COLORADO

# 2025 Strategic Highway Safety Plan

U.S. Department of Transportation
Federal Highway Administration

Colorado Division

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Lakewood, Colorado 80228
720-963-3000

May 29, 2025

Shoshana Lew
Executive Director
Colorado Department of Transportation
2829 W. Howard Place
Denver, CO 80204

**Subject: Colorado Strategic Highway Safety Plan (SHSP) 2025 Update**

Dear Ms. Lew:

The Federal Highway Administration (FHWA) Colorado Division Office received the 2025 Colorado Strategic Highway Safety Plan (SHSP). We are pleased to approve the process through which the updated SHSP was developed. Based on our Division's involvement in the development of the SHSP and the review of the final Plan, we are confident that Colorado has followed a process that is consistent with the requirements as outlined below. Ou

- Conferred with various multi-disciplinary Federal, State, local and Tribal safety stakeholders, considered their input prior to decision making, and routinely informed them about actions taken regarding STSP update development.
- Reached out and provided the opportunity for consultation to a variety of statewide safety stakeholders in the State.
- Used the best available safety data and safety analysis tools to identify critical highway safety issues and determine strategies for safety improvements on all public roads.
- Included emphasis areas and strategies based on data with the greatest potential to reduce fatalities and serious injuries.
- Gave priority to strategies that significantly reduce fatalities and serious injuries in the SHSP emphasis areas and considered systemic improvements and low-cost safety countermeasures.
- Evaluated current SHSP emphasis areas, goals, strategies and actions to determine their effectiveness and incorporate the lessons learned in the STSP update development process.
- Included STSP evaluation process and mechanisms for regularly tracking implementation and monitoring progress.
- Set goals and measurable objectives to track and monitor the status of STSP implementation efforts and monitor progress in each of the established STSP emphasis areas.
- Considered highway safety elements of engineering, education, enforcement, and emergency medical services (the 4 E's) and included strategies to address the State's emphasis areas.
- Coordinated with other on-going statewide planning processes and considered how the STSP emphasis areas compare with the priorities of the other plans or processes.
- Included the State definition of High Risk Rural Roads (HRRR).
- Signed by the Governor or his representative for the State of Colorado.

We look forward to receiving the Action Plan this fall with more details about CDOT's strategies to implement the Plan.

If you have any questions, please contact Charlie Hanf at Charles.hanf@dot.gov.

Sincerely,

JOHN MARTIN CATER

Digitally signed by JOHN MARTIN CATER
Date: 2025.05.29 15:56:25 -06'00'

John M. Cater, P.E
Division Administrator

Attachments:
2025 Strategic Highway Safety Plan (SHSP)

cc:
Charlie Hanf, FHWA Acting Safety Program Manager
Keith Stefanik, CDOT Chief Engineer
San Lee, CDOT Traffic Safety & Engineering Services
Melodie Clayton, Traffic Safety Performance Manager
Gina Espinosa-Salcedo, NHTSA Regional Director

# CDOT Executive Director Letter

## Dear Fellow Coloradans and Visitors,

I am pleased to present the 2025 Colorado Strategic Highway Safety Plan (SHSP). This plan represents a comprehensive and collaborative effort among public agencies, private sector organizations, and advocacy groups dedicated to transportation safety across the state. Through data-driven analysis, cooperative discussions, and the expertise of diverse stakeholders, the SHSP identifies actionable strategies and achievable goals to reduce fatalities and serious injuries throughout Colorado's transportation system.

**Colorado's transportation safety efforts are showing positive results. After a peak of 764 traffic fatalities in 2022, we have seen a decline over each of the past two years.**

In 2024, there were 687 fatalities—a 10% reduction from the 2022 peak. Consistent with the 10-year Statewide Plan and Policy Directive 14, the SHSP identifies a goal of a five percent annual reduction in fatalities and serious injury crashes.

Colorado is committed to providing the best multi-modal transportation system that most effectively and safely moves people, goods, and information. Every agency and jurisdiction plays a crucial role in improving transportation safety, contributing through policy, planning, funding, design, construction, operations, maintenance, and post-crash care to ensure the well-being of all travelers.

The SHSP emphasizes the implementation of proven safety countermeasures, targeted and effective strategy deployment, integration of local agency safety planning, and adoption of innovative technologies that have been demonstrated to reduce fatalities and serious injuries.

I extend my gratitude to the hundreds of stakeholders across Colorado who contributed to the development of this SHSP. Achieving our vision of zero deaths and serious injuries requires a collective commitment, including yours as a user of the transportation system. Please join CDOT and our safety partners in supporting and implementing the SHSP to prevent crashes and save lives on our roadways.

Sincerely,

Sally Chafee Digitally signed by Sally Chafee
Date: 2025.05.19 13:43:02
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**Sally Chafee, Acting Executive Director**
**For: Shoshana Lew, Executive Director**
**Colorado Department of Transportation**

# Partner Pledge & Commitment to Safety

The 2025 Colorado Strategic Highway Safety Plan (SHSP) represents a unified commitment to eliminate traffic fatalities and serious injuries so that every person—regardless of how they travel—can reach their destination safely. Developed through a data-driven, collaborative process, this plan reflects the dedication of transportation safety professionals and stakeholders across Colorado.

As committed safety partners, we stand in support of the SHSP and Colorado's broader transportation safety initiatives. We believe in a future where zero deaths and serious injuries regardless of travel mode is a reality. Achieving this future requires a steadfast commitment to growing Colorado's transportation safety culture within organizations and among the public. Foundational to this effort are the following strategic pillars of partnership:

» **Shared ownership** - responsibility for improving transportation safety must be shared.

» **Mutual agency** - each agency has autonomy and freedom to pursue mutual transportation safety objectives as befits their situation.

» **Accountability** – the problem is urgent, and therefore transparency and accountability are necessary.

Collectively, we pledge to do our part to reach the SHSP's goal of reducing fatalities and serious injuries by five percent per year or 22.6% over the five-year life of the plan. We commit to:

» Lead strategies and action steps relevant to our agency or organization;

» Engage in events, meetings, and initiatives that support the SHSP's success such as safety-related committee meetings, safety summits, and other public and internal initiatives that are focused on improving transportation safety;

» Provide resources and expertise to advance the SHSP's implementation; and

» Advocate for a culture of safety by promoting the SHSP whenever possible.

Together, as the leadership of the Colorado Department of Transportation, Colorado State Patrol, Colorado Department of Revenue, Colorado Department of Public Health and Environment, the Federal Highway Administration, and the National Highway Traffic Safety Administration, we reaffirm our dedication to a safer Colorado. By signing below, we commit to this vision and the actions necessary to make it a reality.

Sally Chafee
Digitally signed by Sally Chafee
Date: 2025.05.19 13:43:18 -06'00'

Sally Chafee, Acting Executive Director
For: Shoshana Lew, Executive Director
*Colorado Department of Transportation*

Matthew C Packard
2025.05.19 16:12:33 -06'00'

Colonel Matthew Packard, Chief
*Colorado State Patrol*

Meghan Tanis
Digitally signed by Meghan Tanis
Date: 2025.05.22 19:55:50 -06'00'

Meghan Tanis, Deputy Executive Director
For: Heidi Humphreys, Executive Director
*Colorado Department of Revenue*

Jill Hunsaker Ryan
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Date: 2025.05.23 16:53:53 -06'00'

Jill Hunsaker Ryan, MPH, Executive Director
*Colorado Department of Public Health and Environment*

# Plan Acknowledgment

The 2025 Colorado Strategic Highway Safety Plan (SHSP) is a result of the collaboration of safety stakeholders from across the state. Partners representing diverse organizations and agencies developed strategies and supporting actions to reduce crashes and the resulting fatalities and serious injuries. **Thank you to the representatives from the following agencies for their support in the 2025 SHSP development and for their continued support during implementation over the next five years.**

- Adams County
- American Automobile Association (AAA) Colorado
- Archuleta County
- Bicycle Colorado
- Bike Together
- Boulder County
- CDOT Highway Safety Office
- CDL Mountain Training
- Central Front Range Transportation Planning Region
- City of Aspen
- City of Aurora
- City of Cortez
- City of Dacono
- City of Denver
- City of Fort Collins
- City of Golden
- City of Greeley
- City of Lakewood
- City of Loveland
- City of Pueblo
- City of Thornton
- Colorado Behavioral Health Administration
- Colorado Commission of Indian Affairs
- Colorado Contractors Association
- Colorado Counties Inc.
- Colorado Department of Education
- Colorado Department of Human Services
- Colorado Department of Motor Vehicles
- Colorado Department of Public Health and Environment
- Colorado Department of Revenue
- Colorado Department of Transportation
- Colorado Governor's Office
- Colorado Judicial Branch
- Colorado Local Technical Assistance Program
- Colorado Municipal League
- Colorado Motor Carriers Association
- Colorado State Patrol
- County Sheriff Association
- Colorado Task Force on Drunk and Impaired Driving (CTFDID)
- Colorado Young Drivers Alliance
- County Sheriffs of Colorado
- Denver Regional Council of Governments
- Denver Streets Partnership
- Douglas County
- Eagle County
- El Paso County
- East Central Council of Governments
- Eastern Transportation Planning Region
- Federal Highway Administration
- Federal Motor Carrier Safety Administration

- Grand Valley Transportation Planning Region
- Gunnison Valley Transportation Planning Region
- Health Promotion Partner
- Intermountain Transportation Planning Region
- La Plata County
- La Plata County Sheriff
- Larimer County
- Mesa County
- Mothers Against Drunk Driving
- Motorcycle Operator Safety Advisory Board
- Montezuma County
- National Highway Traffic Safety Administration
- National Roadway Safety Strategy
- National Workzone Safety
- North Front Range Metropolitan Planning Organization
- Northeast Colorado Council of Governments
- Northwest Transportation Planning Region
- Pikes Peak Area Council of Governments
- Pueblo Area Council of Governments
- Pitkin County
- Region 10 League for Economic Assistance and Planning
- Safe Routes to School
- Safety Circuit Rider Program
- San Luis Valley Development Resources Group
- San Luis Valley Transportation Planning Region
- School Community Youth Collaborative
- Share the Road
- South Central Council of Governments
- Southeast Colorado Enterprise Development
- Southern Colorado Institute of Transportation Technology
- Southern Ute Indian Tribe
- Southwest Colorado Council of Governments
- Statewide Traffic Records Advisory Committee
- Town of Fountain
- Town of Minturn
- Transportation Commission of Colorado
- University of Colorado Health
- Upper Front Range Transportation Planning Region
- Vision Zero Boulder
- Vision Zero Denver
- Weld County
- Western Colorado Contractors Association

