ASPEN SAFETY ACTION PLAN

OCTOBER 2024

CITY OF ASPEN

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1

INTRODUCTION

1. INTRODUCTION

The City of Aspen has been progressive and intentional in its implementation of transportation demand management strategies and active transportation facilities for many years – a testament to the strong values of the community, including environmental stewardship and supporting a healthy and sustainable community. However, even through programming such as free transit service, car and bike share programs, and educational campaigns for safe roadway use, crash and safety incidents still occur and make a strong impact on a small community like Aspen. Safety has been incorporated into many recent planning efforts, but is not currently discussed in one consolidated document to act on and consistently reference. That is where the Aspen Safety Action Plan comes in. This plan dives into the details and concerns regarding roadway safety in Aspen, especially for pedestrians, transit users, and cyclists, and brings all roadway safety data and recommendations into one place.

The Safe System Approach is a framework developed by the Federal Highway Administration (FHWA), aimed at preventing crashes from happening in the first place and minimizing harm to those involved when crashes do occur. This approach is built upon the idea that roadway fatalities and serious injuries are not inevitable, but are preventable. Decisions around how we build our community, how we design our streets, and our own driving behaviors all have significant impacts on making our roads safer.

*The **goal of the Aspen Safety Action Plan** is to assess transportation safety through site visits, crash reports and community input to systemically understand safety issues and ways of addressing them through a Safe System Approach.*

SAFE SYSTEMS APPROACH

Key Safe System Approach goals for Aspen, listed and displayed in ***Figure 1.1*** at right include:

- **Safe Road Users**: People living, working, or traveling in Aspen should be safe walking, biking, rolling, taking transit, or driving.
- **Safe Vehicles**: Promote vehicle designs and regulation that minimize crashes, reduce severity, and incorporate safety measures using the latest technology.
- **Safe Speeds**: Slower travel speeds help save lives and reduce the risk of a life-altering injury or death.
- **Safe Roads**: Design roads so that human error does not result in the loss of human life.
- **Post-Crash Care**: When crashes do occur, reduce harm by providing rapid access to emergency medical care and analyzing data to support system improvements.

Figure 1.1 Safe System Approach

PURPOSE AND SCOPE

The purpose of the Aspen Safety Action Plan is to create a cohesive, comprehensive safety improvement plan for bicyclists, pedestrians, and transit users, while also building on existing planning efforts related to roadway safety. Key efforts include:

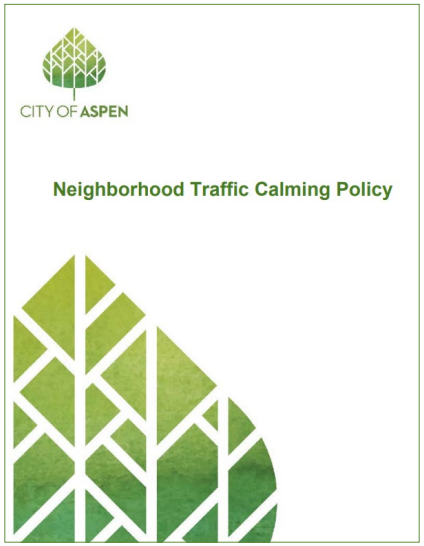
- Define the objectives of the safety action plan, aligning with the Safe Streets and Roads for All (SS4A) program goals to prevent roadway fatalities and serious injuries.
- Emphasize the importance of addressing safety concerns within Aspen to protect residents and visitors, reducing crashes through a comprehensive approach
- Identify safety outcomes from other projects attempt to bring safety forward under one plan.

RELEVANT STUDIES, PROGRAMS AND CAMPAIGNS

Aspen and the surrounding region have made substantial efforts in developing plans and policies that not only focus on general roadway improvements but also provide specific guidance and recommendations to enhance road safety. The plans outlined in further detail below have established a strong foundation for enhancing roadway safety in Aspen.

Aspen Bicycle and Pedestrian Master Plan

This plan identifies gaps and needs in the current Aspen bicycle and pedestrian network, and identifies innovative new bike facility types to explore as a way to improve **safety** for bicyclists. Through the community engagement portion of the Aspen Bicycle and Pedestrian Master Plan , it was mentioned that bicyclists and pedestrians in Aspen are most interested in using facilities that are separated from traffic.



Neighborhood Traffic Calming Policy

The Neighborhood Traffic Calming Policy aims to improve the **safety** and livability of residential neighborhoods in Aspen. Through this policy, City staff works closely with residents within neighborhoods to identify the motor vehicle speed issues on their streets. Identified issues are first tackled using non-infrastructure solutions such as education campaigns and community watches. If non-infrastructure measures prove ineffective in dealing with the issue, a variety of infrastructure-based traffic calming measures are made available. Citizen participation is an important part of all traffic calming projects. The City's goal is to give those who live in the project area the opportunity to become actively involved in the planning and decision-making process while slowing motor vehicle speeds and improving real and perceived **safety** for those walking and biking.

Aspen Area Community Plan (AACP)

The Aspen Area Community Plan (AACP) includes a list of goals and specific infrastructure, policy, and program recommendations related to Safety. The goals are heavily related to safety, including:

1. Improve the convenience, reliability, comfort, affordability, **safety**, capacity, and quality of experience of transit services and improve efficiency and coordination between all related aspects of transportation

2. Ensure **safe** and efficient pedestrian and bike connections exist within the West of Castle Creek Corridor area and connect the area to downtown Aspen.

3. Improve the convenience, reliability, efficiency, comfort, accessibility, affordability, **safety**, capacity, and quality of the regional transit service experience, while ensuring physical improvements are consistent with community character.

4. Improve the convenience, **safety** and quality of experience for bicyclists and pedestrians on streets and trails.

Specific infrastructure projects recommended include building a safe pedestrian crossing on Highway 82 at the Airport Business Center, improving pedestrian access from the Airport Business Center, North 40 and Colorado Mountain College to RFTA bus stops on Highway 82, improve the safety and quality of experience of crossing Main Street in the downtown area, and Highway 82 at various locations between Castle Creek and the ABC, and focusing on developing safe and effective trail connections that are separated from vehicular traffic for both commuter and recreational use in the Castle Creek, Maroon Creek, East/West Highway 82, and Hunter Creek valleys.

Finally, policies and programs recommended related to **safety** include:

1. Creating a comprehensive transportation Master Plan for the West of Castle Creek Corridor based on existing planning efforts to coordinate and improve all aspects of auto, air, transit, parking and trail function in the context of planned development or redevelopment of activity nodes in the corridor.

2. Complete and implement a Highway 82 access control plan study to ensure that design and location of intersections, access and signalization facilitate, rather than impede, the highway's status and function as the main, year-round access to and from Aspen.

3. Amend codes to require that all new major development identify and mitigate its transportation impacts.

Aspen Gets Us There: Comprehensive Transportation + Parking Plan

This transportation and parking system-wide plan is currently under development, but once completed, will take an in-depth look at how transportation options, policies, and practices can better support the City's continued excellence and innovation in various aspects of transportation, including **safety**.

StreetSMART Education Initiative and 2023 Communications Plan

The StreetSMART program is an educational awareness program working to increase **safe** and predictable transportation for all roadway users. A primary objective of the plan is to see a measurable behavioral shift so there are more positive interactions between different travel modes, allowing all community members to feel **safer**.

Transportation Impact Analysis (TIA) Program

City of Aspen Ordinance #8 of 2014 adopted the TIA process, which aims to provide a technical approach to transportation impact analysis for development projects. The goal of this process is to ensure a simple, consistent, and fair approach to assessing the transportation impacts of new developments while maintaining the City's goal of limiting trips over the Castle Creek Bridge to 1993 levels.

A Transportation Impact Analysis (TIA) assesses the potential transportation impacts of proposed development projects on surrounding infrastructure and services. The analysis determines whether the adverse effects of a project constitute significant impacts and, if so, identifies appropriate mitigation measures. This process is essential to ensuring that new developments do not unduly strain the City's transportation systems and maintain the established levels of service.

2

EXISTING CONDITIONS AND CURRENT TRANSPORTATION SYSTEM

2. EXISTING CONDITIONS AND CURRENT TRANSPORTATION SYSTEM

INTRODUCTION

This chapter examines the existing transportation infrastructure and usage patterns in Aspen to provide a foundation for understanding the city's current safety needs. It begins by exploring Aspen's built environment, which includes a mix of residential neighborhoods, a commercial downtown core, and recreational areas such as ski resorts. The chapter then provides an overview of the key roadways that shape vehicle movement through the city, highlighting major corridors like Highway 82 and their role in traffic flow and safety hot spots.

BUILT ENVIRONMENT CONTEXT

The City of Aspen, a city spanning nearly 3.5 square miles, sits along the southeast (upper) end of the Roaring Fork Valley along the Roaring Fork River and is surrounded by the Rocky Mountains' Sawatch Range and Elk Mountains, and the White River National Forest.

The City features a dense commercial downtown core in the eastern part of the community encircled with a mix of single-family residential, multi-family residential, and mixed-use areas. South of the downtown core is access to the Aspen Mountain ski area, including many lodging areas as well as conservation land. As you move northwest, there are several educational facilities, more dispersed single family homes, and recreation open space. Western Aspen features a mix of conservation land, public parks land, golf courses, and access to the Aspen Highlands Ski Area. There are also several Planned Unit Developments (PUDs) in this area.

Key roadways, bike and pedestrian connections, and transit routes (all described in detail below) are used by Aspen residents and visitors to connect to each part of town.

ROADWAY OVERVIEW

The following roadways are the highest-volume roadways that run through Aspen. Along with their high volumes, these corridors also feature the majority of the crash hot spots in Aspen.

Key Roadways and Highways

State Highway 82 cuts through Aspen from west to east, dividing Aspen to the north and south. This corridor takes on multiple names as it traverses the City, including (from west to east) Hallam St, 7th St, Main St, Original St, and Cooper Ave. This is the widest corridor in Aspen, consisting of two travel lanes in each direction, a two-way turn lane down the middle, and parking on either side of the roadway through the center of town. As the highway approaches Aspen's edges, the roadway condenses, becoming one lane in each direction with parking on either side; parking drops off as the road continues out of town.

Hopkins Ave, one block south of Hwy 82, extends west to east from residential 7th St, through the urban core of Aspen, and dead ends after Cleveland St. At this dead end, a trail connection is provided over the Roaring Fork River, and the road picks up for another block on the east side of the river between Park Ave and Midland Ave. The character of the road stays primarily the same along the whole corridor with one lane of travel in each direction and parallel parking on both sides. Angled parking is added on the south side of the corridor through the urban core spanning from Aspen St to Spring St.

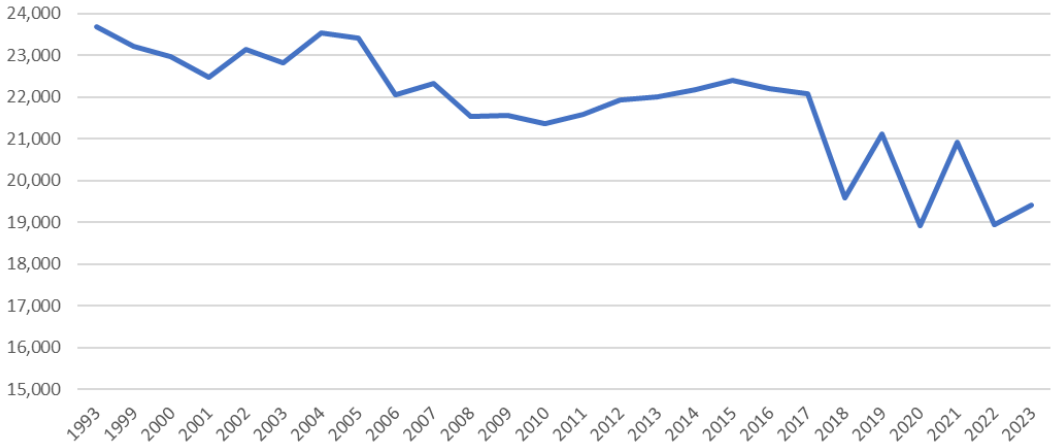
Hyman Ave traverses central Aspen from west to east starting at 3rd St and dead-ending after Cleveland St. The middle of the corridor (between Mill St and Galena St) is part of the Aspen Pedestrian Mall, meaning there is no motor vehicle access. As you move east of the pedestrian mall, the roadway features dense angled and parallel parking and one lane of car travel in either direction. Parking density decreases after Original St with parallel parking one either side. Moving west of the pedestrian mall, the block between Monarch and Mill St Features a contraflow bike lane, one-way vehicle access from the west, and parallel parking on either side of the road.

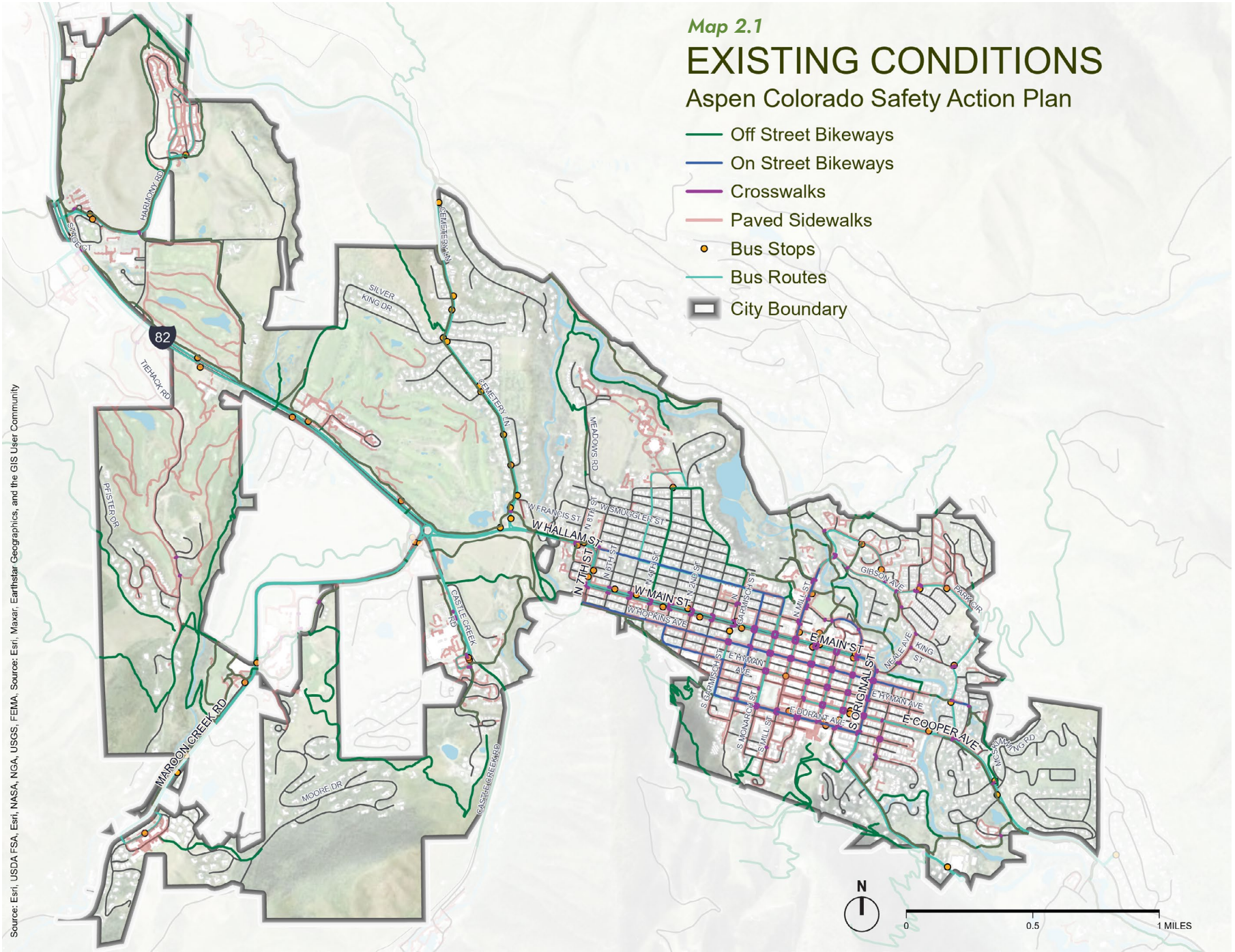
Mill St is a major North/South corridor through central Aspen starting at Gibson Ave and dead-ending after Summit St. Between Hyman Ave and Durant Ave, through traffic is redirected and Mill St becomes a pedestrian mall. South of the pedestrian mall, the road is narrow with one lane in each direction and parallel parking on the east side. North of the pedestrian mall, the street widens with parallel parking on the east side, a transition from parallel to angled parking on the west sign, and a brief contraflow bike lane. North of Main St, the corridor included standard bike lanes, parking on the east side of the road, one lane of travel in each direction, and a turn lane/ boulevard where turning is not needed.

Usage Review (Traffic Volumes)

The traffic volume data for Aspen from 1993 through 2023, shown in ***Figure 2.1***, reveals a general decline in traffic over time, with annual monthly average traffic declining by about 18% since 1993.

Figure 2.1 Change in Annual Monthly Average Traffic on Highway 82




Map 2.1
EXISTING CONDITIONS
Aspen Colorado Safety Action Plan
Off Street Bikeways
On Street Bikeways
Crosswalks
Paved Sidewalks
Bus Stops
Bus Routes
City Boundary
Source: Esri, USDA FSA, Esri, NASA, NGA, USGS, FEMA. Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
N
0
0.5
1 MILES
82
HARMONY RD
SILVER KING DR
CEMETERY LN
TIEHACK RD
PFISTER DR
MEADOWS RD
W FRANCIS ST
W HALLAM ST
N 8TH ST
N 6TH ST
W SMUGGLER ST
W MAIN ST
W HOPKINS AVE
N MILL ST
E MAIN ST
E HYMAN AVE
S ORIGINAL ST
E COOPER AVE
GIBSON AVE
PARK CIR
KING ST
MAROON CREEK RD
CASTLE CREEK RD
MOORE DR
CASTLE CREEK RD

Usage Review (Bike Counts)

The City of Aspen conducted two cyclist counts in 2023 at two locations: Hopkins at 4th and Hallam at 6th during the summer months. The data covers counts of cyclists passing through the respective locations, broken down by direction (IN and OUT), daily averages, peak traffic days, and peak traffic counts.

Key Observations:

Peak Days: Hopkins had its highest traffic on a national holiday (July 4), likely due to special events or increased recreational cycling, while Hallam's peak occurred in September, indicating different traffic patterns or usage between the two locations.

Cyclist Flow: Both locations show a relatively balanced IN and OUT flow of cyclists. While Hopkins experiences higher overall traffic, Hallam remains a key route with substantial usage, seeing 200 cyclists per day. This highlights its importance as a vital connection in Aspen's transportation network, particularly in light of ongoing discussions around the Castle Creek Bridge bike/ped route.

Daily Variations: The charts provided in both reports indicate fluctuations in traffic throughout the year, but further analysis could be done to investigate patterns by season, weather, or local events.

1. Hopkins at 4th (Hopkins 2023 Tube Count)

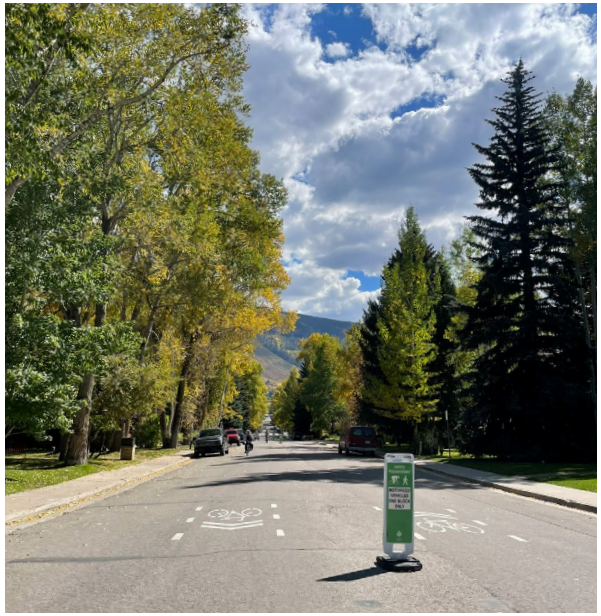
Total Traffic: 103,076 cyclists passed through this location in 2023 during the summer months. This figure does not include winter cyclists.

Daily Average: 701 cyclists.

Peak Day: July 4, 2023, saw the highest traffic with 1,966 cyclists.

Cyclists IN: 48,709 total, with a daily average of 331 cyclists and a peak of 918 cyclists on July 4, 2023.

Cyclists OUT: 54,367 total for the year, with an average of 370 cyclists per day and a peak count of 1,048 on the same peak day.



