COMPREHENSIVE ROADWAY SAFETY ACTION PLAN

Descriptive Crash Analysis

September 2024

Introduction

Purpose of Descriptive Analysis

This document outlines the findings of the descriptive crash analysis conducted for the Doña Ana County Comprehensive Safety Action Plan. The descriptive analysis provides a data-driven basis for understanding the scope of killed and serious injury (KSI) traffic crashes that occurred in Doña Ana County over the most recent five-year period for which data is available (2018-2022), including country-wide trends and general areas of concern. Serious injuries are defined as any non-fatal injuries that prevents a person from walking, driving, or participating in activities they were capable of prior to the crash. These crashes, combined with fatal injuries, are the focus of the crash analysis in this document. This information can be used to identify potential opportunities to reduce KSI crashes through a range of proven strategies.

Study Area

The descriptive analysis summarizes crash data at the county-level, though analysis focuses primarily on the study area for the Safety Action Plan: **non-Interstate roads and highways outside of the municipal boundaries for the City of Las Cruces.** Of the 4,343 crashes in the study area from 2018-2022, 2,280 (52.5%) took place on non-NMDOT roads (i.e., County roads and roads maintained by local jurisdictions), while 2,063 (47.5%) occurred on NMDOT roads (i.e., US and NM highways).

Summary of Key Findings

The following section highlights key findings from the descriptive crash analysis, including data by crash type, severity, and whether crashes also involved bicyclists and pedestrians.

Table 1: Key Findings from Crash Data Analysis

	Doña Ana County	City of Las Cruces (non-Interstates)	Interstates and Frontage Roads	SAP Study Area
Total Crashes	21,468	15,125	2,000	**4,343**
Fatal Crashes	100	39	19	**42**
Serious Injury Crashes	297	148	42	**107**

	Doña Ana County	City of Las Cruces (non-Interstates)	Interstates and Frontage Roads	SAP Study Area
Killed and Serious Injury (KSI) Crashes	397	187	61	**149**
Non-Fatal Injury Crashes	6,413	4,473	596	**1,344**
Non-Injury Crashes	14,955	10,613	1,385	**2,957**
Pedestrian-Involved Crashes	227	175	16	**36**
Bicyclist-Involved Crashes	153	140	0	**13**

Key findings for the ***Doña Ana County study area*** include**:**

- **Crashes by Year**: The total number of KSI crashes fluctuated from 2018-2022, from a low of 24 total KSI crashes in 2019 to a high of 39 KSI crashes in 2021.
- **Injury Severity**: On average, 8.4 crashes per year in the study area resulted in a fatality and 21.4 crashes per year resulted in a serious injury.
- **KSI Crashes by Mode**:
    - Pedestrians: Pedestrian-involved crashes accounted for less than 1% of total crashes, but 5% of all serious injury crashes and 14% of all fatal crashes. Over the five-year period from 2018-2022, there were 36 pedestrian-involved crashes, including six that resulted in a fatality and five that resulted in a serious injury, meaning 30% of pedestrian-involved crashes can be classified as KSI.
    - Bicyclists: Bicyclist-involved crashes accounted for under 0.5% of total crashes, but 2% of all serious injury crashes and 5% of all fatal crashes. There were 13 bicyclist-involved crashes in the years analyzed, two of which resulted in a fatality and two that resulted in a serious injury, meaning 15% of bicycle-involved crashes can be classified as KSI.
    - Motor Vehicles: Motor vehicle crashes accounted for 98.9% of all crashes and 89.9% of all KSI crashes. From 2018-2022, there were 4,294 motor vehicle-only crashes, including 34 fatal crashes and 100 serious injury crashes, meaning 3% of bicycle-involved crashes can be classified as KSI.

Leading KSI Collision Type: Collision with motor vehicle crashes were harmful event type that produced the highest number of KSI crashes in Doña Ana County, accounting for 34.9% of all KSI crashes. Non-collision crashes (e.g., crashes that involved vehicles overturning or rolling over) were the second highest collision type, comprising 24.8% of all KSI crashes.

Environmental Characteristics:

- Weather and Road Conditions**:** The vast majority (90.8%) of KSI crashes occurred in clear conditions. This does not indicate that weather and road conditions do not contribute to KSI crashes. Rather, this trend reflects the fact that most vehicle travel occurs in clear conditions.

