Fehr & Peers

Memorandum

Date: October 14, 2025

To: Jennifer Donlon Wyant and Jeff Jelsma, City of Sacramento

From: Erin Ferguson, Sonia Anthoine, and Ashlee Takushi, Fehr & Peers

Subject: **City of Sacramento Vision Zero Safety Action Plan: Collision Landscape Summary and Collision Profiles**

SA24-0279.00

Conventional safety practice has focused on reacting to collisions and recommendations based on the siloed categories of the Es (engineering, enforcement, education, and emergency services). Since collision reports focus on the moment of impact and time immediately preceding it, and because the purpose of such collision reports is to determine "fault" among the involved parties (such as for insurance claims or criminal prosecution), the "cause" of the collision is often attributed to the behavior of one or both parties. This can miss the contributing factor(s) that preceded the collision by five hours, five years, or even five decades, especially as relates to the built environment (street design and operations) and exposure conditions (why and where travel occurs, where people live and work and why, what modes they have access to and why, etc.).

Additionally, while collision data can give historical knowledge on collision trends, a reactive approach to safety based on collision data alone can miss other areas of the city that may have similar risk factors for severe and fatal injuries if a collision occurs there. Because the root cause of fatalities and serious injuries occurring on the city's roadways is the result of kinetic energy exceeding the human body's tolerable amount of force, identifying locations with high kinetic energy risk potential can be an important proactive approach to safety. An object's mass and speed, as well as the angle of collision impact, determines how much force is applied to a vulnerable human body and the severity of the resulting injury. Kinetic energy risk is a combination of exposure to the risk, presence of conflicts (likelihood), and level of severity (based on speed, mass, and angle).

This memo summarizes the collision landscape summary, contextual risk factors, and Collision Profiles developed as part of the City of Sacramento’s Vision Zero Safety Action Plan Update.

Collision Data and Collision History

Collision data for the City of Sacramento Vision Zero Action Plan (VZAP) Update includes a ten (10) year collision dataset from 2015-2024, available through the City’s Crossroads collision database provided by Sacramento Police Department records. This data focuses on injury collisions (i.e., it excludes collisions that only resulted in property damage). The data provides information on the location, parties, primary collision factors, environmental conditions, and other key characteristics of reported collisions. Collision reporting

forms do not include micromobility options such as electric bicycles, electric skateboards, and electric scooters. Collision data is geolocated and is valuable for mapping and identifying collision patterns, particularly for fatal and severe injury collisions. The analysis includes collisions that only occurred on city-owned roadways and excludes collisions that occurred on state highway facilities and privately maintained streets.

While collision databases like Crossroads remain an excellent source of collision data, it has been found that collision data like this can have certain reporting biases, including:

- Collisions involving people walking, on bicycles, or on motorcycles are less likely to be reported than collisions with people driving.
- Younger victims are less likely to report collisions.
- Alcohol-involved collisions may be underreported.

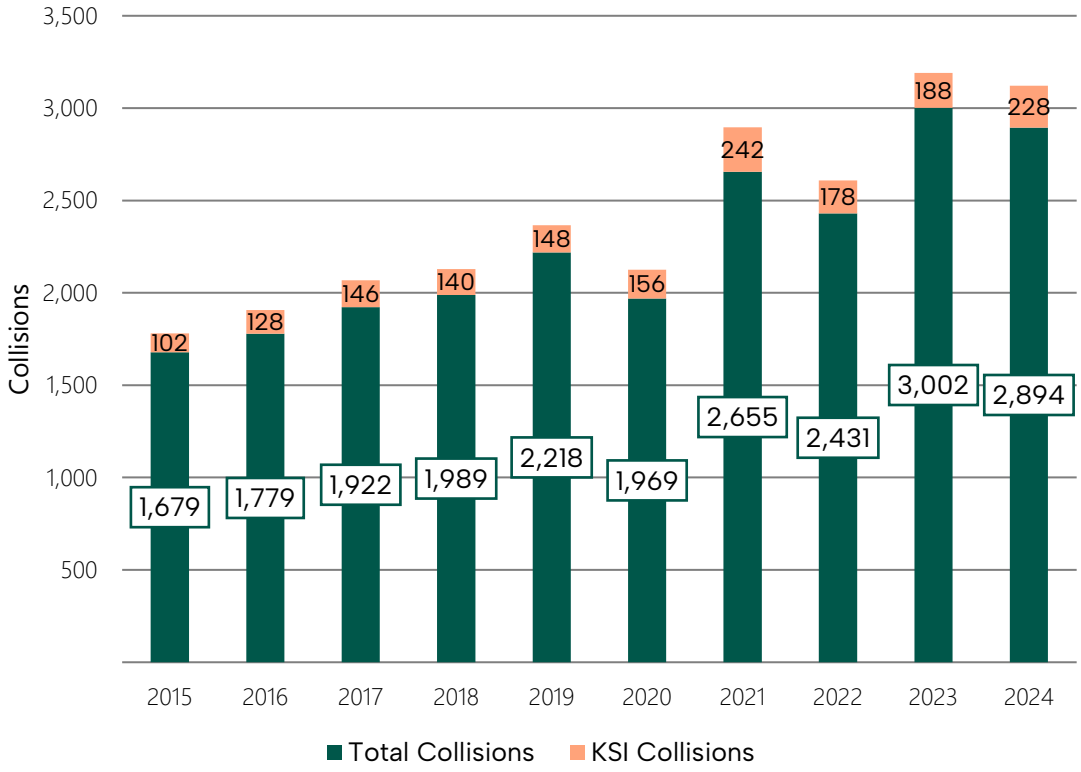
Collision data may also include bias as reports are based on several different factors, such as an officer's perception of the race of those involved, the accuracy of bystander witness reports, and emergency service arrival. However, there is currently limited research on the frequency and effect of reporting biases.

The 2018 Vision Zero Action Plan (2018 Plan), which included analysis of collisions between 2009 and 2015, served as a reference point for this updated analysis, providing a basis for comparison to better understand if and how collision patterns have evolved over time.

Summary

Between 2015 and 2024, there were 22,538 reported collisions resulting in injuries across the City of Sacramento. While total reported collisions decreased in 2020, associated with the COVID-19 Pandemic, the number of collisions in the following years (2021-2024) exhibited a fluctuating upward trend, with a slight decline in 2022. Of the total number of injury collisions, 1,656 resulted in fatalities or serious injuries (KSI collisions). While total reported collisions decreased in 2020, Killed and Severe Injury (KSI) collisions increased slightly during the first period of the COVID-19 pandemic in 2020 and peaked in 2021. After a drop in 2022, KSI collisions rebounded again in 2023 and 2024. Collisions involving people walking and bicycling peaked in 2023 and declined slightly in 2024. Although collisions involving people bicycling returned to pre-pandemic levels in 2024, pedestrian-involved collisions remain elevated.

Figure 1 : Total and KSI Collisions



Source: City of Sacramento, Crossroads Data, 2015-2024.

Table 1 displays the collision summary in the City of Sacramento between 2015 and 2024, separated by modes and fatal and severe injury (KSI) collisions.

Table 1: Collision Summary

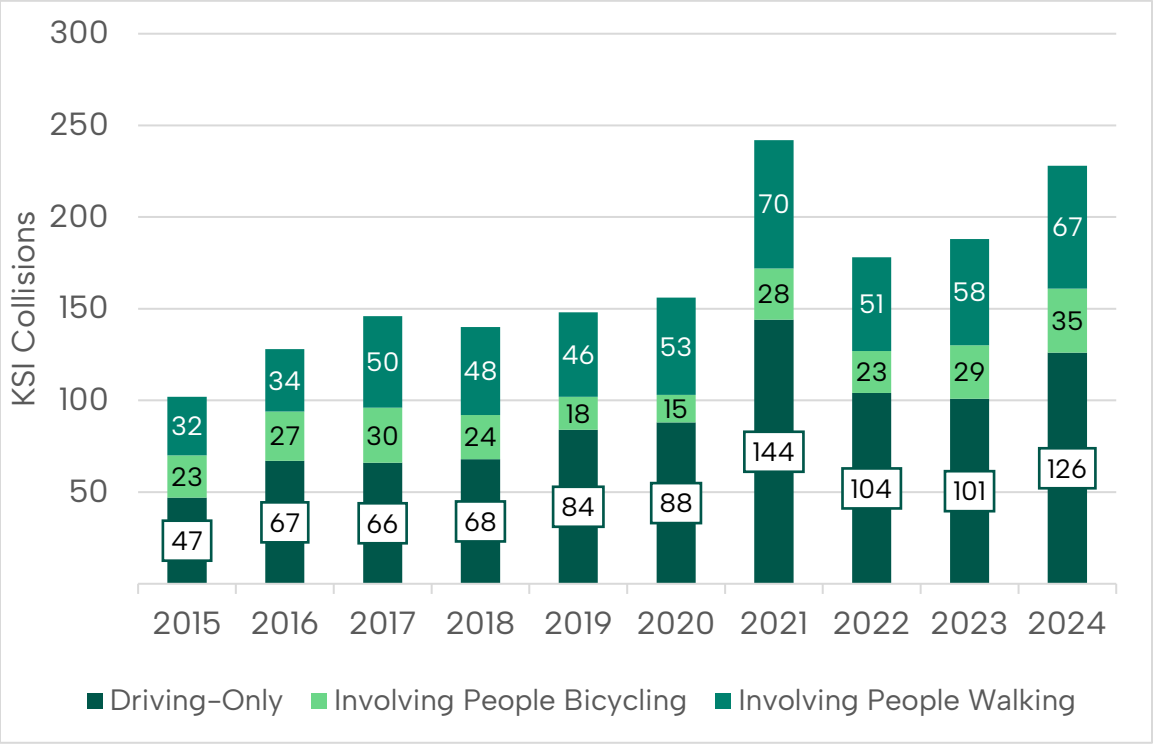
Category	Vehicle-only	Bicycle-involved	Pedestrian-involved	Total
Non-KSI Collisions	17,738	1,714	1,432	20,882[1]
KSI Collisions	895	252	509	1,656
Total	**18,633**	**1,966**	**1,941**	**22,538**[1]

Source: City of Sacramento, Crossroads, 2015-2024.

[1] Total Non-KSI Collisions are 2 trips less than the sum of Non-KSI Collisions for Vehicle-only, Bicycle-involved, and Pedestrian-involved collisions due to the presence of two bicycle-pedestrian collisions from 2015 to 2024.

Between 2015 and 2024, there were 22,538 reported collisions across the City of Sacramento. During those years, the number of collisions resulting in a person being killed or seriously injured (KSI) represented 1,656 of the total collisions (**Table 1**). KSI collisions followed an upward trend beginning in 2015, with an increase in 2021 following the pandemic. While the trend returned to a more gradual pace afterward, a slightly sharper increase was observed in 2024 (**Figure 2**).

Figure 2: Collisions Resulting in Fatality or Serious Injury (KSI Collisions)



Source: City of Sacramento, Crossroads, 2015-2024.

As seen in **Figure 2**, while the total number of KSI (Killed or Seriously Injured) collisions began to increase slightly during the onset of the pandemic in 2020, continuing a general upward trend from previous years, an increase occurred in 2021 across all modes, particularly in vehicle-only KSI collisions (with an increase of 56 incidents). In 2022, the total number of KSI collisions started to decline compared to 2021, with decreases observed across all categories. Notably, vehicle-only KSI collisions dropped from 144 to 104, though collisions involving people walking remained elevated compared to pre-2020 levels. Despite a minor decrease in vehicle-only KSI collisions from 2022 to 2023, KSI collisions across all categories increased from 2022 to 2024.

Vulnerable Road Users

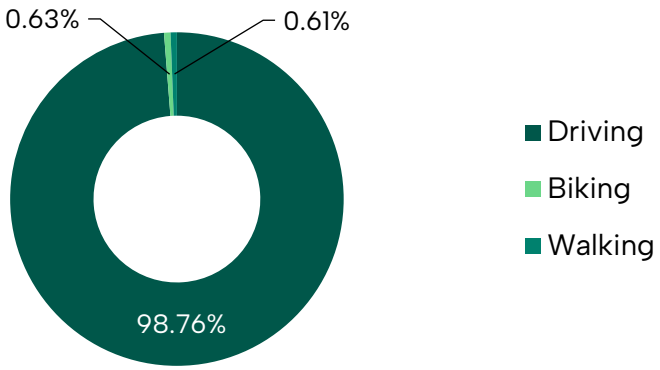
A Vulnerable Road User (VRU) refers to a person walking, bicycling, rolling, or using other modes of travel besides a motor vehicle or motorcycle[1], making them more susceptible to fatal and serious injuries. While VRU trips are usually shorter in length, they are disproportionately involved in more fatal and injury-related collisions.

To estimate miles travelled by mode as a proxy measurement for level of VRU exposure, a data source called Replica was utilized. Replica is a nationwide activity-based travel demand model with detail down to the local street level. Replica uses a number of data sources to inform its model, including connected vehicle, location-based services, and public traffic data. Replica simulates people's activities on a typical weekday and tracks travel of individuals throughout the day in "trip tours" to calculate miles traveled by

[1] See the Federal Highway Administration's official definition here: VRU Safety Assessment Guidance, page 3.

mode or person. **Figure 3a** shows that, according to Replica data, excluding freeways, bicycling and walking constitute a combined 1.24% of miles traveled in the City on the average weekday, with driving as the dominant mode.

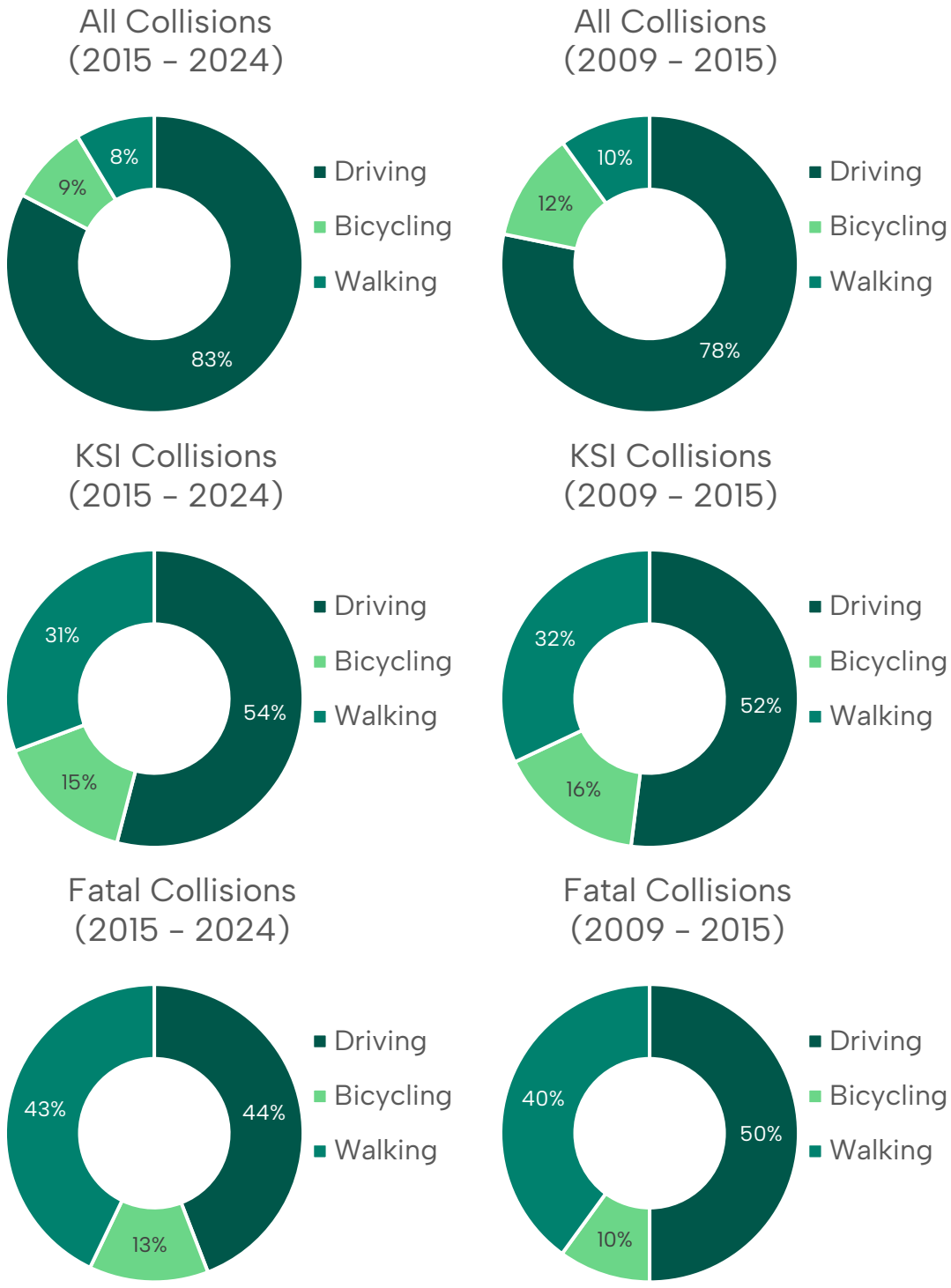
Figure 3a: Miles Traveled by Travel Mode



Source: Replica, Fall 2024.