# Thank You

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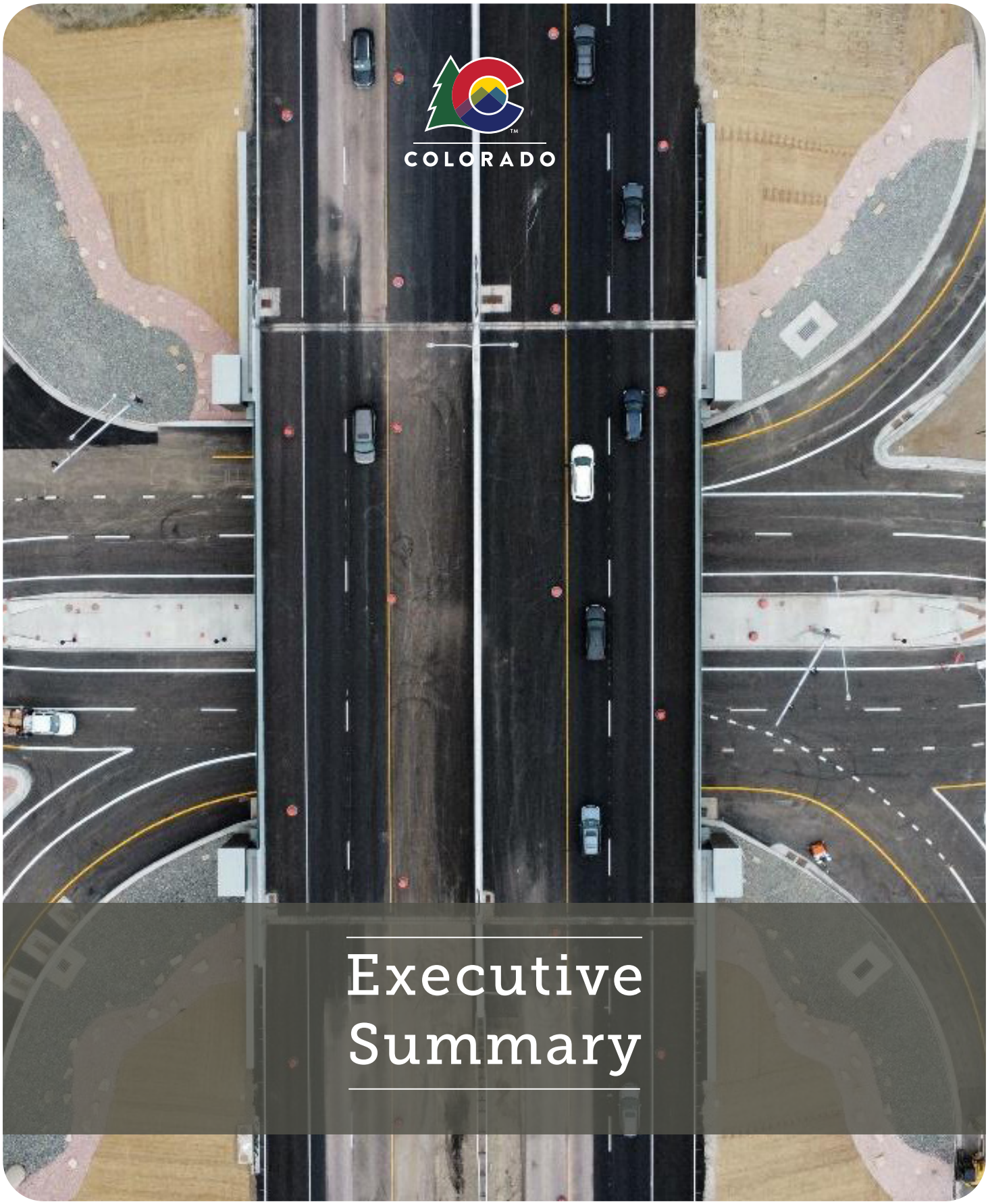
# List of Acronyms

| | |
|---|---|
| AAA | American Automobile Association |
| AASHTO | American Association of State Highway and Transportation Officials |
| ATS | Advancing Transportation Safety |
| BAC | Blood Alcohol Concentration |
| BIPOC | Black, Indigenous and Persons of Color |
| CDOT | Colorado Department of Transportation |
| CDPHE | Colorado Department of Public Health and Environment |
| CMV | Commercial Motor Vehicles |
| CPS | Child Passenger Safety |
| CSP | Colorado State Patrol |
| CVSP | Commercial Vehicle Safety Plan |
| DMV | Department of Motor Vehicles |
| DOR | Department of Revenue |
| DUI | Driving Under the Influence |
| EMS | Emergency Medical Services |
| ERSI | Emergency Responder Safety Institute |
| FARS | Fatality Analysis Reporting System |
| FIRST | Fatality and Injury Reporting System Tool |
| FHWA | Federal Highway Administration |
| GDL | Graduated Driver Licensing |
| GIS | Geographic Information System |
| HRRR | High Risk Rural Roads |
| HSIP | Highway Safety Improvement Program |
| 3HSP | Triennial Highway Safety Plan |
| IIJA | Infrastructure Investment and Jobs Act |
| LEP | Limited English Proficiency |
| LRTP | Long Range Transportation Plan |
| LOSS | Level of Service of Safety |
| LTAP | Local Technical Assistance Program |
| MADD | Mothers Against Drunk Driving |
| NCDOT | North Carolina Department of Transportation |
| NHTSA | National Highway Traffic Safety Administration |
| PBCAT | Pedestrian and Bicycle Crash Analysis Tool |
| PD-14 | Policy Directive 14 |
| PIARC | World Road Association |
| RPO | Regional Planning Organization |
| RSA | Road Safety Audit |
| SADD | Students Against Drunk Driving |
| SEMTAC | State Emergency Medical Trauma Services Advisory Council |
| SHSP | Strategic Highway Safety Plan |
| SME | Subject Matter Expert |
| SSA | Safe System Approach |
| STSP | Strategic Transportation Safety Plan (2020) |
| TDI | Transportation Disadvantaged Index |
| TIM | Traffic Incident Management |
| VMT | Vehicle Miles Traveled |
| VRU | Vulnerable Road User |
| WIGS | Wildly Important Goals |




# Executive Summary

The 2025 Strategic Highway Safety Plan (SHSP) represents a comprehensive, data-driven approach to enhancing roadway safety in Colorado, with the goal of reducing fatalities and serious injuries statewide. Developed collaboratively by key state agencies and other safety stakeholders, the SHSP reflects the shared responsibility of all Coloradans to improve safety of the transportation system for all users.

Stakeholder engagement played a crucial role in shaping the SHSP. From the Steering Committee and Subject Matter Experts to the hundreds of workshop participants and online contributors, diverse voices informed the plan's development. Every piece of feedback—whether gathered through meetings, workshops, emails, or online tools—helped refine strategies, enhance data analysis, and identify additional stakeholders to engage. The SHSP reflects this collective effort, resulting in a comprehensive and inclusive approach to improve roadway safety in Colorado. By identifying 25 Focus Areas across five Emphasis Areas that also correspond with the Safe System Approach—the plan sets a clear path toward achieving the Vision for Colorado's future: **Zero deaths and serious injuries so all people using any transportation mode arrive at their destination safely.**

## Emphasis Areas

Safety Culture

Safe Driving

Safe People

Safe Roads

Post-Crash Care

Focus Areas are contexts or behaviors associated with fatal and serious injury crashes and are categorized based on their contribution to the number of fatalities and serious injuries, recent observed trends (improving, staying about the same, or worsening), or the relation to safety culture. These categories inform related strategies which are specific methods to improve safety as well as the implementation of actions over the next five years. The Focus Area categories are:

» **Safety Culture** grows shared values and beliefs supportive of a safer transportation system,

» **High-Impact** targets the top contributing factors to fatalities and serious injuries,

» **Emerging and Monitoring** areas have increasing fatality and serious injury trends, and

» **Double Down on Success** builds on the success of existing programs/policies.


Figure ES-1: Focus Area Categorization

The SHSP aims to achieve a five percent year-over-year reduction in fatalities and serious injuries. Achieving these targets requires a coordinated effort across multiple agencies, a focus on implementing proven safety countermeasures, and an ongoing commitment to cultivating a statewide safety culture.

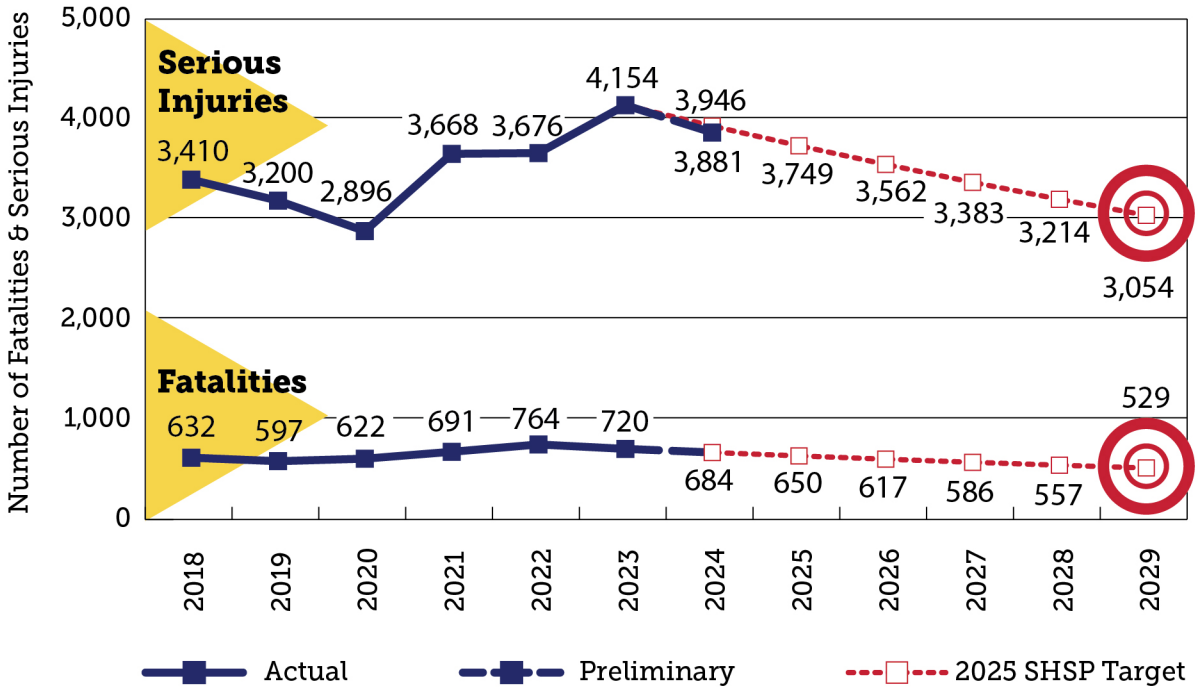
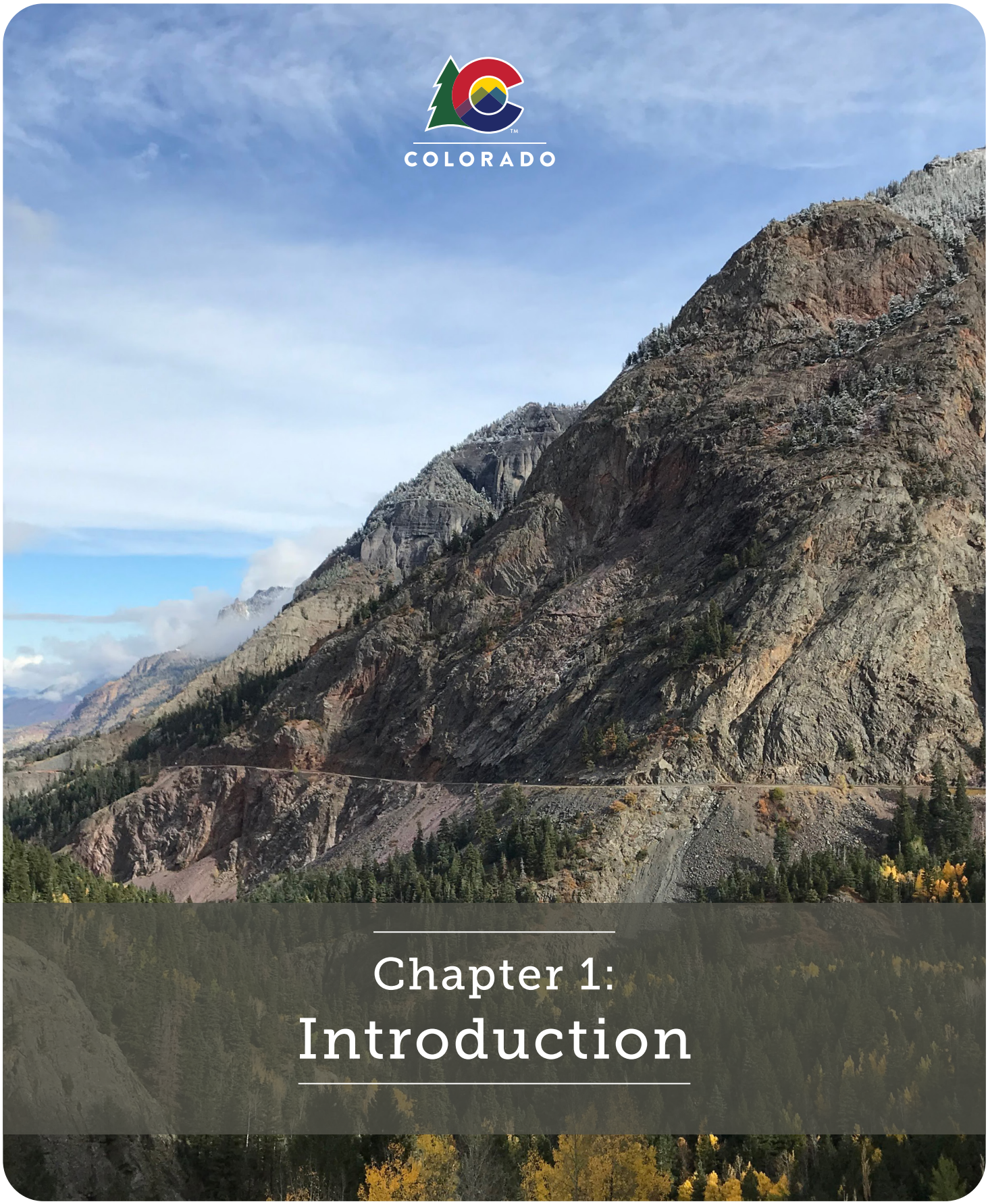