- Hour of the Day**:** KSI crashes in Doña Ana County increase after noon, peaking at 2 PM and remained high from 2 PM to 8 PM, with another peak at 7 PM during the evening commute. There was an uptick in KSI crashes again at 2 AM.
- Lighting Conditions: Though the vast majority of vehicle trips across Doña Ana County take place during daylight hours, only about half of KSI crashes occurred during these times. By contrast, a substantial percent of KSI crashes occurred in dark conditions (38.3%). More than half (55.6%) of pedestrian-involved and exactly half (50%) of bicyclist-involved KSI crashes occurred at nighttime, while 43.1% of vehicle-only KSI crashes occurred at nighttime.

Descriptive Crash Analysis Methodology

This report provides planners, engineers, and decision-makers with high-level data to help respond to historical crash patterns and determine which crash factors tend to produce the most KSI crashes across the roadway system. The high-level summary tables and charts in the section below to illustrate the relationships between crash data factors and various attributes and provide insights into which variables deserve further examination. This analysis can also inform the development of new behavioral safety programs, policy modifications, and safety-focused engineering countermeasures.

Crash Data Overview

Crash data for this analysis was provided by the New Mexico Department of Transportation (NMDOT). The dataset includes all crashes in the five-year period from 2018 through 2022. For this report, crash data on interstates and in the city of Las Cruces were quantified and documented but are not included in the detailed analysis.

This document focuses primarily on KSI crashes, defined as crashes that involved a fatality or serious injury. Fatal crashes are known as “K” severity crashes on the KABCO scale. Serious injury crashes, known as “A” severity crashes on the KABCO scale, are any non-fatal injury crashes that prevent a person from walking, driving, or participating in activities they were capable of prior to the crash.

Study Limitations

Exposure Data

The analyses reported in this document do not adjust for motor vehicle, pedestrian, or bicyclist exposure rates based on volumes for these modes. Therefore, results show crash events but not frequency of crashes normalized by level of traffic or pedestrian and bicycle volumes.

Demographic Data

There was no demographic data, such as age, gender, or race, in the crash data, and therefore to comparisons can be made between crash data and demographic data.

Descriptive Crash Analysis

General Crash Trends

KSI Crashes by Year

Figure 1 shows the number of KSI crashes in the Doña Ana County study area from 2018-2022. Both fatal crashes and serious injury crashes increased slightly over the study period.

