. Apply systemic treatments at segments exhibiting similar crash patterns and roadway characteristics, prioritizing low-cost, high-benefit improvements before major capital reconstruction.
Pedestrian Facilities	Sidewalk installation on both side of the roadways and gap closures (urban and rural), midblock pedestrian crossings (including pedestrian hybrid beacons (PHBs), rectangular rapid flashing beacons (RRFBs), and midblock pedestrian signals), pedestrian refuge islands on multilane roadways, raised crosswalks, intersection and midblock lighting improvements, accessible curb ramps and ADA-compliant upgrades, enhanced pedestrian signing and pavement markings, traffic calming treatments in pedestrian-priority areas, and crossing improvements near transit stops, school zones, and activity centers.	Pedestrians walking along the roadway, midblock pedestrian crashes, multilane crossing crashes, nighttime pedestrian crashes, pedestrian-vehicle crashes near transit stops, school zones, and activity centers.	Use exposure-based and risk-based screening to identify corridors and crossings with documented pedestrian crash history, high pedestrian activity, transit proximity, school zones, multilane crossing conditions, or inadequate crossing visibility. Implement context-sensitive pedestrian treatments systemically across locations exhibiting similar risk characteristics, prioritizing low-cost visibility and crossing enhancements before major capital reconstruction.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Bicycle Facilities (Segments & Intersections)	Buffered or separated bicycle lanes (including parking-protected facilities), dedicated bicycle signal phases, two-stage turn queue boxes, mixing zones with high-visibility conflict markings, floating transit islands, high-visibility bicycle crossing markings, shared-use paths separated from high-speed traffic, shoulder widening to accommodate bicycle travel on rural roadways (with rumble strip offset), enhanced pavement markings and "Bicycles May Use Full Lane" signage, and lighting improvements along bicycle corridors.	Bicycle-vehicle crashes at intersections, bicycle crashes on high-speed segments, overtaking and sideswipe crashes, nighttime bicycle crashes, and crashes involving limited bicyclist conspicuity	Use corridor-level bicycle crash mapping and exposure analysis (e.g., traffic speed, volume, presence/absence of bike facilities, transit stops) to identify high-risk segments and intersections. Prioritize corridors with recurring bicycle crashes and apply appropriate countermeasures.
Corridor Access Management	Implement corridor-level access management strategies to reduce conflict points, including driveway closure, consolidation, or relocation; improved spacing of access points; directional median treatments; turn lane provisions; and movement restrictions (e.g., right-in/right-out) where appropriate	Left-turn and angle crashes at driveways, rear-end crashes at segments, and pedestrian/bicycle crashes near commercial access points.	Use corridor-level crash screening and access density analysis to identify segments with frequent driveway-related conflicts and closely spaced access points. Prioritize arterials with recurring left-turn, rear-end, and pedestrians/bicyclists crashes, and implement phased access management improvements in coordination with local jurisdictions and adjacent property owners.

Facility Type	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Road Maintenance (Pavement & Roadside Asset Management)	Implement a proactive roadway maintenance and surface management program that includes routine pavement condition and skid resistance (friction) monitoring; timely pothole and surface distress repair; shoulder and edge drop-off correction; drainage improvements to reduce hydroplaning risk; vegetation management to maintain sight distance; retro reflectivity upgrades for pavement markings and signs; and maintenance-of-traffic (MOT) practices that safely accommodate pedestrians and bicyclists during construction and work zones.	Wet-weather crashes, roadway departure crashes, motorcycle crashes related to low friction, hydroplaning crashes, nighttime crashes associated with poor visibility, pedestrian trip hazards due to damaged sidewalks, and crashes related to degraded pavement markings or obscured sight lines.	Use pavement condition data, skid resistance testing, wet-weather crash screening, and nighttime crash analysis to identify priority segments for friction enhancement and surface rehabilitation. Integrate safety performance measures into resurfacing and maintenance cycles to ensure friction, marking visibility, and sight distance are systematically addressed before severe crash patterns emerge.

F.2.2 Safe Speeds

Managing speed is a core pillar of the Safe System Approach and is pivotal to achieving Vision Zero goals. Under the SS4A framework, safe speeds ensure that roadway operating speeds are aligned with the human body's tolerance to crash forces, particularly for vulnerable road users. While roadway design and enforcement play critical roles, establishing appropriate speed limit is the foundation of an effective speed management strategy. **Table F- 6** presents the recommended strategies for safer speed for all road users.

Table F-6. Strategies for Safer Speed

Speed Strategy Category	Systemic Countermeasure	Target Risk Pattern	Network-Wide Deployment Approach
Target Speed	Establish and adopt target speeds based on context classification (C1–C5), population density, cross-section elements (e.g., separated bike lanes, shared-use paths), and presence of vulnerable road users; align design speed, posted speed, and operating speed to support the Safe System approach.	High-severity crashes, pedestrian and bicycle fatal/serious injury crashes, speeding-related crashes	Conduct a corridor-level review to determine appropriate context classification of the roadways and evaluate roadway function, land use characteristics, multimodal activity, and the presence of vulnerable road users. Review existing posted speed limits and compare them with observed operating speeds using network-wide speed data (e.g., connected vehicle data or speed studies). Apply tools such as FHWA's USLIMITS2 to support appropriate speed setting. Compare design speed, posted speed, and operating speed, and establish a consistent target speed framework across the network.