As shown in **Figure 3b**, although walking and bicycling each account for less than 1% of the miles traveled in Sacramento, collisions involving walking and bicycling accounted for 8% and 9% of total injury collisions respectively. Furthermore, these groups were disproportionately involved in fatal collisions**,** with 43% involving a person walking and 13% involving a person bicycling. Comparatively, in the 2018 Vision Zero Action Plan, representing data from 2009 - 2015, collisions involving people bicycling accounted for 12% of total injury collisions and 16% of KSI collisions and collisions involving people walking accounted for 10% of total injury collisions and 32% of KSI collisions. The overall involvement rate of these vulnerable road users in injury collisions remained similar across the two study periods, and VRU risk of severe injury or death remained high, emphasizing the continued need for targeted safety measures.

Figure 3b: Collisions by Travel Mode



Source: City of Sacramento, Crossroads, 2015 - 2024; City of Sacramento Vision Zero Action Plan (2018).

Table 2 shows the annual collision rates per million miles traveled, revealing the discrepancy between driving and VRUs. *This data shows that, per mile of travel, people bicycling and walking are approximately 26 times more likely to be involved in a collision.*

Table 2: Annual Collision Rates by Mode

Mode	Collision Type	Collisions per year	Annual Miles Traveled (1,000,000)	Annual Collision Rate per 1M Miles Traveled
Driving	Vehicle-Only	1,863	14,232.60	**0.13**
Bicycling	Involving a Person Bicycling	197	58.64	**3.36**
Walking	Involving a Person Waling	194	56.76	**3.42**

Notes: Collisions per year calculated as an average of the ten-year study period.
Source: City of Sacramento, Crossroads, 2015-2024; Replica, Fall 2024.

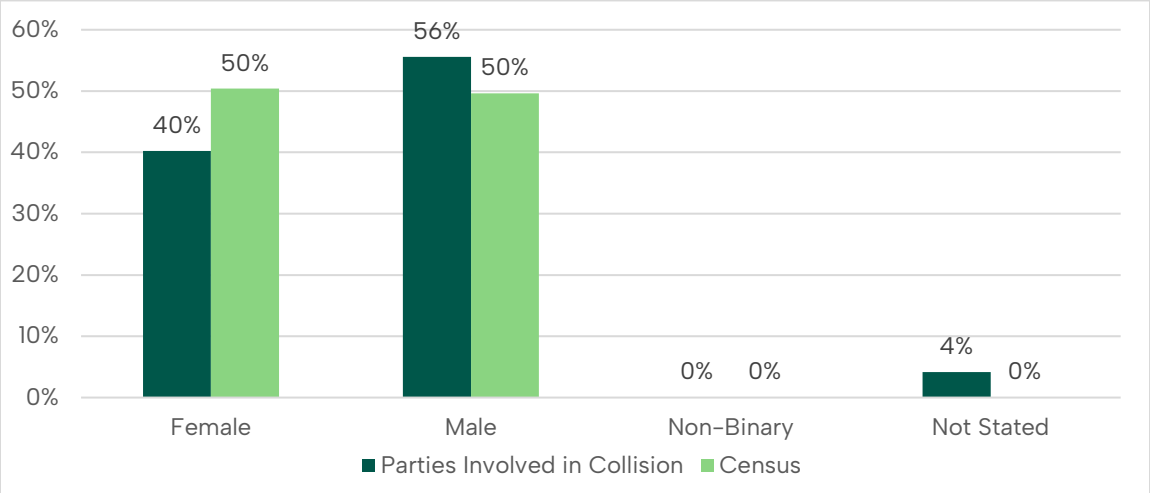
Collision Parties

Analyzing collision parties' demographics provides insights into which populations are most affected and reveals disparities in risk exposure. Note that the Crossroads data only includes the two primary parties involved in the collision, without vehicle passengers. Therefore, there is an underrepresentation in populations that are typically passengers rather than drivers, such as children and the elderly.

Gender

Based on collision parties by gender in **Figure 4**, men are disproportionately involved in collisions compared to women.

Figure 4: Collision Parties by Gender



Source: City of Sacramento, Crossroads, 2015-2024. U.S. Census Bureau, American Community Survey, DP05 2023 5-Year Estimate for the City of Sacramento.

Age

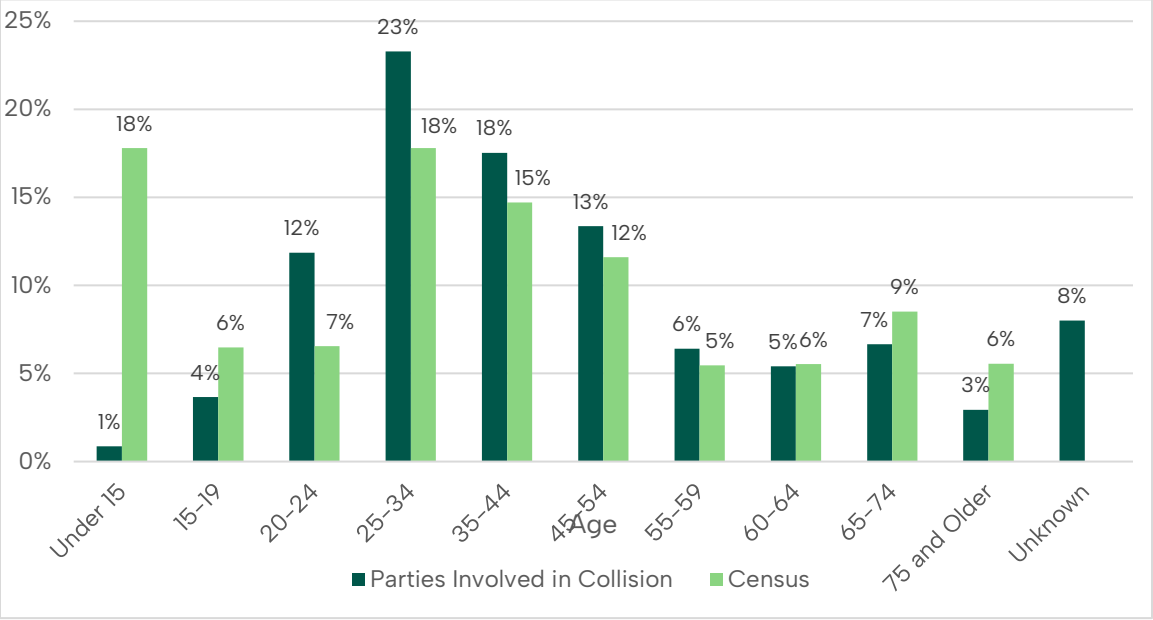
Based on **Figure 5a**, primary parties involved in collisions are concentrated among younger people, with age groups 20 – 35 representing 35% of collisions during the 10-year collision period. In fact, people ages 20 – 55 were over-represented in collision involvement as compared to U.S. Census data for the city. Both

children (age under 15) and the elderly (age 55 and above) make up higher portions of the Sacramento population than in the collision data.

Figure 5b shows the primary collision parties by age compared to their share of miles traveled in the city, as estimated from the Replica data source described in the Vulnerable Road Users section above. This data shows that people under 34 are disproportionately involved in collisions compared to their travel exposure (as measured by miles traveled by any mode).

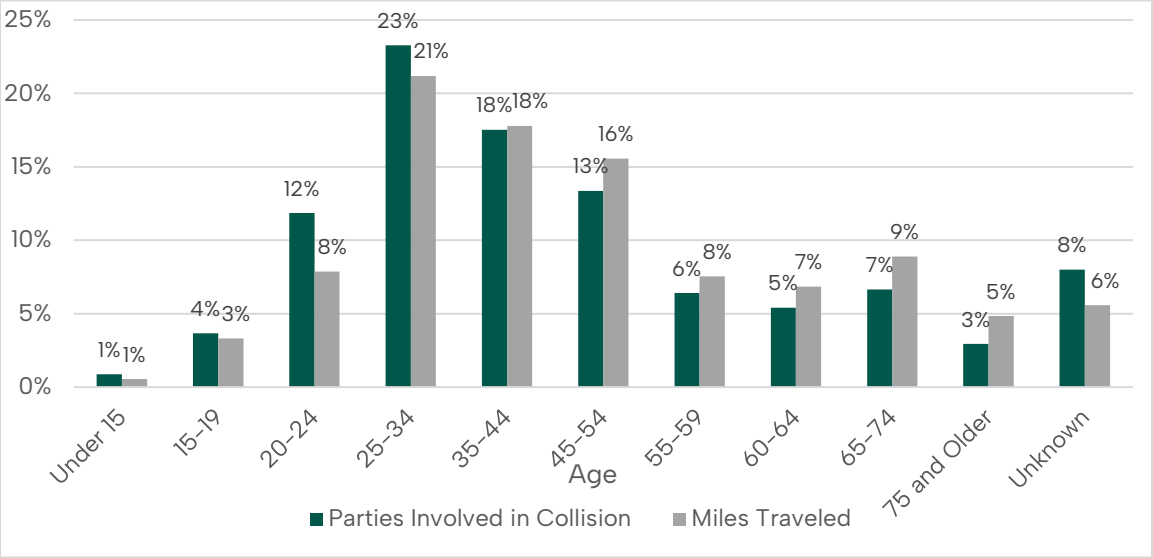
Data from the Transportation Injury Mapping System from UC Berkeley SafeTREC was used as secondary source due to its distinction between parties and victims. In this dataset (which represents 2018 – 2022 data due to lack of victim data collection in prior periods), 66% of victims are drivers, 25% are vehicle passengers, 5% are pedestrians, and 4% are bicyclists. In terms of ages, 3% of victims are under 15, 4% are 15 – 19, and 4% are 65 and over.

Figure 5a: Primary Collision Parties by Age vs. Census



Source: City of Sacramento, Crossroads, 2015-2024. U.S. Census Bureau, American Community Survey, DP05 2023 5-Year Estimate for the City of Sacramento.

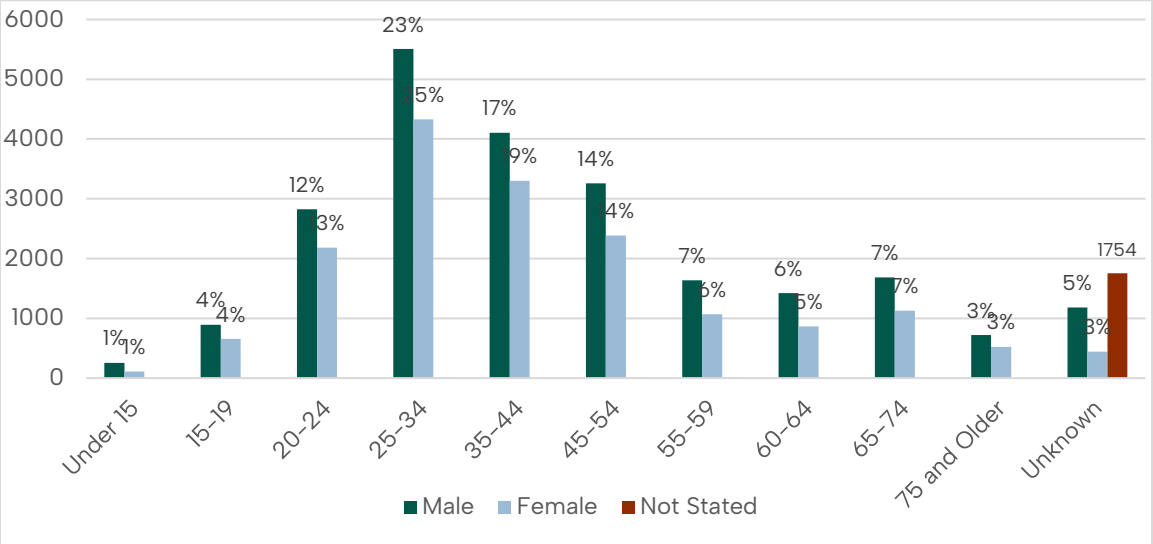
Figure 5b: Primary Collision Parties by Age vs. Miles Traveled



Source: City of Sacramento, Crossroads, 2015-2024. Replica, Fall 2024.

The 2018 Plan analysis focused on victims rather than all parties and had a more restricted set of age ranges, so a comparison is not able to be made. **Figure 6** shows collision parties by age and gender, showing that men outnumber women as primary collision parties in every age group.

Figure 6: Collision Parties by Age and Gender



Source: City of Sacramento, Crossroads, 2015-2024. U.S. Census Bureau, American Community Survey, DP05 2023 5-Year Estimate for the City of Sacramento.

Primary Collision Factors

Collision reports categorize collisions based on the primary collision factor (PCF) as designated by the responding police officer. PCFs do not include contextual information related to the design of the location

that could have been a primary or secondary contributor to the collision, or any upstream factors as noted previously. The most common PCFs in Sacramento for KSIs, as shown in **Table 3**, are unsafe speed, vehicle right-of-way violation, traffic signs and signals violation, improper turning, and driving or bicycling under the influence of alcohol or drugs.

1. **Unsafe Speed** – Refers to motorists operating a vehicle at a speed that exceeds what is considered safe given roadway conditions, including weather, visibility, traffic volume, and road surface characteristics. This violation does not only mean exceeding the posted speed limit but driving at a speed that poses a risk to other road users. Even when it is not cited as the primary cause of a collision, speed contributes to the severity of collisions, including those resulting in serious injuries or fatalities.

2. **Vehicle Right-of-Way Violations** – Occurs when a driver fails to properly yield to another road user who has the legal right-of-way. Failing to yield to oncoming traffic when making a turn, not stopping properly at stop signs, and improperly entering a roadway. These violations can also involve interactions with people walking and bicycling such as failing to yield when turning right on red or not stopping for a person in a crosswalk.

3. **Traffic Signs and Signals Violations** – Indicates failures to comply with traffic control devices, including stop signs and traffic signals. Typical violations include running red lights, failing to stop at limit lines, and proceeding through an intersection without following posted signs.

4. **Improper Turning** – Refers to any turn made that violates traffic regulations or safety guidelines. This includes executing an illegal turn, failing to use a turn signal, or making a turn that interrupts traffic flow. Improper turning violations frequently lead to conflicts at intersections and driveways, increasing the risk of collisions.

5. **Driving or Bicycling Under the Influence of Alcohol or Drug** – Involves operating a motor vehicle or bicycle while impaired by alcohol or drugs, including cases where the driver's blood alcohol concentration (BAC) exceeds legal limits or their ability to drive is otherwise compromised. Impaired driving significantly increases collision risk by reducing reaction time, impairing judgment, and affecting motor coordination, contributing to a higher likelihood of severe or fatal collisions.