Figure 1: KSI Crashes by Year, 2018-2022

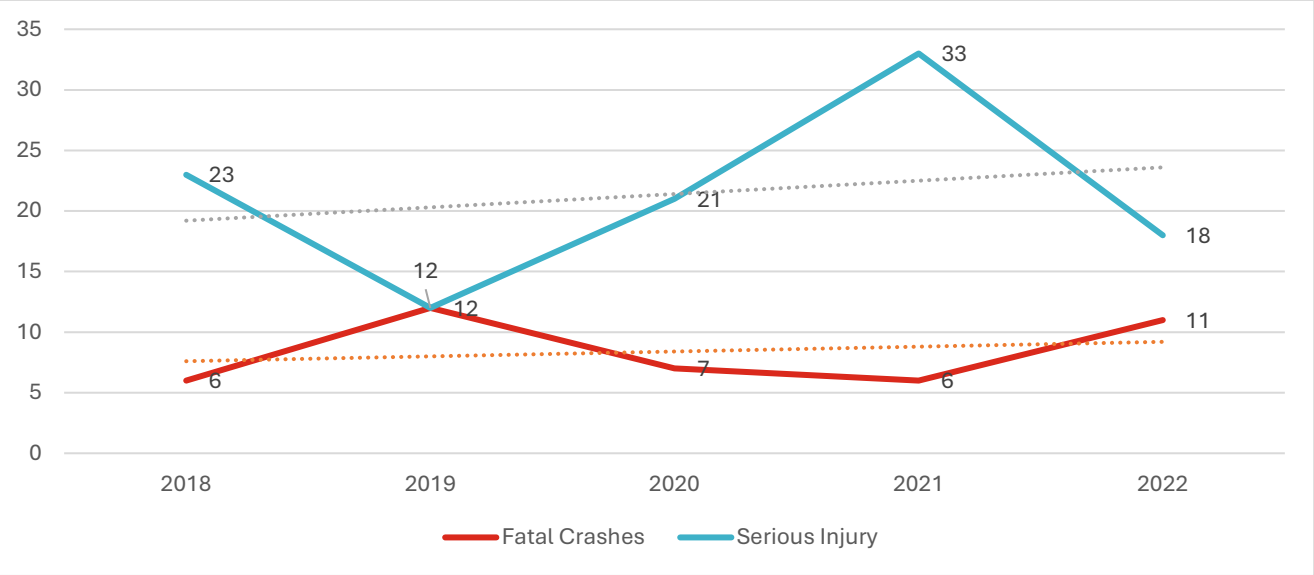
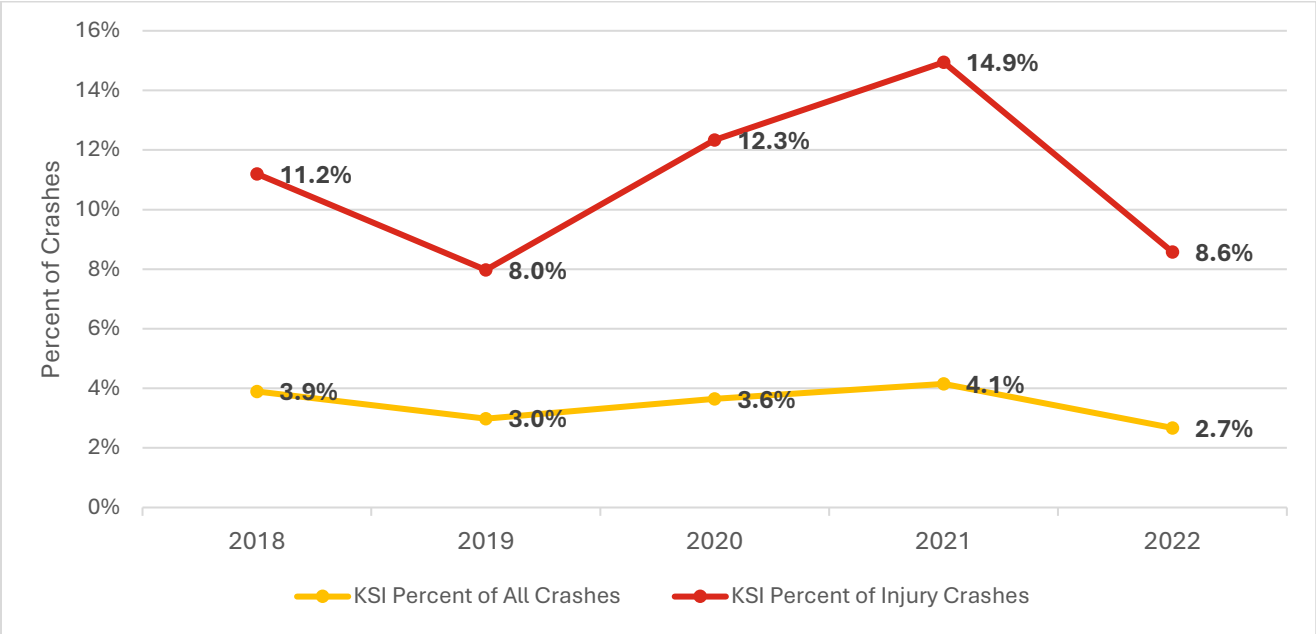


Figure 2 compares KSI crashes as a percentage of total crashes and KSI crashes as a percentage of all injury or fatal crashes. From 2018 to 2021, KSI crashes as a percentage of total injury and fatal crashes increased by about 4 percentage points. KSI crashes as a percentage of all crashes were relatively steady over the five-year study period. Notably, in 2022, KSI crashes as a percent of injury crashes and KSI crashes as a percent of all crashes both decreased, with KSI crashes as a percentage of injury crashes decreasing at a significantly higher rate. Additional years of data will be needed to determine if this reduction in severe crashes constitutes the beginning of a trend or a positive but short-lived anomaly.