Figure ES-2: Traffic Fatalities and Serious Injuries with Future Targets (5% Per Year Reduction)

In addition to the implementation of the strategies identified in this SHSP, the Advancing Transportation Safety Initiative (ATS)—a collaboration of state and local agency safety advocates led by CDOT's Safety Champion—will continue to seek out innovative ways to achieve the state's goal of reducing traffic fatalities and serious injuries. Through collaboration, strategic investments, and focused implementation, Colorado will continue to make strides toward achieving zero deaths and serious injuries for all transportation system users.




# Chapter 1: Introduction

Colorado updates its SHSP every five years to align with changing trends and best practices and to remain eligible for Federal Highway Safety Improvement Program (HSIP) funding (a core federal-aid program to reduce fatalities and serious injuries on all public roads, including non-state and tribal roads). This chapter introduces the plan's Vision and Mission, organization, development, goals, implementation, and alignment with other plans.

# SHSP Vision and Mission

## Vision

The future of Colorado is zero deaths and serious injuries so all people using any transportation mode arrive at their destination safely.

## Mission

Colorado agencies and partners will cooperatively implement strategies that eliminate transportation system fatalities and serious injuries.

The Vision and Mission for Colorado's Strategic Highway Safety Plan (SHSP) were established by the participants of Colorado's Advancing Transportation Safety (ATS) initiative (a statewide collaboration born from the state's previous SHSP) with support and approval by the SHSP's Steering Committee, which includes representatives from:

- Colorado Department of Transportation (CDOT).
- Colorado State Patrol.
- Colorado Department of Revenue.
- Colorado Department of Public Health and Environment.
- National Highway Traffic Safety Administration.
- Federal Highway Administration.
- Additional state agencies, advocacy groups, and special interest organizations.

The plan's Vision and Mission align with Vision Zero, a multinational effort aiming to eliminate fatalities and serious injuries on transportation systems. The Vision and Mission recognize that numbers of fatalities and serious injuries are not just statistics—they reflect the lives of real people forever changed by crashes. Even one life lost or altered is too many.

# SHSP - Bridging Vision & Mission With Action

An SHSP is defined by the Federal Highway Administration (FHWA) as a statewide-coordinated safety plan that provides a comprehensive framework for reducing fatalities and serious injuries on public roads. In essence, it defines the strategies that prioritize and focus actions to achieve the Vision and Mission.

Colorado's SHSP is a data-driven, five-year plan that identifies multidisciplinary strategies (also referred to as countermeasures) to address safety priorities identified by reviewing data and gathering input from key stakeholders. The organization of the SHSP reflects Colorado's adoption of the Safe System Approach which includes five Emphasis Areas (Safety Culture, Safe Driving, Safe People, Safe Roads, and Post-Crash Care) and six principles:

- Death and Serious Injuries are Unacceptable.
- Humans Make Mistakes.
- Humans Are Vulnerable.
- Responsibility is Shared.
- Safety is Proactive.
- Redundancy is Crucial.

## The Five Emphasis Areas and Six Principles of the Safe System Approach

The Safe System Approach (SSA) is recognized nationally and internationally as an effective way to reduce deaths and serious injuries in transportation systems by addressing both human mistakes and human vulnerability. It promotes the design and implementation of transportation networks that prioritize redundant layers of protection for roadway users.

SSA's holistic and comprehensive nature encourages safety professionals to expand their influence beyond roadway design and beyond traditional transportation agencies. Additionally, the SSA prioritizes serious and fatal injuries (as opposed to all crashes), encouraging professionals to target severity reduction as a mechanism to reduce fatalities and serious injuries.

The SHSP follows the FHWA process model of planning, implementation, reporting, and evaluation (Figure 1-1). The remainder of this section describes key activities that shaped the 2025 SHSP.


Figure 1-1: FHWA Process Model

Figure 1-2 summarizes the SHSP planning process. It began by gathering agreement among key leaders on the process and desired outcomes. This was followed by stakeholder engagement with local, regional, state, federal, non-profit, and public- and private-sector organizations, using a robust and inclusive approach. These stakeholders, along with subject matter experts, aligned around the Vision and Mission and provided important insights to data analysis and community relevance, identifying and refining strategies, and action planning. Stakeholders were identified through a robust process further described in Chapter 3 Stakeholder Engagement.

Data collection and analysis informed the SHSP. The safety improvement strategies and actions identified in the plan are the direct result of data analysis, including observed trends in the crash data, the proven effectiveness of safety countermeasures, and self-reported behaviors gained through annual surveys. Chapter 2 Data Analysis & Findings further details the data collection and analysis.

FHWA requires additional analyses focused on three high-priority contexts: High-Risk Rural Roads (HRRR), Older Drivers and Pedestrians, and Vulnerable Road Users (VRUs)(see callout: FHWA Special Contexts for more details).

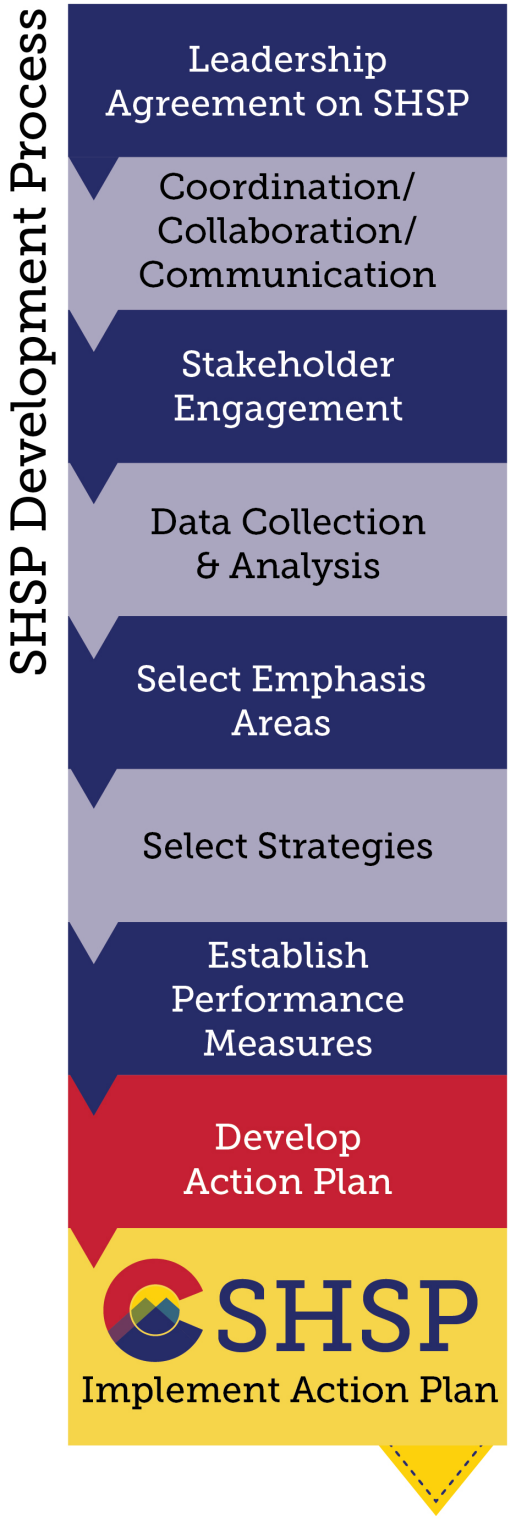



Figure 1-2: Colorado SHSP Development Process

Data collection and analysis coupled with stakeholder input supported the identification of Emphasis Areas (Chapter 4) and the selection of strategies (Chapters 5 - 9).

Performance measures were established based on the previous steps. The SHSP establishes goals to reduce fatalities and serious injuries by 5% year-over-year resulting in a 22.6% reduction from 2024 to 2029. These goals align with CDOT's Policy Directive 14 (a 10-year Statewide Plan). Details of these goals are discussed throughout Chapters 5 through 9.

Achieving these goals requires strong implementation and evaluation. The SHSP describes steps for implementation, reporting, and evaluation. The Advancing Transportation Safety (ATS) initiative is responsible for developing annual Action Plans and facilitating implementation by enumerating action steps with timelines, assigning champions, and creating accountability through regular reporting. Access to timely data, such as CDOT's data dashboards allows stakeholders to monitor and evaluate Colorado's progress on meeting the SHSP's five percent year-over-year reduction goal. Stakeholder reporting and annual reports are crucial for assessing progress toward reducing roadway fatalities and serious injuries. Implementation is discussed in Chapter 10 Implementation.

The Advancing Transportation Safety (ATS) initiative, developed under the 2020 Strategic Transportation Safety Plan (STSP), builds on Colorado's 2015 Moving Toward Zero Deaths effort. Recognizing the need for a unified safety coalition, ATS is the result of implementing STSP Strategy B: Build a Safety Coalition- advocating for safety, fostering a strong safety culture, and reducing fatalities and serious injuries across Colorado. The ATS initiative brings together safety partners across the state to implement strategies adopted through the SHSP. These partners are organized into working groups based on Emphasis Areas and develop, champion, and monitor annual Action Plans.

## FHWA Special Contexts (Special Rules)

Per the requirements of the Highway Safety Improvement Program (HSIP), updates to a state's SHSP must address three specific topics (i.e., special rules) aimed at areas of desired safety improvement. The special rules are assigned to states based on observed crash history and are specific to each state. The Infrastructure Investment and Jobs Act (IIJA), signed on November 15, 2021, introduced a new Vulnerable Road User (VRU) Special Rule under the HSIP while maintaining the existing rules for High-Risk Rural Roads (HRRR) and Older Drivers and Pedestrians. The VRU and Older Drivers and Pedestrians HSIP special rules apply to Colorado. As of 2025, the HRRR special rule does not apply to Colorado. The VRU Special Rule strengthens the focus on non-motorist safety and requires states to complete VRU safety assessments as part of the SHSP update process.

High Risk Rural Roads (HRRR) High Risk Rural Roads (HRRR) are defined in Title 23 of the United States Code as "any roadway functionally classified as a rural major or minor collector or a rural local road with significant safety risks, as defined by a State in accordance with an updated State Strategic Highway Safety Plan (SHSP)." Each state is required to define significant safety risks.

In Colorado, HRRR are defined as:

> Any roadway functionally classified as a rural major or minor collector or a rural local road experiencing severe (serious bodily injury or fatality) crash rates that exceed the average for similar facilities as determined by a Level of Service of Safety (LOSS) (for on-system roadways) or a crash rate analysis (for off-system roadways). On-system roadways are under the jurisdiction of the State of Colorado whereas local agencies (e.g., Cities, Towns, Counties) have jurisdiction over off-system roadways.