2. Hallam at 6th (Hallam 2023 Tube Count):

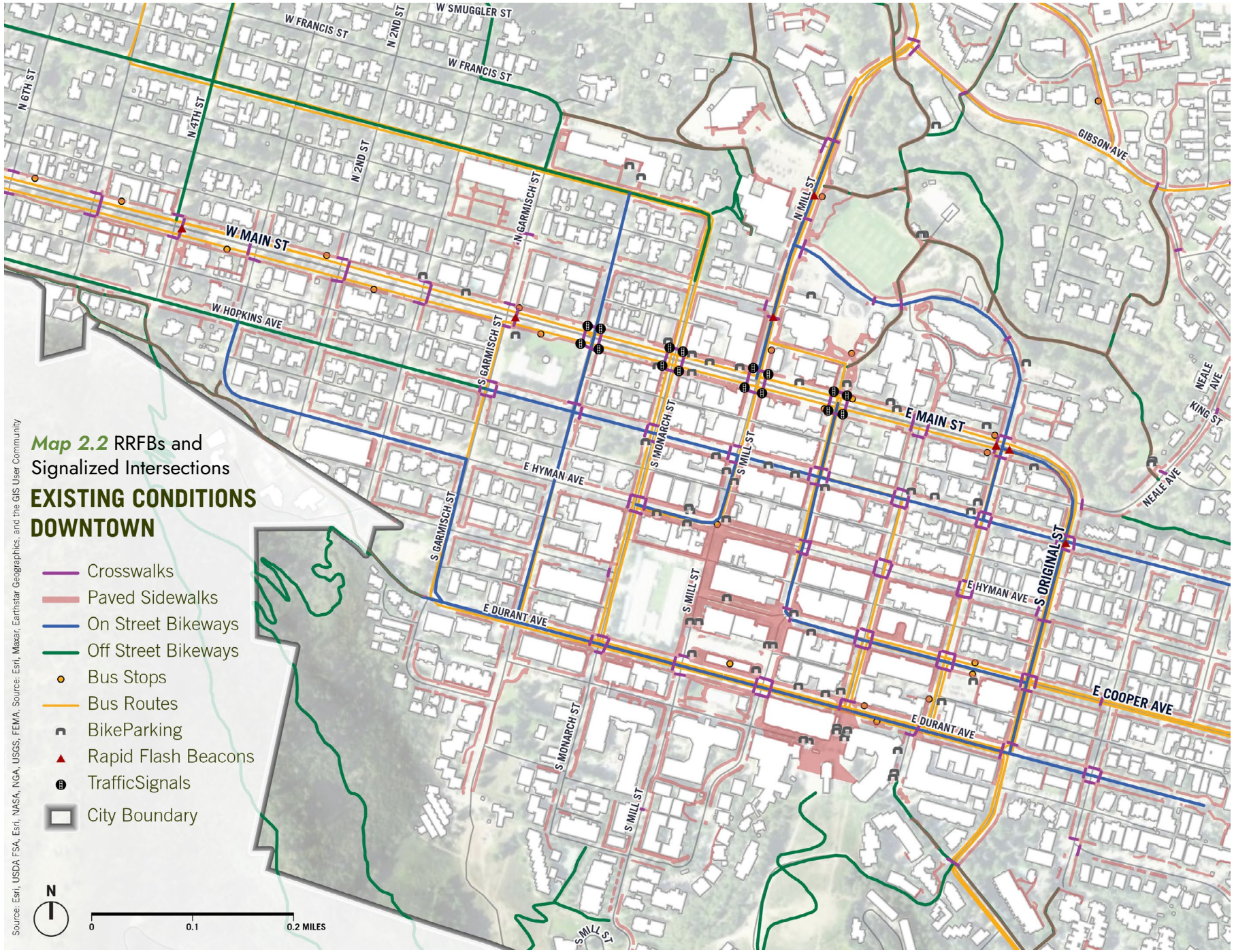
Total Traffic: 29,942 cyclists were recorded passing through Hallam at 6th.

Daily Average: 197 cyclists.

Peak Day: The highest traffic was recorded on September 11, 2023, with 551 cyclists.

Cyclists IN: 15,322 cyclists for the year, averaging 101 cyclists per day, with a peak count of 222 on August 16, 2023.

Cyclists OUT: 14,620 cyclists, with a daily average of 96, and a peak count of 361 on September 11, 2023.


W SMUGGLER ST
W FRANCIS ST
N 2ND ST
W FRANCIS ST
N 6TH ST
N 4TH ST
N 2ND ST
N GARMISCH ST
N MILL ST
GIBSON AVE
W MAIN ST
W HOPKINS AVE
S GARMISCH ST
S MONARCH ST
S MILL ST
E MAIN ST
NEALE AVE
KING ST
E HYMAN AVE
S ORIGINAL ST
E DURANT AVE
E COOPER AVE
Map 2.2 RRFBs and Signalized Intersections
EXISTING CONDITIONS DOWNTOWN
Crosswalks
Paved Sidewalks
On Street Bikeways
Off Street Bikeways
Bus Stops
Bus Routes
BikeParking
Rapid Flash Beacons
TrafficSignals
City Boundary
N
0
0.1
0.2 MILES
Source: Esri, USDA FSA, Esri, NASA, NGA, USGS, FEMA, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

TRANSIT

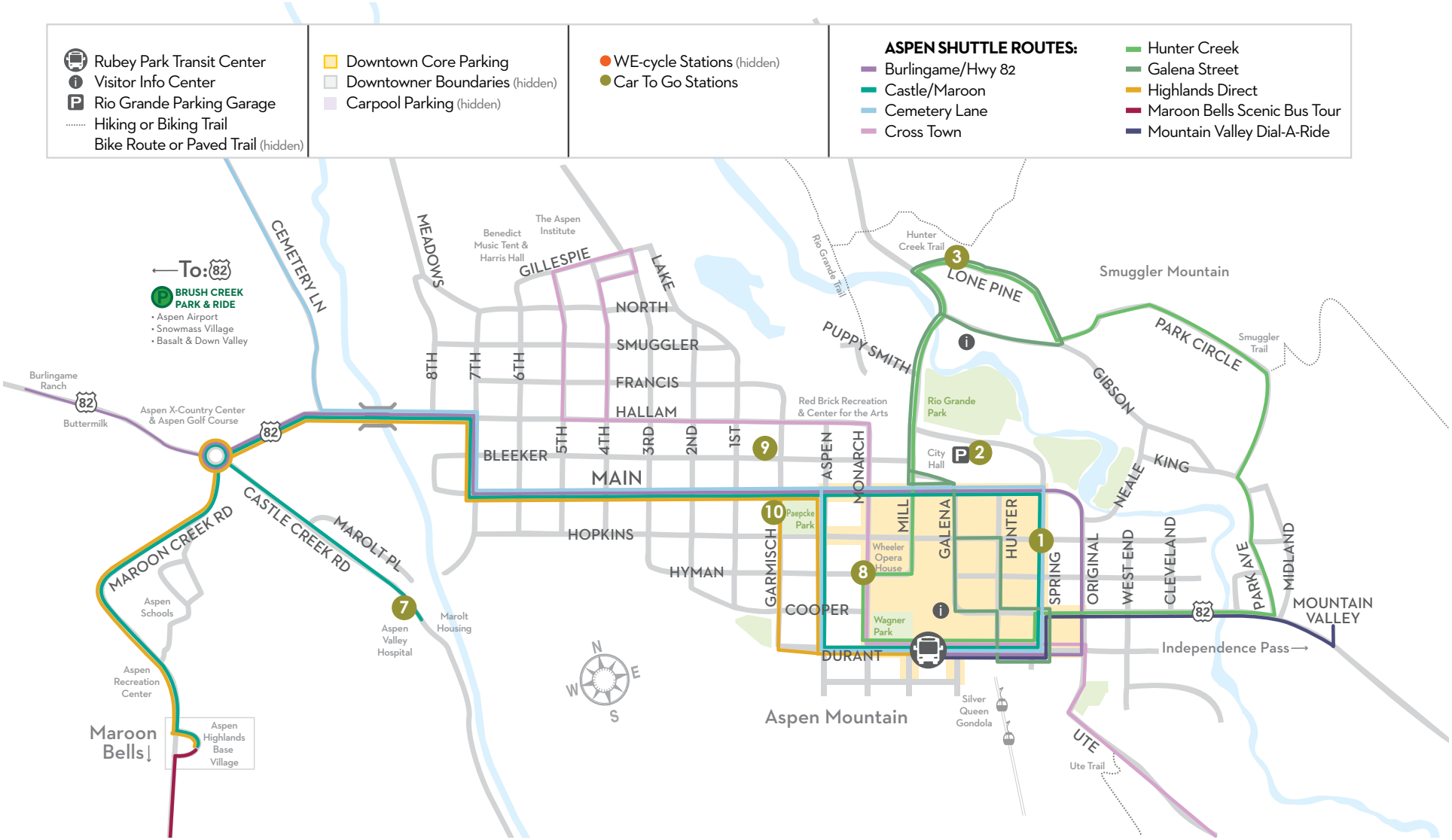
Major Transit Routes and Hubs

Transit is a critical way to get around for many people in Aspen, whether they are community members or visitors. Depending on the season, there are 8 local transit routes, highlighted in *Table 2.1* and *Map 2.3* below.

Table 2.1 Eight Local Transit Routes, Monthly Average Ridership 2019-2023

ROUTE NAME AND ID	AVERAGE RIDERSHIP	MAJOR DESTINATIONS
Castle Maroon (Route ID: CM)	This route consistently has the highest ridership throughout the year, peaking in January (52,177) and December (43,862), with a notable dip in May (14,197). The monthly average ridership is 42,114 riders.	Castle Creek Road, Aspen Valley Hospital, Aspen Highlands
Hunter Creek (Route ID: HC)	This route sees stable ridership across the year, peaking in January (30,504) and December (27,521). The lowest ridership occurs in May (8,596), with an annual monthly average of 25,106 riders.	Hunter Creek residential area, Aspen's downtown core
Burlingame (Route ID: BG)	This route experiences consistent ridership, with peaks in January (13,886) and December (12,470). The lowest ridership occurs in May (5,079), and the monthly average is approximately 11,463 riders.	Burlingame housing development, Highway 82 locations
Aspen Highlands (Direct) (Route ID: AH)	This route sees seasonal peaks, especially in the winter, with the highest ridership in January (11,660) and a notable peak again in December (7,565).	Aspen Highlands Ski Resort
Galena Street (Route ID: GS)	This route has moderate ridership, peaking in January (10,166) and December (10,291).	Hunter Creek residential area, Aspen's downtown core
Cemetery Lane (Route ID: CL)	Ridership on this route is moderate, with peaks in January (8,851) and December (8,013). Ridership dips in May (3,008) and June (4,618), with an annual monthly average of 7,421 riders.	Cemetery Lane residential area
Mountain Valley (Route ID: MV)	This route experiences lower ridership, peaking in January (5,753) and December (4,091). Ridership is lowest in May (1,391), with an annual monthly average of 4,607 riders.	Mountain Valley neighborhood
Cross Town (Route ID: CT)	This route has the lowest ridership, peaking in July (3,704) and January (2,801).	Downtown Aspen, Ute Trail, residential Aspen locations north of Main Street

Map 2.3 Eight Local Transit Routes



Transit Hubs

Aspen's transit system is anchored by several key transit hubs that provide access to both local and regional destinations, supporting the city's efforts to minimize reliance on single-occupancy vehicles. The **Rubey Park Transit Center** (shown in ***Figure 2.2***) is the primary hub, serving as the terminus for many routes and facilitating essential connections to downtown Aspen, ski resorts, and regional areas. Rubey Park's central location makes it a focal point of the transit network, handling high passenger volumes while promoting sustainable and multimodal travel options, including buses, bike share, and year-round bike storage.

Another critical hub is the **8th and Hallam Street Bus Stop**, a key transit point for westbound routes serving neighborhoods like Cemetery Lane and connecting with regional destinations. Located along a major corridor, this stop plays a significant role in Aspen's multimodal transportation system, especially given its proximity to the Castle Creek Bridge bike and pedestrian route. The stop's high volume of cyclists and pedestrians, along with several nearby bike share stations and car-sharing parking spaces, underscores its importance in linking various modes of transportation. This makes it a crucial node in Aspen's efforts to promote sustainable travel and reduce traffic congestion.

The **Paepcke Transit Hub** is another essential part of Aspen's transportation network. It supports both local and regional transit operations, and planned improvements such as pedestrian safety upgrades, rain gardens, and enhanced seating will further strengthen its role. Located near Paepcke Park, this hub is particularly important for facilitating connections to schools, parks, and other community amenities. Paepcke will continue to serve as a vital link for transit users while integrating sustainable features to support Aspen's environmental goals.

Figure 2.2 Rubey Park Transit Center

3

CRASH ANALYSIS

3. CRASH ANALYSIS

INTRODUCTION

Aspen's crash history provides critical insights into the city's transportation safety challenges and trends. Understanding the patterns in crash data over time helps identify areas of concern and guide targeted interventions to improve road safety. The unique geographic and climatic conditions in Aspen, including its mountainous terrain and seasonal weather variations, contribute to the complexities of maintaining safe roads year-round. Traffic volume fluctuations, particularly due to Aspen's status as a popular tourist destination, further influence crash frequency.

This report divides the crash analysis into three datasets to provide a comprehensive view of crash trends:

- **Section 1**: All crash reports data, provided by the City of Aspen, from 2015 to 2023.
- **Section 2**: Crash reports resulting in death or serious injury, provided by the City of Aspen Police Department, from 2019 to August 2024.
- **Section 3**: Correlation between crashes and infrastructure

These datasets allow for a detailed exploration of overall crash trends and a more focused analysis of the most severe incidents, including identifying critical locations and contributing factors. By examining this data, the report aims to provide actionable insights into improving safety for all road users in Aspen.

SECTION 1: ALL CRASH REPORTS DATA
(PROVIDED BY THE CITY OF ASPEN, FROM 2015-2023)

Total Crashes by Year

Aspen's crash history provides critical insights into the city's transportation safety challenges and trends. Understanding the patterns in crash data over time helps identify areas of concern and guide targeted interventions to improve road safety. ***Table 3.1*** highlights the crashes that have been reported in Aspen between 2015 and 2023. ***Figure 3.1*** highlights the top three years with the highest number of crashes.

Figure 3.1 Years with Most Crash Reports from 2015-2023

Table 3.1 Number of crash reports from 2015-2023

YEAR	NUMBER OF CRASHES	ANALYSIS	DETAILED NARRATIVE
2015	648	In 2015, there were 648 reported crashes, marking the beginning of the data period with a relatively high number of incidents.	The year 2015 recorded 649 crashes, setting a high baseline for the subsequent years. This level of crashes may be attributed to a combination of factors, including traffic volumes, weather conditions, and possibly the infrastructure or road safety measures in place at the time. Additionally, any road construction projects or changes in traffic patterns during this year might have played a role in the number of reported crashes.
2016	652	The year 2016 saw a slight increase in crashes, with 652 incidents reported.	The slight increase in crashes from 2015 to 2016 suggests that the factors contributing to road safety challenges in Aspen remained consistent or intensified. The continued high number of crashes could reflect ongoing issues with road conditions, traffic management, or driver behavior. This consistency in crash numbers highlights the need for continued monitoring and potentially new interventions to address persistent safety concerns.
2017	635	In 2017, the number of crashes decreased slightly to 635.	The slight decline in crash reports in 2017 may indicate some improvement in road safety, whether through better road conditions, enhanced enforcement, or public awareness campaigns. However, the decrease is minimal, suggesting that while there might have been some positive changes, the overall risk factors for crashes in Aspen remained largely unchanged. This year could have also seen varying weather conditions or other external factors that temporarily reduced the crash rate compared to previous years.

YEAR	NUMBER OF CRASHES	ANALYSIS	DETAILED NARRATIVE
2018	601	The year 2018 experienced a more noticeable decline in crashes, with 601 incidents reported.	The reduction in crashes in 2018 might reflect the effects of sustained efforts to improve road safety, whether through infrastructure upgrades, better traffic management, or changes in local policies. This year's decline could also be due to favorable weather conditions or a decrease in traffic volumes. The drop in crash numbers suggests that 2018 was a relatively safer year on Aspen's roads, though the number of crashes still indicates room for further improvement.
2019	665	In 2019, crashes increased again to 665, the highest number in the dataset.	The spike in crashes in 2019 marks a significant reversal of the downward trend seen in previous years. Several factors could explain this increase, including a possible rise in traffic volumes due to economic growth or tourism, adverse weather conditions, or changes in road usage patterns. This year's peak might also reflect an increase in reporting accuracy or a higher frequency of certain types of incidents, such as minor collisions. The jump in crashes serves as a reminder that road safety is influenced by a complex interplay of factors, and ongoing efforts are needed to maintain and improve safety.
2020	438	The year 2020 saw a sharp decline in crashes, with only 438 incidents reported.	The significant decrease in crashes in 2020 is likely a direct result of the COVID-19 pandemic, which drastically reduced traffic volumes due to lockdowns, remote work, and travel restrictions. With fewer vehicles on the road, the likelihood of crashes naturally diminished. This year's data highlights the impact that broader societal changes can have on road safety, providing a unique case study on how reduced traffic can lead to lower crash rates. The decrease is particularly stark compared to 2019, emphasizing how extraordinary circumstances like a global pandemic can alter normal traffic patterns and safety outcomes.
2021	569	In 2021, crashes increased to 569, reflecting a partial recovery from the pandemic's impact on traffic volumes.	The increase in crashes in 2021 suggests a return to more typical traffic levels as pandemic restrictions eased and life began to return to normal. However, the crash rate did not reach pre-pandemic levels, which may indicate that some changes in behavior or traffic patterns persisted. For example, more people might have continued working from home, leading to less commuting traffic, or there might have been lingering economic impacts affecting travel behavior. This year marks a period of transition, where road safety measures had to adapt to fluctuating conditions.
2022	461	The year 2022 saw a decrease in crashes, with 461 incidents reported.	The reduction in crashes in 2022 suggests a continuation of the trends seen in 2021, where traffic volumes and patterns were still not fully back to pre-pandemic levels. This decrease could also reflect improvements in road safety initiatives or ongoing changes in driving behavior, such as increased awareness of road safety or continued remote work practices. The relatively low number of crashes compared to earlier years might indicate a new normal in traffic dynamics, with a focus on sustaining these improvements through targeted interventions.
2023	369	The year 2023 records the lowest number of crashes in the dataset, with 369 incidents.	The further decline in crashes in 2023 suggests that the factors contributing to road safety improvements in previous years have continued to be effective. This could include sustained lower traffic volumes, ongoing public awareness efforts, or infrastructure improvements that have reduced the likelihood of crashes. The data for 2023 may also reflect a more permanent shift in driving patterns, with fewer people on the road regularly due to long-term changes in work and travel behavior. The low crash rate in 2023 indicates positive progress in making Aspen's roads safer, though it will be important to monitor whether this trend continues as circumstances evolve.
Total	**5038**		

Summary of Key Findings - Crashes by Year

This analysis highlights the significant variations in crash reports over the years, influenced by external factors like the pandemic, as well as ongoing efforts to improve road safety in Aspen. Understanding these trends allows for better planning and adaptation of road safety measures to maintain and further reduce crash rates in the future.

Highest Crash Year

2019 saw the highest number of crashes, suggesting that a combination of factors such as increased traffic and possibly adverse conditions led to more incidents.

Pandemic Impact

The sharp decline in crashes during 2020 reflects the significant impact of the COVID-19 pandemic on traffic volumes and, consequently, on road safety.

Post-Pandemic Trends

The years following the pandemic (2021–2023) show a gradual decline in crashes, possibly indicating lasting changes in traffic behavior and the effectiveness of ongoing safety measures.

Long-Term Improvements

The overall trend from 2015 to 2023 shows a move towards fewer crashes, particularly in the most recent years, suggesting improvements in road safety or changes in travel behavior.

Total Crashes by Season

The crash data provided in ***Table 3.2*** summarizes the total number of crash reports by season: Spring, Summer, Fall, and Winter. This analysis explores how crash frequencies vary across the seasons, examining potential factors contributing to these variations. It also explores how crash frequencies have changed over the years, examining potential factors contributing to variations in crash reports across this period. ***Figure 3.2*** highlights the seasons with the highest number of crashes.

Figure 3.2 Seasons with Most Crash Reports from 2015-2023

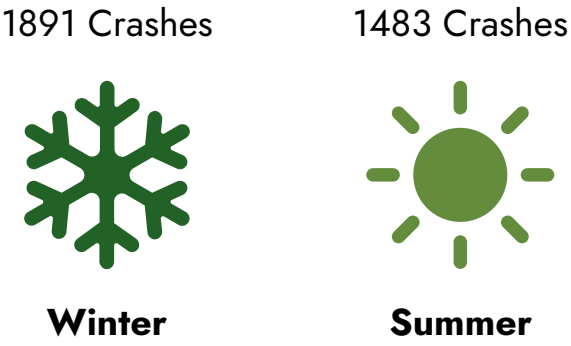


Table 3.2 Number of Crash Reports Each Season from 2015-2023

YEAR	NUMBER OF CRASHES	ANALYSIS	DETAILED NARRATIVE
Spring	775	Spring records 775 crashes, making it the season with the second-lowest number of incidents.	Spring is a transitional season in Aspen, marked by the shift from winter's harsh conditions to warmer and more stable weather. However, spring is considered an off-season for tourism, which results in fewer people using the transportation network and contributes to a lower overall crash rate. While melting snow can create wet, slippery roads that pose some risks like hydroplaning, and variable temperatures may occasionally cause black ice, the reduced traffic volume during this period is the main reason for fewer accidents. As the weather improves and outdoor activities gradually increase, traffic volumes begin to rise, but spring remains relatively quieter compared to the peak winter and summer seasons.
Summer	1483	Summer has 1,483 reported crashes, the second-highest among the seasons.	Summer is a peak season for crashes in Aspen, likely due to a combination of increased traffic volumes and heightened travel activity. The warm weather and long daylight hours attract tourists and locals alike, leading to more vehicles on the road. Aspen, being a popular destination for outdoor activities such as hiking, biking, and festivals, sees a significant influx of visitors during this season. Many of these visitors may be unfamiliar with local roads, leading to a higher likelihood of crashes. Additionally, summer can bring thunderstorms, which can cause sudden changes in road conditions, such as wet and slippery surfaces or reduced visibility. The combination of high traffic volumes, potential for distracted driving, and occasional weather-related hazards contributes to the elevated crash rate during summer.