This 2015-2024 period also reveals a shift towards more right-of way violations and traffic signal violations as major contributors to KSI collisions. In the 2018 Plan analysis (representing collision data from 2009 – 2015), the top primary collision factors for KSI collisions were the same, with similar proportions of pedestrian violation (16%), unsafe speed (14%), vehicle right of way violations (14%), and driving or bicycling under the influence (13%).

Table 3: Primary Collision Factors of Total Collisions and KSI Collisions

Category	Total Collisions	%	KSI Collisions	%
Unsafe Speed	5,826	26%	246	15%
Auto R/W Violation	4,225	19%	172	10%
Traffic Signals and Signs	3,764	17%	204	12%

Category	Total Collisions	%	KSI Collisions	%
Improper Turning	2,776	12%	159	10%
Driving or Bicycling Under the Influence of Alcohol or Drug	1,489	7%	206	12%
Pedestrian Related	1,314	6%	327	20%
Not Stated	821	4%	154	9%
Wrong Side of Road	649	3%	72	4%
Unsafe Lane Change	518	2%	39	2%
Other Hazardous Movement	322	1%	26	2%
Other Improper Driving	251	1%	13	1%
Unsafe Starting or Backing	178	1%	5	0%
Following Too Closely	135	1%	1	0%
Improper Passing	112	0%	13	1%
Other Than Driver	102	0%	15	1%
Lights	18	0%	2	0%
Other	14	0%	2	0%
Brakes	10	0%	0	0%
Hazardous Parking	7	0%	0	0%
Other Equipment	5	0%	0	0%
Impeding Traffic	2	0%	0	0%
Total	**22,538**	**100%**	**1,656**	**100%**

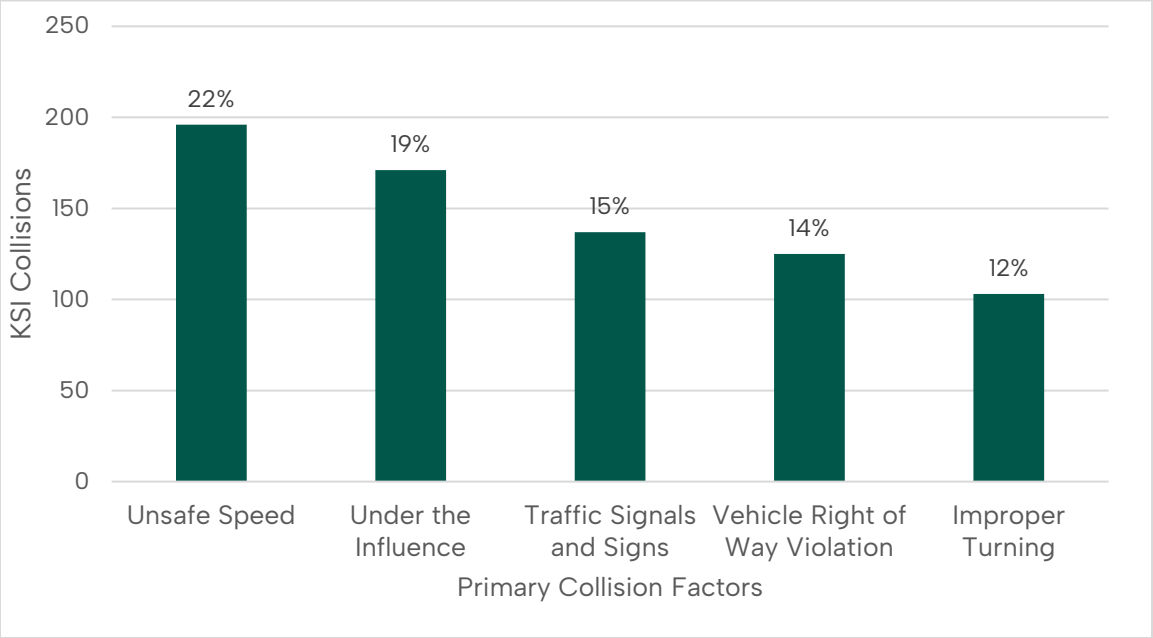
Source: City of Sacramento, Crossroads, 2015-2024.

Note:
1. Crossroads data does not indicate who was at fault. Of the total DUI collisions, 27 were bicycle-involved collisions.
*Pedestrian Violation indicates that the pedestrian violated a rule of the road, such as crossing outside of a crosswalk. The Pedestrian Violation category may be overrepresented due to a lack of clear information related to collision circumstances and the increased likelihood that the pedestrian party may be unable to provide their side of the incident at the time of the collision. In contrast, in a Pedestrian Right of Way Violation, the driver of a vehicle violated the pedestrian's right of way.

KSI Collisions Involving People Driving Only

As shown in **Figure 7**, the prevalence of unsafe speed as a primary collision factor for vehicle-only collisions indicates vehicle speed continues to be an important contributing factor in the occurrence of, as well as the severity of, collisions. The root cause of fatalities and serious injuries occurring on the city's roadways is the result of kinetic energy exceeding the human body's tolerable amount of force.

Figure 7: Primary Collision Factors of KSI Collisions involving Only Vehicles



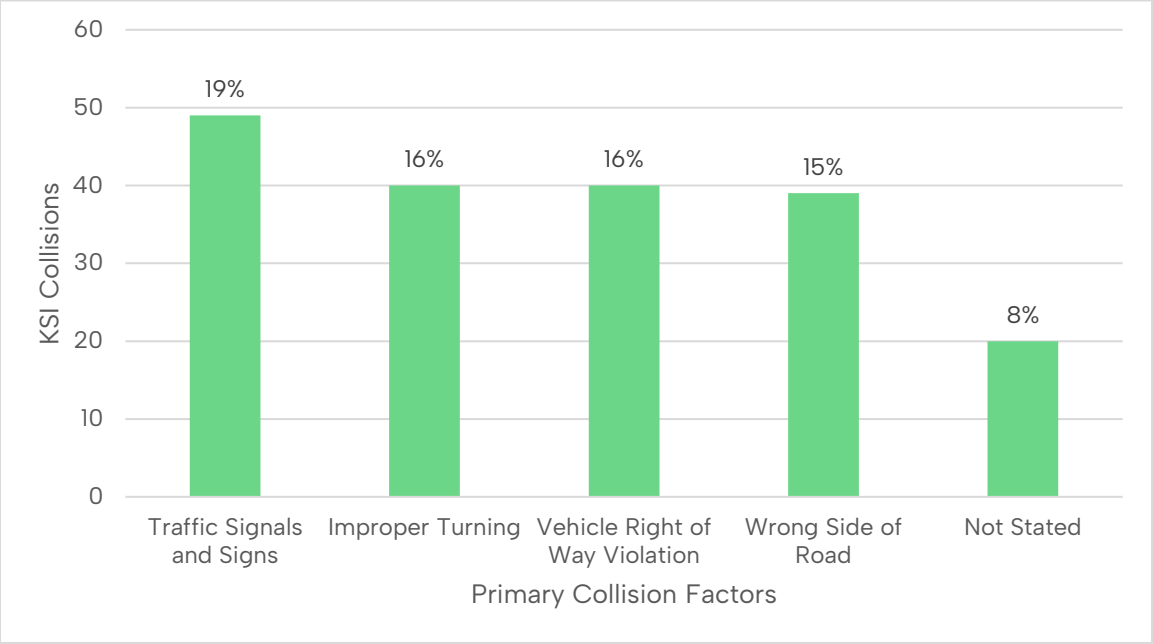
Source: City of Sacramento, Crossroads, 2015-2024.

KSI Collisions Involving People Bicycling

Traffic Signals and Signs violations are cited as the most prevalent primary collision factor for KSI collisions involving people bicycling as shown in **Figure 8**. When bicyclists travel on roadways, challenges with navigating signalized intersections—such as unclear signal phasing, poor visibility of bicycle signals, or lack of dedicated bicycle detection—can result in misjudgment of signal timing or failure to yield, increasing the likelihood of severe collisions at intersections.

In addition, the lack of separated bikeways, one-way street grid in some areas of the City, or clear modal separation, may increase the risk of conflicts with turning vehicles and oncoming traffic. Similarly, in areas with incomplete bicycling infrastructure, bicyclists may ride on the wrong side of the road to better see approaching vehicles or navigate limited crossing options at intersections.

Figure 8: Primary Collision Factors of KSI Collisions Involving People Biking

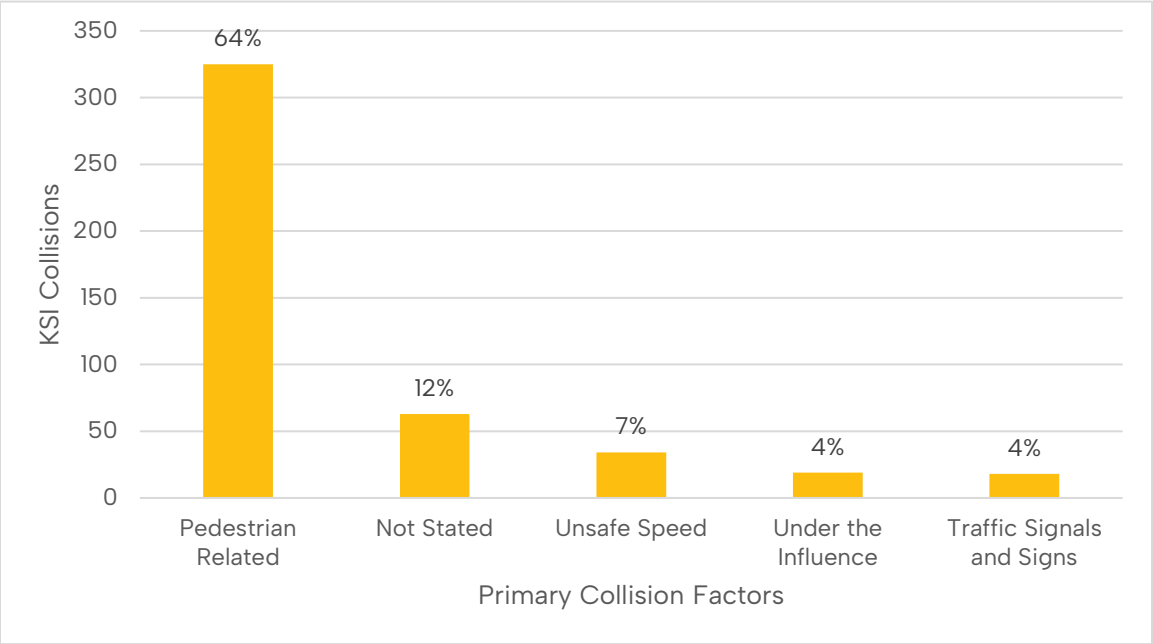


Source: City of Sacramento, Crossroads, 2015-2024.
Note: Crossroads data does not identify who is at fault.

KSI Collisions Involving People Walking

As shown in **Figure 9**, pedestrian-related (which is a combination of right-of-way violation by motorists as well as by pedestrians) is the leading primary collision factor for KSI collisions involving people walking. While unsafe speed appears in a smaller proportion of primary collision factor to the occurrence of KSI collisions involving people walking, impact speed itself directly contributes to the resulting severity of a collision. These data indicate that higher likelihood of collisions at locations where vehicles' and pedestrians' paths of travel cross and right-of-way is not clear and/or actively controlled (e.g., separate time at a signal is given for people to cross when vehicles are required to stop). The likelihood of severe outcome increases as vehicle speed increases. The party associated with the primary collision factor could be either the motorist or the person walking.

Figure 9: Primary Collision Factors of KSI Collisions Involving People Walking



Source: City of Sacramento, Crossroads, 2015 - 2024.

Note: *The **"Pedestrian Related"** category shown here combines two PCF categories: Pedestrian Violation and Pedestrian Right of Way Violation. The former indicates that the pedestrian violated a rule of the road, such as crossing outside of a crosswalk. In contrast, the latter indicates the driver of a vehicle violated the pedestrian's right of way. The Pedestrian Violation category may be overrepresented due to a lack of clear information related to collision circumstances and the increased likelihood that the pedestrian party may be unable to provide their side of the incident at the time of the collision. For this reason, we have elected not to show the distinction between these tallies but instead show all pedestrian-related collisions in one single category.

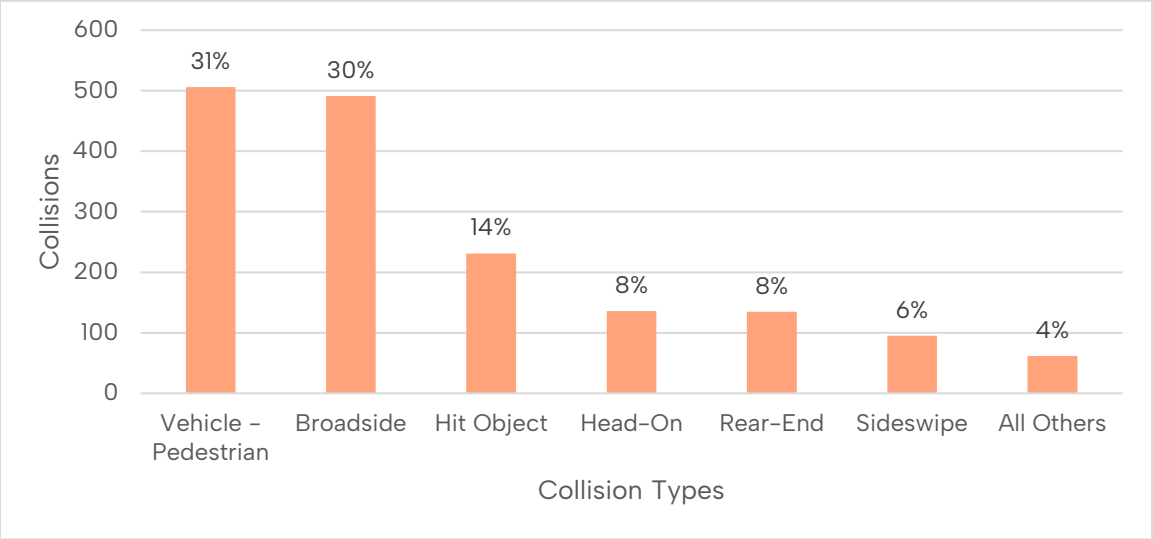
Injury Collisions by Type

Collision types describe how a collision is reported by law enforcement based on the parties involved and generally describe how contact was made between the involved parties, as shown in **Figure 10**. The top three collision types are further described as:

- **VEHICLE-PEDESTRIAN COLLISIONS** – Includes any collision involving both a motor vehicle and a pedestrian.
- **BROADSIDE COLLISIONS** – Refers to collisions between two vehicles on conflicting paths where the front of one vehicle contacts the side of another.
- **HIT OBJECT COLLISIONS** – Involves a vehicle and a non-vehicular object in or near the roadway.

The top three collision types account for 75% of KSI collisions between 2015 and 2024. Collisions associated with higher kinetic energy risk (mass and speed), along with the angle of collision impact (e.g. broadside), tend to have a higher percentage of KSI collisions.

Figure 10: KSI Collision Types



Source: City of Sacramento, Crossroads, 2015-2024.

Note: "Other" and all categories representing fewer than 3% are grouped into "All Others"

Action Before Collision

As shown in **Table 4**, the most common action either party made before a collision was proceeding straight on a roadway, indicating that many collisions occur during typical and predictable movements rather than turning, merging, or other more complex maneuvers. This trend suggests that factors such as right-of-way violations and unsafe speeds contribute to most collisions.