Per FHWA requirements, when a state qualifies for the HRRR special rule, the state must obligate in the following fiscal year an amount equal to at least 200% of the amount of funds the State received for fiscal year 2009 for high risk rural roads. For Colorado, that equates to approximately $2.8M per year. As of 2025, Colorado is not required to set aside these funds; however, whether the special rule applies is reviewed annually to determine if Colorado meets the threshold of the special rule.


Older Drivers and Pedestrians The Older Drivers and Pedestrians Special Rule requires Colorado to include strategies in the SHSP to address the rising rate of fatalities and serious injuries among older road users (age 65 and older). The state must analyze whether increases are due to driver or pedestrian incidents—or both—to guide targeted countermeasures. As detailed in Chapter 7 Safe People, fatality and serious injury increases have occurred among both older drivers and pedestrians, necessitating that the SHSP incorporate treatments from the 2014 FHWA Handbook for Designing Roadways for the Aging Population.

Vulnerable Road Users Under the VRU Special Rule, Colorado must allocate at least 15% of its HSIP funding to projects improving safety of VRUs. All highway safety improvement projects, including those implemented under the VRU Special Rule, must be on a public road consistent with Colorado's SHSP and correct or improve a hazardous road location or feature, or address a highway safety problem. Therefore, Colorado's SHSP addresses fatalities and serious injuries among pedestrians and bicyclists. Furthermore, Colorado uses a data-driven approach to address safety problems and opportunities on all public roads and for all road users as part of the SHSP.

In 2023, Colorado completed a Vulnerable Road Users (VRU) Safety Assessment that outlined strategies and actions aimed at improving safety for those most vulnerable to serious injury or fatality in the event of a crash. The results of the 2023 VRU Safety Assessment informed the VRU Assessment included in this SHSP. Moving forward, the VRU Safety Assessment is now a part of the SHSP process and will be updated every five years. The Safe People Emphasis Area contains the assessment and relevant strategies, described in Chapter 7.

## Emphasis Areas and Focus Areas

Colorado's Emphasis Areas are based on the Safe System Approach and include Safety Culture, Safe Driving, Safe People, Safe Roads, and Post-Crash Care. Within each of these Emphasis Areas, there are Focus Areas that describe particular contexts (e.g., intersections), behaviors (e.g., impaired driving), or populations (e.g., pedestrians) that are associated with fatal and serious injury crashes. For example, in the Safe Roads Emphasis Area there are four Focus Areas: intersections, lane departures, off-system (roads), and speed management (Figure 1-3). This plan identifies specific strategies suitable for each Focus Area including clear performance measures, funding sources, project-level detail, and evaluation criteria. Strategies for each Emphasis Area and Focus Area are included in Chapters 5 through 9.

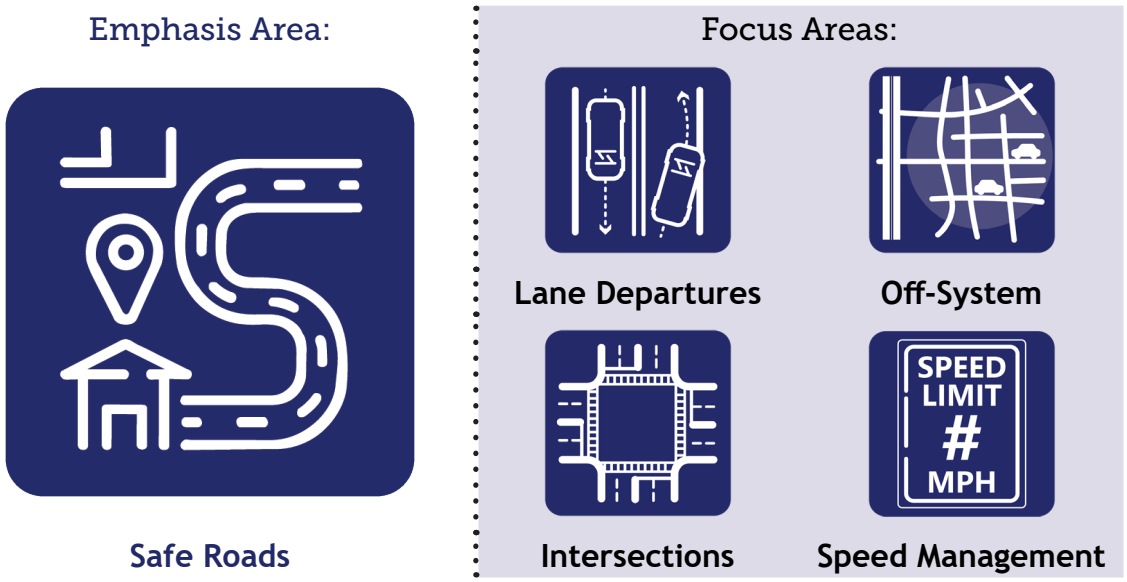



Figure 1-3: Safe Roads Emphasis Area and Focus Areas

# Alignment with Other Plans

The complexity and long-term nature of the transportation system requires multiple short- and long-term plans. Such plans address different geographies (e.g., metropolitan and rural), modes, vehicle classes (e.g., commercial), and safety-related factors (e.g., infrastructure and behavioral).

The SHSP development process involved coordination with various state planning processes, as well as federal, industry-specific, and local road safety plans (Figure 1-4). In total, 44 plans were reviewed to assess alignment with high-level goals, performance measures, strategies, and objectives and identify how these plans could contribute to SHSP implementation. The Appendix includes a full matrix detailing each plan's goals, strategies, objectives, and performance measures and alignment with the SHSP.

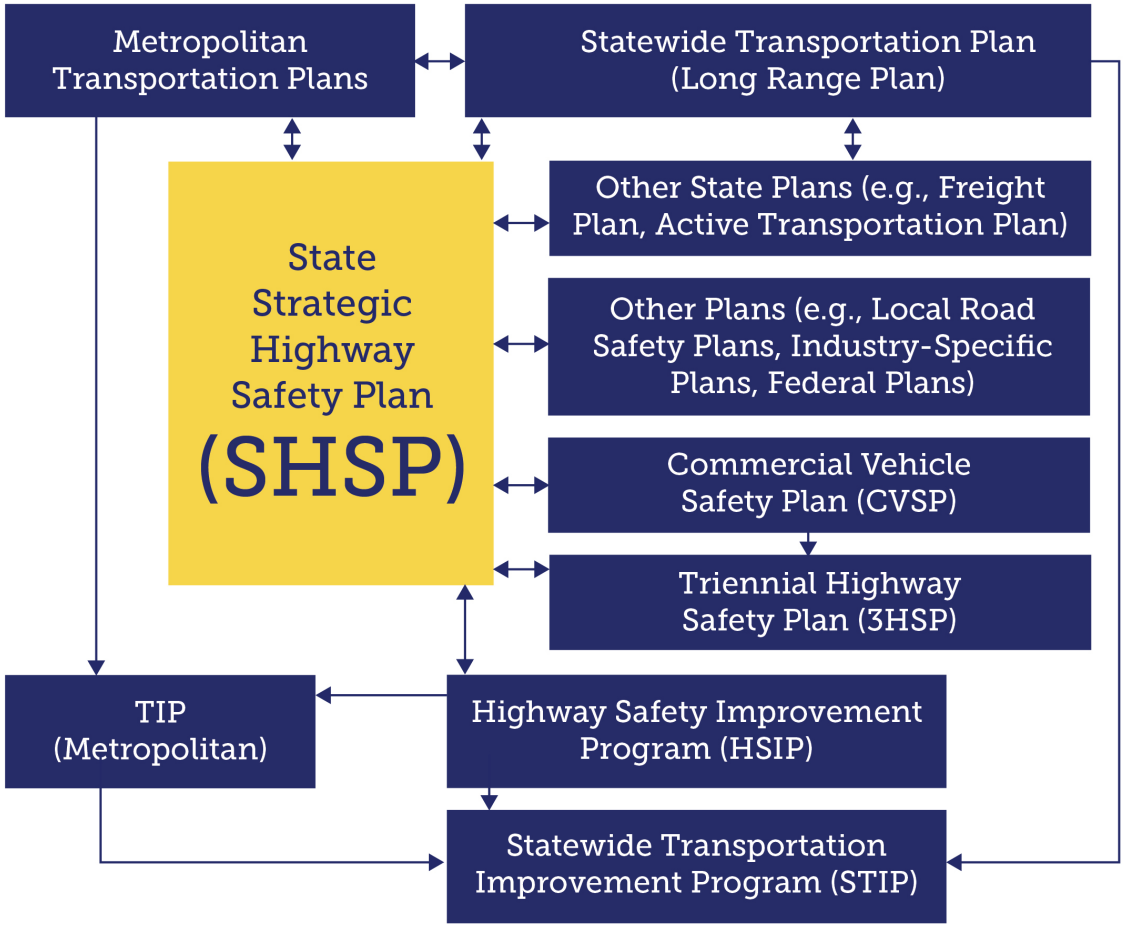



Figure 1-4: Coordinated Transportation Safety Planning, Source reference HSIP.

Opportunities to continue improving alignment with on-going state and local transportation and safety planning efforts include:

- Developing compatible annual planning timelines.
- Using consistent data and analysis strategies.
- Aligning plan and program mission / vision / goals.
- Identifying consistent strategies and countermeasures.
- Determine priorities for the correction of hazardous road locations, sections, and elements via identified crash data analysis.
- Targeting funding to implement strategies associated with SHSP Emphasis Areas.
- Engaging SHSP stakeholders in planning processes, safety committees, and local and regional safety action planning.
- Including safety criteria in performance reviews.
- Providing access to safety data and analysis results.
- Including SHSP criteria in HSIP and Triennial Highway Safety Plan (3HSP) grant solicitation requirement.

## Summary of Strategies

The following tables summarize the SHSP strategies by Focus Area. More detailed descriptions of the strategies are provided in the SHSP Emphasis Area chapters and the Appendix.

Table 1-1. Safety Culture Strategies

| Focus Area | Strategy |
|---|---|
| Organizational Safety Culture | SC1: Conduct organizational safety culture assessments |
| Organizational Safety Culture | SC 2: Local agency support programs (LTAP and Safety Circuit Rider) |
| Organizational Safety Culture | SC3: Expand public engagement |
| Organizational Safety Culture | SC4: Consider communities with below average safety outcomes when making transportation safety investment decisions |
| Organizational Safety Culture | SC5: Enhance collaboration and information sharing among traffic safety professionals |
| Public Safety Culture | SC6: Pilot community-level safety culture partnerships |
| Public Safety Culture | SC7: Educate through media campaigns |
| Public Safety Culture | SC8: Build capacity among the public |

Table 1-2: Safe Driving Strategies

| Focus Area | Strategy |
|---|---|
| Occupant Protection | SD1: Promote proper use through media campaigns |
| Occupant Protection | SD2: Educate on primary seat belt law |
| Impairment | SD3: Provide polydrug impairment education |
| Impairment | SD4: Prioritize high-risk impaired driving corridors |
| Impairment | SD5: Continue high-visibility enforcement |
| Aggression | SD6: Deploy anti-aggressive driving campaigns |
| Aggression | SD7: Prioritize high-risk aggressive driving corridors |
| Speeding | SD8: Prioritize high-risk speeding locations |
| Speeding | SD9: Deploy speed safety camera systems |
| Distraction | SD10: Provide education on hands-free law |
| Distraction | SD11: Enhance data collection |