Figure 2: KSI Crashes as Percentage of Total Crashes and Injury Crashes, 2018-2022



Crashes by Mode

Table 2 shows KSI crashes by mode of travel. Overall, crashes involving only motor vehicles account for 98.9% of all crashes and 89.9% of all KSI crashes. Pedestrian and bicyclist involved crashes are overrepresented in KSI crashes. Pedestrian-involved crashes account for 0.8% of total crashes, but 14.3% of all fatal crashes and 4.8% of all serious injury crashes. Bicycle-involved crashes account for 0.3% of total crashes, but 4.8% of all fatal crashes and 1.9% of all serious injury crashes.

Table 2: KSI Crashes by Mode and Severity, 2018-2022

	Total Crashes	Share of Total Crashes	Fatal Crashes	Share of Fatal Crashes	Serious Injury Crashes	Share of Serious Injury Crashes
Bicyclist-involved	13	0.3%	2	4.8%	2	1.9%
Pedestrian-involved	36	0.8%	6	14.3%	5	4.7%
Vehicle-involved only	4,294	98.9%	34	80.9%	100	93.5%
All crashes	4,343	100%	42	100%	107	100%

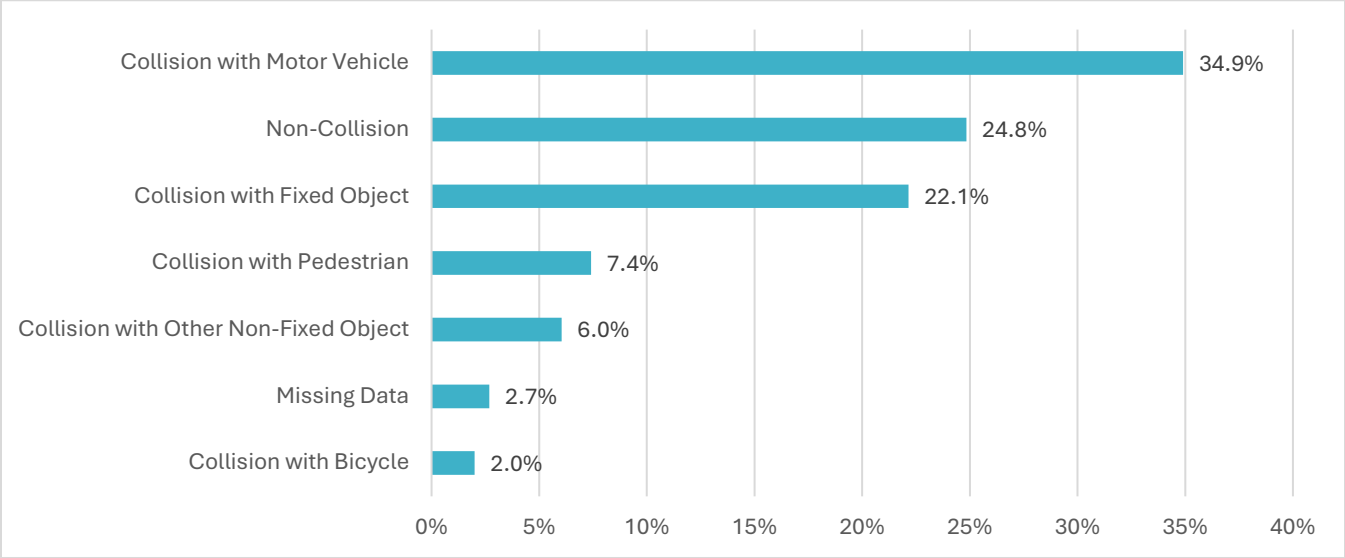
Crash Types and Contributing Factors

Crash Types (First Harmful Event)

Figure 3 summarizes KSI crashes by the first harmful event, as identified in the reported crash data. Collision with a motor vehicle was the leading collision type, observed in 34.9% of KSI crashes. Non-

collision (roadway departure) was the next most common crash type, which includes crashes that involved vehicles overturning or rolling over.