YEAR	NUMBER OF CRASHES	ANALYSIS	DETAILED NARRATIVE
Fall	889	Fall records 889 crashes, showing a decrease from the summer peak.	Fall is another transitional season, with cooler temperatures and the onset of changing weather conditions. The reduction in crashes from summer to fall may be due to a decrease in tourist traffic as the summer vacation season ends. However, fall presents its own set of challenges, such as shorter daylight hours, wet leaves on the road, and the potential for early snow or frost, especially in a mountain region like Aspen. These conditions can create slippery surfaces and reduce visibility, contributing to crashes. Additionally, fall is often the time when school resumes, leading to increased pedestrian and school bus traffic, which can also influence crash rates. The relatively moderate crash rate in fall reflects these factors, as well as the start of preparations for winter driving.
Winter	1891	Winter sees the highest number of crashes, with 1,891 incidents reported.	Winter is the most dangerous season for driving in Aspen, with nearly double the number of crashes compared to spring and fall. The high crash rate is a direct result of severe winter weather conditions, including snow, ice, and reduced visibility. These factors create treacherous driving conditions, with roads often covered in snow or ice, making it difficult for drivers to maintain control of their vehicles. Aspen's mountainous terrain exacerbates these challenges, with steep roads and sharp turns that become even more hazardous in winter. The influx of tourists for winter sports and holiday activities further increases traffic volumes, adding to the risk. Winter driving requires heightened vigilance and skill, and even small mistakes can lead to accidents. The data clearly indicates that winter poses the greatest challenge to road safety in Aspen, underscoring the need for effective winter driving education, road maintenance, and enforcement measures.

Summary of Key Findings - Crashes by Season

This seasonal analysis highlights the importance of preparing for the specific challenges each season brings to road safety in Aspen. Winter requires the most attention due to its high crash rate, necessitating robust road maintenance, public awareness campaigns, and driving regulations. Summer also demands targeted interventions, particularly related to managing tourist traffic and responding to weather changes. Spring and fall, while less risky overall, still require vigilance as drivers adjust to changing conditions. Understanding these seasonal patterns allows for better planning and resource allocation to improve road safety throughout the year.

Winter Dominance
Winter accounts for the highest number of crashes, nearly 38% of the total, reflecting the severe weather conditions, increased hours of darkness and traffic during the holiday season and winter sports period.

Summer Peak
Summer also sees a significant number of crashes, driven by high traffic volumes from tourists and the potential for weather-related hazards like thunderstorms.

Transitional Challenges
Both spring and fall show lower crash rates, but they still present risks due to the variability in weather and road conditions as the seasons change.

Year-Round Risks
While winter and summer are the most dangerous seasons, the data suggests that every season presents unique challenges that require tailored road safety strategies.

Total Crashes by Month

The crash data (displayed in *Table 3.3* and discussed in the text below) summarizes the total number of crash reports by Month in 2015-2023. The crash data provided summarizes the total number of crash reports by each month, from January through December. This analysis explores the distribution of crashes across the year, examining potential factors contributing to variations in crash frequencies in different months.

Table 3.3 Number of Crash Reports Each Month from 2015-2023

MONTH	NUMBER OF CRASHES
January	617
February	571
March	428
April	197
May	150
June	403
July	580
August	500
September	347
October	301
November	241
December	703

Summary of Key Findings - Crashes by Month

This analysis highlights the seasonal variations in crash frequencies, providing valuable insights into when the roads are most dangerous. It underscores the need for targeted road safety measures, such as winter driving campaigns, increased enforcement during the summer tourist season, and public awareness efforts about seasonal driving hazards. Understanding these monthly patterns allows for proactive planning to reduce crash rates and improve overall road safety throughout the year.

Winter Hazards

December and January are the most dangerous months, with the highest number of crashes, reflecting the severe winter conditions and increased holiday traffic.

Summer Surge

July and August also see a significant number of crashes, likely due to the influx of tourists and increased travel during the summer vacation season.

Spring and Fall Transition

March, April, September, and October show lower crash rates as the weather transitions between extreme conditions, but still pose risks due to unpredictable weather and road conditions.

Calm Before the Storm

May experiences the lowest crash rate, primarily due to significantly reduced traffic volumes and lower roadway usage during this off-season period. With fewer vehicles on the roads, there is a decreased likelihood of crashes, even as stable and favorable driving conditions prevail between the end of winter and the onset of summer travel.

Total Crashes by Day of the Week

The crash data, displayed in ***Table 3.4***, summarizes the total number of crash reports by each day of the week, from Monday through Sunday during 2015-2023. This analysis explores the distribution of crashes across the week, examining potential factors contributing to variations in crash frequencies on different days.

Table 3.4 Number of Crash Reports Each Day of the Week from 2015-2023

MONTH	NUMBER OF CRASHES
Monday	798
Tuesday	745
Wednesday	791
Thursday	785
Friday	820
Saturday	602
Sunday	497

Summary of Key Findings - Crashes by Day of the Week

This analysis highlights the need for tailored road safety measures throughout the week. For example, increased traffic enforcement on Fridays could help reduce the number of crashes, while public awareness campaigns might focus on safe driving practices as drivers head into the weekend. Understanding these daily patterns allows for more strategic allocation of resources and the implementation of targeted interventions to reduce crashes and improve overall road safety.

Highest Crash Day

Friday stands out as the day with the highest number of crashes, which could be due to the combination of end-of-week rush, increased social activities, and potentially impaired driving.

Weekend Trend

There's a clear drop in crashes on Saturday and Sunday compared to weekdays, likely reflecting reduced commuting and more recreational, less routine driving.

Midweek Stability

Wednesday and Thursday have a relatively stable number of crashes, suggesting consistent traffic volumes and driving behaviors through the middle of the week.

Monday High

The high number of crashes on Monday may be tied to the challenges of transitioning back to the workweek routine after the weekend.

Total Crashes by Time of Day

The crash data, displayed in ***Table 3.5*** and discussed in the text below breaks down the total number of crash reports by the hour of the day, ranging from midnight to 11:00 PM. This analysis examines the patterns and potential reasons behind these distributions, offering insights into when crashes are most likely to occur. ***Figure 3.3*** highlights the times of day with the highest number of crashes.

Figure 3.3 Times of Day with Most Crash Reports from 2015-2023

Table 3.5 Number of Crash Reports by Time of Day from 2015-2023

HOUR RANGE	CRASH REPORTS	NUMBER OF CRASHES	ANALYSIS
Midnight to 6:00 AM	7:00 AM (70), 8:00 AM (100), 9:00 AM (123), 10:00 AM (105), 11:00 AM (110), Noon (124)	737	The early morning hours, particularly from midnight to 3:00 AM, see a significant number of crashes. This can often be attributed to factors such as driver fatigue, reduced visibility, and the potential influence of alcohol, especially on weekends. The number of crashes gradually decreases between 3:00 AM and 6:00 AM, as traffic volume typically drops during these hours. However, the persistence of crashes during these low-traffic hours indicates the impact of impaired driving and fatigue. By 6:00 AM, as the early morning commute begins, there is a slight increase in crashes, likely due to the onset of commuter traffic combined with lingering nighttime conditions.
7:00 AM to Noon	7:00 AM (70), 8:00 AM (100), 9:00 AM (123), 10:00 AM (105), 11:00 AM (110), Noon (124)	632	This time period aligns with the morning rush hour and the start of the workday. The data shows a gradual increase in crashes starting from 7:00 AM, peaking slightly around 9:00 AM. This pattern is typical as more people hit the roads to commute to work, school, or other morning activities. The peak at 9:00 AM could be due to the convergence of late commuters with those who start work around this time. After 9:00 AM, there's a slight decrease in crashes, though they remain relatively steady throughout the late morning. The data suggests that while the roads are busiest during this period, drivers may be more alert, resulting in fewer crashes compared to the evening rush.
1:00 PM to 3:00 PM	1:00 PM (176), 2:00 PM (220), 3:00 PM (371)	767	The early afternoon hours show an increase in crash reports, with a significant spike at 3:00 PM. This time coincides with school dismissals, the end of the traditional workday for some, and the beginning of the afternoon rush hour. The substantial increase at 3:00 PM could be influenced by the combination of school traffic, after-school activities, and people leaving work early. This period may also reflect the onset of fatigue for those who have been active since the early morning, contributing to a higher likelihood of crashes.
4:00 PM to 6:00 PM	4:00 PM (355), 5:00 PM (389), 6:00 PM (423)	1,167	This is the period with the highest concentration of crashes, coinciding with the evening rush hour. The data shows a progressive increase in crashes, peaking at 6:00 PM. This is typically the time when most people are returning home from work, leading to heavy traffic congestion. The high volume of vehicles, coupled with the end-of-day fatigue and potential impatience among drivers, contributes to the elevated number of crashes. Additionally, during certain times of the year, this period also coincides with the onset of dusk, which can further impair visibility and increase crash risk.
7:00 PM to 11:00 PM	7:00 PM (344), 8:00 PM (327), 9:00 PM (344), 10:00 PM (375), 11:00 PM (345)	1,735	The crash data during the evening hours remains consistently high, only slightly lower than the rush hour peak. This period may see a diverse range of drivers, from those returning home after late work hours to individuals going out for evening social activities. The steady crash numbers from 7:00 PM to 11:00 PM suggest that evening activities, combined with potential alcohol consumption and general tiredness, play a significant role in maintaining a high crash rate. The peak at 10:00 PM may correlate with the end of evening events, such as dinners or social gatherings, where drivers are returning home.

Summary of Key Findings - Crashes by Time of Day

This detailed analysis underscores the importance of targeted road safety interventions, such as increased enforcement during high-risk periods, public awareness campaigns focused on the dangers of impaired driving, and infrastructure improvements to manage congestion and a higher risk of modal conflicts during peak hours. By understanding the specific times when crashes are most likely to occur, policymakers and safety officials can better allocate resources and implement measures to reduce the likelihood of crashes. Key takeaways from the data include:

Highest Crash Period

The highest concentration of crashes occurs between 4:00 PM and 6:00 PM, which aligns with the evening rush hour when roads are most congested.

Midnight to Early Morning

The period from midnight to 3:00 AM shows a notable number of crashes despite lower traffic volumes, likely due to impaired driving and fatigue.

Afternoon Spike

A significant spike in crashes at 3:00 PM coincides with school dismissals and the beginning of the afternoon rush.

Evening Stability

The evening hours (7:00 PM to 11:00 PM) maintain a high number of crashes, reflecting a combination of continued traffic, evening social activities, and potential impairment.

Hot Spot Crash Locations

Crash hot spot locations emerging from the crash analysis includes the downtown core area, Main Street and Highway 82.

General Crash Characteristics

The data from *Table 3.6*, "Crashes by Factor (2015-2023)," provides a comprehensive overview of crash incidents in Aspen, categorized by various contributing factors. A total of 4,474 crashes occurred during this period, with parking-related incidents being the most prevalent at 33% (1,477 crashes indicating the high demand parking system of Aspen and the busy interface between curbside parking and the traveling roadway. Non-injury crashes, comprising 21.9% of incidents, suggest frequent minor collisions, potentially addressable through increased driver awareness and enhanced traffic controls.

Failure to yield or stop contributed to 13.2% of crashes, highlighting the importance of enforcement and better signage. Hit and runs (11.2%) present both legal and safety concerns, while reckless driving (8.2%) underscores the need for public awareness and stricter law enforcement. Snow and ice-related crashes account for 7.5%, reflecting the challenges of Aspen's winter climate, suggesting that improved road maintenance and winter safety measures could reduce incidents. Other factors such as fixed-object collisions, distracted driving, impaired driving, and obstructed views collectively make up a smaller portion of incidents but still emphasize the need for targeted interventions to enhance road safety across the board.

Table 3.6 Crashes by Factor (2015-2023)

CRASH FACTOR	NUMBER OF CRASHES	PERCENT	ANALYSIS
Parking-related	1477	33.0%	The most common factor involves incidents related to parking, which might include collisions during parking maneuvers or issues exiting parking spaces. This high rate suggests where sight lines are impacted near intersections, there may be opportunity to explore different parking layouts.
Non-injury crash	978	21.9%	These incidents, while not resulting in physical injuries, often involve property damage and can signal issues such as minor fender benders in traffic or parking lots. The frequency calls for improved driver awareness and possibly enhanced traffic controls in high-incident areas.
Failure to yield or stop	590	13.2%	A significant number of crashes occur due to drivers failing to obey stop signs or yield signs. Increased enforcement and clearer signage could mitigate this problem.
Hit and run	503	11.2%	These incidents not only reflect on legal and ethical violations but also complicate data collection and insurance claims. Strengthening surveillance and punitive measures may act as deterrents.
Reckless driving	366	8.2%	This factor includes aggressive driving behaviors such as speeding and improper lane changes. Public awareness campaigns and stricter law enforcement are recommended.
Snow or ice	334	7.5%	Considering Aspen's climate, these conditions pose a notable hazard. To mitigate incidents, it may be beneficial to explore ways to support existing road maintenance efforts during winter months and encourage the use of winter tires, while being mindful of environmental concerns and the current capacity of street maintenance teams.
Fixed-object	170	3.8%	Collisions with objects like poles and barriers highlight issues with road layout and visibility. Urban planning improvements could help reduce these types of crashes.
Distracted driver	26	0.6%	Although lower in occurrence, distracted driving is likely underreported and remains a critical safety issue. Initiatives to curb mobile phone use while driving should be intensified.
Impaired driver	16	0.4%	Driving under the influence of alcohol or drugs is especially dangerous. Continued emphasis on enforcement and education regarding DUI is necessary.
Obstructed view	14	0.3%	Minor yet significant, these crashes could be minimized with better parking standards and removal of visual obstructions at intersections.
Total	**4474**		

SECTION 2: CRASHES RESULTING IN INJURY OR DEATH
(PROVIDED BY THE CITY OF ASPEN, FROM 2015-2023)

This section focuses on crash incidents in Aspen that resulted in serious injury or death, which differs from the previous analysis which included all crashes regardless of severity. These crashes are referred to as KSI crashes; KSI stands for "Killed or Seriously Injured." This is a metric commonly used in road safety analysis to measure the severity of traffic accidents. KSI data includes both fatalities (killed) and those who suffer life-threatening or severe injuries (seriously injured) as a result of a traffic collision

This analysis provides critical insight into the most severe outcomes on the city's roads. By isolating KSI crashes from the broader dataset, we can better understand the factors contributing to life-threatening incidents and identify opportunities for targeted interventions. The data spans from 2019 to August 2024, covering a period marked by fluctuations in traffic patterns due to the COVID-19 pandemic and post-pandemic recovery.

Analyzing trends in the occurrence of severe crashes, their distribution across seasons and months, and the types of road users involved, reveals patterns that are essential to understand in order to develop and implement strategies that can reduce the occurrence and severity of such crashes in the future. The following sections present the crash data by year, mode involved, and location, offering a comprehensive view of the factors leading to injury or fatal outcomes on Aspen's roads.

Total Crashes Resulting in Injury or Death by Year

Table 3.7 highlights the total number of crashes resulting in injury or death between the years of 2019 and 2024.

Table 3.7 Total Number of Crashes Resulting in Injury or Death

YEAR	TOTAL NUMBER OF INJURIES OR DEATHS
2019	14
2020	7
2021	12
2022	6
2023	4
2024 (to August 2024)	4
Total	**47**

Key Insights

Peak Year

2019 had the highest number of injuries or deaths, suggesting a year of higher traffic volumes or more severe crashes.

Pandemic Impact

2020 saw a significant reduction in severe outcomes due to the COVID-19 pandemic, highlighting how reduced traffic volumes can lead to safer roads.

Post-Pandemic Recovery

The subsequent years (2021–2023) show a mixed trend, with a rebound in severity in 2021 followed by gradual improvements in 2022 and 2023.

2024 Outlook

As of August 2024, the trend appears to be stabilizing, with similar levels of severity as seen in 2023.

Total Crashes Resulting in Injury or Death by Month and Season

A monthly distribution suggests that crashes are more frequent in winter and summer months, highlighting the need for season-specific safety measures and public awareness campaigns during these periods. *Table 3.8* highlights crashes by month, and *Table 3.9* highlights crashes by season.

Table 3.8 Number of KSI locations by Month

MONTH	TOTAL KSI CRASHES	ANALYSIS
January	7	Winter conditions likely contribute to a higher crash count in this month, with icy roads and reduced visibility as key factors.
February	4	The crash count remains moderately high, continuing the trend of winter-related hazards.
March	6	As spring approaches, the number of crashes remains elevated, possibly due to lingering winter conditions and increased roadway activity.
April	2	There is a significant drop in crashes in April, reflecting improved weather conditions and road safety.
May	2	Similar to April, May sees relatively few crashes, indicating safer driving conditions during late spring.
June	5	The number of crashes begins to increase as summer activities pick up and more people are on the road.
July	10	July stands out with the highest crash count, likely due to increased travel during the peak summer months.
August	3	Similar to July, August experiences a high number of crashes, consistent with high summer traffic volumes.
September	4	Crash numbers begin to decline as summer ends, possibly due to decreased travel after the holiday season.
October	3	There is a slight uptick in crashes, potentially due to changing weather conditions and shorter daylight hours.
November	1	The crash count drops sharply in November, indicating improved safety, possibly due to less travel before winter sets in.
December	1	Despite winter conditions, December shows a low number of crashes, potentially due to heightened caution during the holiday season.

Table 3.9 Number of KSI locations by Season

MONTH	TOTAL KSI CRASHES	ANALYSIS
Spring	8	The number of crashes is relatively low in the spring; transitional weather and increased outdoor activities may contribute to the risks.
Summer	17	Summer experiences the highest number of crashes, likely due to increased travel, tourism, and recreational activities during this period. The higher volume of road users could explain the elevated crash rate.
Fall	10	Fall sees a moderate number of crashes which may be influenced by changing daylight hours and road conditions, particularly as weather begins to cool.
Winter	12	Winter shows a notable number of crashes, likely linked to hazardous conditions such as snow and ice. The increase in crashes underscores the importance of seasonal road maintenance and safe driving practices during winter months.

This seasonal distribution highlights the need for targeted safety interventions, especially in the summer and winter months, when the number of crashes resulting in death or injury is higher.

Summer Peak

Summer sees the highest number of severe crashes, likely due to increased traffic volumes from vacation travel, tourism, and outdoor activities. The combination of busier roads, potential distractions, and occasional summer storms contributes to a higher risk of crashes resulting in death or injury during this season.

Winter Challenges

Winter, with its 12 severe crashes, poses significant risks due to harsh weather conditions such as snow, ice, and reduced visibility. These factors make driving more dangerous, and the data highlights the need for caution and preparation when driving during winter months.

Transitional Risks in Fall and Spring

Both fall (10 severe crashes) and spring (8 severe crashes) are transitional seasons, where changing weather conditions can lead to unexpected hazards. In spring, the shift from winter can result in lingering ice or early rains, while in fall, shorter daylight hours and the onset of wet or frosty conditions can increase the risk of serious crashes.

Monthly Variations

July stands out as the month with the highest number of severe crashes (10), aligning with peak summer travel. In contrast, November and December recorded the fewest severe crashes (1 each), which may reflect either particularly cautious driving during early winter or simply fewer opportunities for severe crashes due to reduced traffic volumes.

Overall Trends

The data shows that severe crashes resulting in death or injury are spread across the year, with notable peaks during periods of high traffic volume (summer) and challenging weather conditions (winter). This suggests that road safety initiatives need to be tailored to address specific seasonal risks, with a focus on mitigating the dangers associated with each season's unique challenges.

The data in *Table 3.10* shows a month-by-month breakdown of KSI locations, providing insight into the distribution of severe crashes across the year. While some months, such as May and June, report fewer KSI crashes, these variations underscore the need for adaptive safety measures throughout the year based on prevailing seasonal conditions and traffic volumes. Notable trends include:

January (7 crashes)

Multiple crashes occurred in 2020, indicating a potential cluster during this year. The presence of winter-related hazards could be a factor.

February (4 crashes)

Although fewer crashes occur, there is consistency across the years.

March (6 crashes)

Severe crashes are clustered at the beginning and middle of the month, likely influenced by transitional weather conditions.

August (10 crashes)

This month exhibits the highest crash frequency, suggesting that peak summer traffic may contribute to the increase.