ITS based speed management	Deploy variable speed limits (VSL), automated speed enforcement cameras (fixed or point-to-point), dynamic speed feedback signs, curve speed warning systems, and dynamic queue warning systems to improve driver compliance and reduce excessive speeds	Speed-related crashes, high-severity (KA) crashes, roadway departure crashes, rear-end crashes associated with speed differentials, crashes on horizontal curves, and corridors with documented speeding problem.	Use speed data, crash history, and roadway characteristics (e.g., curves, high-speed corridors, school zones, high pedestrian activity areas) to identify locations with recurring speed-related risk. Prioritize deployment on corridors with documented operating speeds exceeding posted speeds, high crash severity, and integrate technologies into resurfacing and corridor improvement projects where feasible.
Engineering-Based Speed Management	Implement roadway design strategies that influence operating speeds, including lane reconfiguration (road diets), lane repurposing, lane narrowing where feasible, signal coordination, raised medians, roundabouts, gateway treatments, curb extensions in pedestrian-priority areas, and traffic calming measures appropriate to roadway function.	Speed-related crashes, pedestrian and bicycle crashes on high-speed corridors, roadway departure crashes, and rear-end crashes associated with high speed variability.	Identify corridors where operating speeds consistently exceed posted speeds and where crash severity is elevated. Integrate speed-reducing design treatments into resurfacing, reconstruction, and corridor retrofit projects, prioritizing urban arterials with pedestrian activity and rural segments with documented high-speed crash history.
Enforcement & Automated Speed Compliance	Implement coordinated, data-driven speed enforcement strategies, including high-visibility enforcement operations and legally authorized automated enforcement tools (e.g., school zone speed cameras and red-light cameras). Focus enforcement efforts on corridors with documented speed-related severe crashes and recurring non-compliance.	Corridors with persistent speeding behavior, repeat speed violator locations, high proportions of speed-related fatal and serious injury crashes, and school zones or activity centers with elevated pedestrian exposure.	Use crash data and speed data to identify priority enforcement locations, particularly High Injury Network corridors and school zones. Coordinate with law enforcement agencies to conduct visible enforcement waves supported by public communication. Monitor compliance trends and adjust enforcement deployment based on documented safety outcomes and applicable state legislation.

F.2.3 Safe Road Users

F.2.3.1 Education & Public Awareness Initiatives

Behavioral safety plays a critical role in reducing fatal and serious injury crashes. Review of crash data has identified several behavioral factors associated with severe outcomes. The primary risk factors include impaired driving (alcohol and drugs), speeding and aggressive driving, distracted driving, non-use of seatbelts and motorcycle helmets, and crashes involving young drivers, older drivers, pedestrians, and bicyclists.

Education and public awareness strategies complement engineering and enforcement by addressing the high-risk behaviors identified in the Safety Analysis. These initiatives focus on reducing fatal and serious injury crashes by increasing awareness of behaviors most strongly associated with severe crash outcomes. Following are some examples of educational programs:

i) Targeted Behavioral Campaigns

Public information and social marketing campaigns should focus on specific, measurable behaviors rather than general safety messaging. Outreach may include:

- High-visibility impaired driving messaging during weekends, holidays, and nighttime hours
- Speed awareness campaigns highlighting survivability at lower speeds
- Distracted driving campaigns addressing mobile device use
- Seatbelt and helmet compliance messaging for drivers, passengers, bicyclists and motorcyclists
- Yielding and visibility messaging for pedestrian and bicycle safety

Messaging should be deployed through multiple platforms, including social media, digital advertising, transit advertising, radio, and community-based outreach.

ii) School-Based Programs and Safe Routes to School

Youth education represents a long-term strategy for improving roadway behavior. Coordination with local school districts provides an opportunity to address pedestrian, bicycle, and teen driver safety in areas where crash data indicate elevated risk near school campuses.

Safe Routes to School (SRTS) initiatives provide a structured framework to improve conditions for students walking and biking to school. These programs combine education, encouragement, and coordination with infrastructure and traffic operations to create safer access to school campuses.

In locations with identified pedestrian or bicycle crash patterns, school-based safety efforts may include:

- Student pedestrian and bicycle safety training
- Route planning and identification of safer walking and biking corridors
- School-supported walking and biking events
- Coordination with transportation and public safety agencies to address traffic concerns during school arrival and dismissal periods

Where crash data indicate elevated teen driver risk, outreach efforts may also include messaging focused on impaired driving, distracted driving, seatbelt use, speed compliance, and nighttime driving risks. Schools may also serve as effective distribution channels for safety information directed toward parents and caregivers, including messaging related to safe drop-off behavior, school zone speed compliance, and visibility practices.

Implementation should be coordinated with school districts, local governments, and public safety partners to align youth-focused safety programming with identified crash trends and available funding opportunities.

iii) Bicyclist Awareness Programs

Education efforts should reinforce drivers' understanding of bicyclists' legal rights and responsibilities on roadways, particularly on corridors without separate bicycle facilities. Awareness programs may emphasize that bicyclists are permitted to use the full travel lane where necessary for safety and visibility. Outreach may include deployment of "Bicycles May Use Full Lane" signage, coordination with pavement marking improvements, and targeted messaging explaining yielding requirements and safe passing practices.

iv) Motorcyclist Safety and Rider Responsibility

Motorcyclists face elevated risk due to limited physical protection and reduced visibility in traffic. Education strategies should address both rider responsibility and motorist awareness to reduce crash frequency and severity. These strategies are consistent with guidance from the Florida Department of Transportation (FDOT) Ride Smart Florida campaign, the National Highway Traffic Safety Administration (NHTSA), and the Motorcycle Safety Foundation (MSF).