Figure 3: KSI Crashes by Crash Type (First Harmful Event), 2018-2022



Contributing Factors

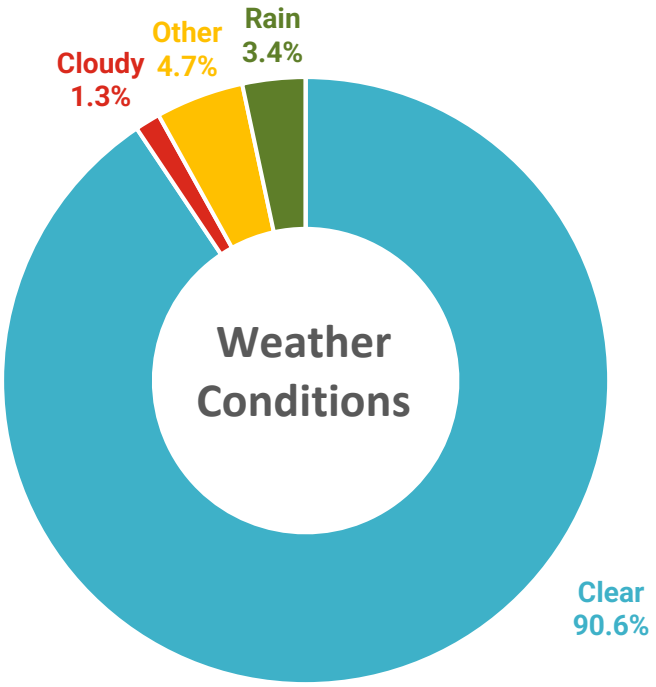
Common contributing factors that lead to crashes include speeding, driver distraction, and use of drugs and alcohol. NMDOT crash data did not include comprehensive data on crash contributing factor, though involvement of alcohol and drugs was noted. Of these two contributing factors, the most common was involvement of alcohol, which was listed for 26.9% of KSI crashes. Additionally, drugs were noted to be involved in 8.6% of all KSI crashes. Taken together, 35.4% of KSI crashes involved the presence of drugs or alcohol.

Environmental Characteristics

Weather Conditions

The majority of KSI crashes (90.6%) occurred in clear weather conditions (see **Figure 4**). It is important to note that most driving, especially in southern New Mexico, occurs in clear conditions. This analysis was not weighted based on traffic volume and should not be interpreted as indicating that poor weather does not contribute to KSI crashes. Further analysis can be conducted to identify areas where inclement weather may contribute to severe crashes.

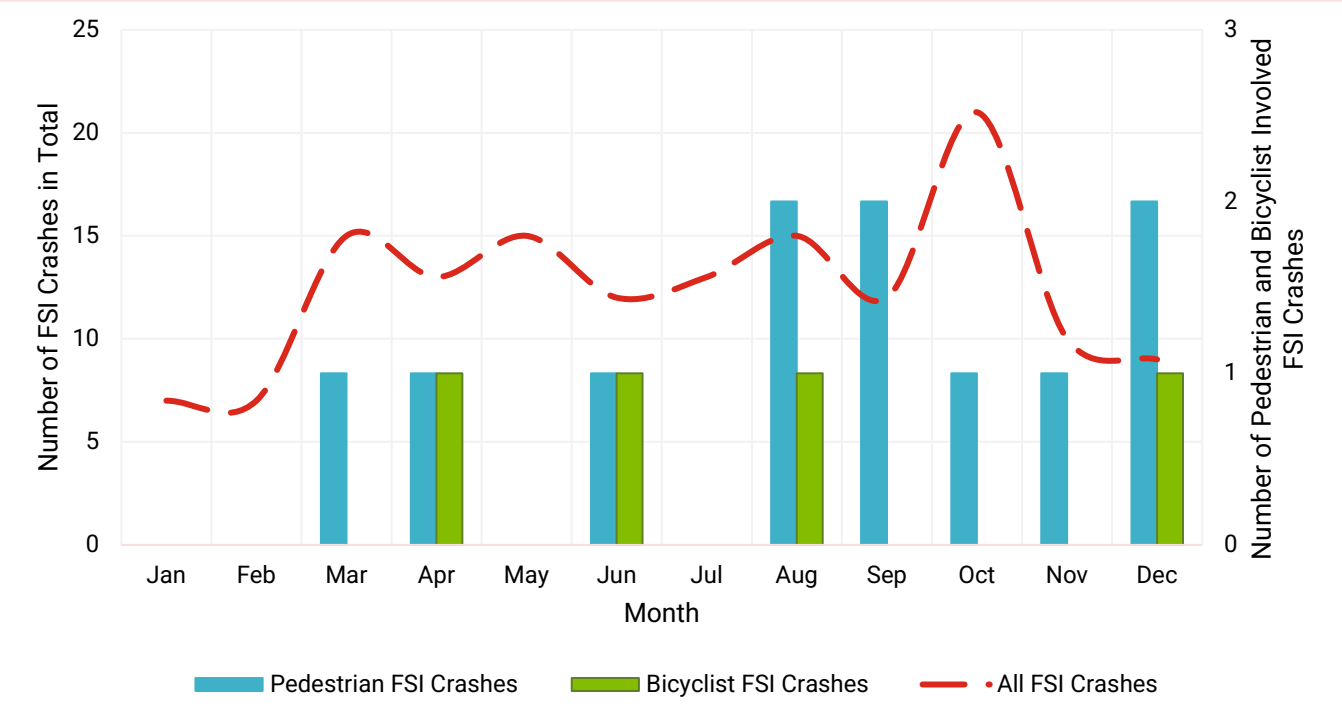
Figure 4: All KSI Crashes by Weather Conditions, 2018-2022