Table 4: Actions Before Collisions

Movement	All Parties	%	At-Fault Parties	%	Non-Fault Parties	%
Proceeding Straight	25,881	60%	12,673	58%	12,414	62%
Making Left Turn	5,958	14%	4,137	19%	1,629	8%
Stopped In Road	3,621	8%	267	1%	3,302	16%
Making Right Turn	1,685	4%	1,124	5%	515	3%
Parked	1,043	2%	28	0%	992	5%
Slowing/Stopping	820	2%	225	1%	582	3%
Entering Traffic	698	2%	578	3%	101	1%
Other	676	2%	292	1%	320	2%
Other Unsafe Turning	502	1%	486	2%	8	0%
Changing Lanes	496	1%	444	2%	44	0%
Making U Turn	489	1%	424	2%	54	0%
Ran Off Road	401	1%	381	2%	9	0%
Traveling Wrong Way	250	1%	236	1%	11	0%
Backing	229	1%	195	1%	23	0%
Passing Other Vehicle	140	0%	121	1%	15	0%
Crossed Into Opposing Lane - Unplanned	137	0%	126	1%	10	0%
Merging	114	0%	95	0%	19	0%
Not Stated	85	0%	23	0%	50	0%
Parking Maneuver	30	0%	20	0%	9	0%

Source: City of Sacramento, Crossroads, 2015 - 2024.

As shown in **Table 5**, the most common action either party made before a KSI collision was proceeding straight on a roadway. This trend once again indicates that unsafe speed and right-of-way violations contributed to most KSI collisions.

Table 5: Actions Before KSI Collisions

Movement	All Parties	%	At-Fault Parties	%	Non-Fault Parties	%
Proceeding Straight	1,889	62%	839	53%	970	72%
Making Left Turn	331	11%	213	14%	101	8%
Other	216	7%	107	7%	85	6%
Making Right Turn	92	3%	64	4%	28	2%
Stopped in Road	90	3%	19	1%	67	5%
Ran Off Road	79	3%	74	5%	0	0%
Entering Traffic	76	2%	64	4%	9	1%
Parked	70	2%	5	0%	59	4%
Other Unsafe Turning	49	2%	47	3%	1	0%
Traveling Wrong Way	34	1%	32	2%	0	0%
Making U Turn	30	1%	25	2%	4	0%
Crossed Into Opposing Lane - Unplanned	27	1%	24	2%	3	0%
Not Stated	23	1%	11	1%	7	1%
Changing Lanes	20	1%	15	1%	3	0%
Passing Other Vehicle	16	1%	16	1%	0	0%
Backing	11	0%	9	1%	0	0%
Slowing/Stopping	10	0%	5	0%	5	0%
Merging	6	0%	3	0%	3	0%
Parking Maneuver	1	0%	1	0%	0	0%

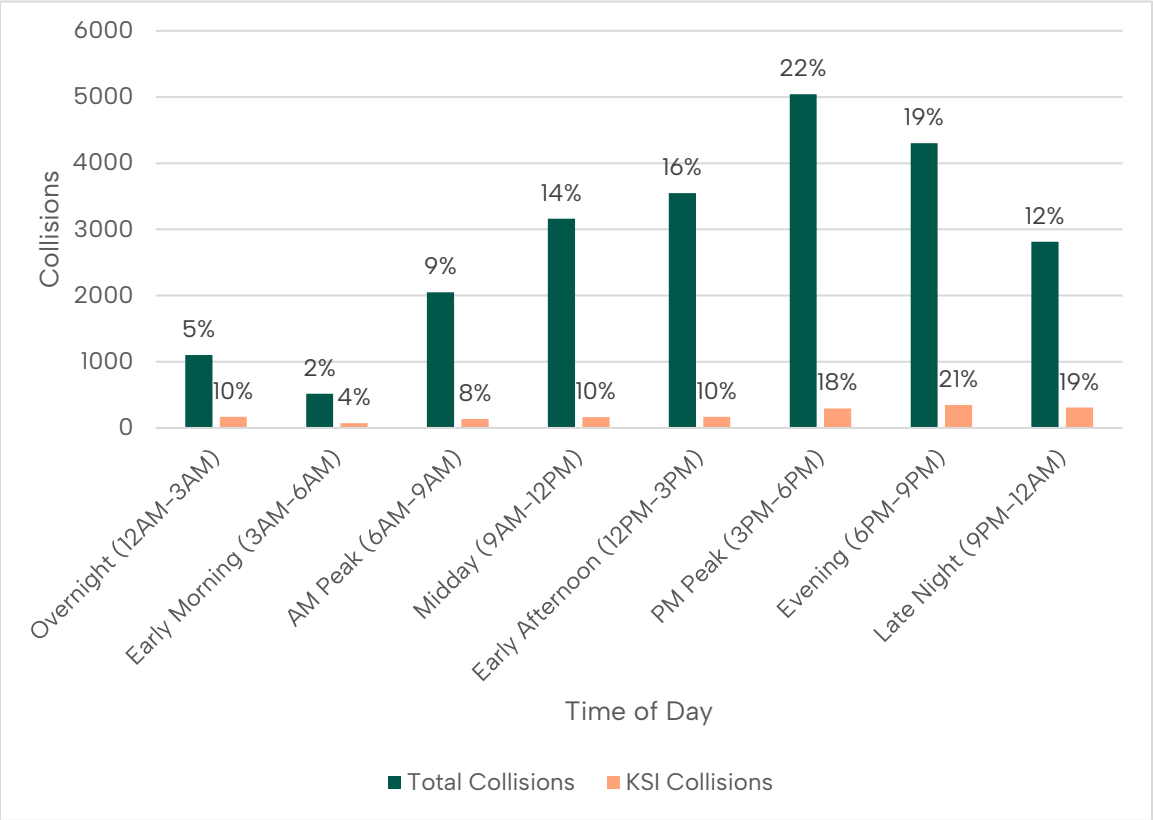
Source: City of Sacramento, Crossroads, 2015 - 2024.

When & Where

Time of Day

As shown in **Figure 11**, the most common time for injury collisions is during the PM peak hours (3 PM – 6 PM). Increased traffic volumes, lower visibility, and a mix of travel modes during commute periods contribute to elevated collision rates during this period. While total collisions decline slightly after 6 PM, the evening period (6 PM–9 PM) shows the highest proportion of KSI collisions, indicating increased severity during later hours. The PM peak period remained the most common time frame for total collisions when compared to the 2018 Plan analysis, with similar rates of collisions throughout the day.

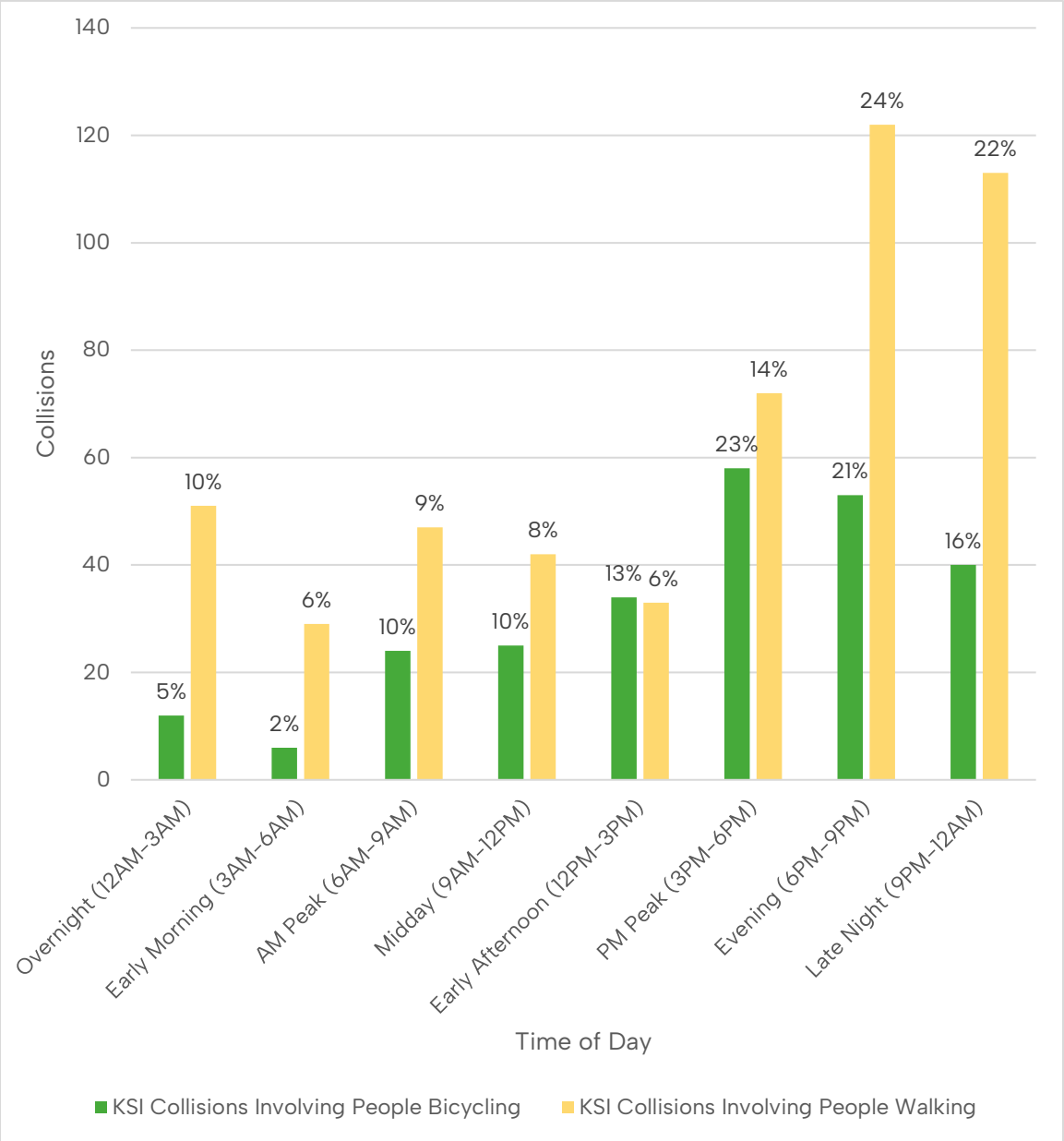
Figure 11: Total Collisions by Time of Day



Source: City of Sacramento, Crossroads, 2015-2024.

As shown in **Figure 12**, the most common time for KSI collisions involving people bicycling and walking is during the PM peak period (3PM - 6PM) through late night (9PM – 12AM), accounting for 60% of all such collisions. This trend likely reflects higher bicycling and walking activities along with higher traffic volumes during commute hours, indicating a greater occurrence of severe outcomes during the evening period. Notably, the late-night period alone, despite typically lower traffic volumes, represents a disproportionate share of KSI collisions (16% of KSI collisions involving people bicycling, and 22% of KSI collisions involving people walking), highlighting elevated severity outcomes during hours of reduced visibility and potentially higher travel speeds.

Figure 12: Collisions Involving People Bicycling and Walking by Time of Day, 2015-2024

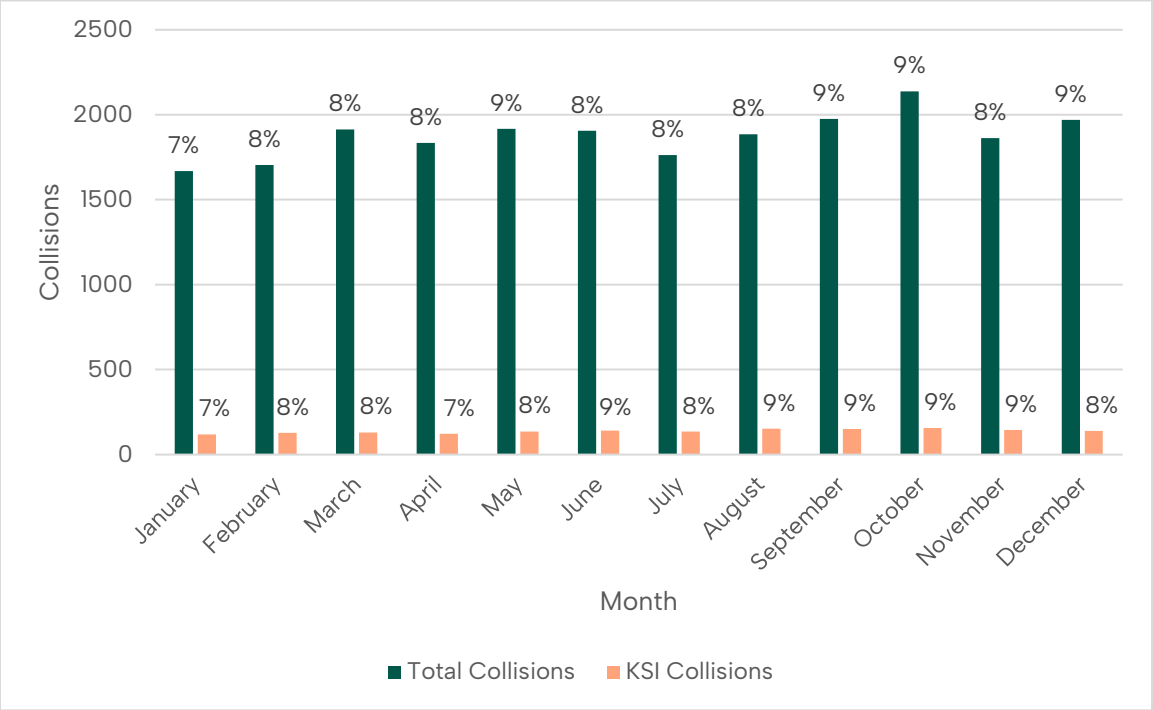


Source: City of Sacramento, Crossroads, 2015-2024.

By Month

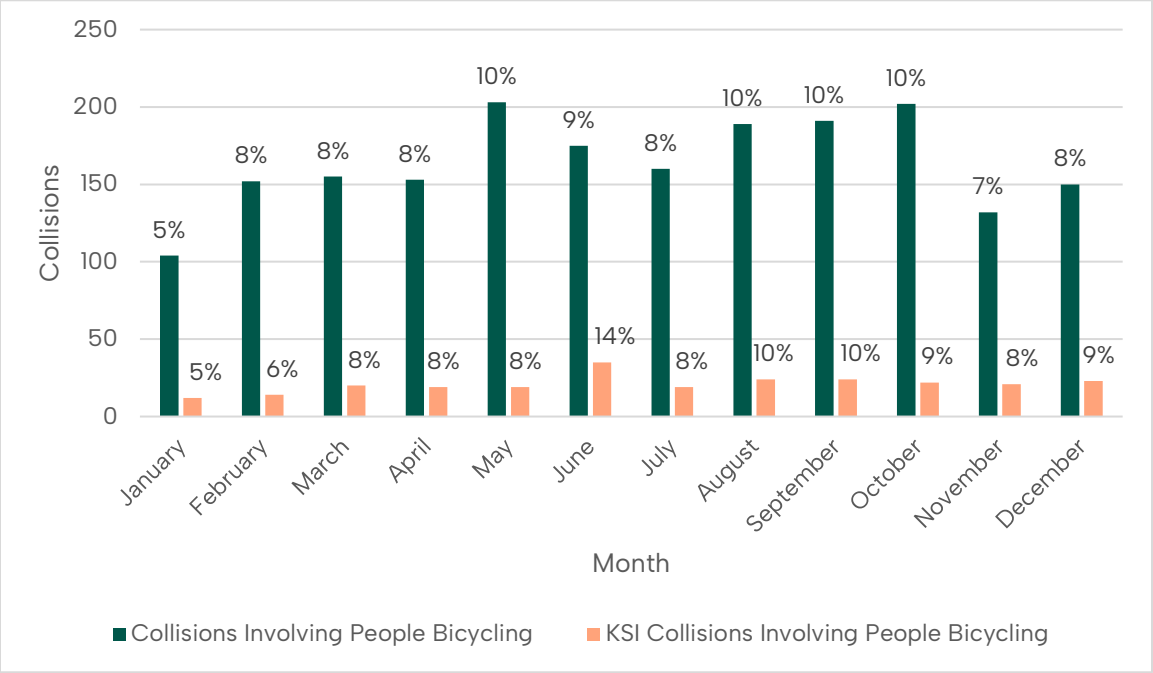
As shown in **Figure 13**, **Figure 14**, and **Figure 15**, total collisions and KSI collisions are relatively even throughout the year for all modes (ranging from 7% to 9%), bicycling (ranging from 5% to 10%), and walking (ranging from 7% to 11%). This suggests that seasonal or monthly factors may not play a substantial role in influencing overall collision trends.