Driver-focused messaging may emphasize:

- "Look Twice" practices at intersections and before lane changes
- Checking blind spots prior to merging or turning
- Maintaining adequate following distance
- Yielding the right-of-way where required
- Avoiding distraction in areas with high motorcycle activity

Rider-focused education may promote:

- Completion of certified motorcycle training and proper licensing endorsement
- Helmet use and protective equipment
- Riding within legal and personal limits

- Avoidance of impaired riding

v) Traffic Law Awareness and New Roadway Design Education

As roadway designs evolve to improve safety, public understanding of traffic laws and new infrastructure treatments becomes essential. Education efforts should support the proper use of safety features implemented through this Safety Action Plan. Where new roadway treatments are introduced such as roundabouts, lane reconfigurations, pedestrian refuge islands, separated bicycle facilities, or new type of midblock crossing treatment such Midblock Pedestrian Signal (MPS), public education should accompany implementation to reduce confusion and improve compliance. Education strategies may include:

- Clear explanations of right-of-way rules at roundabouts
- Guidance on yielding requirements for pedestrians and bicyclists
- Information on the purpose and use of new bicycle facilities
- Messaging on speed compliance in redesigned corridors
- Updates on changes to traffic safety laws or enforcement priorities
- Clear guidance on how to respond to Midblock Pedestrian Signals (MPS), including stopping requirements, signal indications, and pedestrian activation procedures

Temporary demonstrations, pilot projects, and pop-up installations may be supported with targeted outreach to help residents understand how the design functions and why it improves safety. The MPO can coordinate with local governments, transportation agencies, and public safety partners to ensure that educational materials are consistent with adopted roadway standards and enforcement practices.

vi) Community Partnerships and Program Delivery

Effective safety education depends on coordinated implementation across multiple agencies and community partners. Public safety agencies, local governments, public health organizations, advocacy groups, and community-based organizations play an essential role in extending the reach of safety initiatives. Partnership-based delivery may include:

- Engagement with neighborhood associations and community leaders across both counties
- Collaboration with senior centers, youth organizations, and cultural institutions to reach populations disproportionately affected by severe crashes
- Employer and fleet engagement to reinforce workplace and commuting safety practices

Community partners can also provide feedback on local safety concerns, barriers to behavior change, and communication gaps. This feedback loop supports continuous refinement of education strategies and ensures messaging remains relevant to local conditions. Annual coordination meetings and data-sharing practices may be used to align education activities with enforcement schedules, engineering improvements, and performance tracking.

F.2.3.2 Enforcement

When voluntary behavior change is insufficient, consistent and equitable enforcement of traffic safety laws becomes necessary to address behaviors linked to fatal and serious injury crashes. Enforcement efforts should concentrate on violations most associated with severe outcomes, including impaired driving, speeding, distracted driving, and failure to yield.

In some cases, enforcement activities may be paired with educational outreach, such as distributing safety information during operations focused on bicycle lighting, helmet compliance, or pedestrian right-of-way.

A data-informed approach should guide enforcement deployment by identifying corridors, locations, and time periods with elevated crash risk. This allows agencies to concentrate on limited resources along high injury corridors and other priority areas to maximize safety impact.

F.2.4 Safe Vehicle

Safe Vehicles play a critical role in reducing both crash occurrence and crash severity. Advances in vehicle technology, particularly driver assistance systems, have demonstrated measurable safety benefits by mitigating human error and protecting vulnerable road users. While vehicle safety standards are largely governed at the federal level, local and regional agencies can promote adoption through fleet policies, procurement standards, and public education efforts. Strengthening vehicle safety complements roadway and speed management strategies under the Safe System approach.

F.2.4.1 Advanced Driver Assistance Systems (ADAS)

Advancements in vehicle safety technology have significantly improved crash avoidance and injury mitigation. Systems such as Automatic Emergency Braking (AEB), Forward Collision Warning, Lane Departure Warning, Lane Keeping Assist, Blind Spot Monitoring, Rear Cross-Traffic Alert, and pedestrian detection systems help reduce crashes caused by human error. These technologies are particularly effective in mitigating rear-end crashes, lane departure crashes, and pedestrian-related collisions.

Although vehicle safety standards are primarily established at the federal level, regional agencies can promote adoption through public awareness campaigns, partnerships with dealerships and insurers, and encouragement of consumer education regarding vehicle safety ratings and crash avoidance technologies. As newer vehicles equipped with advanced driver assistance systems become more prevalent, they can contribute to measurable reductions in both crash frequency and severity across the region.

F.2.4.2 Fleet Safety Leadership (Public & Private)

Local governments, transit agencies, school districts, freight operators, and commercial fleet owners can demonstrate leadership by incorporating enhanced safety technologies into fleet procurement and replacement policies. Public fleets should prioritize vehicles equipped with advanced driver assistance systems (ADAS), telematics, speed management systems, and crash avoidance technologies. School buses and transit vehicles may incorporate enhanced visibility systems and pedestrian detection features to improve safety for vulnerable road users.

Given the severity of crashes involving heavy trucks and large commercial vehicles, fleet operators should also consider collision mitigation braking systems, blind spot detection, side guards in urban environments, enhanced mirror or camera systems, and electronic stability control. Routine safety training, driver monitoring systems, and proactive fleet management practices can further reduce crash risk. By establishing strong fleet safety standards and promoting collaboration between public and private operators, the region can accelerate the integration of safer vehicles into daily operations.

F.2.4.3 Emerging Technologies & Ongoing Policy Monitoring

Vehicle and roadway technologies continue to evolve, creating new opportunities to reduce crash frequency and severity. Connected vehicle systems and advanced crash-avoidance technologies can enable real-time communication between vehicles and infrastructure, supporting improved decision-making and enhanced traffic operations. As these systems mature, they may allow for dynamic safety applications such as adaptive signal timing, real-time speed management, and enhanced red-light running prevention. Emerging speed assistance technologies including intelligent speed assistance has been evaluated at the national level as potential tools to reduce excessive speeding and are recommended to use by the National Transportation Safety Board (NTSB). While such requirements are not currently mandated in Florida, ongoing federal research and policy discussions may influence future vehicle safety standards, particularly for high-risk vehicle classes such as heavy-duty trucks.