KSI Crashes by Time of Year

Figure 5 summarizes KSI crashes by month of the year. Overall, the highest number of KSI crashes occurred in October (21), with the lowest number of KSI crashes taking place in the winter months from December to February. The highest number of KSI crashes that involved pedestrians occurred in August, September, and December. KSI crashes that involved bicyclists tended to occur in late spring and summer months, which may correspond with increased bicycling in Doña Ana County.

Figure 5: KSI Total, Pedestrian, and Bicyclist Crashes by Month of Year, 2018-2022



KSI Crashes by Time of Day and Mode

Figure 6 summarizes the number of KSI crashes by mode throughout the course of the 24-hour daily period. Total KSI crashes tended to increase starting at 1 PM, peaking at 2 PM and again at 6 PM. KSI crashes remained relatively high from 2 PM to 8 PM during the evening commute. There were upticks in KSI crashes again around 2 AM and 6 AM, but generally KSI crashes were lower throughout the night and morning than during afternoon hours. Traffic volumes are generally higher in the afternoon hours, which could contribute to the higher number of KSI crashes in afternoon hours. A spike in KSI crashes between 1 AM and 3 AM could be related to impaired drivers. Pedestrian-involved KSI crashes peaked at 3 PM, with a sustained presence of crashes between the hours of 5 PM and 9 PM. Bicyclist-involved KSI crashes occurred in the morning at 6 AM and 9 AM and in the evening at 7 PM and 8 PM.