Table 1-3: Safe People Strategies

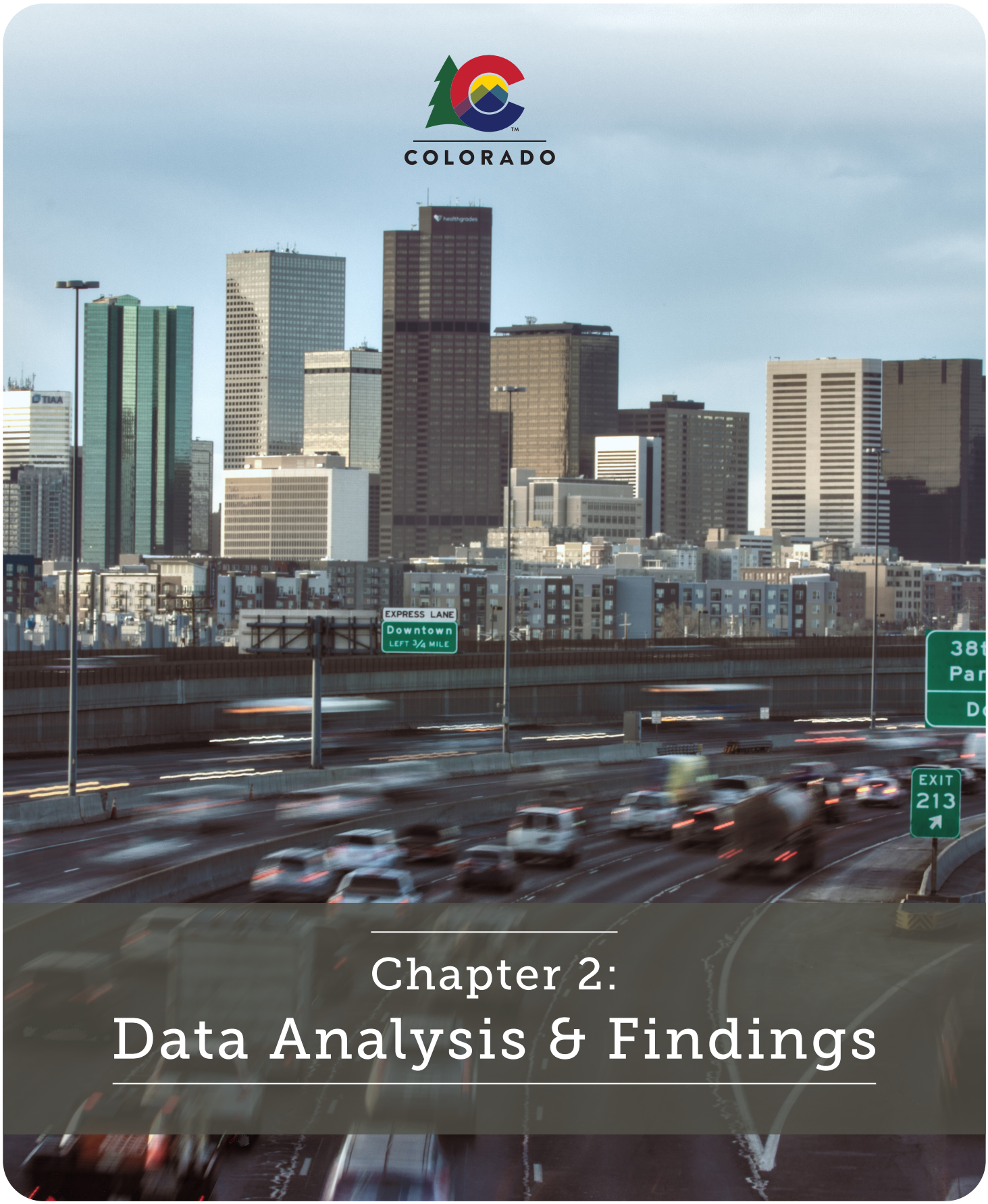
| Focus Area | Strategy |
|---|---|
| Motorcyclists | SP1: Expand motorcycle operator safety training |
| Motorcyclists | SP2: Increase public awareness of motorcycle safety |
| Motorcyclists | SP3: Improve motorcycle licensing and endorsement |
| Motorcyclists | SP4: Increase helmet and other personal protective equipment (PPE) use |
| Aging Drivers | SP5: Improve visibility of traffic control devices |
| Aging Drivers and Pedestrians | SP6: Improve sight distances |
| Aging Drivers and Pedestrians | SP7: Expand community-based mobility options |
| Aging Drivers | SP8: Enhance and expand resources for aging drivers |
| Young Drivers | SP9: Expand access to driver's education |
| Young Drivers | SP10: Improve quality of driver's education |
| Pedestrians and Bicyclists | SP11: Prioritize pedestrian and bicycle crash types |
| Pedestrians and Bicyclists | SP12: Improve VRU exposure data |
| Pedestrians and Bicyclists | SP13: Conduct Road Safety Audits (RSAs) |
| Pedestrians and Bicyclists | SP14: Perform regional pedestrian/bicyclist studies |
| Pedestrians and Bicyclists | SP15: Analyze VRU crash demographic data |
| Pedestrians and Bicyclists | SP16: Conduct VRU before-and-after studies |
| Pedestrians and Bicyclists | SP17: Educate traffic safety professionals on VRU best practices |
| Pedestrians and Bicyclists | SP18: Inventory VRU infrastructure |
| Pedestrians and Bicyclists | SP19: Expand VRU data sources |
| Pedestrians and Bicyclists | SP20: Evaluate VRU priority locations |
| Work Zones | SP21: Create work zone safety committee |
| First Responders | SP22: Provide resources and support for first responders |

Table 1-4: Safe Roads Strategies

| Focus Area | Strategy |
|---|---|
| Lane Departures | SR1: Install traffic controls and safety barriers |
| Lane Departures | SR2: Improve roadway geometry |
| Off-System | SR3: Provide local agency assistance |
| Off-System | SR4: Encourage community-specific plans |
| Intersections | SR5: Reduce intersection conflicts |
| Intersections | SR6: Perform Intersection Control Evaluations (ICE) |
| Intersections | SR7: Incorporate VRU designs |
| Intersections | SR8: Prioritize high-risk intersection locations |
| Intersections | SR9: Implement improved traffic controls |
| Speed Management | SR10: Promote appropriate speeds |
| Speed Management | SR11: Set safe and realistic speed limits |

Table 1-5: Post-Crash Care Strategies

| Focus Area | Strategy |
|---|---|
| TIM/EMS | PC1: Improve collection of post-crash care data |
| TIM/EMS | PC2: Improve quality of care |
| TIM/EMS | PC3: Provide education on post-crash care best-practices |
| TIM/EMS | PC4: Enhance programs in light of differences in post-crash care outcomes |
| TIM/EMS | PC5: Support statewide traffic incident management (TIM) activities |




# Chapter 2:
# Data Analysis & Findings

The Strategic Highway Safety Plan (SHSP) utilizes a data-driven process, using safety data to identify trends, pinpoint problems, and develop targeted strategies with actionable implementation measures. This section provides an overview of key safety trends in Colorado. Each Emphasis Area and relevant Focus Areas have a distinct data profile and set of characteristics that expand upon this data. For more details on data trends for specific Emphasis Areas and Focus Areas, see Chapters 5 through 9.

# Background

There are numerous ways to measure "safety," so it is important to understand what safety means in the context of this plan. Historically, a roadway was said to be "safe" if it complied with accepted standards and guidelines. Later, safety was measured by the total number of crashes or a simple crash rate. This plan utilizes current best practices by measuring fatalities and serious injuries, following the SSA principle "death and serious injuries are unacceptable." This method entails measuring safety in terms of crash severity or the highest level of injury resulting from a crash.

The following are common terms utilized in describing transportation safety (AASHTO, 2010):

- Crash frequency: the number of crashes in a given study area and study period. Crash frequency can relate to all crashes or a subset of crash severities, crash types, or a combination of the two.
- Crash rate: the number of crashes normalized by some level of exposure, such as vehicle miles traveled (VMT).
- Crash severity: the level of injury resulting from a crash. Crash severity can be defined at either the person level or at the crash level. At the person level, this represents the severity reported for each person involved in a crash. At the crash level, this represents the most severe injury resulting from the crash. Crash severity is commonly categorized on crash reports using the KABCO scale, where:
    - K is a fatality.
    - A is a suspected serious injury.
    - B is a suspected minor injury.
    - C is a possible injury.
    - O is no apparent injury, also known as property damage only (PDO).

# Methodology

Data analyses were performed to identify key factors contributing to traffic related fatalities and serious injuries. The data analysis focuses on fatal (K) and serious injury (A) crashes, also referred to as severe crashes. Stakeholder input, including feedback from the Steering Committee and Subject Matter Experts (SMEs), aided in the development and interpretation of the analysis.

The analysis provided context for each of the five Emphasis Areas and helped identify factors contributing to observed crash data trends:

Safety Culture | Safe Driving | Safe People | Safe Roads | Post-Crash Care

- **Safety Culture:** Community engagement, law enforcement collaboration, data access, and public outreach.
- **Safe Driving:** Behavioral risk factors, high-risk corridors, high-risk counties, and legislation.
- **Safe People:** High-risk populations, overrepresented travel modes, roadway workers and first responders.
- **Safe Roads:** Common crash types, roadway-related risk factors, high-crash locations, and high-risk counties, municipalities, and tribal territories.
- **Post-Crash Care:** EMS response and transport times, hospital admissions, access to trauma centers, secondary crash rates, and post-crash care analysis.

The SHSP is a statewide plan, making a "hot spot" approach to identifying and treating specific locations based on crash history inappropriate. In contrast, a "systemic approach" to safety acknowledges that crash frequency or rates at specific locations are not always sufficient to determine which safety improvement actions to implement and where to implement them. Systemic implementation of safety actions helps address the most serious crash types on the entire road system, not just at specific high-crash spot locations. The systemic safety approach offers a means to identify crash types (e.g., intersection, roadway departure, pedestrians) and the location-related factors that contribute to the highest number of fatal and serious injury crashes of each type, and widely implement low-cost countermeasures over several locations with similar crash characteristics and/or similar roadway features.

In addition to the factors that contribute to observed crash trends, cost-effectiveness of strategies and the benefit-cost of subsequent strategy-based actions are important considerations. The SMEs, FHWA's Proven Safety Countermeasures, National Highway Traffic Safety Administration's (NHTSA) Countermeasures that Work, and FHWA's Crash Modification Factors Clearinghouse all influenced strategy identification and definition. See Chapter 10 Implementation for more details related to the effectiveness of strategies.

# Data Sources

Colorado agencies collect, maintain, and analyze transportation, socioeconomic, EMS, community engagement and other data. This collective data, in addition to the national sources such as the Fatality Analysis Reporting System (FARS), the Fatality and Injury Reporting System Tool (FIRST), U.S. Census Data, and Emergency Responder Safety Institute (ERSI) data, provides a comprehensive understanding of Colorado's transportation safety landscape.

The SHSP is built upon a comprehensive understanding of historical crash data. In Colorado, crash data originates with law enforcement officers who prepare crash reports and submit the information to the Department of Revenue (DOR). The DOR is the custodian of record for crash reports and disseminates the data to other systems, including those associated with the driver and the vehicle. CDOT receives, processes, and analyzes crash data and provides summary reports to FHWA and NHTSA.

Crash data originates from police crash reports. Different reporting practices among law enforcement officers or agencies can result in inconsistencies in the crash data. Furthermore, the reporting officer may not have complete information when filling out the report, which results in some subjectivity in the data. For instance, it can be difficult for an officer to determine if distraction or speeding were factors in a crash unless there is evidence such as testimonial evidence (e.g., admission of high-risk driving behavior). It is also noteworthy that Colorado's crash report form changed in 2020, resulting in different data being available before and after this date. Because of these changes, some analyses are only performed using data after 2020, including speed-involved crashes.

Historical crash data is also used to identify expected safety performance of roadways and intersections. Level of Service of Safety (LOSS) reflects the safety performance of a particular location through a comparison with other similar locations. Locations with a higher-than-expected crash severity or frequency are typically considered good candidates for safety improvement.

Population trends and public health data also play a role in safety analysis. The Colorado State Demographer and the Department of Local Affairs track current and projected population data. CDPHE collects and maintains data pertaining EMS. Data relating to EMS dispatch and response, medical treatment, and hospital-related data are important to understanding the factors that contribute to the survivability of the crash.