Figure 13: Total Collisions by Month



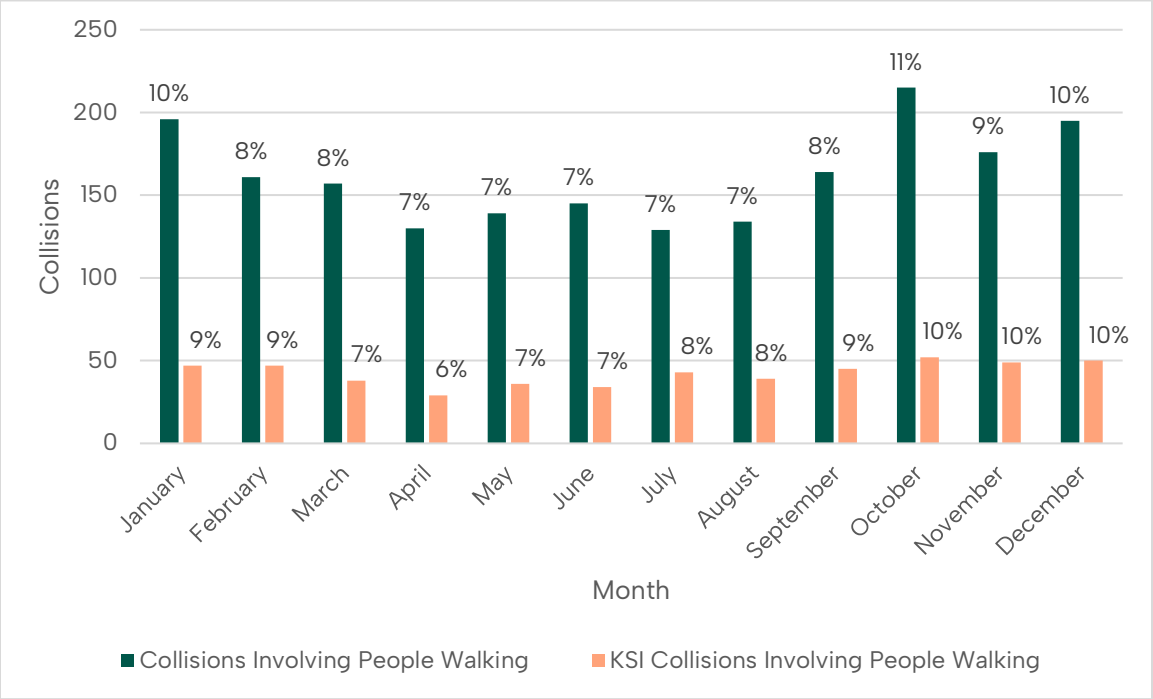
Source: City of Sacramento, Crossroads, 2015 – 2024.

Figure 14: Collisions Involving People Biking by Month



Source: City of Sacramento, Crossroads, 2015 – 2024.

Figure 15: Collisions Involving People Walking by Month



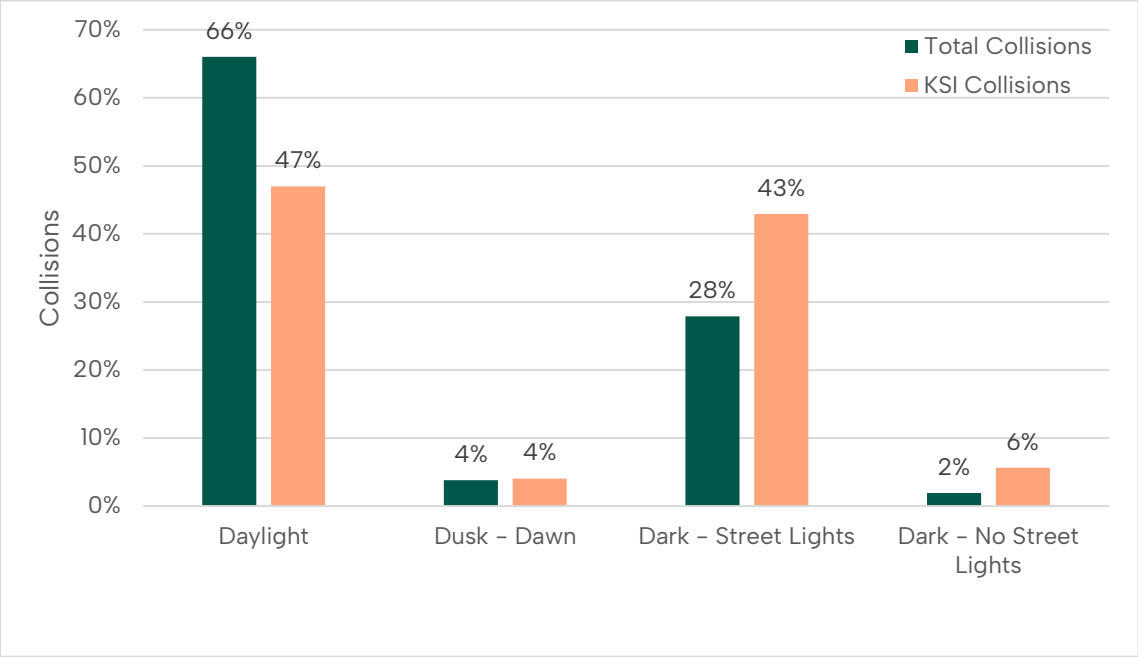
Source: City of Sacramento, Crossroads, 2015 – 2024.

Lighting

Based on **Figure 16**, over 60% of total collisions occurred during daylight. Nearly half of the total collisions occurred at night in locations where streetlights were present, while 2% of reported collisions occurred in the dark where there were no streetlights present. This may indicate that despite providing lighting, other roadway features may be contributing to increased collision occurrence.

For KSI collisions, both conditions of daylight and nighttime with streetlight each account for about 40% of collisions. However, the proposed of KSI collisions that occur in dark conditions is greater. This indicates that nighttime collisions may be related to reduced visibility and the challenges of street lighting.

Figure 161: Collisions by Lighting Conditions



Source: City of Sacramento, Crossroads, 2015 – 2024.

Contextual Trends

Collision data is paired with geographic data provided by the City of Sacramento to reveal collision profiles with collision locations, land use types, and roadway characteristics.

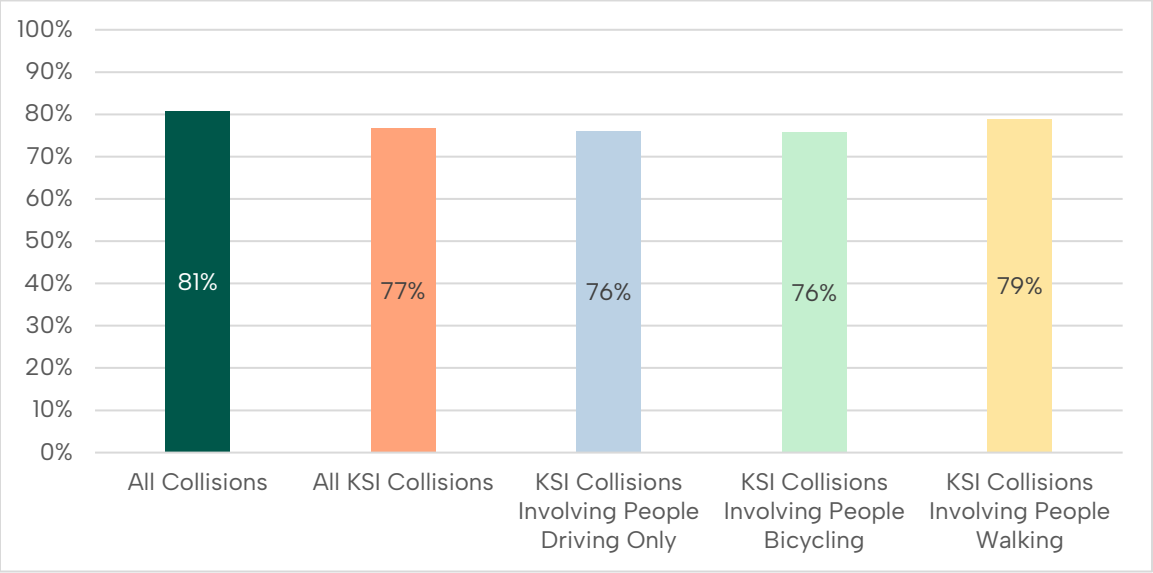
Collision Location

Figure 17 shows that the majority of collisions in Sacramento from 2015 to 2024 occurred within 150 feet of intersections (81% of all collisions, 77% of all KSI collisions). This pattern is consistent across travel modes, with 76% of KSI collisions involving only people driving and bicycling, and 79% of those involving people walking occurring near intersections.

Compared to the 2018 Plan, which defined intersection-related collisions as those within 100 feet, the most recent 10-year data show a higher overall share of collisions near intersections. This is likely due to the use of a larger 150-foot threshold, expanded to be more consistent with the typical size of intersections in the City[2]. The 2018 Plan also shows greater variation by mode, with a higher share of KSI collisions involving people bicycling (85%) and a lower share involving people walking (66%).

[2] Caltrans allows crashes within 250 feet to be counted as intersection crashes as part of HSIP grant funding. However, given typical sizes of intersections in Sacramento, using 150 feet was deemed most appropriate.

Figure 172: Share of Collisions Occurring Near Intersections (Within 150 ft)

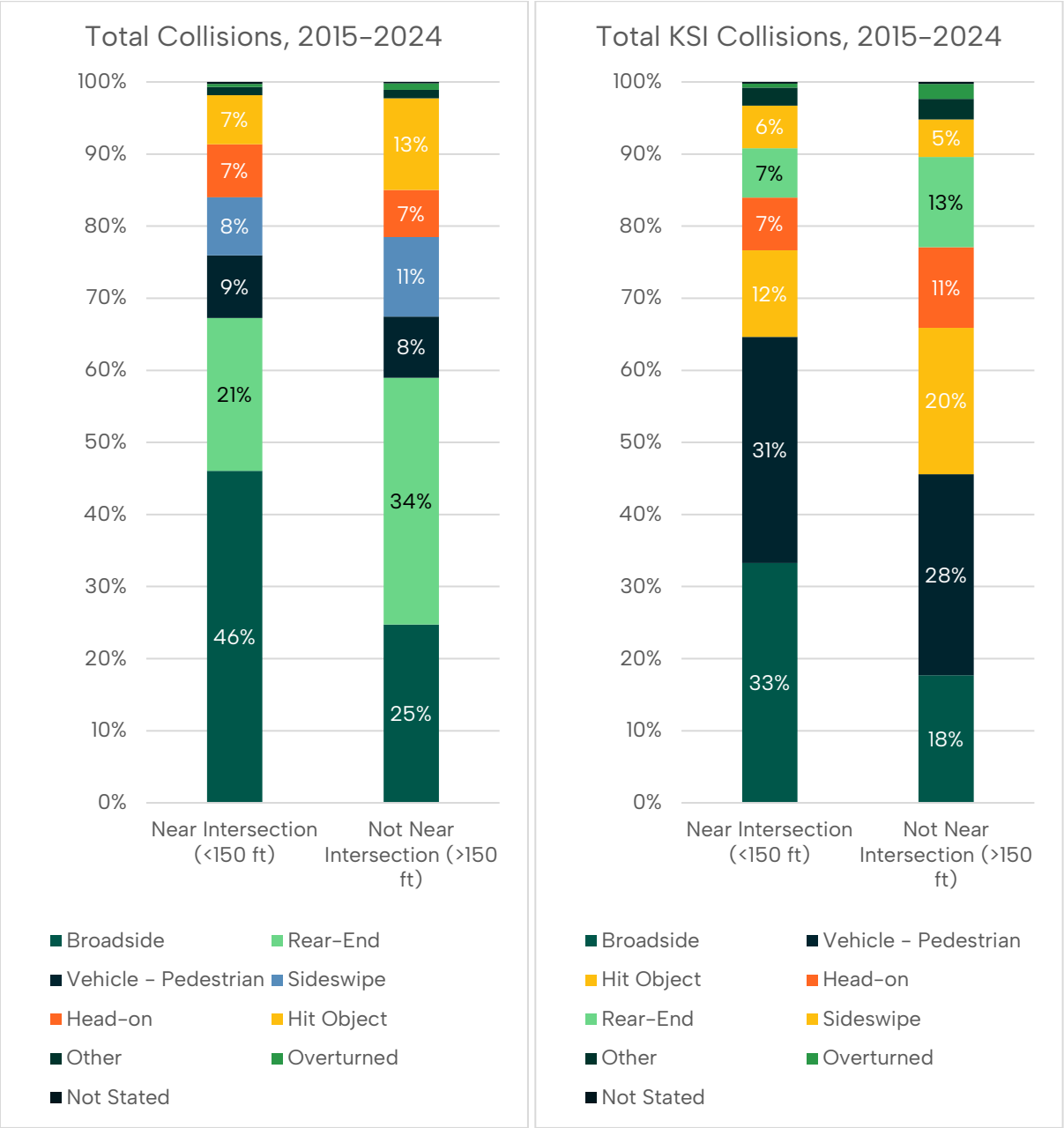


Source: City of Sacramento, Crossroads, 2015 – 2024.

While a similar share of collisions occurred near intersections for both total and KSI collisions, the distribution of collision types differs notably (See **Figure 18**). For total collisions, broadside collisions were most common near intersections (46%), while rear-end collisions were most common further from the intersections (34%).

Among KSI collisions near intersections, broadside (33%) and vehicle-pedestrian (31%) collisions occurred at nearly equal rates, indicating a higher severity risk for pedestrian-involved crashes in these areas. Away from intersections, vehicle-pedestrian collisions became the most prevalent KSI type (28%), followed by hit-object (20%) and broadside collisions (18%).

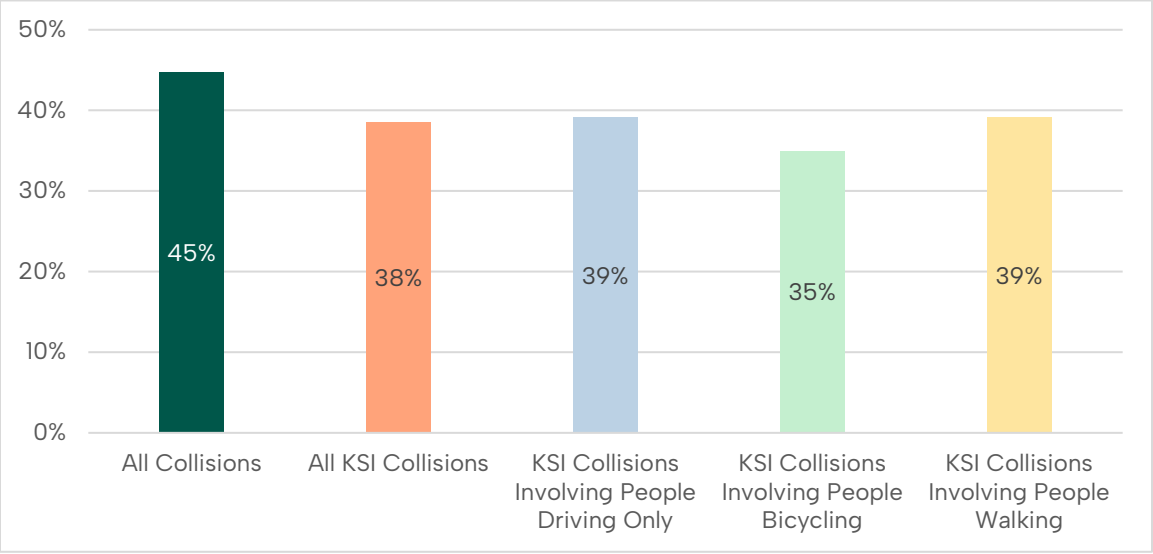
Figure 183: Collision Type of All Collisions and All KSI Collisions Occurring Near Intersections (Within 150 ft)



Source: City of Sacramento, Crossroads, 2015 – 2024.