Table 3.10 Number of KSI Locations by Date within Month

MONTH	TOTAL KSI CRASHES	CRASH DATES
January	7	1/30/2023, 1/27/2022, 1/25/2020, 1/24/2020, 1/21/2020, 1/16/2020, 1/10/2020
February	4	2/3/2024, 2/25/2022, 2/21/2021, 2/21/2021
March	6	3/16/2024, 3/23/2023, 3/3/2023, 3/3/2023, 3/15/2020, 3/4/2019
April	2	No recorded KSI crashes
May	2	5/31/2021, 5/14/2019
June	5	6/28/2021, 6/19/2019
July	10	7/4/2024, 7/31/2021, 7/13/2019, 7/4/2019, 7/1/2019
August	3	8/5/2024, 8/30/2021, 8/12/2021, 8/2/2021, 8/2/2021, 8/5/2020, 8/31/2019, 8/22/2019, 8/2/2019, 8/1/2019
September	4	9/10/2021, 9/29/2019, 9/3/2019
October	3	10/13/2022, 10/25/2021, 10/13/2021, 10/14/2019
November	1	11/17/2022, 11/8/2022, 11/5/2019
December	1	12/2/2022

Total Crashes Resulting in Injury or Death by Mode Involved

The data on crash modes reveals the significant involvement of various road users in KSI incidents, underscoring the need for targeted interventions:

Table 3.11 Crashes Resulting in Injury or Death by Mode Involved

MODE	PERCENT OF CRASHES	ANALYSIS
Driver Involvement	100%	Every crash involved a driver, indicating that driver behavior is a key factor in KSI incidents. Interventions such as stricter enforcement of traffic laws and driver education could help address this issue.
Pedestrian Involvement	40%	A substantial portion of crashes involved pedestrians, signaling an urgent need for improved pedestrian infrastructure, such as safer crosswalks, better lighting, and traffic calming measures in high-pedestrian areas.
Bicyclist Involvement	17%	With 17% of the crashes involving bicyclists, the data points to the need for safer cycling infrastructure, such as protected bike lanes, and campaigns to raise awareness about sharing the road with cyclists.
Motorcyclist Involvement	2%	Although motorcyclists were involved in a smaller percentage of crashes, their vulnerability in these incidents calls for focused safety measures, including increased helmet use and better road conditions to support motorcycle safety.

Crashes Resulting in Injury or Death by Clusters and Hot Spots

The map on the following page (*Map 3.1*) shows the locations of crashes that resulted in death or serious injury in Aspen.

Crash locations can be broadly clustered into:

Downtown Core Crashes

The downtown area bordered by East Main Street, South Original Street, East Durant Avenue and South Aspen Street account for 12 crashes resulting in one death and eleven serious injuries.

West Main Street Crashes

The section of West Main Street between South Aspen Street and North 7th Street account for 6 crashes resulting in serious injury.

Highway 82 Outside the Urban Aspen Area

The western city limits to South 7th Street, and the eastern city limits to South Original Street account for 10 crashes resulting in one death and nine serious injuries.

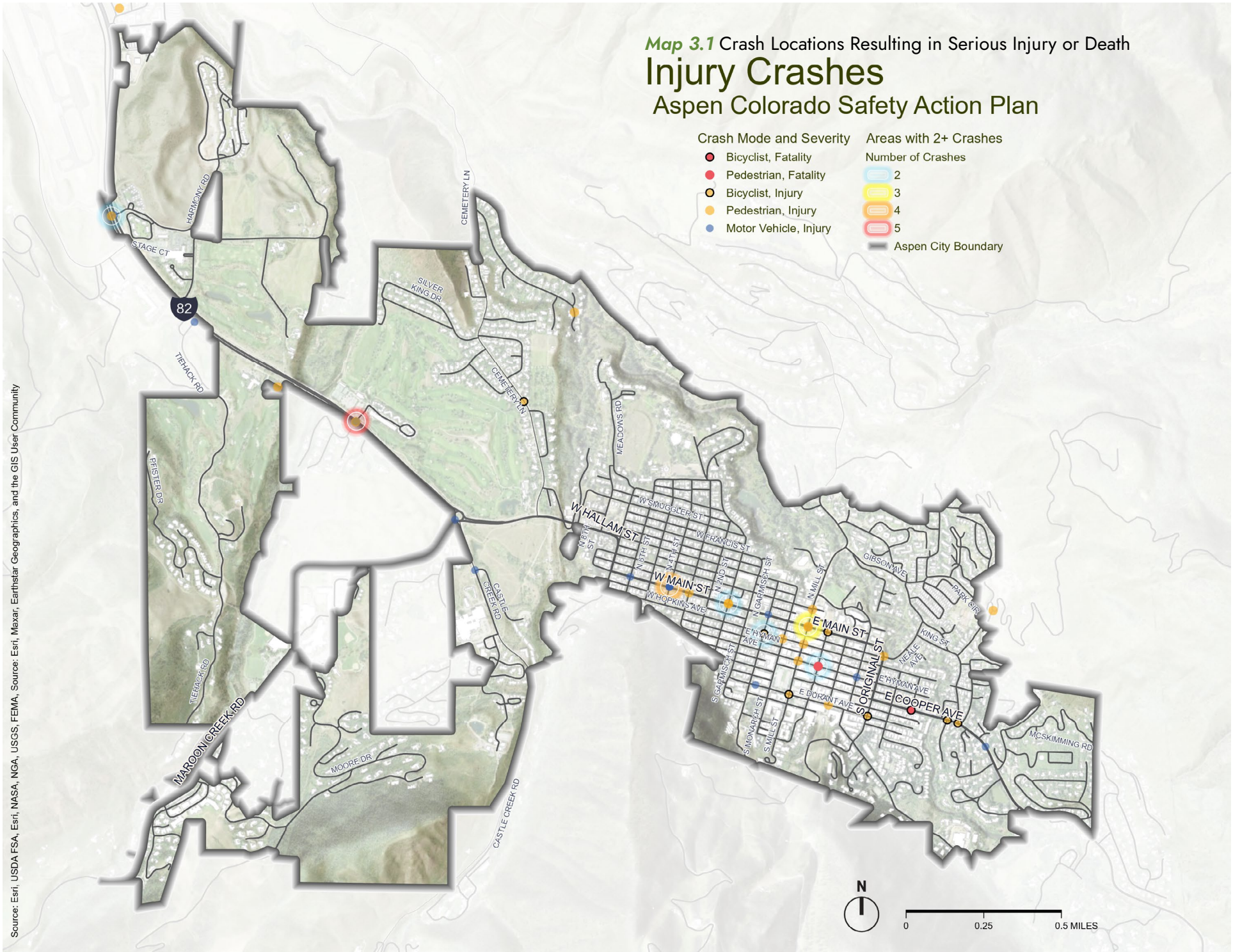
Hot Spots (areas with more than one crash resulting in death or serious injury):

- Highway 82 and Truscott: Five crashes
- Main Street and 4th Street: Four crashes
- Main Street and Mill Street: Three crashes
- Hyman Street and Galena Street: Two crashes (one resulting in death)
- Hyman Street and Aspen Street: Two crashes
- Main Street and 1st Street: Two crashes
- Highway 82 and Harmony Road: Two crashes

Map 3.1 Crash Locations Resulting in Serious Injury or Death

Injury Crashes

Aspen Colorado Safety Action Plan



Source: Esri, USDA FSA, Esri, NASA, NGA, USGS, FEMA, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

SECTION 3: CORRELATION BETWEEN CRASHES AND INFRASTRUCTURE

Transit and Crash Location Summary

Identification of Locations near Transit Stations or Stops with Crashes

Aspen's transit network, particularly in the downtown core and along Main Street, plays a crucial role in facilitating mobility for residents and visitors. The routes with the highest ridership, including Castle Maroon, Hunter Creek, and Burlingame, feature multiple bus stops in the central, high-traffic areas of the city. These transit stops are often located near major intersections and along busy corridors, making them key locations for both pedestrian and vehicle interactions.

The alignment of transit routes with crash data reveals that Main Street and the downtown core are areas of concern when it comes to traffic safety near transit stops. Main Street, which carries Highway 82 traffic through Aspen, experiences high volumes of vehicles and pedestrians. The combination of heavy usage and the frequent boarding and alighting of passengers at bus stops increases the potential for conflicts. In particular, intersections along Main Street, such as those at Mill Street and Galena Street, see elevated crash rates due to the density of traffic and proximity to transit stops.

Table 3.12 Crashes near Bus Stops

CRASH LOCATION	BUS STOP(S) WITHIN 1 BLOCK	STOP ID	PED INJURY OR DEATH CRASH COUNT	KEY FACTORS	RECOMMENDATIONS
Hyman and Mill Street, and Hyman and Galena	Hyman Ave and Mill Street	163	3	This area is a bustling commercial zone with significant pedestrian activity due to nearby restaurants, shops, and cultural attractions, particularly around the Hyman Avenue pedestrian mall. With pedestrians frequently crossing streets, limited crosswalks and signage are in place to protect them from vehicle traffic. Additionally, Mill Street is a main vehicular access point to the downtown core.	Consider enhancing the visibility of crosswalks at these intersections, especially near the bus stop. Traffic calming measures such as raised crosswalks, speed humps, or flashing pedestrian crossing signals could help reduce the risk of crashes in these high-traffic areas.
Main and Mill	Main Street/ Galena Street and Aspen Library	67 and 245	2	Main Street is one of Aspen's busiest corridors, connecting the downtown area with residential neighborhoods and major transit hubs. The intersection of Main and Mill is a critical crossing point for both pedestrians and transit users accessing bus services. The area connects to the Aspen Library and Rubey Park Transit Center, generating considerable foot traffic. Combined with the high volume of vehicles, a potential conflict zone is created.	Protected or raised medians could provide refuge for pedestrians crossing the street. Coordinating traffic signals to give pedestrians more crossing time when buses are expected to stop could also help.
Main and 2nd and Main and 1st	Main Street and 2nd	129 and 66	2	This stretch of Main Street experiences significant through-traffic as well as local traffic, with bus stops serving both locals and visitors. The intersections at 1st and 2nd streets provide access to residential areas, but the lack of pedestrian infrastructure (e.g., crosswalks or signals) between these intersections may be a factor in the crashes. Pedestrians may be crossing mid-block to catch buses or navigate the area, particularly if formal crossing points are too distant.	Adding pedestrian crossings mid-block between 1st and 2nd streets could improve safety by reducing the likelihood of jaywalking. A pedestrian refuge island or dedicated pedestrian signals could also help alleviate risks. Given the proximity to multiple bus stops, ensuring there is adequate pedestrian infrastructure in this area is crucial.

Location Hot Spots

Downtown Core Crashes

Crashes Resulting in Death or Injury:
12 crashes, 1 death, 11 serious injuries.

Infrastructure Considerations:

Pedestrian Density: The downtown core has high pedestrian activity, especially near crosswalks and intersections. Insufficient pedestrian crossing infrastructure, like inadequate crosswalk visibility, lack of sight distance at intersections, or insufficient time to cross , could contribute to these incidents.

Intersection Design: The complexity of intersections in downtown areas (e. inconsistent roadway widths, parallel and angled parking, one-way and two-way travel, etc.) can increase the risk of collisions.

Sidewalk Conditions: Narrow or obstructed sidewalks could force pedestrians closer to vehicular traffic or into the roadway, raising the risk of pedestrian-vehicle interactions.

Traffic Calming Measures: The absence of speed bumps, raised crosswalks, or other traffic-calming measures might allow vehicles to travel at higher speeds, increasing the severity of crashes.

Parking Considerations: Parking-related crashes may be a factor due to high turnover, especially in areas with parallel and angled parking. Parked vehicles often block sightlines for pedestrians and drivers alike. Moreover, all drivers become pedestrians upon exiting their vehicles, adding to the need for clear, safe pedestrian pathways near parking zones.

Downtown Core Crash Hot Spots:

Mill Street from Bleeker Street to Hyman Avenue: This stretch of Mill Street includes four intersections (Bleeker Street, Main Street, Hopkins Avenue, and Hyman Avenue), which experience high pedestrian and motorized traffic. The wide crossing distances, reduced visibility due to parked cars, and lack of pedestrian refuges or bulb-outs make these intersections particularly hazardous. Over the past five years, five pedestrian-motorist crashes resulting in injury have occurred here, with Main Street and Mill Street accounting for three of these crashes. These intersections were frequently mentioned during public outreach as areas of concern, particularly for their wide crossings and fast-moving traffic.

Galena Avenue and Cooper Avenue: This intersection marks the point where the pedestrianized area of Cooper Avenue ends and opens to vehicular traffic. The transition from pedestrian-only zones to trafficked roads poses a risk as drivers may not anticipate pedestrians crossing, and pedestrians may not expect approaching vehicles. In the past five years, this intersection saw one pedestrian death. Additionally, numerous comments from the public indicate a general sense of discomfort around downtown intersections, specifically relating to pedestrian safety.

West Main Street Crashes

Crashes Resulting in Death or Injury:
6 crashes, all resulting in serious injury.

Infrastructure Considerations:

High Traffic Volume: Main Street is a major thoroughfare, and high traffic volumes can lead to a higher likelihood of crashes. If the street is not equipped with adequate pedestrian crossings, or if crosswalks are poorly marked and cross wide distances with multiple lanes, pedestrians and cyclists are at greater risk.

Frequent Crossing: There are numerous bus stops along Main Street that naturally attract pedestrians who need to cross the street to access the bus. If these crossings are not well-marked or if there are no nearby crosswalks, pedestrians may attempt to cross at unsafe points, leading to a higher risk of pedestrian-vehicle collisions.

Immediate Need to Cross: Passengers disembarking from a bus often have an immediate need to cross the road, especially if their destination or transfer point is on the opposite side. This urgency can lead them to cross at undesignated spots, especially if the nearest crosswalk is not conveniently located.

Crossing Multiple Lanes: On roads like West Main Street that have multiple lanes, pedestrians have to cross several lanes of traffic in both directions without refuge. The risk of an accident increases if drivers in one lane stop, but drivers in adjacent lanes do not see the pedestrian and continue driving.

Lack of Separation: The absence of dedicated bike lanes or barriers separating sidewalks from the road could contribute to these crashes.

Crosswalk Placement: The placement and frequency of crosswalks on West Main Street are critical for pedestrian safety. Extended sections without crossings, such as the area between 4th and 8th, where a transit stop is located at 6th, may lead pedestrians to jaywalk, increasing the risk of accidents.

West Main Street Crash Hot Spots:

Main Street from 1st Street to 4th Street: This stretch of Main Street includes four intersections (1st, 2nd, 3rd, and 4th Streets) that are high-risk areas due to a combination of heavy pedestrian footfall and motorized traffic. These intersections are major pedestrian destinations, as they host bus stops on either side of the street. The wide crossing distances and fast-moving traffic present significant challenges for pedestrian safety. Over the past five years, seven crashes resulting in injury have occurred along this corridor, with a mix of pedestrian-motorist and motorist-motorist collisions. Main Street and 4th Street account for four of these injury-causing crashes. Community feedback has frequently highlighted concerns about the wide crossing distances and the high speeds of traffic, reinforcing the need for enhanced pedestrian safety measures in these areas.

Highway 82 Outside the Urban Aspen Area

Crashes Resulting in Death or Injury:
10 crashes, 1 death, 9 serious injuries.

Infrastructure Considerations:

High Speeds: Highways inherently carry the risk of high-speed collisions. On Highway 82, crashes may involve vehicles losing control, particularly in adverse weather conditions or during sudden stops. Examples include the 45 mph stretch of Highway 82 west of Aspen.

Limited Access Points: Highway 82 may lack frequent pedestrian crossings, leading to risky crossing behaviors by pedestrians and cyclists. This could be exacerbated if there are no crosswalks or pedestrian underpasses are not obvious.

Vehicle-Pedestrian Interactions: In areas where the highway transitions into more urban settings, drivers may not adjust their speed appropriately, leading to crashes where pedestrians are present. Examples include Hallam Street and 8th, which is also where a BRT stop is located.

Intersection and Merge Conflicts: The transition areas where Highway 82 intersects with urban streets or where lanes merge can create conflict points. Vehicles entering or exiting the highway at high speeds may collide with slower-moving or stopped traffic. Examples include entering and exiting the Highway 82 roundabout with Castle Creek Road.

Highway 82 Outside the Urban Aspen Area Crash Hot Spots:

The intersection of Highway 82 and Truscott Place is a key hot spot. As a high-speed entry point into Aspen from the north, this area features a major bus stop. While there is an existing underpass allowing pedestrians to avoid crossing the highway at grade, the intersection has still seen five crashes, including motorist-pedestrian incidents resulting in injury. The combination of high speeds and pedestrian activity at this major intersection suggests a need for improved wayfinding to direct people to the safe crossing underpass. Enhanced signage and wayfinding, along with other safety measures, could help reduce crash risks and better protect pedestrians.

4

COMMUNITY ENGAGEMENT

4. COMMUNITY ENGAGEMENT

INTRODUCTION

The City of Aspen Safety Action Plan (SAP) outreach initiative gathered community input through multiple channels, including stakeholder and citizen walking tours, interviews, surveys, and public engagement events. The project aimed to identify key safety concerns and gather feedback on potential improvements for pedestrians, cyclists, transit users and drivers.

Key findings highlighted a range of issues, including visibility challenges, congestion at popular locations, concerns about distracted driving, and specific intersections needing infrastructure modifications. Additionally, suggestions for improved pedestrian and cyclist safety measures, better education on safe practices, and enhanced signage and lighting were recurrent themes. This input will guide the development of actionable strategies to enhance safety for all modes of transport in Aspen.

ENGAGEMENT STRATEGIES

A mix of engagement strategies were used to engage with as many community members as possible. These methods included:

Aspen Community Voice Website - 422 visits

Online Survey (English/Spanish) -
71 respondents total

Small Group Interviews - 2 groups

Events

- Rubey Park Pop-Up Event
- Bike to Work Day
- Aspen Farmer's Market
- City of Aspen Police Department Bike Auction

Stakeholder and Community Walking Tours

- Tour Promotion
  - Employee newsletter
  - Media advisory to all local outlets
  - Digital Ads - Aspen Times
  - Digital Ads - Aspen Daily News
  - Paid social media campaign
  - Partner promotion - Aspen Recreation Center, Red Brick

KEY THEMES AND PARTICIPANT RECOMMENDATIONS

E-bike Safety and Regulation

E-bikes have emerged as a significant concern due to their high speeds on shared paths, inconsistent rider etiquette, and skill level. Many participants fear conflicts and advocate for speed limit enforcement and public education to promote safer practices.

"E-bikes travel at high speeds, especially on the bike paths (Rio Grande and ABC) and on Hopkins ped-bikeway."

Visibility

Issues with sight lines, especially at intersections with physical obstructions. Recommendations include removing obstacles, trimming trees/foliage, moving and/or adding signage like stop signs to ensure compliance.

"Poor sight lines due to fences, trees, and other plants, make it hard to see oncoming traffic or pedestrians."

Pedestrian Street Crossings

A significant concern raised by community members is the safety of pedestrians at street crossings, especially on Main Street. Issues include drivers not yielding at crosswalks or flashing beacons, poor pedestrian visibility, and a lack of adequate infrastructure such as raised or enhanced signals.

"Drivers are not stopping with pedestrian flashers at Main Street crossings."

Cyclist Safety

Challenges include insufficient bike lanes, confusion over bike lanes versus bike sharrows, cars backing out of head-in parking spaces in the core, and unpredictable interactions with pedestrians and vehicles. The contra lane on Mill Street causes confusion and bikers think riding against traffic is acceptable elsewhere in town. Participants suggested clearer lane markings, and enhanced signage to ensure safe navigation and to reduce incidents with other road users.

"Need better markings for bike lanes to avoid conflicts with cars."

Distracted Driving and Speed Management

There is growing concern about distracted driving (due to cell phones or tourists not knowing the area) and vehicles moving at excessive speeds that lead to pedestrian/cyclist near-misses and collisions. Suggestions include speed reduction measures and enhanced enforcement.

"Distracted drivers don't see people stepping into crosswalks, especially in the downtown area."

Public Education and Awareness

The need for more public education on safe practices, such as signaling when passing on a bike, and understanding pedestrian right-of-way at crossings. Educational programs and signage improvements are recommended.

Congestion and Multi-Modal Conflicts

Overcrowded areas like Gondola Plaza and 'Restaurant Row", especially during peak seasons, where multiple forms of transportation converge, are problematic. Participants likened navigating these locations to playing a video game. Suggestions include creating designated drop-off zones (skiers and diners) and better delineated crosswalks.

"Gondola Plaza is a mess in winter with too many cars and pedestrians all trying to share the same space, much less cross the street."

Lighting and Safety at Night

Lack of adequate lighting in certain areas (e.g., Glory Hole Park, Waters Ave., South Mill Street) contributes to poor visibility for both pedestrians and cyclists and creates hazardous conditions for all road users, particularly in areas with high foot traffic.

It is a tricky balance to strike between the outdoor lighting restrictions of the city and safety. Suggestions were made for additional lighting.

"Not enough streetlights on key paths and intersections, especially where tourists walk at night."

"NEAR-MISS" LOCATIONS

Near-miss locations noted in the public survey.

Main Street Intersections

13 Mentions in Survey

Multiple entries highlight concerns at various intersections along Main Street, including specific mentions of "Main and Hunter," "Main and Mill," and general concerns about every intersection on Main Street. The wide nature of Main Street and fast-moving traffic seem to contribute to these concerns.

Cycling and Walking Concerns

15 Mentions in Survey

There are specific mentions of areas that are unsafe for biking and walking, such as "All of Hopkins" and "West Hopkins and S Aspen Street intersection." These locations suggest that certain streets might not be adequately equipped or safe for non-vehicular traffic.