Road Safety Audits (RSAs) continue to be an emerging practice in Colorado. As they become more commonplace, RSA findings and recommendations can be used to inform subsequent strategies and actions, including identification of systemic safety countermeasures. Chapter 7: Safe People and Chapter 8: Safe Roads include strategies intended to strengthen RSA practices.

The Appendix provides a full list of data sources.

# Safety Trends

This section provides an overview of statewide safety trends. More detailed analysis of crash trends and contributing factors for each Emphasis Area are presented in their respective chapters (Chapters 5 through 9).

Traffic-related fatalities have increased steadily since 2013 and more sharply within the last few years. Based on 5-year rolling averages, fatalities increased by 11% from 2019 to 2023. Over this same period, the 5-year rolling average for serious injuries rose by 28%. This reflects a sharp increase since 2020 when stay-at-home conditions were widespread due to the COVID-19 pandemic. Considering the amount of motor vehicle travel in Colorado, measured in VMT, fatality rates have also increased steadily since 2013, and more sharply since 2019.

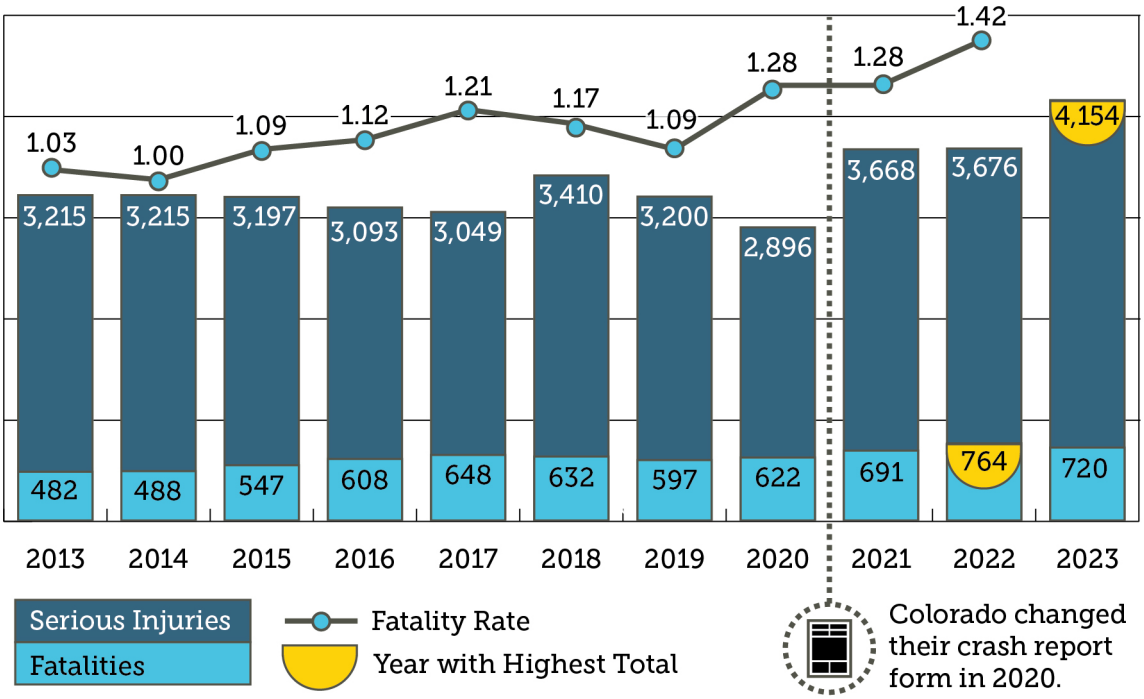



Figure 2-1: Fatalities and Serious Injuries by Year**

*VMT data not available for 2023

**Sources: FHWA Highway Statistics Tables VM-2. (2017 to 2022); CO Crash Database as of January 2024 (2017 to 2023); HSIP 2022 Report (2013 to 2016)

## Emphasis Areas and Key Crash Factors in Colorado

One of the central roles of Colorado's SHSP is to identify and categorize Focus Areas—safety categories that offer the greatest potential to reduce fatalities and serious injuries. The 20 Focus Areas, which are grouped by Emphasis Areas, were selected through crash data analysis and stakeholder input, including Subject Matter Experts (SMEs). Fourteen (14) of these identified Focus Areas have substantial data to accompany them.. Figures 2-2 through 2-4 omit the following six focus areas: Public Safety Culture, Organizational Safety Culture, First Responders, Speed Management, Traffic Incident Management, and EMS, as the related data do not fit these analyses.

While each Emphasis Area and Focus Area is addressed in its own chapter, the plan recognizes that multiple contributing factors often intersect in a single crash. For example, addressing speeding may also help reduce lane departure and impaired driving crashes. The SHSP identifies strategies that proactively target overlapping risks, as well as individual contributing factors.

Intersections, lane departures, and improper use of occupant protection remain some of the leading contributors to fatal and serious injury crashes in Colorado.

Although crashes involving pedestrians, bicyclists, and motorcyclists make up a lesser share of total crashes, they result in disproportionately severe outcomes. For example, since 2021, pedestrians and bicyclists accounted for approximately 17% of all traffic fatalities, despite being involved in far fewer crashes overall.

The figures on the following page illustrate the relative severity of different Focus Area crashes. While some crash types have lower total numbers, such as those involving pedestrians or bicycles, they more frequently result in fatal or serious injury outcomes on a per-crash basis.

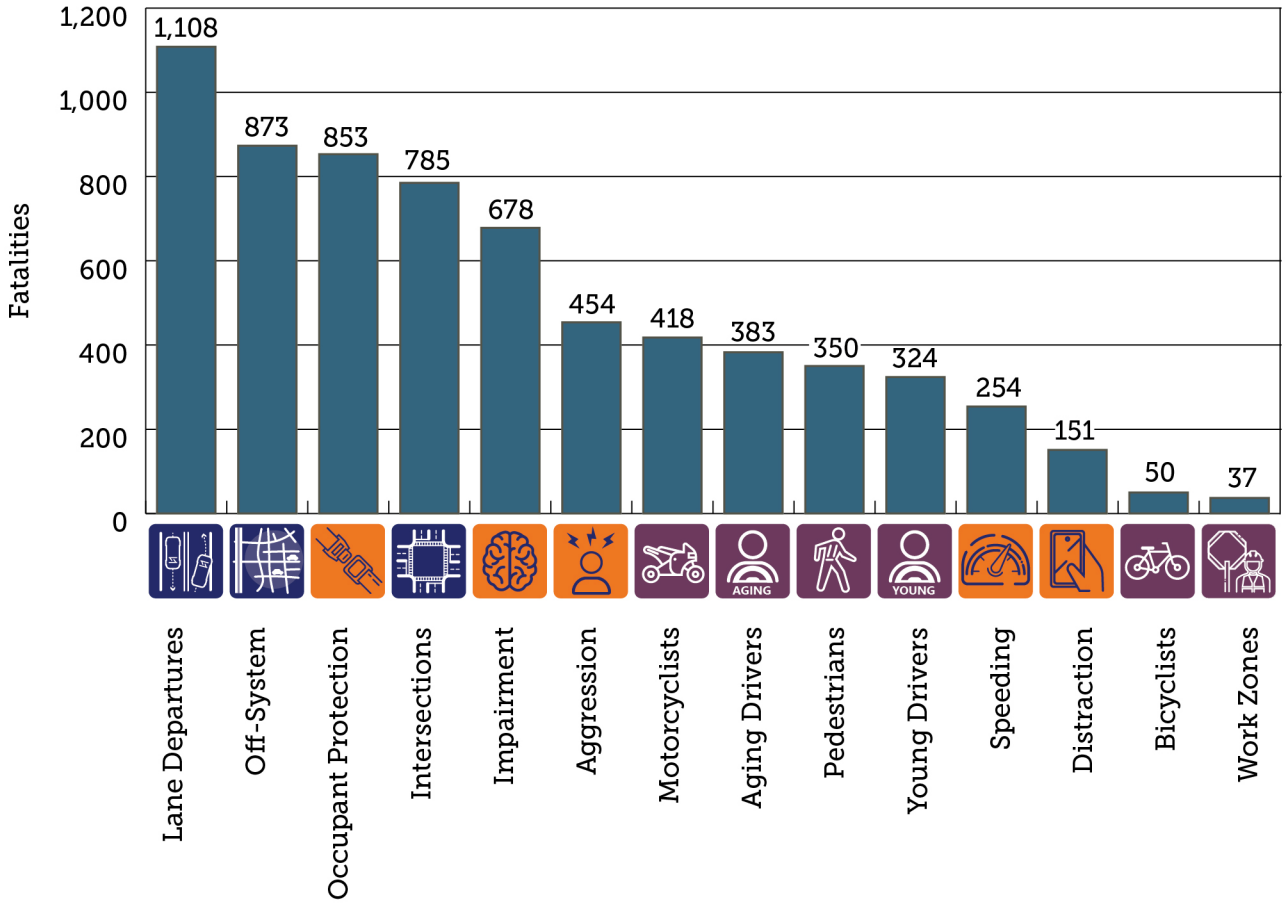



Figure 2-2: Total Fatalities by Focus Area (2021 to 2023)

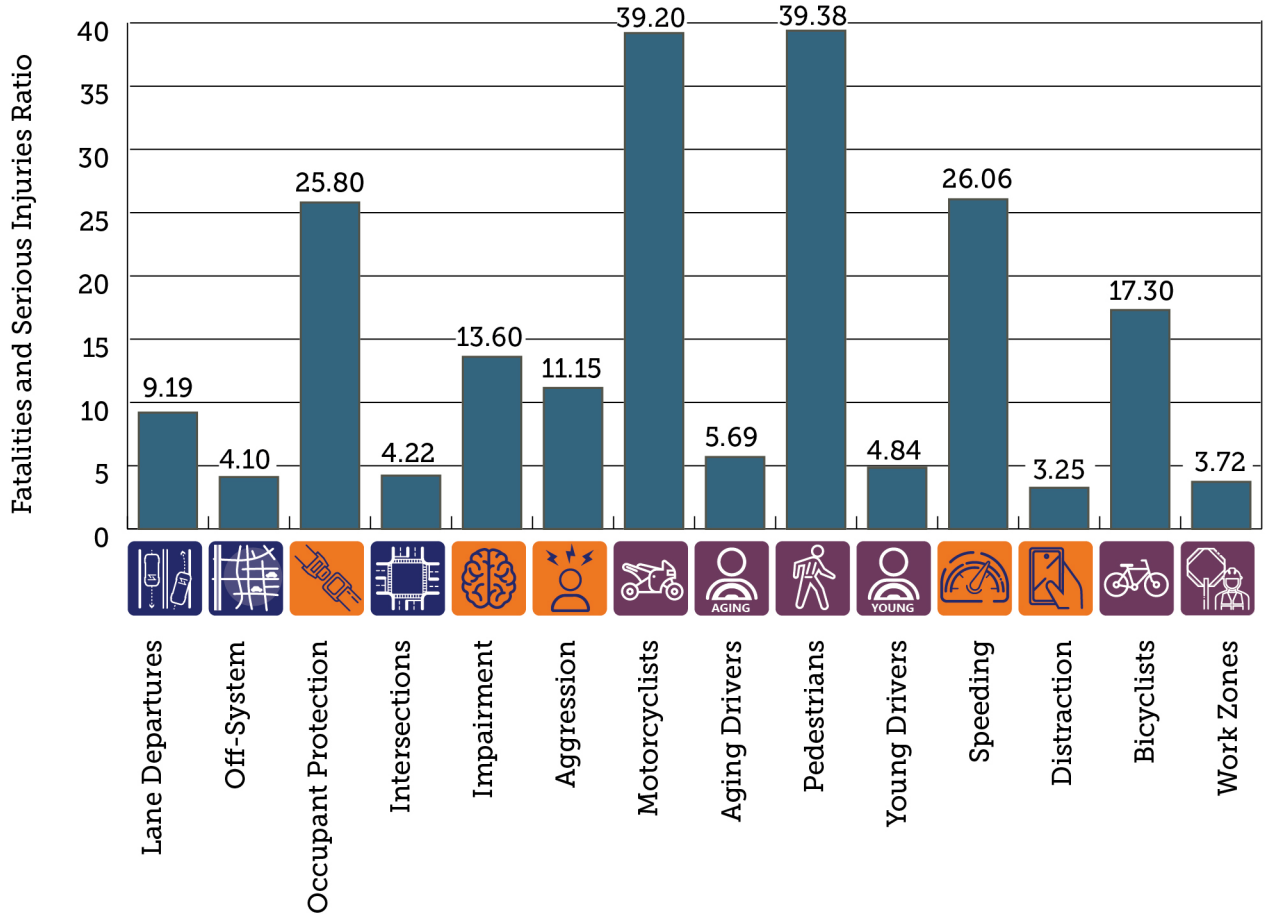



Figure 2-3: Ratio of Fatalities and Serious Injuries to Total Crashes by Focus Area (2021 to 2023)

Figure 2-3 highlights how crashes within certain Focus Areas have a much higher likelihood of resulting in deaths or serious injuries. For example, 39.2% of motorcycle crashes result in a serious injury or fatality. In contrast, 9.2% of lane departure crashes result in serious injury or fatality. It is important to note that although each lane departure crash is less likely to result in a serious injury or fatality, they nevertheless make up a large proportion of the total number of crashes resulting in fatalities and serious injuries and therefore are an important Focus Area of the SHSP.