Regional agencies should monitor legislative developments, pilot programs, and national safety recommendations related to connected and automated vehicle technologies. Proactively preparing for integration through infrastructure readiness, data coordination, and policy alignment will position the region to adopt proven safety innovations as they become practical and widely available.

F.2.4.4 Vehicle Maintenance & Inspection Practices

Proper vehicle maintenance is a foundational component of roadway safety. Mechanical deficiencies such as worn tires, brake failure, malfunctioning lights, or improperly secured cargo can increase crash risk and severity. While vehicle inspection standards are primarily governed at the state level, local and regional partners can support education, compliance, and enforcement initiatives that promote safe vehicle operation. Public fleet operators should maintain rigorous preventive maintenance programs to ensure that vehicles meet or exceed safety standards. Coordination with law enforcement and commercial vehicle inspection programs can help identify high-risk vehicles, particularly within freight and heavy-duty fleets. Outreach efforts aimed at educating drivers about tire safety, brake maintenance, and seasonal vehicle preparation can further reduce preventable crashes. By emphasizing proper vehicle upkeep and inspection compliance, the region can reduce crash risks related to mechanical failure and strengthen overall system reliability.

F.2.5 Post-Crash Care

Post-crash care focuses on reducing the severity of injuries after a crash has occurred by ensuring rapid detection, timely emergency response, and access to appropriate trauma care. Survival outcomes are closely tied to the time between the crash event and definitive medical treatment.

The Safe System approach recognizes that preventing death and serious injury does not end at crash prevention. Coordinated emergency response, efficient traffic incident management, and continuous review of severe crashes are essential components of a comprehensive safety strategy. This section outlines strategies to strengthen interagency coordination, reduce response times, and improve system learning following serious and fatal crashes.

F.2.5.1 Emergency Medical Services (EMS) Coordination

Rapid emergency response is critical to improving survival outcomes following severe crashes. Coordination among law enforcement, fire rescue, emergency medical services (EMS), and transportation agencies plays a central role in reducing response times and ensuring safe scene management. A data-informed approach should be used to identify corridors and locations with recurring crashes to assess response coverage and potential gaps. Strategies may include improving dispatch coordination, enhancing access along high-risk corridors, supporting emergency vehicle signal preemption where appropriate, enhance the visibility of emergency vehicles (e.g., retroreflective striping and chevrons, high-visibility paint, and built-in passive lights) and ensuring clear roadway access for first responders. The MPO may support coordination efforts with public safety partners to identify operational barriers that affect response time and prioritize transportation improvements that reduce emergency response delays.

F.2.5.2 Trauma System & Hospital Access

Access to appropriate trauma care within a critical timeframe significantly influences survival and recovery outcomes following severe crashes. Coordination with regional trauma networks and healthcare providers is essential to ensure that seriously injured patients are transported to facilities equipped to provide definitive care. The MPO, in coordination with EMS and regional healthcare partners, may support efforts to strengthen trauma system capacity by identifying funding opportunities, encouraging adoption of technologies that reduce notification and triage time (such as automatic crash reporting and geolocation tools), and promoting participation in state- and federally recognized training programs.

F.2.5.3 Traffic Incident Management (TIM)

Traffic crashes increase the risk of secondary collisions and can significantly disrupt roadway operations. Effective Traffic Incident Management (TIM) focuses on coordinated detection, response, and clearance of incidents to restore traffic flow safely and reduce exposure for first responders and the traveling public.

FDOT plays a primary role in regional TIM operations through its Traffic Management Centers (TMCs), which monitor and manage traffic conditions on the state highway system. Coordination among FDOT, local jurisdictions, law enforcement, fire rescue, and towing partners is essential to reduce incident duration and improve scene safety. Continued advancement of data-driven tools, including systems that support advanced warning capabilities and predictive analysis to identify locations with elevated crash risk can further strengthen incident response and reduce secondary crash risk. While operational responsibility rests with FDOT and local agencies, the MPO may support expansion of incident management strategies to additional high-risk corridors through regional planning and project prioritization.

F.2.5.4 Fatal Crash Review & System Learning

Establish a formal Fatal Crash Review process to systematically examine every traffic fatality and identify contributing roadway, behavioral, vehicle, and environmental factors. This review should be conducted by a multidisciplinary team that may include law enforcement, transportation agencies, public health officials, emergency responders, and planning staff. The objective is not to assign fault, but to identify systemic risk factors and opportunities for prevention.

Each fatal crash review should evaluate roadway design characteristics, operating speeds, traffic control, visibility conditions, land use context, and emergency response timelines. Findings should be documented in a standardized format and used to inform engineering improvements, enforcement strategies, policy updates, and educational efforts.

Beyond individual case review, recurring themes and patterns should be tracked across cases to identify systemic deficiencies. Lessons learned should be integrated into corridor screening processes, capital project prioritization, and policy development to ensure continuous safety improvement. This structured learning approach strengthens accountability, accelerates countermeasure deployment, and supports a proactive Safe System framework.

F.2.5.5 Data Integration & Continuous Improvement

Strengthen cross-agency data integration to support coordinated safety decision-making and long-term system improvement. This includes improving the consistency, completeness, and timeliness of crash reporting, and integrating data from law enforcement, transportation agencies, emergency medical services (EMS), hospitals, and public health partners. A unified safety data framework should allow agencies to analyze crash severity, response times, injury outcomes, roadway characteristics, and behavioral factors collectively rather than in isolation. Linking crash data with EMS transport times, hospital trauma data, and roadway inventory information can provide a more comprehensive understanding of both crash causation and post-crash survivability. Data findings should be routinely reviewed and incorporated into corridor screening, capital improvement programming, enforcement planning, and public education strategies. Establishing regular interagency data review meetings and performance monitoring dashboards can support transparency and continuous evaluation of safety outcomes. By institutionalizing data sharing and performance tracking, the region can transition from reactive crash response to proactive risk management, ensuring that safety investments are guided by measurable outcomes and evolving system needs.