Mill Street Intersections

9 Mentions in Survey

Several locations involving Mill Street were mentioned, such as "Mill and Main," "Mill and Gibson," and "8th St and Main St" This suggests that Mill Street may be particularly tricky for drivers, bikers, and pedestrians.

Multi-Lane Merges

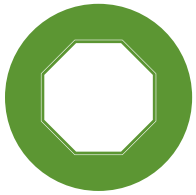
1 Mention in Survey

There were mentions of locations where "two lanes merge down to one lane while exiting town," which points to specific areas where traffic merges may create hazardous conditions.

Core Downtown Area

8 Mentions in Survey

The "Driving in the core" and other mentions of downtown intersections (e.g., near the Hotel Jerome) indicate a general sense of discomfort with navigating through the heart of Aspen. This might be due to a mix of high traffic, pedestrian activity, and complex intersections.



Inconsistent Stop Signs

4 Mentions in Survey

The West End's "inconsistent stop signs" are noted as confusing, leading to potential safety issues, especially for pedestrians.

5

SAFETY RECOMMENDATIONS

5. SAFETY RECOMMENDATIONS

INTRODUCTION

The Recommendations chapter is structured to provide a comprehensive approach to enhancing safety across various contexts within Aspen. This chapter outlines both citywide strategies and specific recommendations tailored to distinct areas such as the Downtown Core, Main Street, and Outer Aspen. The organization allows for the implementation of broad citywide initiatives alongside targeted actions within each typological zone, ensuring a holistic improvement in safety.

Recommendations Structure

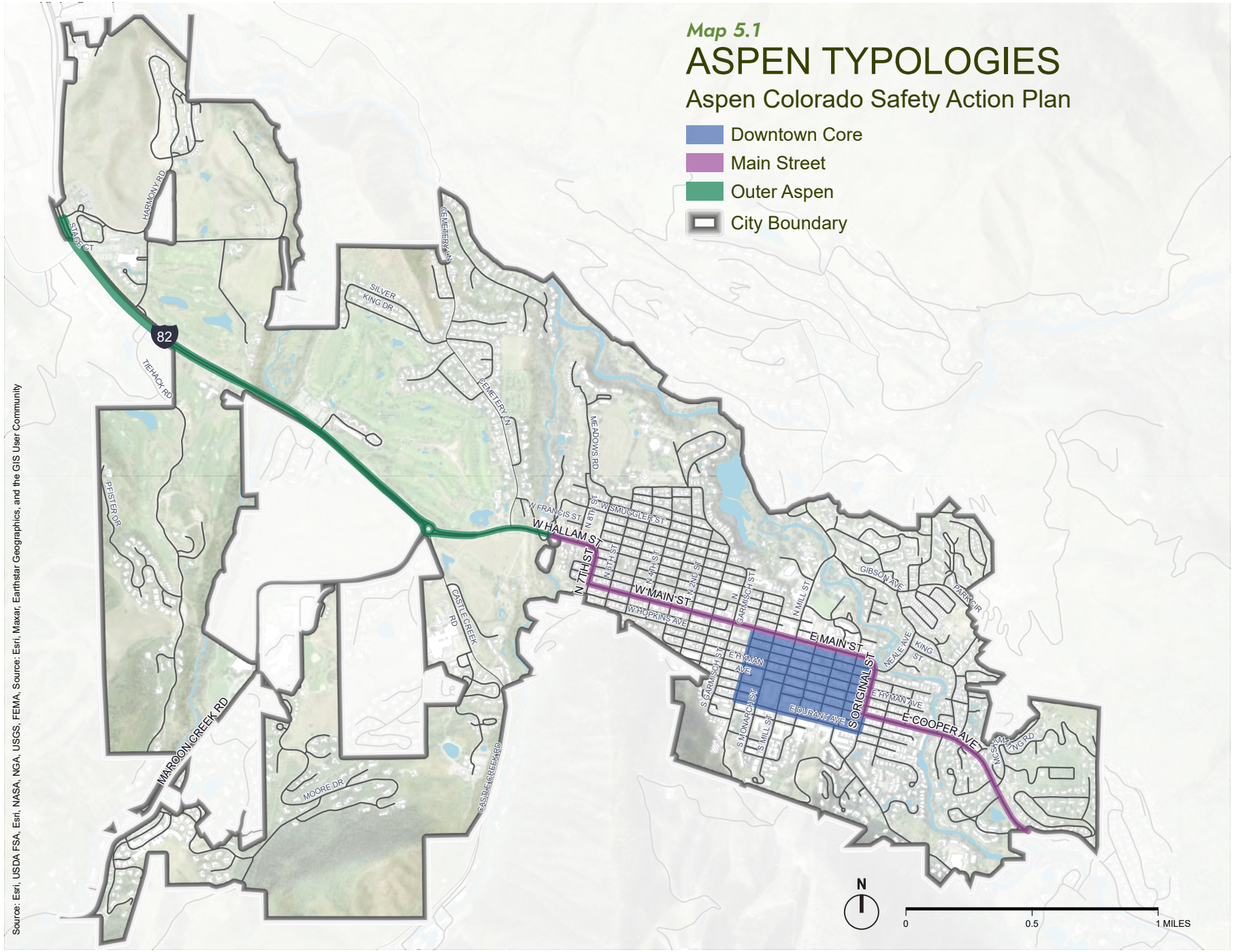
The safety recommendations in this chapter are focused on the following:

- **Infrastructure Improvements & Priority Areas**: Identification of both project-specific and broader focus areas for infrastructure improvements identified through the data analysis and public input process.
- **Citywide Safety Improvements**: These are broad strategies applicable across the entire city to foster a culture of safety and address overarching safety concerns.
- **Typology-Specific Strategies**: Tailored recommendations addressing the unique needs and challenges of specific areas within Aspen, categorized into Downtown Core, Main Street, and Outer Aspen. This structure ensures that safety measures are contextually relevant and effectively address localized issues.
- **Countermeasure Toolkit**: Each typology contains a toolbox of context-sensitive countermeasures that can be leveraged as design details are assessed.

TYPOLOGIES

Overview of Typology Creation and Usage

Typologies were developed to concentrate safety recommendations on specific geographic and contextual areas within Aspen. Each typology, shown in ***Map 5.1***, represents a distinct environment that presents its own set of safety challenges, informed by crash data analysis and community input. This focused approach ensures that safety efforts are both targeted and effective, addressing the unique dynamics of each area.


Map 5.1
ASPEN TYPOLOGIES
Aspen Colorado Safety Action Plan
Downtown Core
Main Street
Outer Aspen
City Boundary
82
HARMONY RD
STAGECOT
SILVER KING DR
CEMETERY LN
TIEHACK RD
PFISTER DR
MEADOWS RD
W FRANCIS ST
W SMUGGLER ST
W HALLAM ST
N 8TH ST
N 7TH ST
N 6TH ST
N 4TH ST
N 2ND ST
W MAIN ST
W HOPKINS AVE
CASTLE CREEK RD
MAROON CREEK RD
MOORE DR
CASTLE CREEK RD
N GARMISCH ST
N MILL ST
GIBSON AVE
PARK CIR
E MAIN ST
E HYMAN AVE
S GARMISCH ST
S MONARCH ST
S MILL ST
E DURANT AVE
S ORIGINAL ST
NEALE AVE
KING ST
E COOPER AVE
N ORIGINAL ST
N 6TH ST
N
0
0.5
1 MILES
Source: Esri, USDA FSA, Esri, NASA, NGA, USGS, FEMA, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Downtown Core

The Downtown Core typology encompasses the area bordered by East Main Street, South Original Street, East Durant Avenue, and South Aspen Street. This area was identified due to the high concentration of crashes, resulting in one death and eleven serious injuries, as well as the high density of pedestrian and vehicular traffic.

General Characteristics

The downtown core of Aspen has the highest volumes of pedestrian activity alongside high volumes of vehicular traffic and on-street parking. The area is the hub of Aspen, with a concentration of destinations, such as retail, restaurants and transit services.

Crash Analysis

The crash data highlights the Downtown Core as a significant hot spot for serious incidents, primarily due to high pedestrian activity, comprising both locals and tourists, interacting with motorized vehicles. In some areas there are conflicts between high pedestrian footfall and motor vehicle access. There is also a high volume of non-injury, property damage-only crashes due to the turnover of parking in the Downtown Core and tourist nature of town which brings in a large number of visitors on all modes (bike, pedestrian, transit, vehicle).

Community Engagement

Feedback from the community emphasized concerns about pedestrian safety, the need for better traffic management, and the complexity of navigating the downtown area. These concerns were particularly focused on the busy intersections and the interaction between pedestrians, cyclists, and vehicles.

Transit

The Downtown Core is a central hub for transit services, with several bus routes running through the area, including those operated by the Roaring Fork Transportation Authority (RFTA). This high frequency of transit vehicles helps alleviate traffic congestion but also adds complexity to the busy streetscape. The area's transit network provides crucial connections for both locals and tourists, linking key destinations such as retail areas, hotels, and recreational spots.

Main Street

The Main Street typology covers Main Street, including key intersections and areas identified as high-risk through crash analysis. Main Street serves as a major thoroughfare through Aspen, linking different parts of the city and facilitating both local, tourist and through traffic. Main Street is also designated as Colorado State Highway 82, and therefore has unique characteristics compared to other Aspen streets.

General Characteristics

Main Street runs through Aspen and is the main thoroughfare, with numerous lanes and wide crossing distances. The street carries the most traffic of any road in Aspen while also being the main route for transit. Either side of the street are residential, retail, and civic buildings.

Crash Analysis

Crashes along Main Street, especially in the West Main Street section between South Aspen Street and North 7th Street, have been linked to serious injuries. The analysis showed that high traffic volumes, long crossing distances, and numerous turning movements contribute to the risk of collisions. Main Street is also the widest street in Aspen, with five travel lanes along the majority, so it presents potential for and evidence of a larger number of rear-end and multiple-threat crash types. Main Street has numerous bus stops along it.

Community Engagement

Residents and visitors expressed concerns about the safety of crossing Main Street on foot or bike, especially near busy intersections and bus stops. Locations cited included Paepcke Bus Stop, Main and 8th bus stop and Main and 4th bus stop. There were calls for improved pedestrian infrastructure, such as better-marked crosswalks, traffic calming measures, and dedicated bike lanes to reduce conflicts between different road users.

Transit

Main Street is a primary route for transit in Aspen, with numerous bus stops located along its length, serving both local routes and regional connections through the Roaring Fork Transportation Authority (RFTA). As Colorado State Highway 82, it carries a high volume of transit vehicles, making it a critical artery for people traveling into and out of the city. This transit access is essential for connecting residents and visitors to key destinations across Aspen.

Outer Aspen

The Outer Aspen typology refers to the areas on the edges of Aspen, including State Highway 82 outside the urban Aspen area. These areas are characterized by higher-speed roads, fewer intersections, and a mix of local and through traffic, often leading to a different set of safety challenges.

General Characteristics

Outer Aspen is less dense, with connections to other cities and towns in the valley via Highway 82. Major destinations include ski resorts and the Aspen Airport. Highway 82 itself is wide with speeds ranging from 35 to 45 mph.

Crash Analysis

Outer Aspen, particularly along Highway 82, were identified as a major concern due to the number of crashes resulting in serious injury. High speeds, limited bicycle and pedestrian infrastructure, and the potential for vehicle conflicts at intersections and highway access points were significant factors contributing to these crashes.

Community Engagement

Community feedback highlighted concerns about the lack of safe pedestrian crossings, the dangers of merging onto or off the highway, and the need for better signaling and speed management. There was also concern about the interaction between local traffic and higher-speed vehicles traveling through these areas.

Transit

Transit services primarily run along State Highway 82, providing critical connections between Aspen and surrounding communities such as Carbondale and Glenwood Springs. While these services are vital for commuters and visitors, the higher speeds and fewer intersections along this corridor present unique challenges for safe and efficient transit operations. Transit stops are more spread out, and limited pedestrian infrastructure can make accessing these stops difficult.

SUMMARY OF STRATEGIES

Safe Systems Approach

The City of Aspen's Safety Action Plan strategies were developed based on the data collection, analysis, coordination, and community engagement efforts undertaken during the Plan process. The targeted strategies and action items are centered around the Safe System Approach principles as follows:

Safer People

This principle focuses on creating a safer culture by encouraging responsible behavior from all road users. Implementation techniques may include initiatives such as **High-Visibility Enforcement** to target dangerous driver behavior and **Targeted Training** to educate partners and professionals on fostering safer practices.

Safer Roads

Ensuring that roads are designed and maintained with safety in mind is key. This could involve **Safety Improvements' Implementation** through leveraging existing programs, establishing pilot programs, prioritizing enhancements along the High Injury Network (HIN) and near transit, updating design guidelines, and actively pursuing funding opportunities.

Safer Speeds

Managing vehicle speeds is critical for reducing the severity of crashes. Examples of implementing this principle include fostering a **target-speed setting approac**h, expanding the use of speed cameras, and establishing **Pedestrian Priority Zones** in areas with high pedestrian activity.

Safer Vehicles

Vehicle technology plays a vital role in preventing crashes. As fleet vehicles age out, replacing them with models equipped with **crash-prevention technology** is a key strategy. Additionally, partnering with technology vendors to install **intersection safety improvements**, such as near-miss detection technology, can further enhance safety.

Post-Crash Care

Rapid and effective response after a crash is essential for minimizing harm and preventing future incidents. A potential implementation technique is establishing a **multi-agency crash rapid response team** to evaluate factors such as engineering, behavior, vehicle technology, and land use to inform future safety improvements.

Recommendation Summary

Safety recommendations are split into those that are city-wide, and those that are typology and location specific. ***Table 5.1*** below summarizes all safety recommendations emerging from this safety action plan. A detailed discussion and additional specifics on each recommendation is included in the following section. ***Table 5.2*** summarizes safety recommendations near transit stops.

Recommendation Summary Map

The Recommendations Summary Map (***Map 5.1***) depicts the top locations where safety improvements are needed to address identified issues from the data analysis and public feedback, in addition to safety recommendations near transit stops. Data identified locations are priorities for future assessment leveraging countermeasures listed within respective typologies below. Other infrastructure recommendations correspond with recommendation reference numbers listed in ***Table 5.1*** and are described in greater detail in the following section.

Locations on the ***Map 5.2*** identified as data driven are priority areas identified through the crash analysis. Additional details on those locations are included in ***Table 5.3***.

Table 5.1 by Typology

REFERENCE	TITLE	TIME FRAME Short-term: 1-2 Years Medium-Term: 3-5 years Long-term: 5+ years	BRIEF DESCRIPTION	HOW WILL IT REDUCE CRASHES?
CW1 - Citywide	Review crash data collection, analysis and sharing	Short-term	Review current data collection and sharing practices between APD and City of Aspen. Develop data transfer process that minimizes risk of error when entering into City databases. Publish an annual safety report.	Timely and accurate data is essential to target safety remediation improvements.
CW2 - Citywide	Enhanced Data Analysis Tools	Short-term	Identify ways to better interpret and analyze crash data to take proactive safety action.	Better analytics can help predict safety hot spots and introduce remedial work before a serious crash occurs.
CW3 - Citywide	Targeted community engagement, marketing and dialogue.	Medium-term	Continuous outreach to the community, including targeted engagement for diverse groups such as residents, students, and tourists. Incorporates K-12 safety education and seasonal tourist campaigns.	Engaging the community and fostering long-term behavior changes will create a city-wide safety-conscious culture, reducing crashes and promoting safer travel practices across all groups.
CW4 - Citywide	Regular Safety Audits	Medium-term	Implement a program for regular safety audits at key intersections and high-risk areas.	Identifies and mitigates risks in critical areas before they result in accidents.
CW5 - Citywide	Review city code and design standards with regards to intersections	Medium-term	Assess city code and design standards for intersection design, sight lines, and all-way stops.	Updates to the code can ensure intersections are safer, reducing potential conflict points for all road users.

REFERENCE	TITLE	TIME FRAME Short-term: 1-2 Years Medium-Term: 3-5 years Long-term: 5+ years	BRIEF DESCRIPTION	HOW WILL IT REDUCE CRASHES?
CW6 - Citywide	Update the Active Transportation Master Plan	Long-term	Develop a comprehensive plan to optimize pedestrian, cyclist, and transit mobility. Last Bicycle and Pedestrian Plan was published in 2016.	Updating the active transportation plan will create safer, more efficient routes, reducing the potential for conflicts and crashes.
D1 - Downtown	Improvements for Intersection Visibility and Pedestrian Protection	Short-term	Enhance visibility at intersections through daylighting, bulbouts, and better signage.	Improved visibility reduces the risk of accidents at intersections, particularly for pedestrians.
D2 - Downtown	Implement gateway treatments to enhance pedestrian priority.	Medium-term	Install gateway treatments to signify entry into pedestrian-prioritized zones.	Clearly defined pedestrian zones slow traffic and reduce the likelihood of pedestrian-vehicle conflicts.
D3 - Downtown	Extending Pedestrianization in Downtown Core	Medium-term	Expand pedestrian-only zones and enhance public spaces in downtown Aspen.	Reducing or discouraging vehicle access in high-traffic pedestrian areas minimizes the potential for accidents.
D4 - Downtown	Improve safe access to and from Hyman Ave and Mill Street Bus Stop (ID 163)	Medium-term	This study supports the already assigned improvements for this bus stop in 2026.	There were three crashes that involved pedestrians and resulted in death or injury within one block of the Hyman Ave and Mill Street Bus Stop. Improving safe access aims to mitigate these crashes.
M1 – Main Street	Upgrade Crossings	Short-term	Upgrade critical crossings on Main Street with signalized pedestrian crossings. The number of lanes and volume of traffic on Main St warrant a more enhanced pedestrian crossing than a striped crosswalk or single RRFB. Upgrade RRFB crossings with the addition of a median island to break crossing into one vehicle direction at a time, or upgrade to Pedestrian Hybrid Beacon or Pedestrian Signal.	Signalized crossings improve pedestrian safety at high-risk locations, reducing crash likelihood.
M2 – Main Street	Complete Streets Study of Main Street	Medium-term	Conduct a complete streets study for Main Street for holistic modal enhancements.	A complete streets approach ensures all users are considered, reducing conflict and improving safety for vulnerable users.

REFERENCE	TITLE	TIME FRAME Short-term: 1-2 Years Medium-Term: 3-5 years Long-term: 5+ years	BRIEF DESCRIPTION	HOW WILL IT REDUCE CRASHES?
M3 – Main Street	Improve safe access to and from transit services	Medium-term	Improve safe access at these bus stops by implementing raised crosswalks across Main Street at Galena Street and also across Main Street at Mill Street to improve crossing safety and pedestrian visibility.	There were four crashes that involved pedestrians and resulted in injury within one block of these bus stops. Improving safe access aims to mitigate these crashes.
M4 – Main Street	Restrict access to 7th and 8th Streets from Main Street.	Long-term	Reducing conflict points between the heavily used trail and vehicles in the area, such as limiting vehicle access across the trail at 7th and 8th, would not only enhance safety but also improve access to the bus stops and the WE-cycle station on both sides of the road.	Reducing vehicle-pedestrian and vehicle-bicyclist interactions in these areas will decrease the likelihood of crashes. People driving from Main Street to/from 7th and 8th are traveling from a relatively high-speed and high-trafficked street onto a much more residential street, while crossing a bike path with limited visibility.
O1 - Outskirts	Variable Message Signs	Short-term	Install VMS to provide real-time safety information to drivers.	Real-time alerts help drivers adjust their behavior in response to current conditions, reducing crash risks.
O2 - Outskirts	Review Crossing Points and Improve Wayfinding	Medium-term	Evaluate and enhance crossing points on Highway 82.	Improved crossings will make it safer for pedestrians and cyclists to navigate across busy highways. Enhanced or added wayfinding on existing paths and undercrossings increases compliance to cross Highway 82 safely.
O3 - Outskirts	Reduce speeds	Medium-term	Lower speed limits on key sections of Highway 82 near Aspen.	Reducing speeds decreases the severity of crashes and allows more time for drivers to react to potential hazards.
O4 - Outskirts	Automated Enforcement	Long-term	Implement speed and red-light cameras on Highway 82.	Automated enforcement reduces the likelihood of speeding and red-light violations, leading to fewer crashes.

Table 5.2 Summary of Safety Recommendations near Transit Stops

CRASH LOCATION	BUS STOP(S) WITHIN 1 BLOCK	STOP ID	PEDESTRIAN INJURY OR DEATH	DESCRIPTION	RECOMMENDATIONS
T1 - Main and 2nd, Main and 1st	Main Street and 2nd	129, 66	2	Lack of pedestrian infrastructure between intersections, leading to mid-block crossings.	Add mid-block pedestrian crossings between 1st and 2nd Streets. Consider pedestrian refuges or dedicated pedestrian signals to improve safety.
T2 - Hyman Ave and Mill Street Bus Stop	Hyman Ave and Mill Street Bus Stop	163	3	Busy pedestrian area near bus stop with crashes involving pedestrians.	Improve safe access to the bus stop by enhancing pedestrian infrastructure as part of the planned 2026 improvements.
T3 - Main Street at Galena and Mill Streets	Main Street at Galena and Mill Streets	67, 245	4	High crash rate involving pedestrians at busy intersections near bus stops.	Install raised crosswalks and improve pedestrian visibility. Coordinate traffic signals to allow more time for pedestrian crossings when buses are expected to stop.
T4 - Hallam (82) at 7th and 8th Streets	Main Street at 7th and 8th Streets	52, 53	N/A	Conflict between vehicles and heavily used trail, creating potential risks for pedestrians and cyclists.	Restrict vehicle access across the trail at 7th and 8th Streets to reduce conflicts, improve safety, and enhance access to bus stops and the WE-cycle station.