As shown in **Figure 19**, 45% of all collisions and 38% of KSI collisions occurred within 150 feet of signalized intersections. The share of KSI collisions near signals was similar across modes, with a slightly higher share of KSI collisions involving people driving only or walking (39%), and a slightly lower share for bicycling (35%).

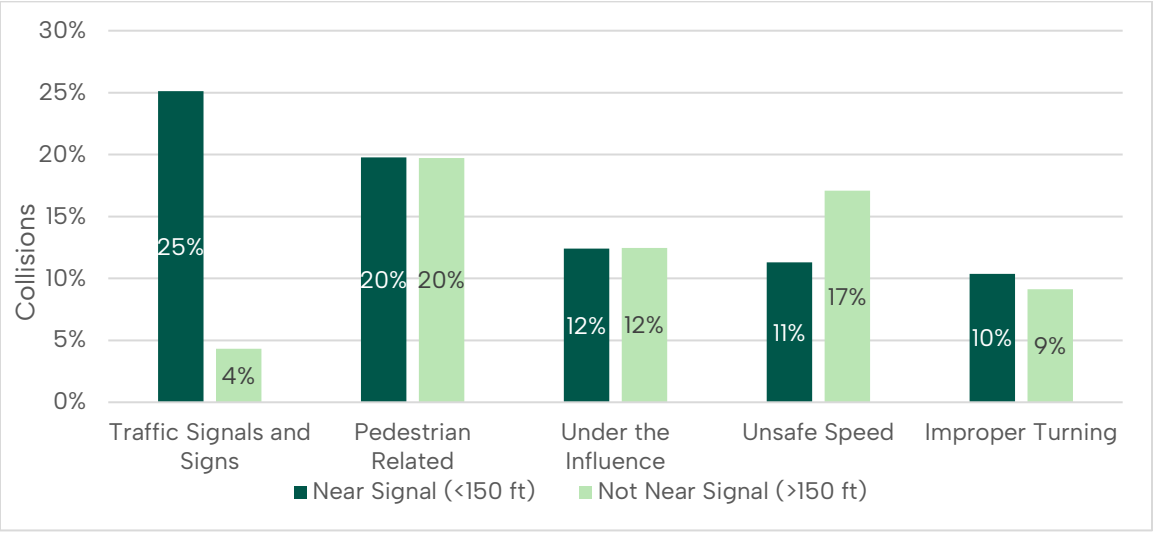
Figure 194: Share of Collisions Occurring Near Signals (Within 150 ft)



Source: City of Sacramento, Crossroads, 2015 – 2024.

As shown in **Figure 20**, "Traffic Signals and Signs" and "Pedestrian Related" factors are the leading primary collision factors for KSI collisions occurring near signals, accounting for 25% and 20% of such collisions, respectively. The contributions of pedestrian-related factors, driving under the influence, and improper turning are relatively consistent both within and beyond 150 feet of signals, suggesting that these PCFs are likely independent of signal proximity. While pedestrian-related factors remain prominent beyond 150 feet of signals, the influence of traffic signals and signs factors drops to just 4%. In contrast, collisions involving unsafe speed become more prominent, contributing to 17% of KSI collisions away from signals.

Figure 205: Top Five Primary Collision Factors of All KSI Collisions Occurring Near Signals (Within 150 ft)



Source: City of Sacramento, Crossroads, 2015 – 2024.

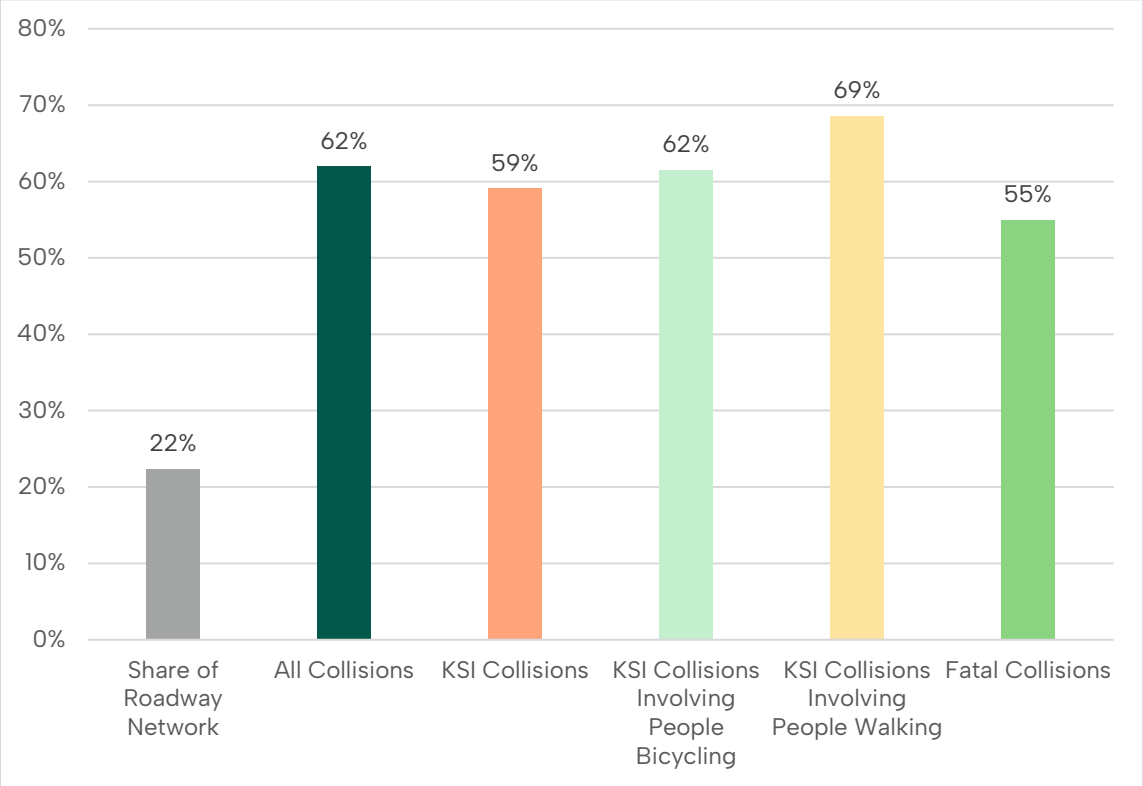
Land Uses

Figures 21 to 25 compare the share of collisions occurring within 250 feet of various land use types.

Collisions are most concentrated near commercial areas (See **Figure 21**), with only 22% of the roadway network falling within commercial areas, but 62% of all collisions and 59% of KSI collisions involving people walking occurring nearby. While only 13% of roadways are within 250 feet of transit stations, 43% of all collisions and 41% of KSI collisions involving a person walking (See **Figure 25**) occurred nearby. Multifamily areas follow, with 34% of all collisions and 33% of KSI collisions involving bicyclists (See **Figure 24**) occurring on only 22% of the total roadway network.

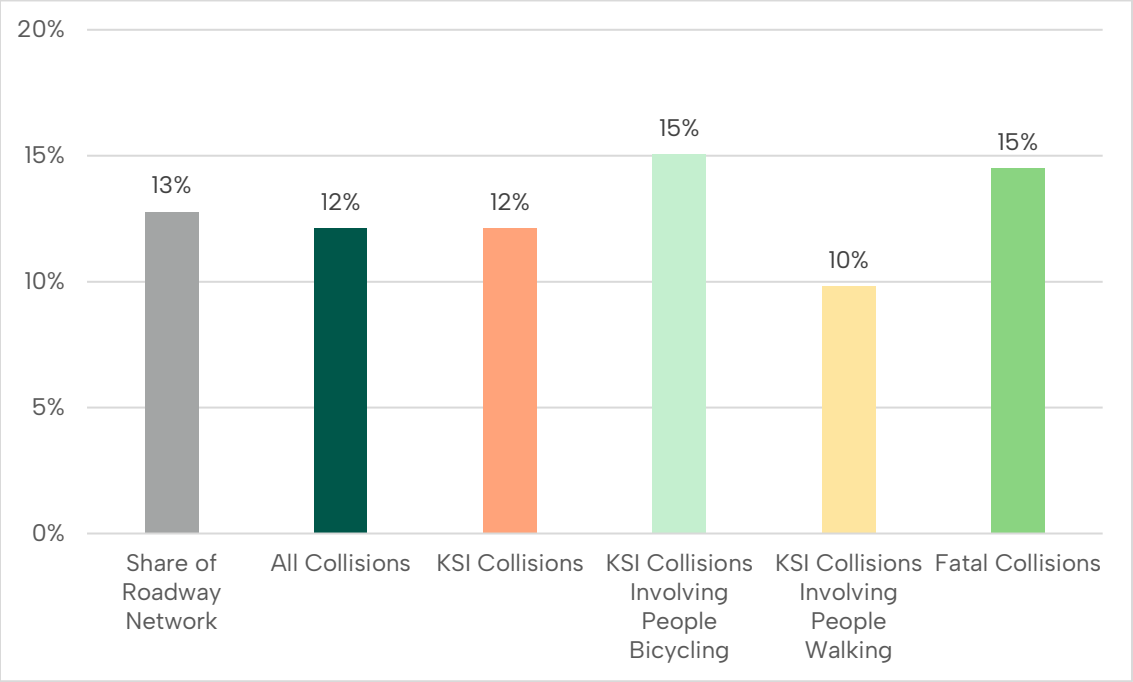
In contrast, parks and schools account for smaller shares (See **Figure 22** and **Figure 23**). Near parks, 15% of KSI bicyclist collisions occur, while near schools, 10% of KSI collisions involving a person walking are reported. These patterns suggest higher collision risk near commercial, transit, and multifamily areas, particularly for people walking and biking.

Figure 21: Share of Collisions Near Commercial Areas (<250ft)



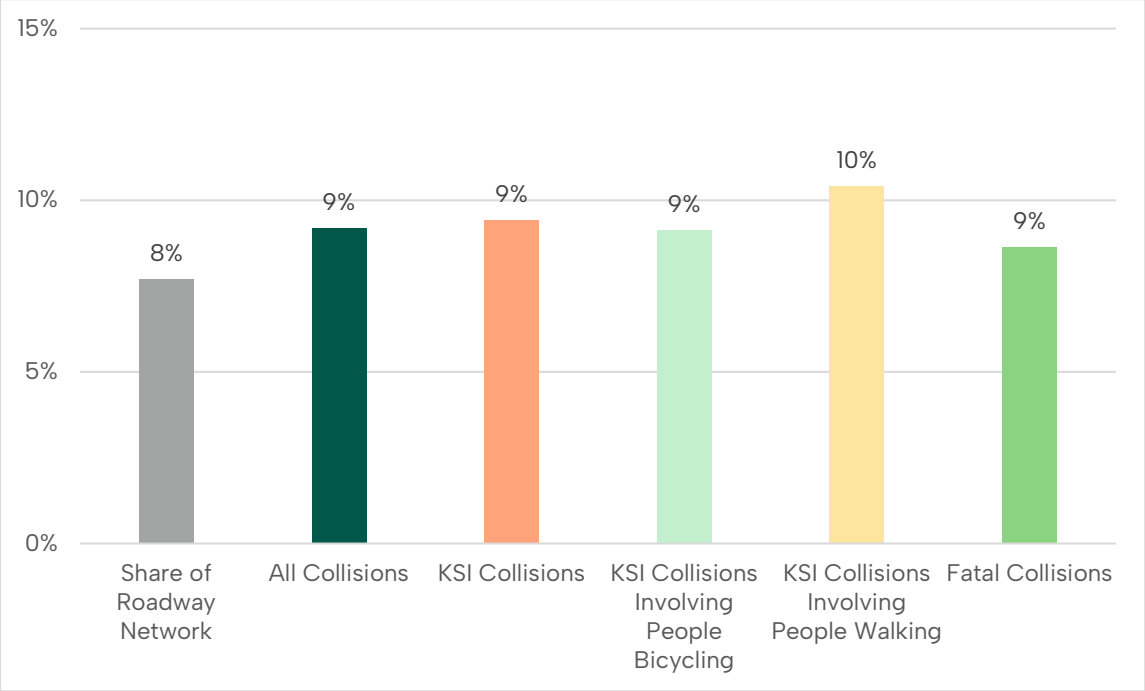
Source: City of Sacramento, Crossroads, 2015 - 2024.

Figure 22: Share of Collisions Near Parks (<250ft)



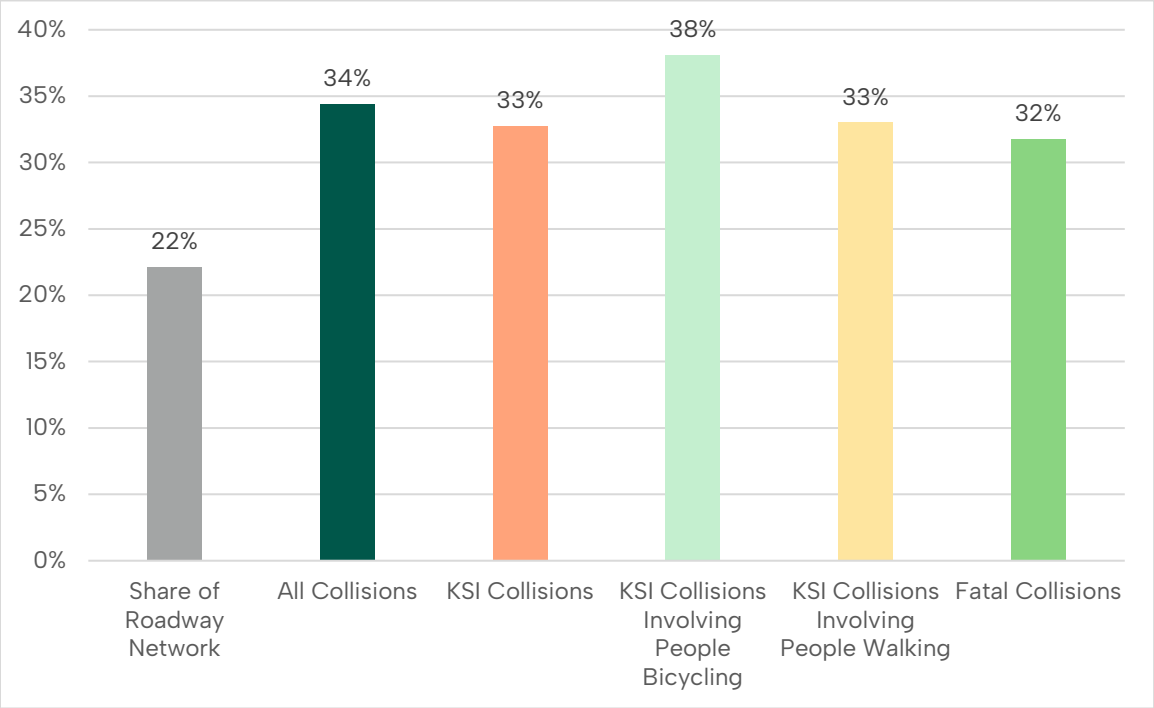
Source: City of Sacramento, Crossroads, 2015 - 2024.