APPENDIX G

Vision Zero Dashboard How-To Guide

APPENDIX G: Vision Zero Dashboard How-To Guide

G.1. Introduction

A dashboard was developed that consolidates key crash trends, high risk locations, and safety interventions of the Vision Zero plan. This chapter provides a brief user guide for the Lake-Sumter MPO Vision Zero Dashboard (**Figure G-1**). The guide explains the overall structure of the dashboard, navigation features, and basic interpretation of the visualizations.

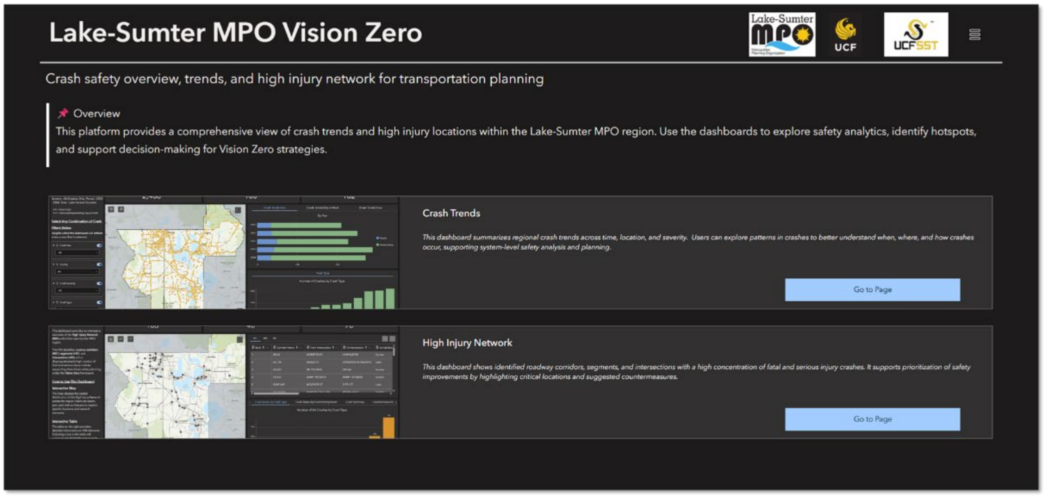


Figure G-1. Lake-Sumter MPO Vision Zero Dashboard Landing Page

The dashboard is designed to support regional crash analysis by summarizing crash trends and identifying high injury locations within the Lake-Sumter MPO region. This guide serves as a reference for users seeking to understand how to access and interpret the information displayed.

The Lake-Sumter MPO Vision Zero Dashboard consists of two primary components:

- **Crash Trends**: Summarizes regional crash patterns over time, by severity, and by geographic location.
- **High Injury Network**: Identifies roadway corridors, segments, and intersections with elevated concentrations of fatal and serious injury crashes, as defined in Chapter 3.

The dashboard is intended for use by MPO staff, local agency planners, transportation engineers, safety analysts, and residents. It is designed to provide a clear and accessible interface for reviewing regional crash data and supporting safety-related planning activities.

G.2. Dashboard Structure and Navigation

The landing page serves as the primary access point to the dashboard. From this page, users can navigate to the two main analytical components: (1) Crash Trends and (2) High Injury Network (HIN). Each section can be accessed by selecting the corresponding "Go to Page" button or by clicking the dashboard preview image (**Figure G-2**). In addition, a menu icon located in the upper-right corner provides access to a side navigation panel, allowing users to switch between pages at any time. The navigation structure is designed to allow users to move seamlessly between summary-level trend analysis and location-specific safety screening.

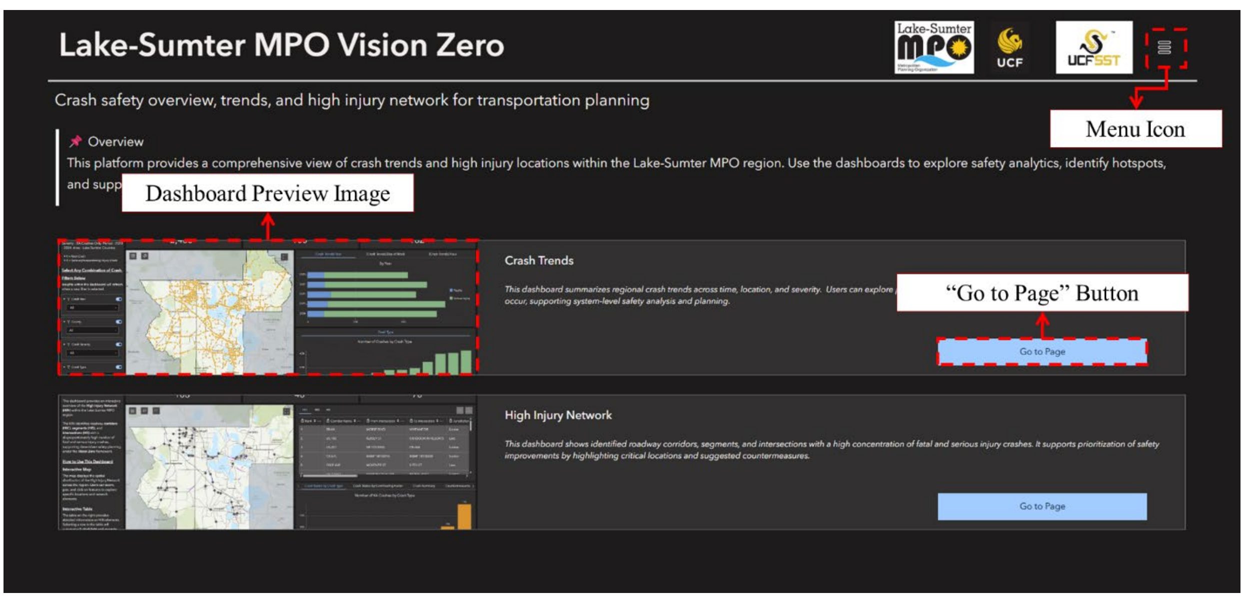


Figure G-2. Navigation Elements on the Dashboard Landing Page

G.2.1. Crash Trends Dashboard

The Crash Trends Dashboard provides a summary of fatal (K) and serious injury (A) crashes within the Lake-Sumter MPO region for recent 5 years (2020-2024) (**Figure G-3**). The dashboard integrates spatial visualization, summary indicators, and trend-based charts to support regional safety assessment.