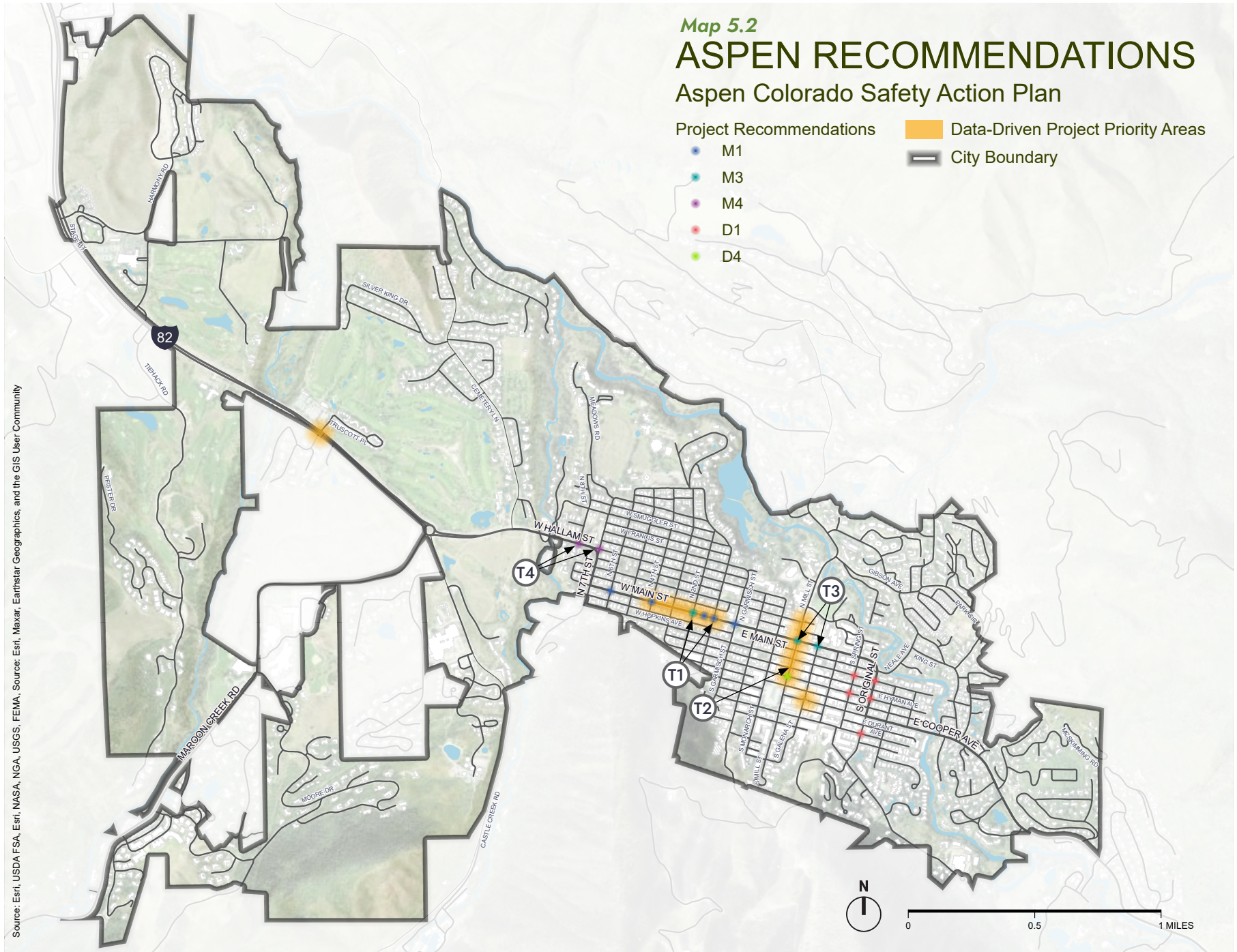

Map 5.2
ASPEN RECOMMENDATIONS
Aspen Colorado Safety Action Plan
Project Recommendations
M1
M3
M4
D1
D4
Data-Driven Project Priority Areas
City Boundary
T1
T2
T3
T4
W HALLAM ST
N 7TH ST
W MAIN ST
E MAIN ST
S ORIGINAL ST
E COOPER AVE
MAROON CREEK RD
82
SILVER KING DR
TIEHACK RD
CEMETERY LN
TRUSCOTT PL
PRESTER DR
MEADOWS RD
CASTLE CREEK RD
MOORE DR
N
0
0.5
1 MILES
Source: Esri, USDA FSA, Esri, NASA, NGA, USGS, FEMA, Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Table 5.3 Data Driven Priority Areas

PRIORITY	LOCATION	DESCRIPTION	SAFETY ISSUES	CRASHES	PUBLIC ENGAGEMENT
1	Main Street from 1st Street to 4th Street	Four intersections along Main Street (1st Street, 2nd Street, 3rd Street and 4th Street).	Intersections in locations with high pedestrian footfall and high motorized traffic. There are pedestrian destinations, including bus stops, either side of Main Street. Very wide crossing distances for pedestrians. Main Street is the a main east/west connecting road in Aspen.	Seven crashes resulting in injury over the past five years. A mix of pedestrian-motorist and motorist-motorist crashes. Main Street and 4th Street account for four of these crashes resulting in injury.	Main Street intersections mentioned multiple times during outreach, specifically the wide crossing distances and fast-moving traffic.
2	Mill Street from Bleeker Street to Hyman Avenue	Four intersections along Mill Street (Bleeker Street, Main Street, Hopkins Avenue and Hyman Avenue).	Intersections in locations with high pedestrian footfall and high motorized traffic. Wide crossing distances, reduced sightlines/ visibility due to parking and lack of pedestrian refuges or bulb-outs. Mill Street is a main north/south connecting road in Aspen.	Five pedestrian - motorist crashes resulting in injury to pedestrian over the past five years. Main Street and Mill Street account for three of these crashes.	Mill Street intersections mentioned during outreach, specifically Main and Mill.
3	Galena Avenue and Cooper Avenue	Intersection of Galena Avenue and Cooper Avenue	Location where the pedestrianized area of Cooper Avenue ends and opens to the trafficked roadway. Drivers may not be anticipating pedestrians crossing, and pedestrians may not be anticipating traffic.	One pedestrian death during the past five years.	Numerous comments to a general sense of discomfort around downtown.
4	E Hopkins Ave and S Aspen Street	Intersection of E Hopkins Ave and S Aspen Street	This intersection is frequently used by pedestrians, cyclists, and drivers, and it is located on a transit route. The topography of the roadway creates potential hazards, as vehicles may not have sufficient stopping distance when traveling downhill, particularly in icy or snowy conditions. Additionally, the intersection is adjacent to Paepcke Park, increasing the likelihood of families crossing the street to access the park. Parked cars can impede sightlines of crossing pedestrians. Paeocke Park also houses a transit hub.	This location was identified during public outreach as a site where near-misses occur.	This intersection was one of the most frequently cited locations in our engagement process, with many participants reporting unsafe or uncomfortable experiences when traveling through the area.

DETAILED SAFETY STRATEGIES

This section provides additional detail on summary recommendations contained in ***Table 5.1*** and ***Map 5.1***. It is organized into city-wide strategies and location-specific (typology-based) recommendations that address both general safety concerns and specific high-risk areas. The city-wide strategies focus on broad initiatives such as enhancing data collection and analysis, conducting regular safety audits, and fostering community engagement, while the location-specific recommendations provide targeted interventions for high-traffic zones like the downtown core and Main Street. Together, these strategies aim to create a safer, more accessible Aspen for all residents and visitors.

City-wide Safety Recommendations

The city-wide safety strategies outlined here provide a broad, systemic approach to improving transportation safety across Aspen. These recommendations are designed to address city-wide issues and are not tied to specific locations. They emphasize collaboration between city departments, external partners, and the community to create a unified approach to transportation safety. From improving crash data collection to fostering a culture of safety through public engagement, these strategies aim to lay the foundation for long-term safety improvements that benefit all road users, including drivers, cyclists, and pedestrians. By implementing these strategies, Aspen can address safety concerns at a holistic level, ensuring that interventions are timely, data-driven, and responsive to the community's needs.

RECOMMENDATION CW1:
Review crash data collection, analysis and sharing.

Short-term

Objective: Ensure timely and accurate crash data collection and analysis for effective safety remediation.

Issue: The current crash data collection and sharing processes may benefit from better alignment across departments to enhance data consistency and support timely decision-making, while maintaining collaborative interdepartmental relationships.

Description: A review of the crash data collection process between the Aspen Police Department and the City of Aspen is necessary to align systems and minimize data errors. Having accurate, timely data enables the city to target safety interventions more effectively, helping to prevent serious incidents by identifying trends and hot spots.

Recommendations:

- Review the crash data transfer processes to reduce the risk of error when entering data into city databases.
- Streamline communication between the Aspen Police Department and the City of Aspen for data sharing.
- Invest in technology to automate and simplify data entry, ensuring accuracy and timeliness.
- Publish an annual safety report showing crash patterns alongside work done to improve safety.

Case Study/Resource: FHWA cites Utah DOT as a case study in how to share safety data among different departments[1]

[1] *https://highways.fhwa.dot.gov/sites/fhwa.dot.gov/files/migrate/noteworthy/utah_case_studyFinal.pdf*

RECOMMENDATION CW2:
Enhanced Data Analysis Tools

Short-term

Objective: Use advanced tools to predict and address crash hot spots before serious incidents occur.

Issue: Current data analytics tools may not fully enable the city to proactively address emerging safety issues.

Description: By investing in enhanced data analytics tools, the City of Aspen can gain deeper insights into crash data, allowing for predictive analysis and timely interventions. This approach helps in taking proactive measures to improve safety and prevent accidents.

Recommendations:

- Invest in tools that utilize predictive analytics, real-time data, and machine learning models.
- Train staff to interpret crash data and take preemptive action based on findings.
- Use advanced analytics to map and predict high-risk locations and implement safety improvements before crashes occur.

Case Study/Resource: FHWA's case study[2] on using the usRAP[3] system to improve safety.

[2] *https://highways.dot.gov/media/11016*
[3] *http://www.usrap.org/*
[4] *https://www.bikewalkmontana.org/education*
[5] *https://www.saferoutespartnership.org/sites/default/files/resource_files/buildingblocks_final.pdf*
[6] *https://www.nj.gov/oag/newsreleases19/pr20190521b.html*

RECOMMENDATION CW3:
Comprehensive Community Safety Engagement + Education Program

Medium-term

Objective: Foster a culture of safety through a comprehensive and inclusive engagement program targeting Aspen's diverse communities—residents, students, and visitors—by promoting ongoing dialogue, education, and tailored safety campaigns.

Issue: A lack of consistent and targeted community engagement, early education, and tourist-specific outreach may hinder the development of a city-wide culture of safety in Aspen, contributing to unsafe behaviors among various groups, including residents, students, and visitors.

Description: A well-rounded safety engagement program will be instrumental in shaping safe travel behaviors across Aspen. This initiative should include continual dialogue and collaboration with community leaders, organizations, and local agencies to support existing safety programs while creating new, targeted outreach efforts. Specific audiences, such as residents, Spanish-speakers, students, and tourists, will benefit from tailored marketing, education, and campaigns. The program should also focus on long-term cultural change by incorporating multimodal safety education for K-12 students and seasonal safety campaigns for tourists, especially during Aspen's peak travel seasons. Ongoing evaluation and adaptation of the outreach strategies will ensure the program remains responsive to community feedback and evolving needs.

Recommendations:

- Collaborate with local organizations and community leaders: Support and enhance existing safety programs, and foster community partnerships to engage Aspen's diverse population.
- Develop a K-12 multimodal safety curriculum: Educate the next generation on pedestrian, cyclist, and driving safety through school programs and community events.
- Implement tourist-specific safety campaigns: Create seasonal campaigns to educate visitors on safe travel practices, emphasizing winter driving and summer pedestrian safety.
- Multilingual and targeted marketing: Provide materials tailored to different groups, such as tourists, Spanish-speaking residents, and commuters, using a variety of media and communication methods.
- Ongoing community dialogue: Continuously adapt the outreach based on feedback and emerging safety trends.

Case Studies/Resources:

- Walk Bike Montana's targeted safety outreach program for diverse audiences[4].
- Safe Routes to School multimodal safety curriculum[5].
- New Jersey's "101 Days of Summer" Traffic Safety Campaign[6].

RECOMMENDATION CW4:
Regular Safety Audits

Medium-term

Objective: Conduct regular safety audits to identify and mitigate risks before accidents occur.

Issue: Lack of consistent and proactive safety assessments at high-risk intersections may allow hazards to go unnoticed.

Description: Implementing a program for regular safety audits across key intersections and high-risk areas will help identify potential hazards early. These audits should involve collaboration between departments and community input to ensure comprehensive assessments.

Recommendations:

- Schedule regular safety audits for high-risk areas, including key intersections.
- Locations to consider: near Aspen schools and public parks.
- Engage multiple city departments and community members in audit processes to ensure thorough safety evaluations.
- Address any identified issues promptly with safety enhancements.

Case Study/Resource: Refer to the Federal Highway Administration's (FHWA) road safety audit program.

RECOMMENDATION CW5:
Review city code with regards to intersections

Medium-term

Objective: Improve intersection safety by updating city codes and design standards.

Issue: Current intersection design standards may not provide optimal visibility and safety for all road users.

Description: Review city code specific to intersections. Many intersections in the City have different sight-lines which can reduce visibility for all road users. This is especially impactful for vulnerable road users who may need to walk into the road to check whether there is any on-coming traffic.

City code review could include:

- Standardize intersection sight-lines,
- Revise requirements for all-way-stops,
- Standardize corner radius,
- Identify updates to intersection designs, such as incorporating MUTCD, PROWAG, and FHWA/AASHTO guidance.

Case Study/Resource: MUTCD, PROWAG, and FHWA/AASHTO guidance.

RECOMMENDATION CW6:
Update the Aspen Active Transportation Master Plan

Long-term

Objective: Develop a comprehensive plan to enhance pedestrian priority and optimize transportation routes.

Issue: Lack of a long-term plan to support active transportation mobility and safety in the downtown core.

Description: A comprehensive Active Transportation Masterplan is essential for addressing the various transportation challenges in Aspen. The previous Bicycle and Pedestrian Masterplan was published in 2017, however since that time a new mobility landscape has emerged including eScooters and eBikes, as well as a nationwide trend to higher deaths and injuries to vulnerable road users. This plan should focus on improving pedestrian safety, reducing vehicle speeds, and optimizing transit and cycling routes to create a safer, more efficient downtown area.

Recommendations:

- Pedestrian Priority: Plan to expand pedestrian zones, improve crosswalks, and implement traffic-calming measures.
- Speed Management: Plan to introduce lower speed limits, speed humps, and increased enforcement.

- Cyclist Infrastructure: Plan to develop protected bike lanes, bike boxes, and clear signage for cyclists.
- Public Transit Optimization: Plan to improve access to transit.

Case Studies/Resources: San Francisco's Better Streets Plan[7].

The **Federal Highway Administration's (FHWA) Safety Countermeasure Clearinghouse** is an online resource that provides transportation professionals with detailed information about proven safety strategies to reduce crashes and enhance roadway safety. These countermeasures include engineering, enforcement, education, and emergency response strategies tailored to specific safety challenges. Examples of countermeasures include traffic calming measures like speed humps and roundabouts, enhanced crosswalks with flashing beacons or pedestrian signals, and roadway design improvements like protected bike lanes or medians.

For our project, we have selected countermeasures that best suit the conditions of each of the identified typologies—**Downtown Core** (*Table 5.4*), **Main Street** (*Table 5.5*), and **Outer Aspen** (*Table 5.6*)—to ensure the most effective safety improvements based on the unique characteristics of these areas. This tailored approach optimizes safety benefits for all road users.

In this context, two key metrics are used to evaluate the effectiveness of safety countermeasures: **Crash Reduction Factor (CRF)** and **Crash Modification Factor (CMF)**.

- **CRF (Crash Reduction Factor)**: CRF is a percentage value that indicates the expected reduction in crashes after implementing a safety measure. For example, a CRF of 0.681 for an all-way stop control means it is expected to reduce crashes by 68.1%. CRF helps practitioners estimate the crash reduction impact of a specific treatment based on historical data.
- **CMF (Crash Modification Factor)**: CMF is a numerical multiplier used to estimate how a safety countermeasure will modify the expected number of crashes. A CMF of less than 1.0 indicates a reduction in crashes, while a CMF greater than 1.0 suggests an increase. For example, a CMF of 0.36 for improved bike lane protection means it is expected to reduce bicycle-related crashes by 64% (1 - 0.36 = 0.64). CMFs are often linked to specific countermeasures in the FHWA CMF Clearinghouse using a unique ID number for reference.

Both **CRF** and **CMF** serve as valuable tools to assess the potential impact of selected countermeasures within our typologies, helping to ensure data-driven decisions that maximize crash reduction and improve safety outcomes.

[7] *https://sfplanning.org/resource/better-streets-plan*

Downtown Core Safety Recommendations

The Downtown Core is one of Aspen's most vibrant and heavily trafficked areas, which presents unique safety challenges for pedestrians, cyclists, and drivers. This section focuses on strategies that are specifically tailored to the safety needs of this high-density urban area. These recommendations aim to enhance pedestrian priority, improve visibility at intersections, standardize crosswalk designs, and create a safer and more enjoyable environment for all users. Through short- and long-term measures, including infrastructure changes and targeted safety campaigns, these strategies will help reduce conflicts between different modes of transportation and foster a safer downtown experience. By prioritizing both safety and mobility, the recommendations seek to ensure that Aspen's downtown remains accessible, vibrant, and safe for residents, visitors, and businesses alike.

Table 5.4 Downtown Core Countermeasure Toolkit

COUNTERMEASURE	CRF	TYPE OF CRASH	CMF ID
All way stop control	0.681	All Crashes	CMF 3128
Convert angle parking to parallel parking	0.65	All Crashes	163
Implement transit lane priority (at transit-serviced locations)	0.806	All Crashes	7274
Improve bike lane protection	0.36	Bicycle Crashes	CMF 11301
Install Bicycle Boulevard	0.63	Bicycle Crashes	CMF 3092
Install traffic signal	0.44	All Crashes	CMF 325
Lane narrowing	0.58	All Crashes	CMF 7827
Lighting	0.581	All Crashes	11027
Lower posted speed	0.8273	K (fatal), A (serious injury)	11291
Presence of far-side transit stop location (transit-related crashes)	0.55	All Crashes	2080
Restrict left or right turn (transit-related crashes)	0.72	All Crashes	2084
Roundabouts	0.512	Injury Crashes	CMF 4870
Speed feedback signs	0.05	All Crashes	CMF 6885
Traffic calming	0.11	Injury Crashes	CMF 586

RECOMMENDATION D1:
Improvements for Intersection Visibility and Pedestrian Protection

Short-term

Objective: Enhance visibility and safety at intersections.

Issue: Poor visibility due to parking, vegetation, and wide turning radii and increased crash risks at poorly visible intersections.

Description: Intersections in the Downtown Core are often hindered by poor visibility due to street-side parking, vegetation, and wide turning radii. These factors create dangerous conditions where pedestrians are not visible to drivers until they are already in the road, increasing the likelihood of crashes.

Recommendations:

- *Standardize curb extensions and parking setbacks at downtown intersections:* Over the past years, the City has been modifying intersections in the core to include curb extensions at a number of locations. Implementing this across the core at all intersections will shorten pedestrian crossing distance, and improve visibility between pedestrians, cyclists, and drivers. Implementing a standard parking setback of 20-30' behind crosswalks on all intersection legs will create clear sight lines.

  Possible locations for implementation:

  - Hyman Ave/Spring St
  - Hopkins Ave/Spring St
  - Hopkins Ave/Original St
  - Hyman Ave/Original St
  - Durant Ave/Original St

- Increased Daylighting: Expand the no-parking zones at intersections to create better sightlines for both drivers and pedestrians. This "daylighting" strategy ensures that parked vehicles do not obstruct the view at crosswalks. Best practice is to daylight 20-30' behind the crosswalk to increase pedestrian visibility and that of the intersecting street.

- Curb Extensions and Pedestrian Refuges: Introduce curb extensions at intersections to shorten the crossing distance for pedestrians and to slow down vehicles making turns. In high-traffic areas with adequate roadway width, pedestrian refuges in the middle of the road can provide a safe space for crossing in two stages while also providing traffic calming benefits.

- Add (or enhance) RRFBs to existing uncontrolled crossings: Add supplementary advanced RRFB assembly to existing crossings with low visibility, such as on North Mill St near Clark's Market, and consider adding RRFBs near Rubey Park transit hub.