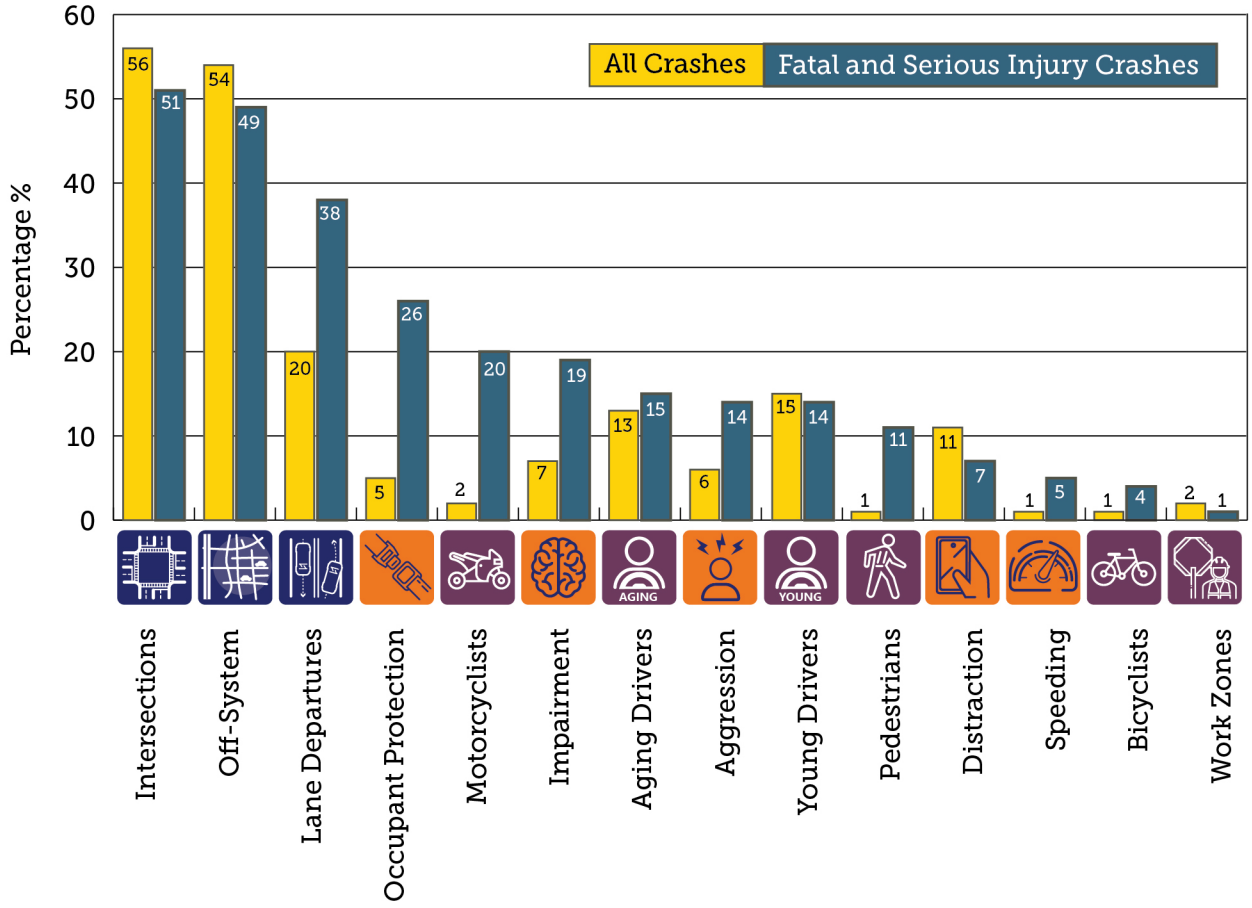



Figure 2-4: Proportion of Fatal and Serious Injury Crashes vs. All Crashes by Focus Area (2021 to 2023)

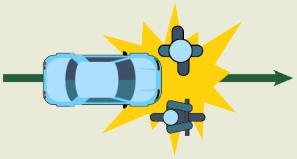
The number of fatal and serious injury crashes by Focus Area is important, as is the proportion of fatal and serious injury crashes to all crashes, as these illustrate areas where disproportionality creates opportunity for the application of safety improvement strategies. Trends within each Focus Area are also informative as they reveal whether existing strategies are yielding improvement (fewer crashes year-over-year) or if the opposite is true. As shown in Table 2-1, these trends indicate whether a Focus Area is grouped into Safety Culture, High-Impact, Emerging and Monitoring, and Doubling Down on Success categories. As described more thoroughly in Chapter 10 Implementation, the Focus Area category provides a glimpse into the effectiveness of current safety improvement efforts, and aids in the identification of new strategies.

Table 2-1: Focus Area Trends and Resulting Category

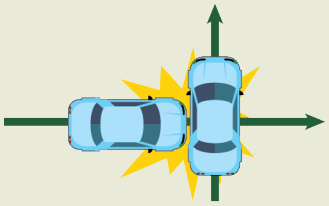
| Focus Area | 2021 Fatal & Serious Injuries | 2022 Fatal & Serious Injuries | 2023 Fatal & Serious Injuries | Total (2021-2023) | % Change (2021-2023) | Focus Area Category |
|---|---|---|---|---|---|---|
| Intersections | 2,062 | 2,183 | 2,529 | 6,774 | 23% | High-Impact |
| Off-System | 1,993 | 2,092 | 2,315 | 6,400 | 16% | High-Impact |
| Lane Departure | 1,805 | 1,827 | 1,775 | 5,407 | -2% | High-Impact |
| Occupant Protection | 1,263 | 1,271 | 1,246 | 3,780 | -1% | High-Impact |
| Impairment | 913 | 986 | 992 | 2,891 | 9% | High-Impact |
| Motorcycles | 800 | 800 | 842 | 2,442 | 5% | High-Impact |
| Young Drivers | 606 | 735 | 794 | 2,135 | 31% | Emerging & Monitoring |
| Aging Drivers | 673 | 679 | 771 | 2,123 | 15% | Emerging & Monitoring |
| Pedestrians | 446 | 484 | 625 | 1,555 | 40% | Emerging & Monitoring |
| Speeding | 178 | 236 | 292 | 706 | 64% | Emerging & Monitoring |
| Bicyclists | 164 | 149 | 210 | 523 | 28% | Emerging & Monitoring |
| Work Zones | 43 | 52 | 65 | 160 | 51% | Emerging & Monitoring |
| Aggression | 608 | 731 | 690 | 2,029 | 13% | Emerging & Monitoring |
| First Responders* | N/A | N/A | N/A | N/A | N/A | Emerging & Monitoring |
| Emergency Medical Services* | N/A | N/A | N/A | N/A | N/A | Emerging & Monitoring |
| Distraction | 353 | 339 | 348 | 1,040 | -1% | Doubling Down |
| Speed Management* | N/A | N/A | N/A | N/A | N/A | Doubling Down |
| Traffic Incident Management* | N/A | N/A | N/A | N/A | N/A | Doubling Down |
| Wildlife-Vehicle Collisions | 25 | 36 | 31 | 92 | 24% | Doubling Down |
| Commercial Vehicles* | N/A | N/A | N/A | N/A | N/A | Doubling Down |
| Children Passenger Safety (Under 15) | 173 | 147 | 176 | 496 | 2% | Doubling Down |
| Winter Weather Related* | N/A | N/A | N/A | N/A | N/A | Doubling Down |
| Highway-Rail Grade Crossings | 13 | 9 | 20 | 42 | 54% | Doubling Down |

*Note: Data for these Focus Areas either do not apply in this way, or are not available.

Collision with Fixed Object
20%



Pedestrian and Bicyclists Crashes
17%



Broadside Collision
15%

While the Focus Areas help guide strategic priorities and actions, it is equally important to understand the specific types of crashes contributing to fatalities and serious injuries on Colorado's roadways. From 2019 to 2023, the most common fatal and serious injury crash types statewide were collision with a fixed object (20%), pedestrian and bicyclist crashes (17%), and broadside collisions (15%). These crashes frequently occur at intersections and in areas with high conflict points between road users. Reducing these crash types is essential to improving roadway safety across Colorado.

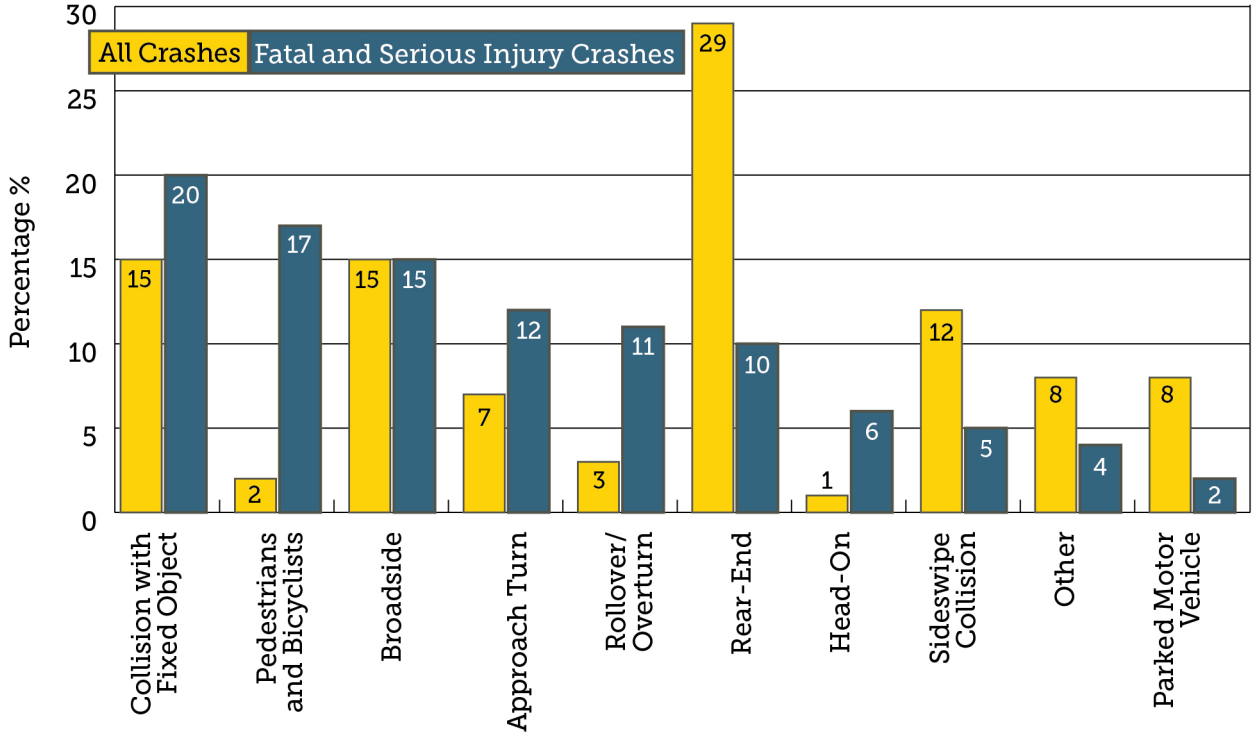



Figure 2-5: Fatalities and Serious Injuries by Crash Type (2021-2023)

## Evolving Travel Trends

The societal shifts from the COVID-19 pandemic had significant impacts on travel patterns and safety across Colorado. VMT declined sharply due to stay-at-home conditions, yet fatal crashes increased, leading to a spike in the fatality rate. This trend highlights how external factors, such as cultural and economic shifts, may compound safety risks.