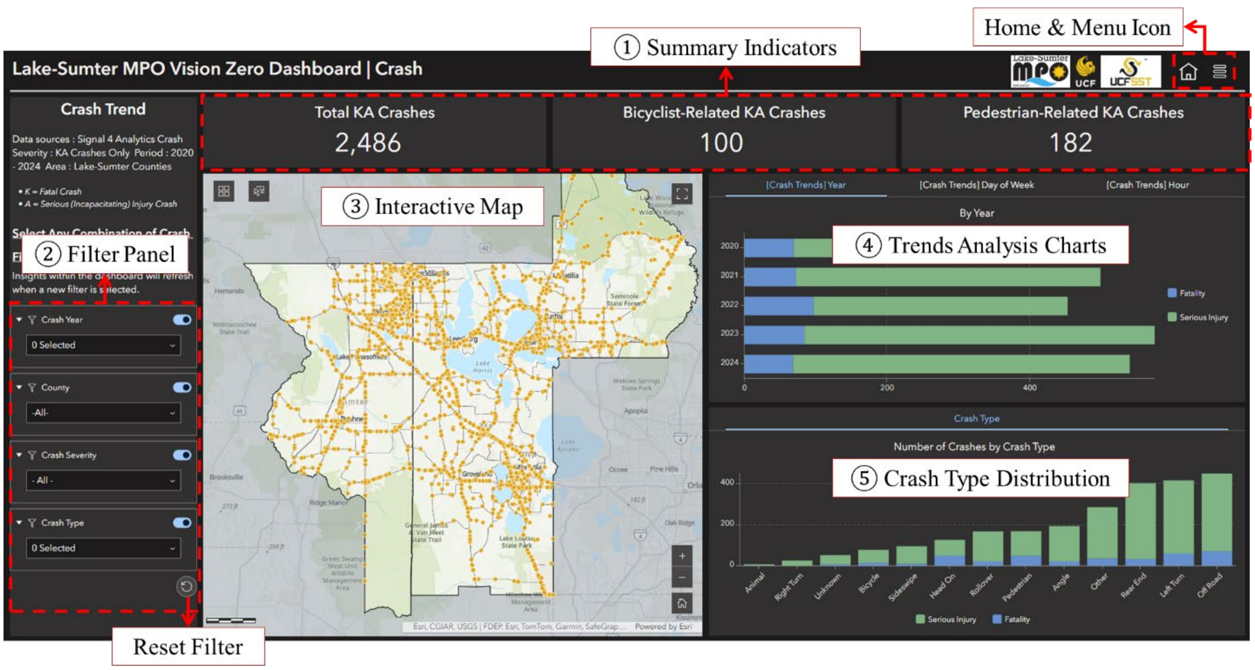


Figure G-3. Crash Trends Dashboard Interface & Major Components

The Crash Trends Dashboard consists of five primary components (**Figure G-3**):

(1) Summary Indicators (Top Panel): At the top of the dashboard, summary metrics display the total number of KA crashes, bicyclist-related KA crashes, and pedestrian-related KA crashes.

(2) Filter Panel (Left Side): The left-side filter panel allows users to refine the analysis by

(a) Crash Year (2020–2024; multiple years may be selected)

(b) County (Lake or Sumter County),

(c) Crash Severity (Fatal (K) or Serious Injury (A)), and

(d) Crash Type (e.g., Angle, Rear-End; multiple types may be selected).

All charts and the map update automatically when filters are applied. This dynamic filtering enables users to explore specific subsets of crash data without navigating away from the page.

(3) Interactive Map (Center Panel): The central map displays the spatial distribution of fatal and serious injury crashes across the Lake-Sumter MPO region. Each point represents a KA crash location. The map updates dynamically based on selected filters. This map supports geographic identification of crash concentrations and potential hotspot areas.

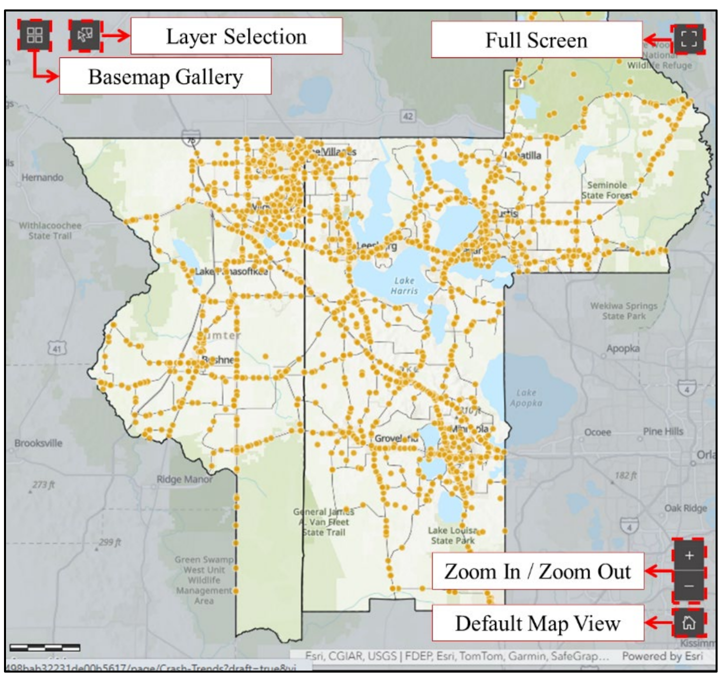


Figure G-4. Map Navigation and Control Icons

(4) Trend Analysis Charts (Right Panel – Upper Section): The upper-right section includes temporal trend charts showing crash distributions: (a) By Year, (b) By Day of

Week, and (c) By Hour. Stacked bar charts distinguish between fatal and serious injury crashes. These charts allow users to evaluate temporal patterns and detect variations across years or time periods. All charts update automatically when filters are applied.