- Improved Signage: Continue upgrading signage at intersections to warn drivers of pedestrian crossings ahead, especially in areas with limited visibility or high pedestrian traffic. Ensure that signage is clear, well-placed, and compliant with current best practices. In addition to traditional signs, consider the use of dynamic signage that activates when pedestrians are present, particularly at high-traffic or high-risk intersections.

- Pavement Markings: Since the city already re-stripes annually using retroreflective paint and has implemented yield arrows where applicable, further enhancements could focus on additional visual and tactile cues to increase driver awareness. Options could include:

- High-Contrast Pavement Markings: Utilize bold or patterned crosswalk designs (such as zebra-style stripes or colored crossings) to increase visibility further.

- Textured or Raised Markings: Implement textured or raised pavement markings to provide a tactile warning for drivers, especially on approaches to high-risk pedestrian areas. These can be useful in slowing down vehicles and improving alertness.

- Illuminated Pavement Markings: In areas with significant crash histories or nighttime safety concerns, consider installing solar-powered or LED-embedded crosswalks that illuminate as pedestrians enter the crosswalk. This would provide additional visibility during adverse weather conditions or low-light situations.
- Quick-build pilot program for bulb-outs: Develop a pilot program for quick-build or temporary bulb-outs, which can be tested before permanent installations are completed (example in ***Figure 5.1***). This program could also be a basis for seeking grant funding and building support for long-term improvements. While there has been resistance to temporary measures due to their perceived effort and impact, a well-designed pilot could demonstrate the benefits of bulb-outs and gather public and stakeholder support until permanent installations can be done. This could serve as an opportunity to showcase incremental improvements and secure future funding.

Figure 5.1 Quick-build Bulb-Outs

RECOMMENDATION D2: Implement Gateway Treatments to Enhance Pedestrian Priority

Medium-term

Objective: Signal transitions to pedestrian-prioritized zones.

Issue: People driving through downtown without consideration that they have entered an area with more exposure to people walking and biking.

Description: Gateway treatments are critical in creating a visual and physical cue for drivers that they are entering a pedestrian-prioritized area. These treatments can include signage, changes in road surface, and physical infrastructure like bulbouts and raised crosswalks, which signal a transition from a vehicle-dominated space to a pedestrian-friendly zone.

Recommendations:

- Signage and Surface Treatments: Install clear signage at all major entry points to the Downtown Core, alerting drivers to the pedestrian priority. Surface treatments such as textured pavements, different colored road materials, or raised crosswalks (***Figure 5.2***) can further reinforce this message.
- Bulbouts and Narrowed Lanes: Implement bulbouts at intersections to narrow the driving lanes, which naturally slows down vehicles and increases pedestrian visibility. Temporary bulbouts can be created using planters or bollards as a trial before committing to permanent infrastructure.

Case Studies/Resources: New York City Street Design Manual[8], NACTO Street Design Elements: Gateway[9], FHWA Intersection Safety Strategies[10], NACTO STAR Guide[11].

Figure 5.2 Raised Crosswalk - New York City Street Design Manual

[8] *https://www.nycstreetdesign.info/geometry/raised-crosswalk*
[9] *https://nacto.org/publication/urban-street-design-guide/street-design-elements/curb-extensions/gateway/*
[10] *https://highways.dot.gov/safety/intersection-safety*
[11] *https://globaldesigningcities.org/wp-content/uploads/2022/09/iRAP-Star-Ratings-of-the-GSDG.pdf*

RECOMMENDATION D3:
Extending Pedestrianization in Downtown Core

Medium-term

Objective: Expand pedestrian zones to enhance safety and urban experience.

Issue: Pedestrian zones end abruptly, drivers could be made more aware of the prioritization of pedestrians with extended surface treatments.

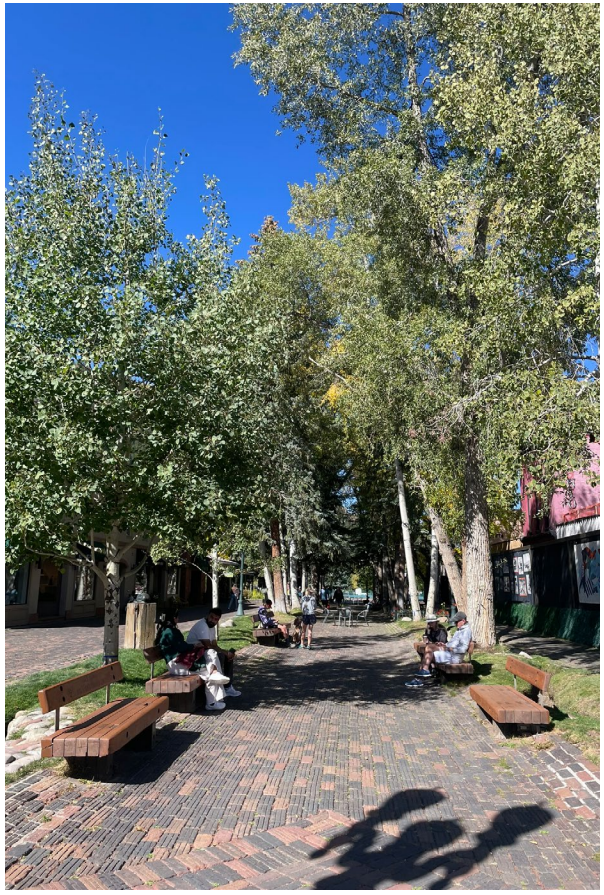
Description: Expanding pedestrian-only zones in the Downtown Core can significantly enhance pedestrian safety and the overall urban experience. Areas such as Galena Street and Cooper Avenue, near Paradise Bakery, and Mill Street and Hyman Avenue, near the Wheeler Opera House, are prime candidates for pedestrianization due to their heavy foot traffic to and from the Aspen pedestrian mall and the resulting current conflicts between pedestrians and vehicles. Similarly, the intersection of Durant Avenue and Hunter Street near Gondola Plaza is a good candidate for improved pedestrianization. All these streets listed are transit corridors, and transit-only access could also be considered at these locations.

Recommendations:

- Surface Treatment Extensions: Extend the pedestrianized areas by continuing a pedestrian friendly surface treatment, such as those on Hyman Avenue. This can create a continuous pedestrian network where foot traffic is prioritized, and vehicles are either restricted or slowed significantly through horizontal and vertical design elements. Surface treatments should adhere to PROWAG guidance.
- Vehicle Access Management: Implement measures such as retractable bollards or time-of-day restrictions to manage vehicle access in these pedestrian zones. This ensures that service vehicles can access the area during off-peak hours, while pedestrians dominate the space during peak times.
- Public Space Enhancements: Invest in public space enhancements such as seating, greenery, public art, and wayfinding signs. These improvements (example shown in ***Figure 5.3***) can make the pedestrian zones more attractive and user-friendly, encouraging more foot traffic and reducing reliance on vehicles.

Case Studies/Resources: Similar successful pedestrianization projects in comparable cities.

Figure 5.3 Public Space Enhancements



RECOMMENDATION D4:
Improve Safe Access at Hyman Ave and Mill Street Bus Stop

Medium-term

Objective: Enhance safe access to and from Hyman Avenue and Mill Street Bus Stop and formalize the Galena shuttle stop within the plaza to boost ridership and connectivity.

Issue: A history of pedestrian crashes within one block of the bus stop and the lack of formal infrastructure for the Galena shuttle stop lead to safety concerns.

Description: The improvements target enhancing pedestrian safety around the Hyman Ave and Mill Street Bus Stop (ID 163), where three pedestrian crashes resulting in death or injury have occurred. The goal is to mitigate these incidents through better access to and from the bus stop. The planned formalization of the Galena shuttle stop will further increase ridership and improve transit connectivity between the parking garage and the downtown core.

The project will be funded with a $150,000 transfer from the Transportation Fund in 2026. The project scope includes installing shuttle stop amenities such as a shelter, improved mobility options, and wayfinding infrastructure.

Recommendations:

Pedestrian Access Enhancements:

- Crosswalk Marking: Paint the full width of the curve to clearly designate it as the pedestrian crosswalk. Consider raising the intersection to slow traffic and make the crosswalk more prominent.
- Lighting and Signage: Improve lighting along the crosswalk and install clear signage to alert both pedestrians and drivers about the designated crossing area. Add tactile warnings for accessibility and ensure the crosswalk is clearly visible in all conditions.

Formalization of Shuttle Stop:

- Build a formal Galena shuttle stop within the plaza, complete with shelter, seating, and real-time transit information. The formalized stop will enhance the user experience and encourage higher shuttle ridership.

Crash Mitigation Measures:

- Implement specific safety measures such as pedestrian signal upgrades, advanced stop bars for vehicles, and clear signage warning drivers about pedestrian activity near the bus stop.

Transit and Wayfinding Upgrades:

- Install wayfinding signage that helps pedestrians and cyclists navigate between the bus stop, shuttle, and nearby destinations. These upgrades (example in ***Figure 5.4***) will make it easier for people to move safely and efficiently within the area.

Figure 5.4 Transit and Wayfinding Upgrade Example - Town of Estes Park

Main Street Safety Recommendations

Main Street, which serves as a critical corridor for both local and regional traffic, presents unique challenges for pedestrian and cyclist safety in Aspen. With high traffic volumes and a wide, five-lane cross-section, Main Street has become a significant barrier to safe pedestrian and cyclist movement. The recommendations in this section focus on improving pedestrian crossings, managing vehicle access, and enhancing overall safety along this important corridor. These strategies aim to reduce conflicts between different modes of travel, enhance transit access, and create a more walkable and bike-friendly environment. By addressing both short-term improvements and long-term structural changes, these recommendations will help transform Main Street into a safer and more accessible thoroughfare for all road users.

Table 5.5 Main Street Countermeasure Toolkit

COUNTERMEASURE	CRF	TYPE OF CRASH	CMF ID
All way stop control	0.681	All Crashes	CMF 3128
Appropriately Timed Yellow Change Intervals	0.36	Rear end	CMF 4221
Centerline rumble strips	0.36	Run Off Road Crashes	CMF 10448
Edgeline/shoulder rumble strips	0.32	Run Off Road Crashes	CMF 10449
Flashing Yellow Arrow (FYA) signals	0.365	Left Turn Crashes	CMF 4175
Implement transit lane priority (at transit-serviced locations)	0.806	Left Turn Crashes	7274
Improve bike lane protection	0.36	Bicycle Crashes	CMF 11301
Install traffic signal	0.44	All Crashes	CMF 325
Lane narrowing	0.58	All Crashes	CMF 7827
Leading ped/bike interval	0.13	All Crashes	CMF 9916
Lighting	0.581	All Crashes	11027
Median	0.61	All Crashes	CMF 21
Presence of exclusive left or right turn on either approach (transit-serviced locations)	0.96	All Crashes	2091
Protected-only left/right turns	0.666	Left Turn Crashes	CMF 11162
Reduce speed limit to 5 mph below engineering recommendation	0.4	All Crashes	CMF 10249
Reflective Signal backplates	0.15	All Crashes	CMF 1410
Refuge island	0.09	All Crashes	CMF 9121
Restrict left or right turn (transit-related crashes)	0.72	All Crashes	2084
Road diet	0.64	Injury Crashes	CMF 11129
Roundabouts	0.512	Injury Crashes	CMF 4870
Speed feedback signs	0.05	All Crashes	CMF 6885
Speed safety cameras	0.22	All Crashes	CMF 8183
Traffic calming	0.11	Injury Crashes	CMF 586
Transverse rumble strips	0.25	Angle Crashes	CMF 9049
Wider edge lines	0.365	Injury Crashes	CMF 4737

RECOMMENDATION M1: Upgrade Main Street Crossings for Pedestrians

Short-term

Objective: Make crossing Main Street safer for pedestrians.

Issue: Crossing Main Street/SH 82 is a significant barrier for pedestrians and cyclists in Aspen. The five-lane cross-section increases the risk of multiple-threat crashes and rear-end collisions. Additionally, safe access to nearby bus stops, such as the 6th Street bus stop, is a concern due to the lack of designated crossing infrastructure. Ensuring that pedestrians and transit users can safely access these stops is crucial for the city's transportation network

Description: There are existing Rectangular Rapid Flashing Beacon (RRFB) crossings at Main and 4th Street and Main and Garmisch Street, near the Paepcke Park bus stops. However, the length of crossings and traffic volumes on Main Street warrant more robust pedestrian safety solutions. Upgrading these crossings to Pedestrian Hybrid Beacons (PHB) or Pedestrian Signals is recommended to improve safety. While Aspen has no current PHBs, their implementation should be accompanied by an education campaign to familiarize both drivers and pedestrians with their use.

Additionally, improving access to key transit stops—especially the 6th Street bus stop—where access is currently challenging due to a lack of RRFBs or other crossing devices is critical for pedestrian and transit user safety.

Recommendations:

Added and Enhanced Pedestrian Crossings for Main Street:

- The combination of high traffic volumes and the number of lanes on Main Street means more than a standard striped crosswalk or single RRFB is necessary for pedestrian safety at key locations.
- At transit stops and high-pedestrian traffic areas, install RRFBs with a median island. This allows pedestrians to cross one direction of traffic at a time.
- Where medians are not possible, install Pedestrian Hybrid Beacons (PHBs) or Pedestrian Signals at key crossings, particularly near bus stops and high-crash areas, to ensure pedestrian safety across the full width of Main Street.

Possible locations for implementation:

- Main St between 1st and 2nd Streets: Consider adding an RRFB or PHB to improve mid-block pedestrian access between these busy areas, particularly given the proximity to the 6th Street bus stop and transit access needs.
- Main St/4th St and Main/Garmisch: Add a median island or upgrade the existing RRFBs to PHBs or Pedestrian Signals to improve pedestrian safety near the Paepcke Park bus stops.
- Main St/6th St: Install an RRFB or PHB to improve pedestrian access to the 6th Street bus stop, which currently lacks safe crossing infrastructure.

Signalized Crossings and Intersection Modifications:

- 4th and Main Street: Consider restricting westbound left turns to create space for a pedestrian refuge island on the east leg, with an added RRFB assembly to connect to the existing pedestrian path toward the music tent. Alternatively, upgrade the crossing to a PHB or Pedestrian Signal.
- 1st and Main Street: Given that this is close to an existing RRFB at 2nd Street, re-evaluate the need for an additional crossing. If needed, an RRFB with a refuge island or a PHB/pedestrian signal could be added. However, prioritize locations with higher pedestrian and transit traffic (e.g., 2nd Street).

Leading Pedestrian Intervals (LPIs):

- Maintain the existing LPIs at signalized intersections along Main Street. If feedback indicates that additional time is needed for pedestrian crossings during peak hours, consider extending the LPIs from 2 seconds to 3-5 seconds, depending on pedestrian traffic. However, further analysis is

recommended before dedicating resources to these changes, as current signal timing (typically 3 seconds) appears to function well without significant safety concerns.

Innovative Solutions:

- Consider implementing pedestrian scrambles at busy signalized intersections, such as Main and Mill Street, where pedestrian priority already exists, to allow pedestrians to cross in all directions at once. This reduces the potential for vehicle-pedestrian conflicts, especially in areas with high pedestrian volumes and left-turning vehicles.

Additional Considerations for Transit:

- Ensure that all crossing improvements account for access to nearby bus stops. Safe pedestrian crossings are critical for encouraging transit use, and improvements near bus stops (e.g., 6th Street, Paepcke Park, and Main/Garmisch) should be prioritized to support the city's broader transportation goals.

Case Studies/Resources: City of Denver Complete Streets Guidelines, DRCOG Complete Streets Guidelines.

RECOMMENDATION M2:
Complete Streets Study of Main Street

Medium-term

Objective: Implement a Complete Streets approach to improve safety, accessibility, and transit access.

Issue: Main Street's current design primarily favors vehicular traffic, compromising safety for pedestrians, cyclists, and transit users. With unsafe access to and from bus stops along this major transit corridor, there is an urgent need to enhance safety and mobility for all road users.

Description: This proposal for a comprehensive Complete Streets study to improve mobility and access along Main Street. Traffic volumes are approximately 19,000 AADT (Annual Average Daily Traffic) as of 2023. This volume suggests that a road diet may be feasible, as the FHWA recommends road diets for roads with 5,000-20,000 AADT. Additionally, FHWA studies suggest that road diets can reduce crashes by 19-47%. The reallocation of space from a road diet could improve mobility for all modes, including pedestrians, cyclists, and transit users. Given that Main Street is a major transit corridor with bus stops that currently have unsafe access, improving transit accessibility and safety is a critical focus. This recommendation will require coordination with CDOT.

Recommendations:

- Conduct Comprehensive Study: Assess current infrastructure and identify improvements for all road users, including transit access enhancements.
- Implement Complete Streets Design: Incorporate features such as dedicated bike lanes, safer pedestrian crossings, optimized traffic flow, and improved access to bus stops.
- Evaluate Effectiveness: Conduct before-and-after crash reviews to measure the success of safety improvements, including the impact on transit accessibility and usage.

Case Studies/Resources: NACTO, City of Denver Complete Streets Guidelines, DRCOG Complete Streets Guidelines.

RECOMMENDATION M3:
Improve Safe Access to and from Transit Services

Long-term

Objective: Enhance safety for accessing transit stops along Main Street, particularly in areas with high pedestrian activity and crash risk.

Issue: Currently, crossing distances are long, and there are visibility issues at key intersections, particularly near bus stops, creating difficult environments for transit riders. Several pedestrian crashes have occurred near these stops, necessitating action to improve access and safety.

Description: Main Street serves as a major transit corridor in Aspen, yet several bus stops along the street, such as Main Street/ Galena Street, Aspen Library, and Main Street/2nd Street , pose safety challenges for pedestrians due to long crossing distances, poor visibility, and high traffic volumes. Over the years, these locations have seen multiple pedestrian-involved crashes, emphasizing the need for significant safety improvements. This recommendation seeks to improve pedestrian and cyclist safety through a combination of enhanced infrastructure and smart technology solutions. The aim is to create safer environments for people accessing transit services and reduce the likelihood of crashes near bus stops.

Recommendations:

Raised Crosswalks:

- Implement raised crosswalks across Main Street at Galena Street and Mill Street to improve pedestrian visibility and crossing safety. Raised crosswalks will help slow down vehicles and give pedestrians priority at busy crossings, addressing the areas where crashes have occurred.

Extended Leading Pedestrian Intervals (LPIs):

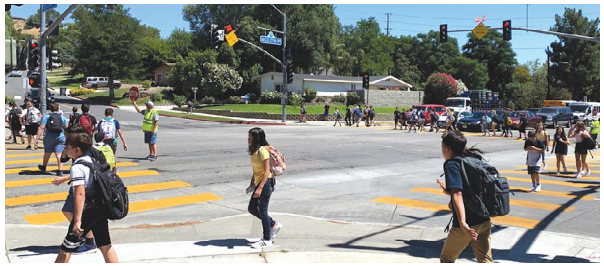
- Increase LPI Duration: Extend the current Leading Pedestrian Interval (LPI) from 2 seconds to 3-4 seconds at intersections such as Main/Galena to give pedestrians more time to start crossing before vehicles get a green light, thereby reducing the risk of conflicts, especially with left-turning vehicles.
- Pedestrian Scramble: Consider implementing a pedestrian scramble (example shown in ***Figure 5.5***) at high-risk intersections like Main/Galena, where all vehicle traffic stops, and pedestrians can cross in any direction. This would greatly reduce vehicle-pedestrian conflicts, particularly on the west side where left-turning vehicle conflicts are frequent.

Smart Lighting:

- Pedestrian-Scale Lighting: Install smart lighting systems at key intersections and transit stops. These lights will adjust in response to movement and environmental factors, providing improved illumination where it's most needed.
- Motion-Activated Lighting: Increase lighting brightness when pedestrians are present, especially during low-visibility hours or adverse weather conditions, to enhance pedestrian safety.
- Environmental Sensing: Smart lighting systems will adapt to changing weather, ensuring visibility is maintained even during snow, fog, or rain.

Case Studies/Resources: San Diego CA's smart streetlights implementation[12].

Figure 5.5 Pedestrian Scramble Example - Santa Clarita, CA



[12] *https://betterbuildingssolutioncenter.energy.gov/implementation-models/san-diego-more-efficient-street-lighting-smart-technologies-and-utility*

RECOMMENDATION M4:
Restrict Access to 7th and 8th Streets

Long-term

Objective: Improve safety by limiting access from 7th and 8th Streets to Hallam Street.

Issue: The current access from Main Street to 7th and 8th Streets creates significant conflicts between vehicles, pedestrians, and cyclists. The transition from Main Street, a high-speed, high-traffic corridor, to the more residential 7th and 8th Streets presents safety risks, particularly where the heavily used bike path crosses these streets. This bike path is a major route for both commuters and recreational users, and frequent close calls between vehicles, pedestrians, and cyclists at these intersections highlight the need for improved safety measures. Additionally, a Bus Rapid Transit (BRT) stop is located near these intersections, increasing pedestrian traffic as people cross 7th and 8th Streets to access the signalized crossing point for the BRT stop, further compounding the risk of conflicts. Accessing this BRT stop was cited in public engagement as an issue.