Figure 23: Share of Collisions Near Schools (<250ft)



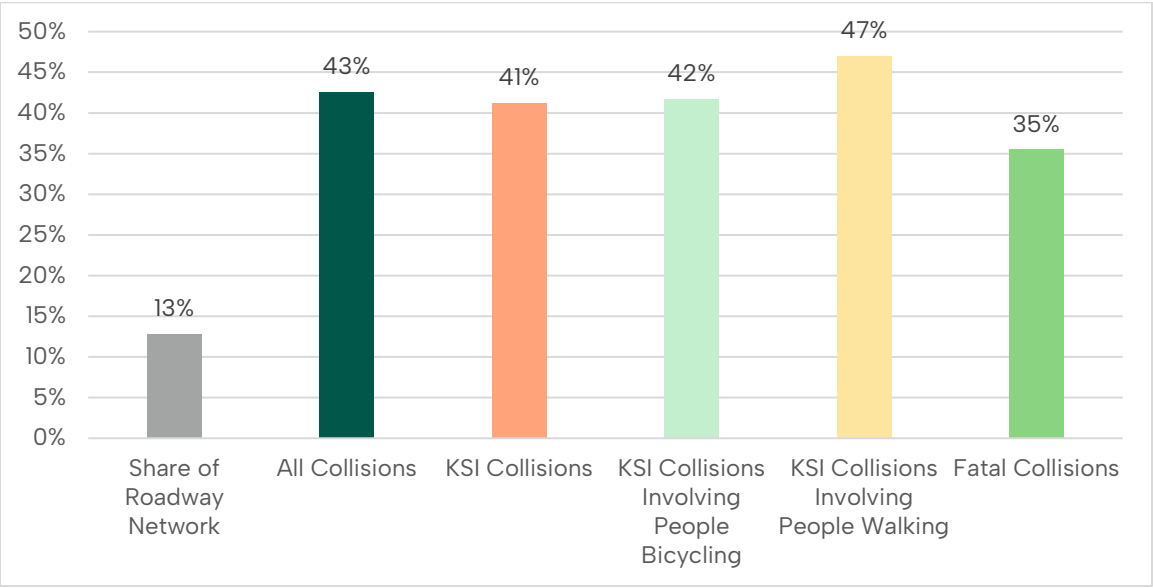
Source: City of Sacramento, Crossroads, 2015 - 2024.

Figure 24: Share of Collisions Near Multifamily Areas (<250ft)



Source: City of Sacramento, Crossroads, 2015 - 2024.

Figure 25: Share of Collisions Near Transit Stations (<250ft)

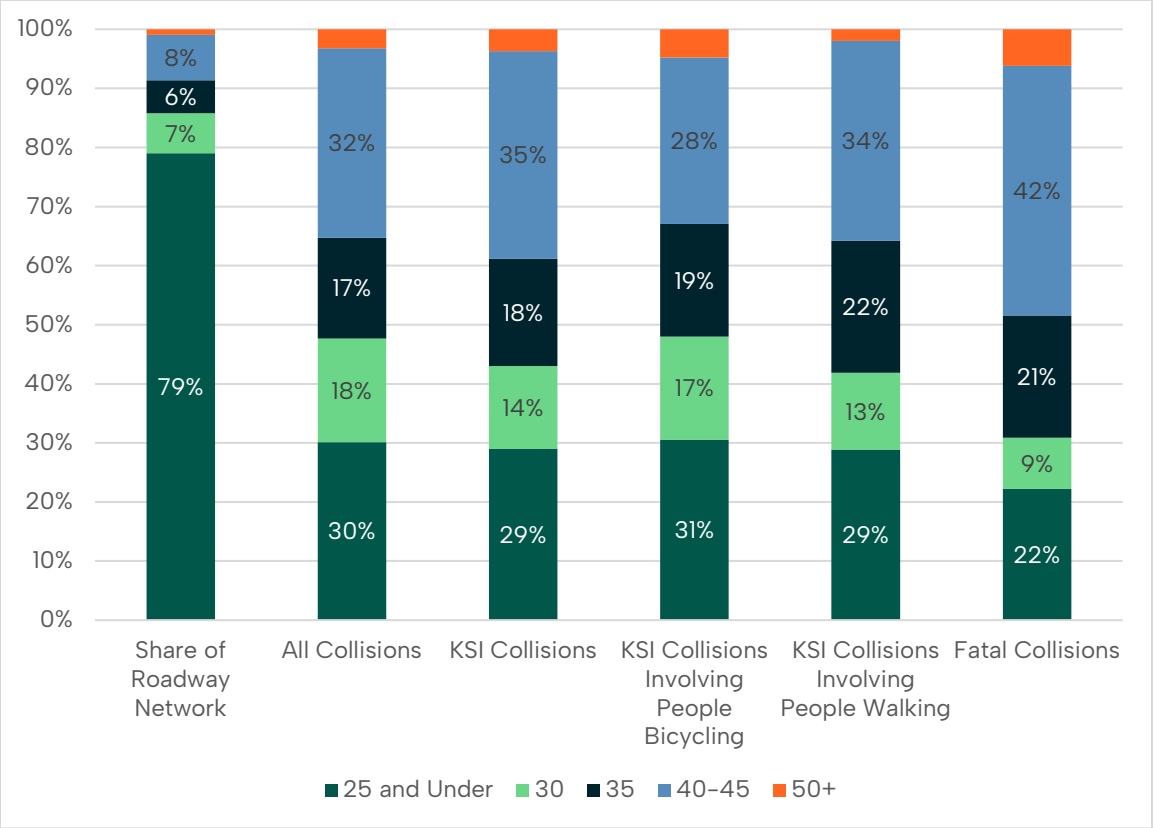


Source: City of Sacramento, Crossroads, 2015 - 2024.

Roadway Characteristics

As shown in **Figure 26**, most collisions, including KSI collisions and fatal KSI collisions, occur on roadways with posted speed limits between 40–45 mph, even though these roadways make up a smaller share of the overall roadway network (8%), highlighting the relationship between higher speeds and severe collisions. Roadways with posted speed limits at 25 mph and lower represent the second-highest share of collisions (30% of all collisions), likely due to share of the overall network (79% of the City's street network), likely higher volumes of vulnerable road users, and frequent conflict points in urban environments.

Figure 26: Share of Collisions by Posted Speed Limit



Source: City of Sacramento, Crossroads, 2015 - 2024.

Collisions were also analyzed based on the City's roadway classifications/designations. These classifications are based on level of connectivity, daily volumes, and design speeds, adjacent land uses, and level of access control, as specified in the City of Sacramento's *Street Design Standards*[3].

According to the *Street Design Standards*, the roadway classifications have the following purposes:

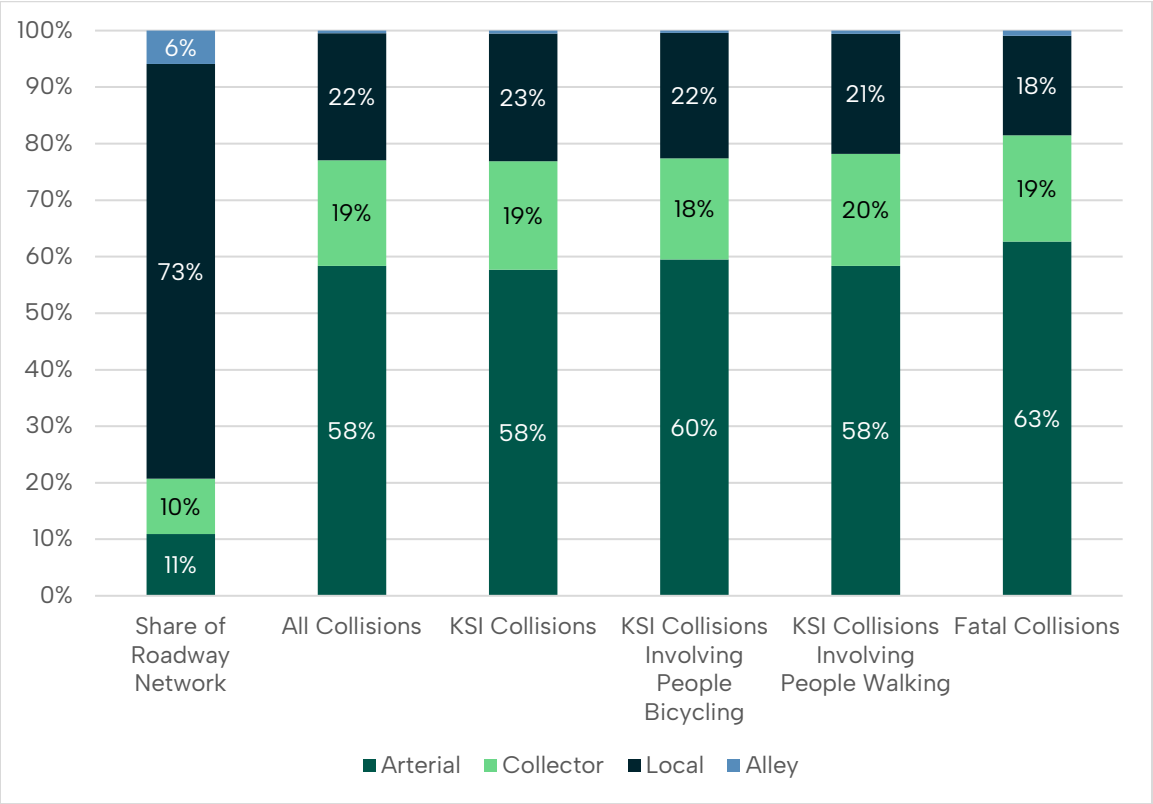
- Alley: Provide access to the rear of parcels and public utilities.
- Local:

[3] Section 15.5, https://www.cityofsacramento.gov/content/dam/portal/pw/Publications/Engineering/Development-Engineering/Design-Procedures-Manual/section15-street-design-standards.pdf

    - Local residential serves residential land uses. Residential streets "should discourage speeds in excess of 25 mph" and "should result in traffic volumes less than 4,000 vehicles per day" (pg. 4)
    - Local commercial serves commercial land uses.
    - Local industrial serves industrial land uses.
- Collector - Minor & Major: Connects local streets to arterials.
- Arterial: Provides mobility and regional connectivity.

Figure 27 shows that the majority of collisions in the city occur on arterial roadways, although arterial roadways only make up 11% of the total roadway network, consistently accounting for over half of the collisions across all collision types. Local roadways represented the second-largest share, contributing approximately 22% of all collisions, which is likely due to the large share of local roadways in the roadway network (73%).

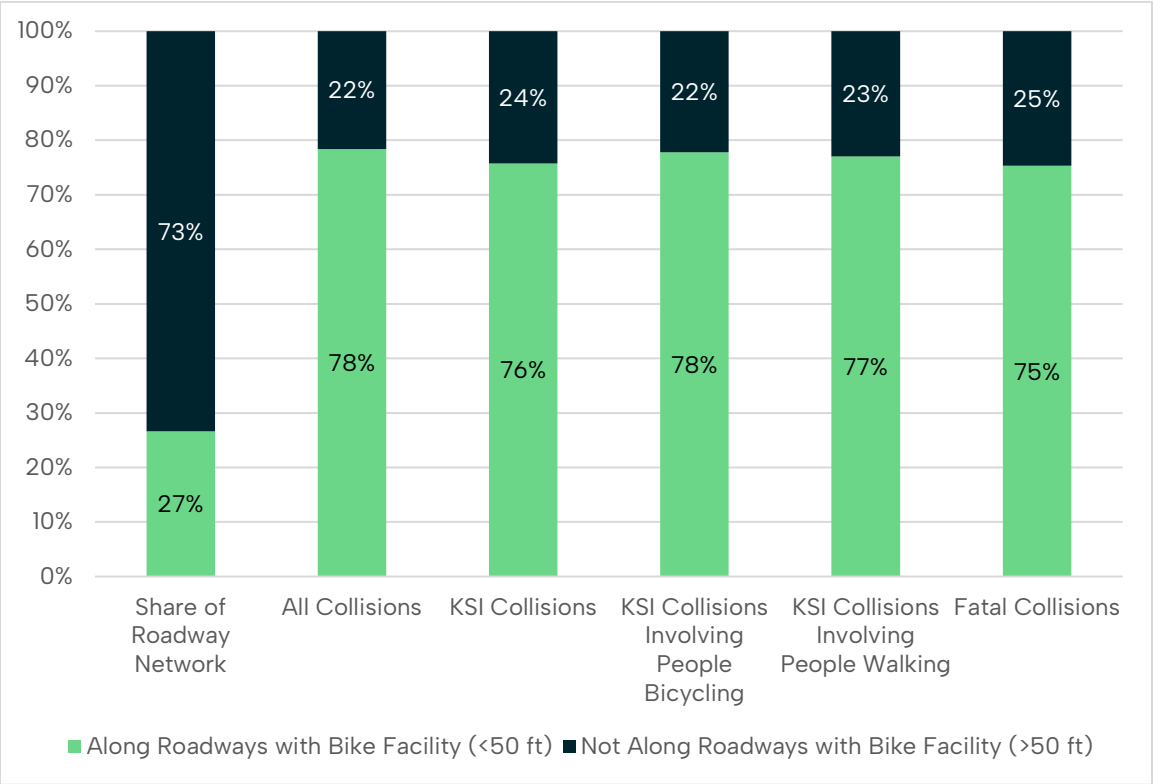
Figure 27: Share of Collisions by Roadway Classification



Source: City of Sacramento, Crossroads, 2015 - 2024.

Figure 28 shows that the majority of collisions, including KSI collisions, occurred along roadways with bike facilities, accounting for 75% to 78% across all categories, including KSI collisions involving people walking and bicycling. While the share of roadways that have bike facilities only makes up 27% of the total roadway network, this suggests that collisions are more likely to occur along roadways with bike facilities due to a higher number of people bicycling and walking along these facilities and potentially limited separation from vehicle traffic.

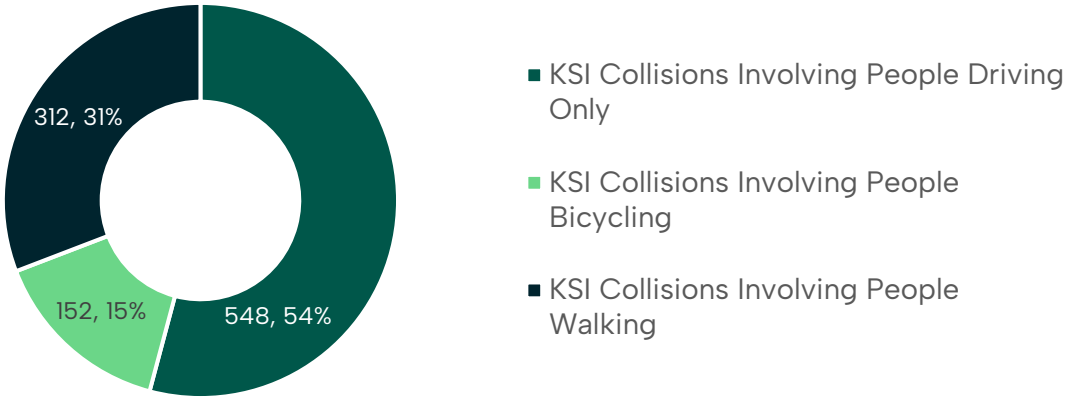
Figure 28: Share of KSI Collisions on Bike Facilities



Source: City of Sacramento, Crossroads, 2015 - 2024.

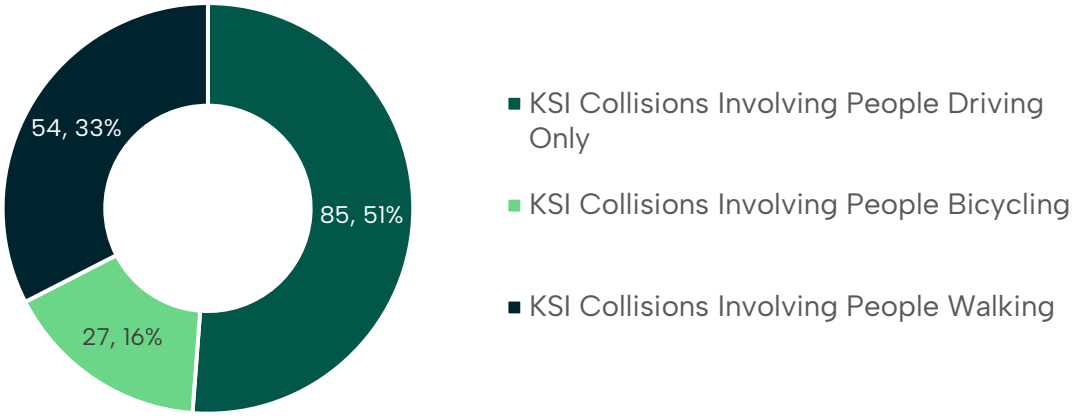
Figure 29 shows that of all KSI collisions on roadways along Class II Bike Facilities, the majority of collisions involve people driving only (54%), followed by people walking (31%), and people bicycling (15%). A similar trend is observed for KSI collisions on roadways along Class III Bike Facilities (See **Figure 30**), even though the total number of KSI collisions has dropped.