(5) **Crash Type Distribution (Right Panel – Lower Section):** The lower-right chart presents the number of KA crashes by crash type. Crash types are displayed in descending order based on crash frequency. This chart helps identify predominant crash mechanisms and supports targeted countermeasure discussions. The chart updates dynamically when filters are applied.

The Crash Trends Dashboard is intended for regional-level safety trend assessment. Users may utilize the dashboard to:

- Identify increasing or decreasing trends in KA crashes
- Examine temporal patterns associated with crash severity
- Understand dominant crash types contributing to serious injuries and fatalities

G.2.2. HIN Dashboard

The HIN Dashboard provides an interactive overview of roadway corridors, segments, and intersections within the Lake-Sumter MPO region that exhibit elevated concentrations of fatal (K) and serious injury (A) crashes for the 2020-2024 period (**Figure G-5**).

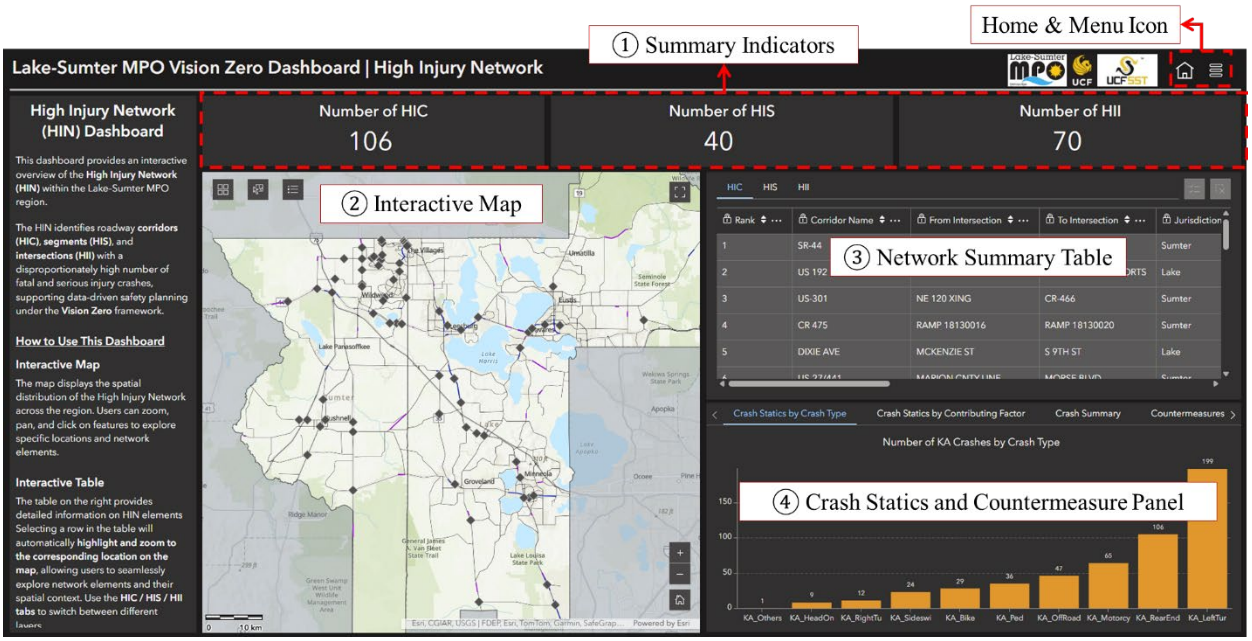


Figure G-5. High Injury Network Dashboard Interface & Major Components

The High Injury Network Dashboard consists of four primary components (**Figure G-5**):

(1) Summary Indicators (Top Panel): The top panel summarizes (a) Number of High Injury Corridors (HIC), (b) Number of High Injury Segments (HIS), and (c) Number of High Injury Intersections (HII). These indicators provide a high-level overview of identified high-risk network elements within the region.

(2) Interactive Map (Center Panel): The central map displays the spatial distribution of the HIC, HIS, and HII. Users may zoom, pan, and click on network elements to examine specific locations. When a network element is selected on the map, the corresponding record in the network summary table (right panel – upper section) is automatically updated and highlighted for HIC, HIS, and HII. For HIC, the Safety Analysis and Crash Statics and Countermeasure Panel (right panel – lower section) is also updated to display detailed crash diagnostics and countermeasure information. Detailed diagnostic information in the lower panel is available for the Top 30 ranked HIC, consistent with the documentation provided in Appendix E.