Description: Restricting vehicle access from 7th and 8th Streets to Hallam Street (where Main Street transitions into 7th Street, then becomes Hallam Street before connecting to Highway 82) is being recommended primarily to address safety concerns. This measure is focused on reducing vehicle-pedestrian and vehicle-bicyclist interactions at critical points where the trail crosses these streets. Unlike other planning efforts that may prioritize traffic flow and travel times, the purpose of this recommendation is to enhance safety along a heavily trafficked multi-use trail that sees both commuter and recreational users. The frequent close calls between vehicles, pedestrians, and cyclists at these intersections can be mitigated by limiting vehicle access. While the Aspen Police Department currently places temporary barriers on 7th Street during peak periods to manage traffic and reduce conflicts, a permanent access restriction would offer a more reliable solution to improve safety.

In areas where the highway transitions into more urban settings, such as Hallam Street, drivers may fail to adjust their speed appropriately, further increasing the risk of crashes involving pedestrians and cyclists. A key example is the intersection of Hallam and 8th Streets, where high pedestrian activity occurs due to the nearby BRT stop. By restricting vehicle access and enhancing safety measures in this area, the risk of vehicle-pedestrian collisions can be significantly reduced, creating a safer environment for all users.

Recommendations:

- Access Restrictions: Implement permanent vehicle access restrictions from 7th and 8th Streets to Hallam Street to decrease conflict points and improve safety at these intersections, specifically targeting the high-risk crossings along the heavily used trail.
- Safety Improvements: Enhance bicycle lanes and pedestrian pathways within the restricted areas to create a safer and more comfortable environment for non-motorized users.
- Reduced Conflicts: Clearly designate zones for vehicles, pedestrians, and cyclists to minimize interactions and reduce the likelihood of crashes, particularly at the trail crossings.
- Improved Transit Access: Enhance safety and convenience for Bus Rapid Transit (BRT) users by ensuring safer pedestrian crossings and more secure connections to the BRT stop.

Outer Aspen Safety Recommendations

The outer areas of Aspen, particularly along Highway 82, present unique safety challenges due to higher traffic speeds, limited crossing opportunities, which can be exacerbated by Aspen's changing weather conditions. This section focuses on improving safety for drivers, cyclists, and pedestrians in these less urbanized but heavily trafficked areas. Recommendations include both short-term and long-term strategies, such as the use of Variable Message Signs (VMS) to provide real-time safety updates, reviewing crossing points for safer pedestrian and cyclist passage, and reducing speed limits to minimize crash risks. By incorporating advanced technologies like automated enforcement and enhancing infrastructure, these strategies aim to create safer routes for both local and regional traffic while addressing the specific conditions and needs of Aspen's outer regions.

Table 5.6 Outer Aspen Countermeasure Toolkit

COUNTERMEASURE	CRASH REDUCTION FACTOR (CRF)	TYPE OF CRASH	CMF ID
Dynamic signal warning flashers	0.814	All Crashes	4198
Advance static curve warning signs	0.7	All Crashes	71
Install centerline rumble strips	0.63	Head on,Sideswipe	3355
Install centerline rumble strips	0.89	All Crashes	3342
Install wider markings and both edgeline and centerline rumble strips with resurfacing	0.62	K (fatal),A (serious injury),B (minor injury),C (possible injury)	4790
Install chevron signs and curve warning signs	0.592	All Crashes	1905
High friction surface treatment (HFST)	0.529	All Crashes	10318
High reflectivity signs (curve/ advance intersection)	0.75	K (fatal),A (serious injury),B (minor injury),C (possible injury)	2433
Lighting (intersection)	0.792	All	10993
Lighting (segment)	0.46	All + Nightime, Serious Injury	2870
Shoulder Rumble Strips	0.83	Run off road, K (fatal),A (serious injury),B (minor injury),C (possible injury)	3447
Edge lines	0.848	All	10243

RECOMMENDATION O1: Variable Message Signs (VMS)

Short-term

Objective: Provide real-time safety information to drivers.

Issue: Numerous crashes along Highway 82 due to unsafe driving behaviors in inclement weather.

Description: Variable message signs can be highly effective in enhancing safety by providing real-time information to drivers. These signs can prompt drivers to reduce speed during adverse weather conditions, caution them to be aware of different road users as they approach Aspen's more urban areas, and share crucial updates like crash statistics, warnings about crash hot spots, and alerts for potential congestion or incidents ahead. Utilizing these signs can significantly help in reducing crash risks.

Recommendations:

- Strategic Placement: Install VMS at key entry points and high-risk areas.
- Real-time Data Integration: Connect VMS to traffic cameras and weather stations for timely updates.
- Public Safety Campaigns: Use VMS to display safety messages encouraging safe driving behaviors.

Case Studies/Resources: Washington State's Active Traffic and Demand Management[13] system

RECOMMENDATION O2: Review Crossing Points and Improve Wayfinding

Medium-term

Objective: Improve safety for pedestrians and cyclists crossing Highway 82.

Issue: Highway 82 presents high-speed challenges with limited safe crossing opportunities.

Description: Crossing Highway 82 is challenging for pedestrians and cyclists. Conducting a thorough review of locations with the highest rates of bicycle and pedestrian crashes could yield important recommendations for improving safety at these critical points, either with increased or enhanced wayfinding to guide pedestrians and cyclists to existing underpasses and safe crossing points. By clearly marking and promoting these crossing locations, the City of Aspen can reduce unsafe crossings, encourage the use of safer routes, and improve overall pedestrian and cyclist safety.

Recommendations:

Highway 82 West of Aspen

- Conduct an audit of existing crossing points: Identify all current safe crossings, including overpasses, underpasses, and crosswalks equipped with pedestrian signals.
- Identify optimal signage locations: Determine where pedestrians and cyclists are most likely to cross unsafely and place wayfinding signage at key decision points, such as trail intersections, busy streets, and near bus stops.
- Design clear, visible signage: Use universally recognizable symbols, maps, and arrows that clearly indicate the direction and distance to the nearest safe crossing points.
- Incorporate signage into digital navigation tools: Work with local navigation apps, maps, and cycling route planners to include safe crossing points in digital wayfinding solutions.
- Promote awareness: Through public outreach campaigns, educate residents and visitors on the importance of using safe crossings and how to identify them.

Highway 82 East of Aspen

- Signalized Crossings with Pedestrian Countdown Timers: Consider installing signalized crossings at key intersections, equipped with pedestrian countdown timers to improve safety and give pedestrians clear information on how much time they have to cross. These crossings should be synchronized with traffic lights to minimize waiting times and improve flow for both vehicles and pedestrians.

[13] *https://wsdot.wa.gov/travel/operations-services/active-traffic-and-demand-management*

- Mid-Block Crosswalks with Flashing Beacons: Consider mid-block crosswalks with flashing beacons (example shown in ***Figure 5.6***) that activate when a pedestrian is present. These beacons significantly increase the visibility of the crossing, alerting drivers to stop and allowing pedestrians to cross safely. This recommendation is for east of Aspen.

Case Studies/Resources: The National Center for Rural Road Safety[14] includes numerous resources for improving bicycle and pedestrian crossings in a more rural context.

Figure 5.6 Mid-block Crosswalk with Flashing Beacon Example - Chapel Hill, NC

[14] *https://ruralsafetycenter.org/*
[15] *https://nacto.org/publication/city-limits/the-tools/case-studies-in-lowering-speed-limits/*
[16] *https://injuryfacts.nsc.org/motor-vehicle/motor-vehicle-safety-issues/speeding/*

RECOMMENDATION O3:
Reduce Signed Speed Limits

Medium-term

Objective: Enhance safety by maintaining lower speed limits consistently.

Issue: Speed limit increases from 35 mph to 45 mph near Tusscott Place create hazardous conditions.

Description: Currently, the speed limit increases from 35 mph to 45 mph just west of Highway 82 and Tusscott Place. Maintaining the 35 mph speed limit up to the City of Aspen border would enhance safety, particularly in areas identified as crash hot spots.

Recommendations:

- Speed Limit Review: Work with the Colorado Department of Transportation (CDOT) to conduct a review of current speed limits along Highway 82, particularly in transition areas. Propose reducing the speed limit to 35 mph within the City of Aspen.
- Public Awareness Campaign: Launch a public awareness campaign to educate drivers about the dangers of speeding and the benefits of reduced speed limits in improving road safety. Use social media, local radio, and signage to spread the message.

Case Studies/Resources: Several case studies cited by NACTO, including Seattle, WA and Cambridge, MA[15]

RECOMMENDATION O4:
Automated Enforcement

Long-term

Objective: Utilize technology to enforce speed and traffic signal compliance.

Issue: Speeding drivers is a key cause of traffic related injuries and deaths.

Description: Given the relatively straight and wide nature of Highway 82, implementing automated enforcement measures, such as speed and red-light cameras, should be considered. These systems can play a key role in reducing unsafe driving behaviors and improving overall safety on this stretch of road. Nationwide, speeding accounts for nearly 30% of all traffic deaths[16].

Recommendations:

- Feasibility Study: Conduct a feasibility study, in coordination with CDOT, to determine the most effective locations for installing automated enforcement systems along Highway 82. Consider areas with high crash rates and where traditional enforcement is challenging.
- Pilot Program: Launch a pilot program with a limited number of speed and red-light cameras. Monitor the impact on speeding and crash rates before deciding on broader implementation.

- Public Education: Implement a public education campaign to inform drivers about the presence of automated enforcement and the reasons for its use. Highlight the safety benefits and the goal of reducing accidents.

Case Studies/Resources: Cited by the FHWA: Montgomery County, Maryland successfully implemented automated speed enforcement[17]

[17] *https://highways.dot.gov/safety/learn-safety/noteworthy-practices/automated-speed-enforcement-montgomery-county-maryland*

6

FUNDING AND IMPLEMENTATION

6. FUNDING AND IMPLEMENTATION

INTRODUCTION

The recommendations are divided into short-, medium-, and long-term phases to allow for effective prioritization and allocation of resources.

TIMELINE AND PHASING

Short-Term (1-2 Years)

These recommendations focus on immediate safety enhancements that can be implemented within a short timeframe, addressing high-risk areas and improving data collection and analysis.

Medium-Term (3-5 Years)

These recommendations are more comprehensive and require further planning and collaboration. They focus on improving infrastructure for pedestrians, cyclists, and transit users, while fostering a culture of safety through community engagement.

Table 6.1 Short-term Recommendations

REFERENCE	TITLE	KEY ACTIONS	EXPECTED OUTCOME
CW1	Review crash data collection and sharing	Improve data entry, streamline APD-City communication, publish annual reports	Accurate safety data, timely interventions
CW2	Enhanced data analysis tools	Invest in predictive analytics tools, train staff	Proactive crash prevention
M1	Upgrade Main Street crossings	Install PHBs, pedestrian signals, and median islands at key crossings	Safer pedestrian crossings at high-traffic locations
O1	Install VMS on Highway 82	Install real-time message signs for weather/safety alerts	Improved driver behavior in response to road conditions
D1	Improve intersection visibility	Daylight intersections, install curb extensions	Enhanced pedestrian visibility, reduced crash risks

Table 6.2 Medium-term Recommendations

REFERENCE	TITLE	KEY ACTIONS	EXPECTED OUTCOME
M2	Complete Streets Study of Main Street	Conduct a study to implement multimodal improvements	Improved safety for pedestrians, cyclists, and transit users
M3	Improve safe access to transit services	Install raised crosswalks, extend LPIs, consider pedestrian scrambles	Enhanced pedestrian safety at bus stops
CW3	Community safety engagement program	Develop K-12 curriculum, tourist campaigns, and multilingual materials	Long-term behavioral changes, safer travel practices
D2	Implement gateway treatments	Install signage, surface treatments, bulbouts at pedestrian-priority zones	Slower vehicle speeds, enhanced pedestrian priority

Medium-Term (3-5 Years)

(continued)

REFERENCE	TITLE	KEY ACTIONS	EXPECTED OUTCOME
O2	Review and improve Highway 82 crossings	Conduct crossing audits, install mid-block crosswalks, improve wayfinding	Safer crossings for pedestrians and cyclists
CW4	Regular safety audits	Conduct regular audits of high-risk intersections and transit hubs	Early detection and mitigation of hazards
CW5	Review intersection design standards	Update city codes for sightlines, all-way stops, corner radius	Improved intersection safety for all road users
D3	Extend pedestrian zones	Expand pedestrian-only areas, install surface treatments	Fewer vehicle-pedestrian conflicts, improved urban experience
O3	Reduce speeds on Highway 82	Lower speed limits, launch public awareness campaign	Safer driving speeds, fewer crashes

Long-Term (5+ Years)

Long-term recommendations involve more complex infrastructure changes and policy shifts that require coordination with external agencies and sustained investment over time.

Table 6.3 Long-term Recommendations

REFERENCE	TITLE	KEY ACTIONS	EXPECTED OUTCOME
M4	Restrict access to 7th and 8th Streets	Limit vehicle access, improve pedestrian/bike paths	Reduced vehicle-pedestrian conflicts, safer transit hubs
O4	Automated enforcement on Highway 82	Install speed and red-light cameras at high-crash locations	Fewer speeding violations, fewer crashes
CW6	Update Active Transportation Master Plan	Develop long-term plan for pedestrian, cyclist, and transit safety	A safer, connected multimodal transportation network

PERFORMANCE METRICS

To ensure the success of these safety interventions, the following Key Performance Indicators (KPIs) and data collection methods are proposed. These metrics align with SS4A's requirements for continuous monitoring and evaluation.

1. Crash Data and Safety Metrics

- **KPI**: Reduction in total crashes and crash severity (fatalities and serious injuries) at targeted intersections and transit stops.
- **Data Collection**: Regular crash data analysis, comparing pre- and post-implementation data, focusing on high-risk areas identified in the Safety Action Plan.
- **Evaluation**: Publish an annual safety report to track progress, highlight crash trends, and inform future improvements.

2. Transit Accessibility and Pedestrian Safety

- **KPI**: Increase in safe pedestrian crossings at key transit stops (Main Street).
- **Data Collection**: Collect pedestrian count data at upgraded crossings, monitor compliance with new signals (PHBs, pedestrian scrambles), and survey transit users for feedback.
- **Evaluation**: Conduct before-and-after studies of pedestrian movements and crash data to assess the effectiveness of crossing improvements.

3. Vehicle Speed and Traffic Compliance

- **KPI**: Reduction in speeding violations and red-light running incidents on Main Street and Highway 82.
- **Data Collection**: Install speed cameras and red-light cameras to monitor compliance, supported by manual traffic counts and enforcement data.
- **Evaluation**: Use data from automated enforcement systems to measure changes in driver behavior over time, with an emphasis on compliance with new speed limits.

4. Community Engagement and Behavioral Change

- **KPI**: Increase in community participation in safety engagement programs and positive shifts in safety-related behaviors.
- **Data Collection**: Track participation in K-12 safety programs, tourist-specific campaigns, and general safety outreach efforts through surveys and event attendance records.
- **Evaluation**: Conduct regular community surveys to gauge shifts in behavior and assess the long-term impact of educational efforts on travel practices.

5. Infrastructure Utilization and Active Transportation

- **KPI**: Increase in pedestrian and cyclist usage of upgraded infrastructure, such as pedestrianized zones, protected bike lanes, and multimodal transit routes.
- **Data Collection**: Use pedestrian and cyclist counters, complemented by user surveys, to measure active transportation levels in upgraded areas.
- **Evaluation**: Analyze trends in active transportation growth following infrastructure upgrades, focusing on safety improvements and transit connectivity.

Methods for Ongoing Data Collection and Analysis

To ensure the effectiveness and sustainability of the safety strategies outlined in Aspen's Safety Action Plan, it is essential to implement robust and continuous data collection and analysis methods. This approach allows the city to monitor the progress of safety interventions, assess their impact, and make informed adjustments as necessary. By using a combination of automated systems, manual data collection, crash data analytics, and community feedback, Aspen can develop a comprehensive understanding of traffic patterns, safety concerns, and the evolving needs of its residents and visitors. The following methods are recommended to support ongoing data collection and analysis, which align with the Safe Streets and Roads for All (SS4A) program's requirements for continuous monitoring and proactive intervention.

Automated Systems: Install permanent traffic counters, pedestrian counters, and air quality monitors in high-traffic zones and along key transit corridors.

Manual Data Collection: Supplement automated data with regular on-site safety audits, traffic counts, and pedestrian surveys to ensure a holistic understanding of safety trends.

Crash Data Analytics: Continue utilizing advanced analytics tools to identify emerging safety trends and high-risk locations, enabling proactive safety interventions.

Community Feedback: Use digital platforms (e.g., surveys, apps) to continuously collect feedback from residents, tourists, and transit users on their experiences and safety concerns.

FUNDING SOURCES

To effectively fund the recommended safety strategies, Aspen should leverage a mix of federal, state, and local funding sources (highlighted in *Table 6.4*). Additionally, partnerships with local businesses and community organizations can provide sponsorships and in-kind support. Prioritizing projects based on impact and feasibility will ensure optimal use of available funds.

Table 6.4 Potential Funding Sources for Safety Strategies

STRATEGY REFERENCE	TITLE	FUNDING SOURCES/OPPORTUNITIES
CW1	Review crash data collection, analysis, and sharing	Local Funds, Federal Highway Safety Grants, SS4A Grants
CW2	Enhanced data analysis tools	Federal Grants (e.g., U.S. Department of Transportation grants for safety technology, Safe Streets and Roads for All)
CW3	Targeted community engagement, marketing, and dialogue	Local Community Grants, Nonprofit Partnerships, NHTSA Highway Safety Grants
CW4	Regular safety audits	Local Funds, State Safety Improvement Program (SSIP), Federal Road Safety Audits Funding, INFRA Grants
CW5	Review city code and design standards for intersections	State and Federal Planning Grants (e.g., FHWA), Local Funds
CW6	Update the Active Transportation Master Plan	Federal Transportation Alternatives Program (TAP), State Multimodal Planning Grants, SS4A
D1	Improvements for Intersection Visibility and Pedestrian Protection	MUTCD Compliance Funds, Local Road Safety Funds
D2	Implement gateway treatments to enhance pedestrian priority	Local Funds, Federal and State Transportation Safety Grants (SSIP, TAP)
D3	Extending pedestrianization in Downtown Core	Local Business Improvement District Funds, Federal RAISE Grants, Local Revitalization Funds
D4	Improve safe access to and from Hyman Ave and Mill Street Bus Stop	Transportation Alternatives Program (TAP), Local Funds, State Transit Infrastructure Grants
M1	Upgrade Main Street crossings	State Safety Improvement Program (SSIP), Local Funds, Federal Transportation Alternatives Program (TAP), SS4A
M2	Complete Streets Study of Main Street	State and Federal Complete Streets Planning Grants, CDOT Main Streets Revitalization Program

STRATEGY REFERENCE	TITLE	FUNDING SOURCES/OPPORTUNITIES
M3	Improve safe access to and from transit services	State Pedestrian and Bicycle Safety Grants, SS4A, Transportation Alternatives Program (TAP)
M4	Restrict access to 7th and 8th Streets from Main Street	Local Traffic Calming Funds, Federal Congestion Mitigation and Air Quality Program (CMAQ), SS4A
O1	Install variable message signs	State Transportation Safety Improvement Program, Local Funds
O2	Review Crossing Points and Improve Wayfinding on Highway 82	Federal Highway Safety Improvement Program (HSIP), State Pedestrian and Bicycle Safety Grants
O3	Reduce speeds on Highway 82	Federal and State Speed Management Program Funds, CDOT Highway Safety Grants
O4	Automated enforcement	State Grants for Automated Enforcement, Local Law Enforcement Budget, Highway Safety Improvement Program (HSIP)

As safety has become a major focus of roadway design in the United States in recent years, numerous federal funding sources have become available to assist with safety-related projects. A list of the federal funding opportunities is included in ***Table 6.5***.

Table 6.5 Potential Federal Funding Sources for Safety-Related Projects

FUNDING SOURCE NAME	TYPE	ABOUT	LEARN MORE
Safe Streets and Roads for All (SS4A)	Direct Grant	The SS4A program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.	https://www.transportation.gov/grants/SS4A
Raise Grants	Direct Grant	RAISE is a discretionary grant program for investments in surface transportation infrastructure. The program helps communities around the country carry out projects with significant local or regional impact.	https://www.transportation.gov/RAISEgrants/raise-nofo
INFRA Grants	Direct Grant	INFRA awards competitive grants for multimodal freight and highway projects of national or regional significance to improve the safety, efficiency, and reliability of the movement of freight and people in and across rural and urban areas.	https://www.transportation.gov/grants/infra-grant-program

FUNDING SOURCE NAME	TYPE	ABOUT	LEARN MORE
Infrastructure Investment and Jobs Act (IIJA)	State DOT Grants	IIJA provides $550 billion over fiscal years 2022 through 2026 in new Federal investment in infrastructure, including in roads, bridges, and mass transit, water infrastructure, resilience, and broadband.	https://www.fhwa.dot.gov/bipartisan-infrastructure-law/
Surface Transportation Block Grant Program (STBG)	State DOT Grants	The Surface Transportation Block Grant Program (STBG) promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs.	https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm
Transportation Alternatives (TA) "set-aside" with STBGP	State DOT Grants	Set-aside fundings includes a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school projects.	https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm
Congestion Mitigation and Air Quality Program (CMAQ)	State DOT Grants	Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).	https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm
Highway Safety Improvement Program (HSIP)	State DOT Grants	The Highway Safety Improvement Program (HSIP) is a core Federal-aid program with the purpose to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.	https://www.fhwa.dot.gov/bipartisan-infrastructure-law/hsip.cfm