Figure 29: Share of KSI Collisions on Class II Bike Lanes



Source: City of Sacramento, Crossroads, 2015 - 2024.

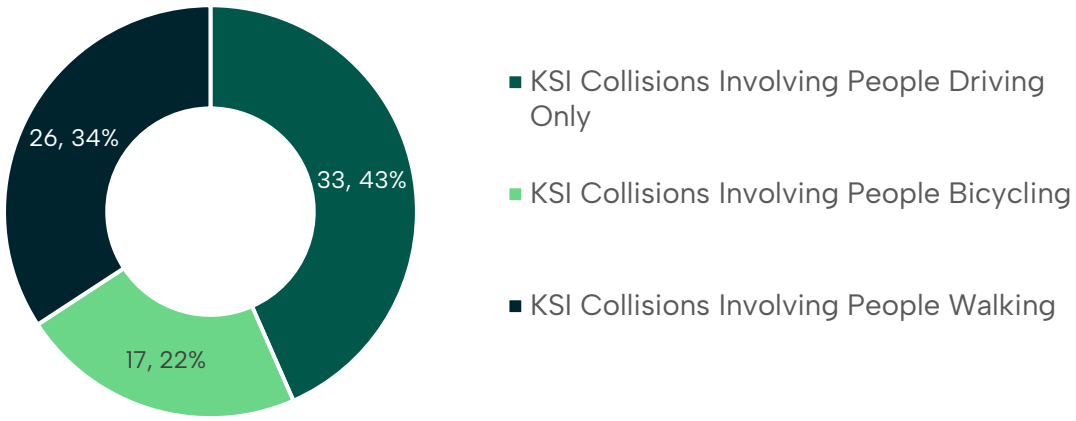
Figure 30: Share of KSI Collisions on Class III Bike Routes



Source: City of Sacramento, Crossroads, 2015 - 2024.

KSI collisions on roadways along Class IV bike facilities show a more evenly distributed pattern across travel modes, with 43% involving only people driving, 22% involving people bicycling, and 34% involving people walking (See **Figure 31**).

Figure 31: Share of KSI Collisions on Class IV Separated Bikeways



Source: City of Sacramento, Crossroads, 2015 - 2024.

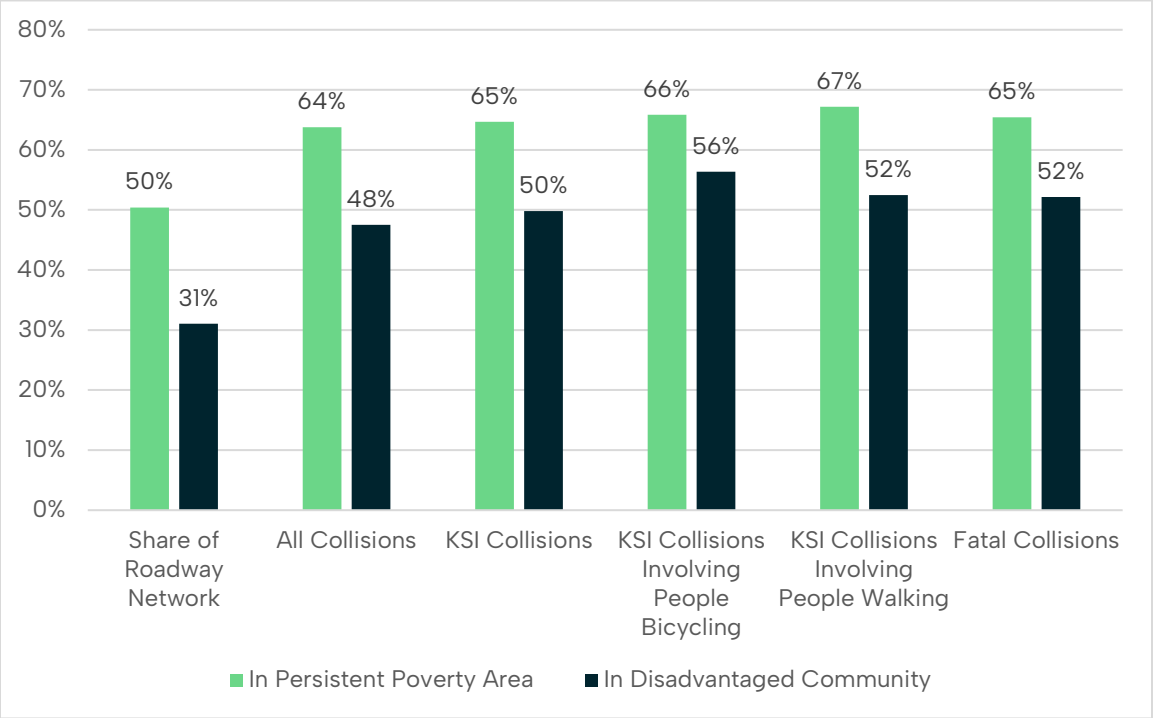
Disadvantaged Community Data

Figure 32 shows that the majority of collisions in Sacramento from 2015 to 2024 occurred within *areas of persistent poverty* (64% of all collisions, 65% of all KSI collisions). Areas of persistent poverty are defined by the Bipartisan Infrastructure Law as Census Tracts in with a poverty rate of at least 20 percent as measured by the 2014-2018 5-year data from the Census American Community Survey. The rate of collisions occurring in areas of persistent poverty is consistent across travel modes, with 66% of KSI collisions involving people bicycling, and 67% of those involving people walking, underscoring the importance of prioritizing safety improvements in areas of persistent poverty for all road users.

Figure 32 also shows that approximately half of collisions in Sacramento from 2015 to 2024 occurred within *disadvantaged community areas*, as designated by SB 535 (48% of all collisions, 50% of all KSI collisions). The disadvantaged community definition includes census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0 for pollution burden and socioeconomic factors, census tracts identified in the 2017 DAC designation as disadvantaged, and lands under the control of federally recognized Tribes. The rate of collisions occurring in disadvantaged communities is consistent across travel modes, with 56% of KSI collisions involving people bicycling, and 52% of those involving people walking.

Compared to the 2018 Plan analysis which also analyzed disadvantaged community areas, the most recent decade of data shows a higher overall share of collisions in disadvantaged communities across all modes. Although the general trends are similar, the 2018 Plan shows greater variation by mode, with a higher share of KSI collisions involving people walking (50%) and a lower share involving people bicycling (38%).

Figure 32: Share of Collisions in Disadvantaged Community and Persistent Poverty Area, 2015-2024



Source: City of Sacramento, Crossroads, 2015 - 2024.

As shown in **Table 6,** roadways in disadvantaged communities had nearly double the amount of crashes during the 10-year study period compared to roadways outside of disadvantaged communities, and over double the amount of KSI crashes during the 10-year study period compared to roadways outside of disadvantaged communities

Table 6: Annual Collision Rates by Mode

Mode	Miles	Collisions (10-year period)	KSI Collisions (10-year period)	Collisions per mile	KSI Collisions per mile
Roadways in Disadvantaged Communities	514.98	10,712	825	20.80	1.60
Roadways outside of Disadvantaged Communities	1,144.08	11,826	831	10.34	0.73
All Roadways	1,659.06	22,538	1,656	13.58	1.00

Source: City of Sacramento, Crossroads, 2015-2024; Fehr & Peers, 2025.

Systemic Analysis

Using the collision data and geographic analysis above, a systemic matrix that cross tabulated collision factors (e.g., severity, time of day, violation, type) and contextual factors (e.g., roadway characteristics, land use, location type) was created.

The systemic matrix allows the project team to consider different ways in which collision profiles (defined below) may emerge:

- Collision typing to understand the number of different types of collisions that occur on different roadways and location types.
- Identification of systemic trends with a high number of total collisions or proportion of KSI collisions.
- Uncovering disproportionality in the percentage of different roadway and location types with the percentage of collisions that occur on those roadways.
- Identifying the top locations where collisions profiles occur.
- Countermeasure pairing and project development.

Collision Profiles

Crash profiles describe the crash characteristics and contextual factors associated with notable collision types. Identifying these profiles is a part of the systemic analysis to proactively identify locations which have similar contexts but may have experienced fewer collisions. Individual collisions may fall under multiple profiles (i.e., collision may be speed related and involve DUI but are different profiles).

When identifying crash profiles, we look for:

- Number of collisions and severe collisions.
- Overrepresentation of KSI collisions.
- Geographic overrepresentation (e.g., collisions are larger % than share of roadway network- like percent of roadway miles by speed/classification/etc. or percent of intersections by land use).
- Combination of factors that are related and can lead to countermeasure recommendations.

The profiles identified during this process are as follows:

Collisions Involving People Walking and Biking

From 2015 to 2024, 17% of injury collisions (3,907) and 46% of KSI collisions (761) meet this profile. People walking and biking account for a disproportionate share of severe outcomes, as they only make up less than 2% of miles traveled in the City.

In the broader transportation network, 82% of injury collisions and 78% of KSI collisions that meet this profile occurred within 150 feet of an intersection. Specifically, 81% of injury collisions and 79% of KSI collisions that involve people walking occurred within 150 feet of an intersection. 59% of injury collisions and 54% of KSI collisions that involve people biking occurred on a roadway with a separated bikeway or bike lane.

For all the collisions that meet this profile,

- 44% of injury collisions and 56% of KSI collisions occurred on higher-speed roads with limits of 35 MPH or greater;
- 38% of injury collisions and 59% of KSI collisions occurred at dusk, dawn, or nighttime during non-daylight conditions;
- 71% of injury collisions and 76% of KSI collisions occurred in either persistent poverty areas or disadvantaged communities.

Broadside Collisions Near Intersections in Commercial Areas

From 2015 to 2024, 24% of injury collisions (5,450) and 16% KSI collisions (266) meet this profile.

For all the collisions that meet this profile,

- 65% of the injury collisions and 71% of KSI collisions occurred within 150 feet of a signalized intersection;
- 34% of injury collisions and 41% of KSI collisions occurred on a designated truck route;
- 49% of injury collisions and 50% of KSI collisions occurred in either persistent poverty areas or disadvantaged communities.

Conflict Management at Intersections (Auto Right of Way & Traffic Signals and Signs Primary Collision Factors within 150 feet of an intersection)

From 2015 to 2024, 32% of injury collisions (7,287) and 21% of KSI collisions (344) meet this profile. For context, among these collisions, 10% of injury collisions and 22% of KSI collisions involve people biking.

For all the collisions that meet this profile,

- 56% of injury collisions and 61% of KSI collisions occurred within 150 feet of a signalized intersection;
- 71% of injury collisions and 73% of KSI collisions occurred in either persistent poverty areas or disadvantaged communities.

Collisions Near Transit Stops (within 250 feet)

From 2015 to 2024, 43% of injury collisions (9,599) and 41% of KSI collisions (683) meet this profile. Notably, 10% of injury collisions and 36% of KSI collisions that meet this profile involve people walking.

For all the collisions that meet this profile:

- Only 34% of injury collisions and 37% of KSI collisions occurred more than 50 feet from an intersection, and 13% of injury collisions and 15% of KSI collisions occurred more than 150 feet from an intersection;
- 70% of injury collisions and 73% of KSI collisions occurred in either persistent poverty areas or disadvantaged communities.

Collisions Near Parks and Schools (within 250 feet)

From 2015 to 2024, 20% of injury collisions (4,519) and 20% of KSI collisions (337) meet this profile. Specifically, 9% of injury collisions and 29% of KSI collisions that meet this profile involve people walking, while 10% of injury collisions and 16% of KSI collisions that meet this profile involve people biking.

For all the collisions that meet this profile,

- 17% of injury collisions and 15% of KSI collisions involve people under 24, while 21% of injury collisions and 19% of KSI collisions involve people 25-24;
- 56% of injury collisions and 58% of KSI collisions occurred along arterial roadways;
- 53% of injury collisions and 61% of KSI collisions occurred on roadways with speed limits of 35 MPH or greater;
- 62% of injury collisions and 53% of KSI collisions occurred less than 50 feet from an intersection, and 81% of injury collisions and 74% of KSI collisions occurred less than 150 feet from an intersection.

Unsafe Speed Collisions on Arterial Roadways (Unsafe Speed Primary Collision Factor and Arterial or highway ramp location)

From 2015 to 2024, 17% of injury collisions (3,891) and 8% of KSI collisions (131) meet this profile, while arterials only make up a small portion of the total roadway networks (approximately 11%)

For all the collisions that meet this profile,

- 70% of total injury collisions and 59% of KSI collisions occurred within 150 feet of an intersection;
- 48% of total injury collisions and 34% of KSI collisions occurred within 150 feet of a signalized intersection;
- 39% of injury collisions and 83% of KSI collisions occurred at dusk, dawn, or nighttime (non-daylight conditions).
- 73% of injury collisions and 71% of KSI collisions occurred in either persistent poverty areas or disadvantaged communities.

Some of these profiles are similar to those in the 2018 Action Plan. A comparison is provided in **Table 7** below.

Table 7: Collision Profile Comparisons: 2025 vs 2018

2025 Collision Profile	2018 Collision Profile
1. Collisions Involving People Walking and Biking	60+ Year Old Pedestrians; Pedestrian Crashes Near Transit Stops; Broadside Crashes - Bicycle Involved; Driver Making Left or Right Turn - Bicycle/ Pedestrian Involved; Pedestrian Crossing Outside of an Intersection or Crosswalk
2. Broadside Collisions at Intersections in Commercial Areas	Crashes in Commercial Areas; Broadside Crashes - Bicycle Involved
3. Lack of Conflict Management at Intersections (Auto ROW & Traffic Signals and Signs Primary Collision Factors)	Driver Making Left Or Right Turn - Bicycle/ Pedestrian Involved

4.	Collisions Near Transit Stops	Pedestrian Crashes Near Transit Stops
5.	Collisions Near Parks and Schools	
6.	Unsafe Speed Collisions on Arterials	Unsafe Speed on Non-Local Streets; 35+ MPH Streets

The profiles will be paired with safety countermeasures most relevant for the crash and location context. Together, these engineering, education, and enforcement countermeasures make up a toolbox of safety interventions the city will utilize to implement projects tailored to unique safety issues.

Conclusion

In the 10-year period between the start of 2015 and end of 2024, a total of 22,538 collisions resulting in injury and 1,656 collisions resulting in KSI were reported across the City of Sacramento. This represents the same proportion of KSI collisions of total collisions from the 2018 Vision Zero Action Plan.

The proportion of injury collisions involving people bicycling and walking has decreased in comparison to the 2018 Plan analysis, with collisions with people bicycling dropping from 12% to 9% of total injury collisions and collisions with people walking from 10% to 8%. However, their share of KSI collisions remains high, with 15% involving people bicycling and 31% involving people walking.

Additionally, the top five primary collision factors (PCFs) have changed, with Unsafe Speed and Driving or Bicycling Under the Influence remaining as key factors, but other primary collision factors such as right-of-way violations and traffic signal violations emerging.

Geographic trends in the data reveal that collisions and KSI incidents are concentrated near intersections, commercial areas, multifamily housing, and transit stations—locations with higher walking and biking activity. Arterial roadways and streets with 40–45 mph speed limits account for the highest share of severe collisions.