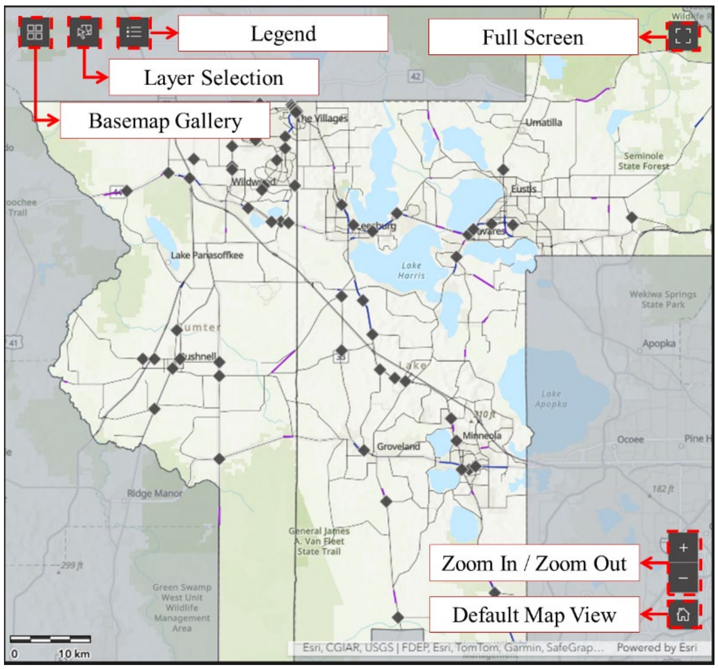


Figure G-6. High Injury Network Dashboard Interface & Major Components

(3) Network Summary Table (Right Panel – Upper Section): The upper-right panel presents a summary table of HIN elements. The general information presented in this table corresponds to the detailed inventory provided in Appendix A. Selecting a row in the table automatically highlights and zooms to the corresponding location on the map, enabling efficient spatial exploration of prioritized locations.

(4) Crash Statics and Countermeasure Panel (Right Panel – Lower Section): The lower-right section provides crash diagnostics and recommended countermeasures associated with the selected HIN element (**Figure G-7**). Available tabs include: (a) Crash Statistics by Crash Type, (b) Crash Statistics by Contributing Factor, (c) Crash Summary, (d) Countermeasures, and (e) Image View of Countermeasure Summary. The detailed crash analysis and countermeasure information presented in this panel is available for the Top 30 ranked HIC, consistent with the corridor-level assessments documented in Appendix A. This panel integrates crash analysis and safety strategy information to support data-informed planning decisions.

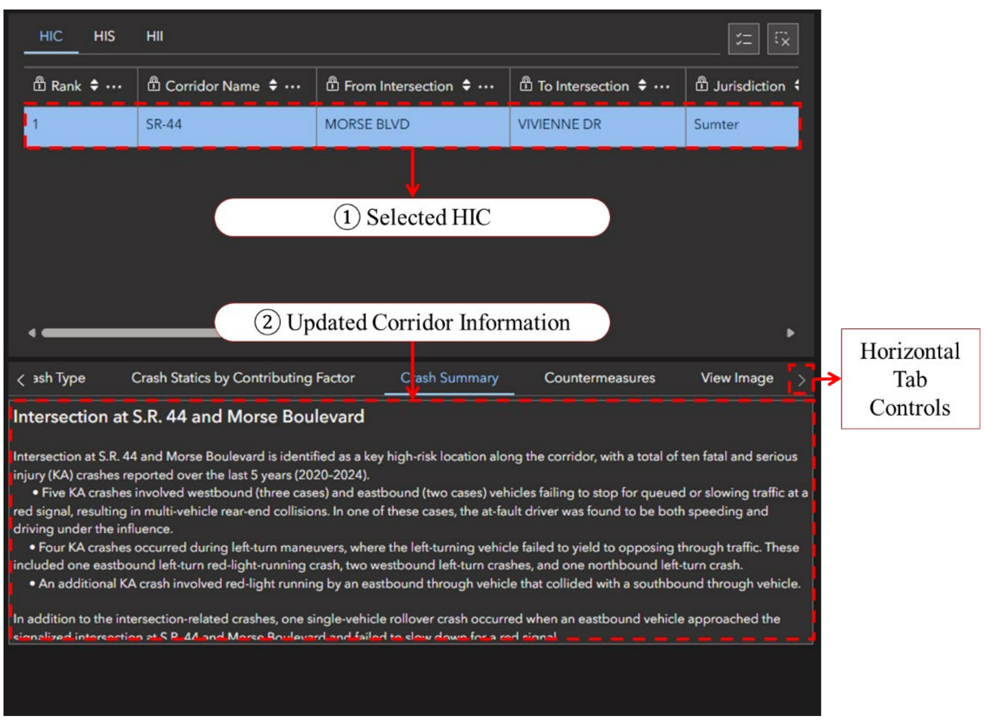


Figure G-7. HIN Selection and Information Panel Interaction

The HIN Dashboard is intended to support network-level screening and safety prioritization within the Lake-Sumter MPO region. Users may utilize the dashboard to:

- Identify corridors, segments, and intersections with concentrated fatal and serious injury crashes
- Compare and rank high-risk network elements across jurisdictions
- Examine crash characteristics and contributing factors for prioritized corridors
- Review documented safety concerns and associated countermeasure strategies
- Support data-informed planning, programming, and investment decisions

G.3. Summary

The Lake-Sumter MPO Vision Zero Dashboard integrates regional crash trend analysis and High Injury Network (HIN) screening into a unified, interactive decision-support platform. The Crash Trends component provides a system-level overview of fatal and serious injury crashes across time, geography, and crash type, enabling users to monitor patterns and assess overall safety conditions within the region.

Alongside this, the High Injury Network Dashboard identifies and ranks corridors, segments, and intersections with elevated concentrations of severe crashes. For the Top 30 ranked High Injury Corridors, the dashboard provides detailed crash diagnostics and countermeasure summaries, supporting targeted safety improvements and strategic investment planning.

Together, these components allow users to move seamlessly from regional safety monitoring to location-specific diagnostic review, facilitating data-informed transportation planning and advancing Vision Zero objectives within the Lake-Sumter MPO region.

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