Figure 6: KSI Total, Pedestrian, and Bicyclist Crashes by Hour of Day, 2018-2022

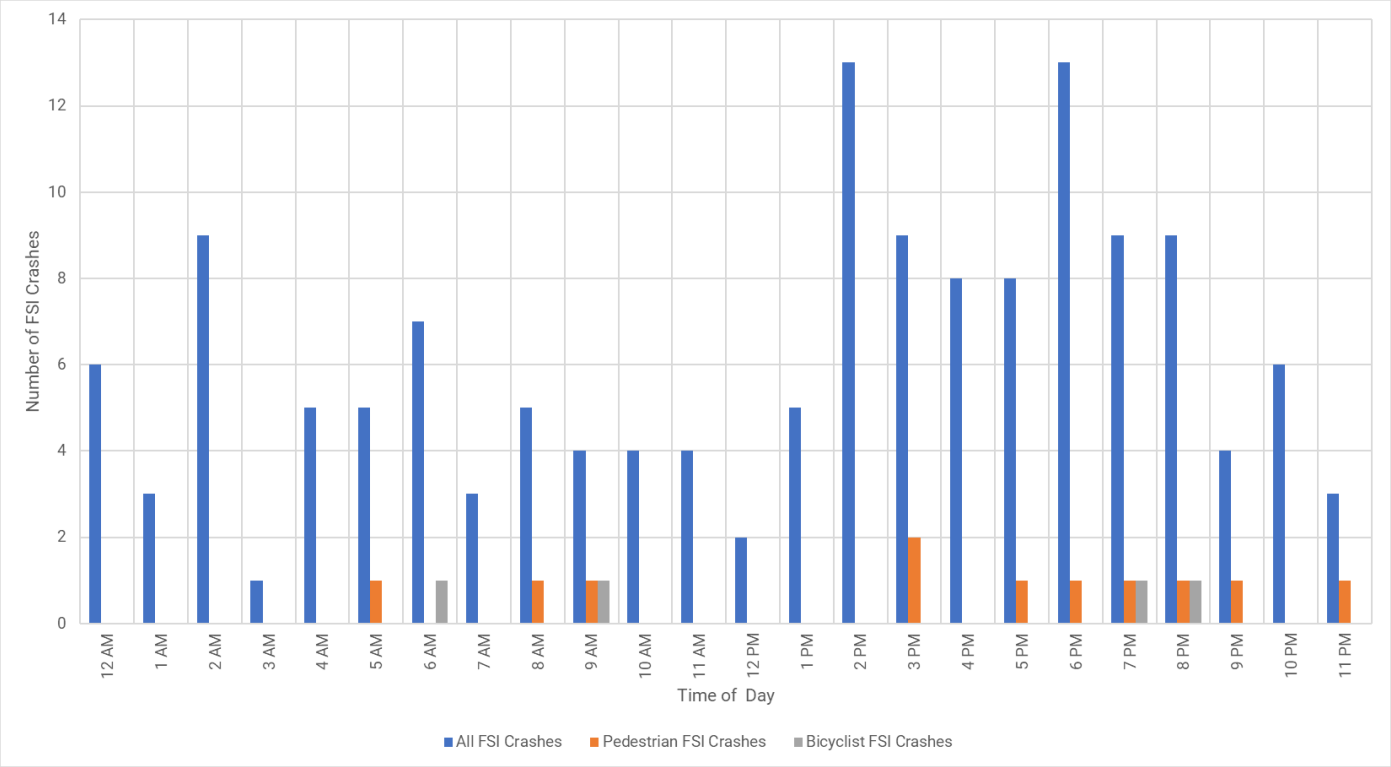


Table 3 shows crashes by time of day and day of week. The time of day with the highest KSI crashes was from 6 PM to 9 PM, when lighting conditions are more likely to be dark and there are still relatively high rates of exposure. Overall, most KSI crashes occur on Saturdays and Sundays and during the hours of 6 PM to 9 PM. Crashes during these times could be related to impaired driving. This high rate of KSI crashes on Saturday nights carried over into the early morning hours of Sunday morning between 12 AM and 3 AM.

Table 3: KSI Crashes by Time of Day and Day of Week, 2018-2022

	12 AM - 3 AM	3 AM - 6 AM	6 AM - 9 AM	9 AM - 12 PM	12 PM - 3 PM	3 PM - 6 PM	6 PM - 9 PM	9 PM - 12 AM	Grand Total
Sun	**8**	**0**	**2**	**1**	**3**	**6**	**5**	**2**	**27**
Mon	2	1	1	2	4	5	**2**	1	18
Tue	1	1	2	2	4	5	**1**	0	16
Wed	0	2	2	1	1	1	**4**	1	12
Thu	2	1	2	1	4	1	**2**	4	17
Fri	1	1	1	3	3	2	**5**	0	16
Sat	**4**	**4**	**5**	**2**	**1**	**6**	**12**	**9**	**43**
Total	*18*	*10*	*15*	*12*	*20*	*26*	***31***	*17*	*149*

Lighting

Lighting refers to whether a crash occurred during daytime or nighttime hours and whether the crash occurred in an area with streetlights. Proper lighting can increase visibility for all road users, while dark, unlit conditions can be associated with low visibility and more severe crashes. Figure 7 summarizes the lighting conditions for all KSI crashes. While 39% of all KSI crashes occurred in dark and unlit conditions, 50% of bicyclist-involved KSI crashes and 63% of the pedestrian-involved KSI crashes occurred in dark and unlit conditions. Though the number of pedestrian and bicycle KSI crashes is relatively small, the disproportionate share of crashes in dark or unlit conditions speaks to the potential for lighting as a targeted countermeasure.

Figure 7: KSI Crashes by Lighting Conditions, 2018-2022