In Colorado, urban areas account for over double the VMT of rural areas in a typical year. Urban VMT saw the steepest decline in 2020, but since then, travel has largely rebounded to pre-pandemic levels, with continued growth expected. While urban areas have higher traffic volumes and more crashes overall, rural areas experience disproportionately severe crashes on a per-crash basis. Understanding these geographic differences is crucial for improving safety statewide.

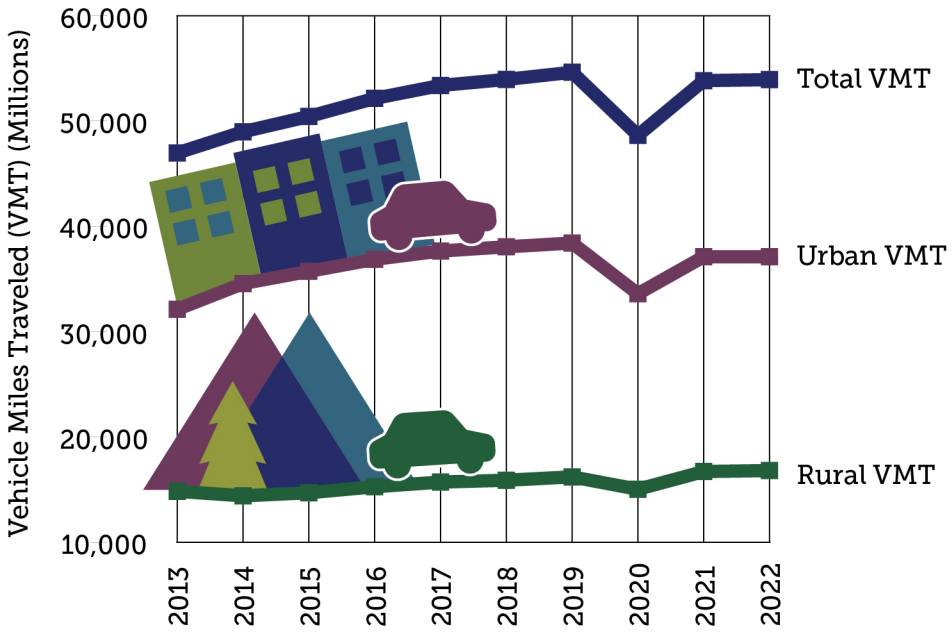



Figure 2-6: Urban vs. Rural VMT Trend (2013-2022)

Source: FHWA Highway Statistics Tables VM-2. (2013 to 2022)

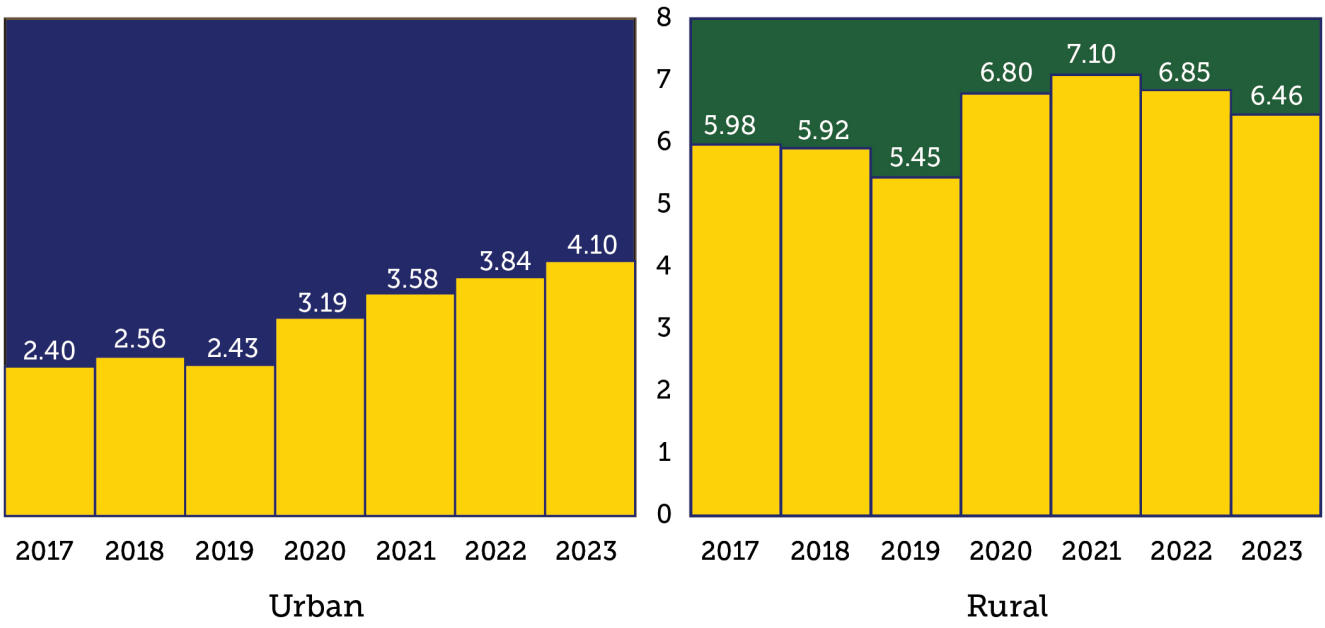



Figure 2-7: Urban vs. Rural Fatal Crash Rate per 100 Crashes (2017-2023)

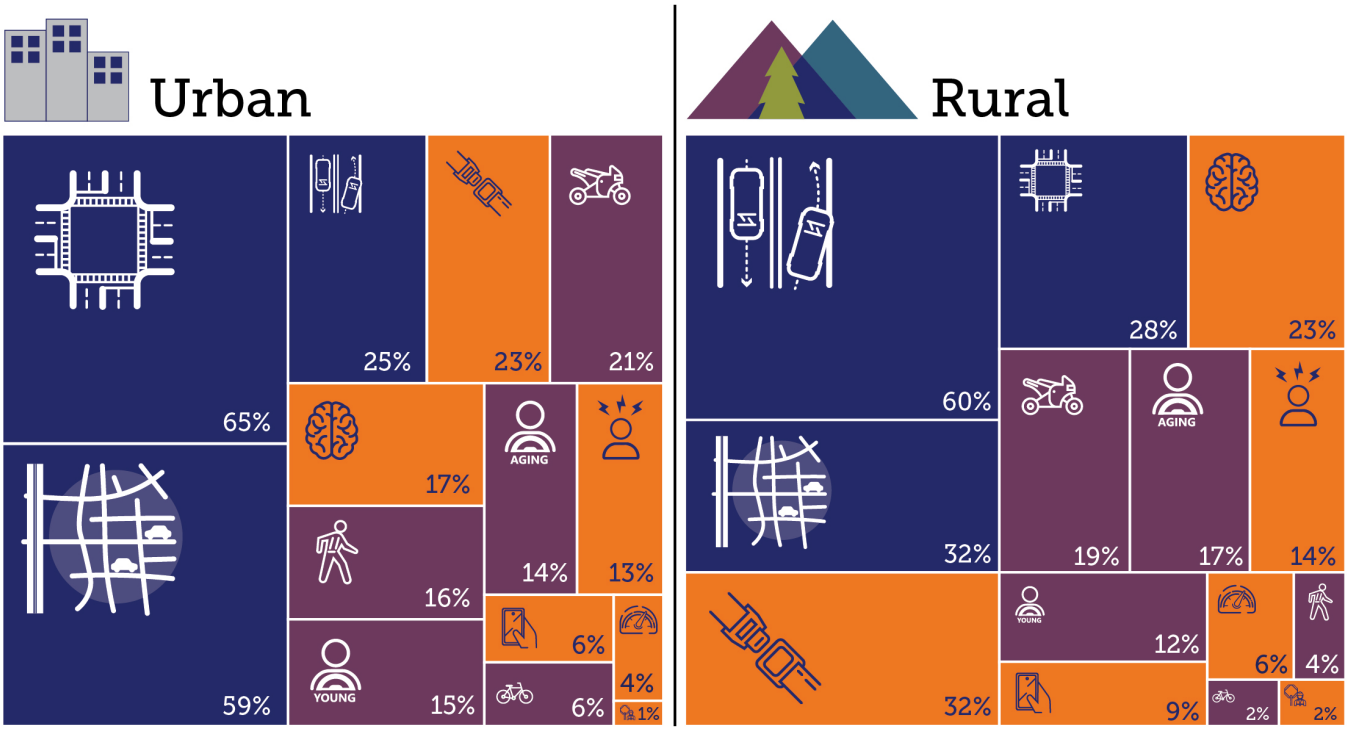
Source: CO Crash Database as of January 2025 (2017 to 2023)

## Urban and Rural Contexts

Urban and growing communities face safety challenges shaped by their environment. With more pedestrians, bicyclists, and other VRUs, urban areas see a higher proportion of severe crashes involving these road users. This is primarily due to more frequent daily interactions between vehicles and other road users on city streets.

While Colorado continues to urbanize, rural communities experience distinct safety risks that require attention. Although urban areas have three times as many crashes as rural areas, rural crashes more frequently result in fatalities and serious injuries. Factors such as higher speed, lower seat belt use, and lower access to post-crash care contribute to the severity of rural crashes. Addressing these differences is critical for improving safety statewide.

Figure 2-8 illustrates the percentage of fatal and serious injury crashes in urban and rural areas across key Focus Areas. Note that crashes often include multiple contributing factors and represent multiple Focus Areas. For example, a single crash may involve speeding, impairment, and lane departure. As such, the percentages in the figure total more than 100 percent.




| Urban | |
|---|---|
| Intersection 65% | Young Driver 15% |
| Off-System 59% | Aging Driver 14% |
| Lane Departure 25% | Aggression 13% |
| Occupant Protection 23% | Distraction 6% |
| Motorcyclists 21% | Speeding 4% |
| Impairment 17% | Bicyclists 6% |
| Pedestrians 16% | Work Zone 1% |

| Rural | |
|---|---|
| Lane Departure 60% | Aggression 14% |
| Off-System 32% | Young Driver 12% |
| Occupant Protection 32% | Distraction 9% |
| Intersection 28% | Speeding 6% |
| Impairment 23% | Pedestrians 4% |
| Motorcyclists 19% | Bicyclists 2% |
| Aging Driver 17% | Work Zone 2% |

Figure 2-8: Urban and Rural Fatal and Serious Injuries by Focus Area

Source: CO Crash Database as of January 2025 (2021 to 2023)

## State and Local Road Contexts

The state's roadway system also plays a critical role in crash trends. Though the state highway system accounts for only 10% of Colorado's total roadway miles, it carries 49% of the total VMT. Reflecting this pattern, 52% of fatal and serious injury crashes occur on state highways, while 48% happen on off-system roadways. This means that strategic safety improvements on a smaller subset of high-risk state highways could address a significant portion of severe crashes.

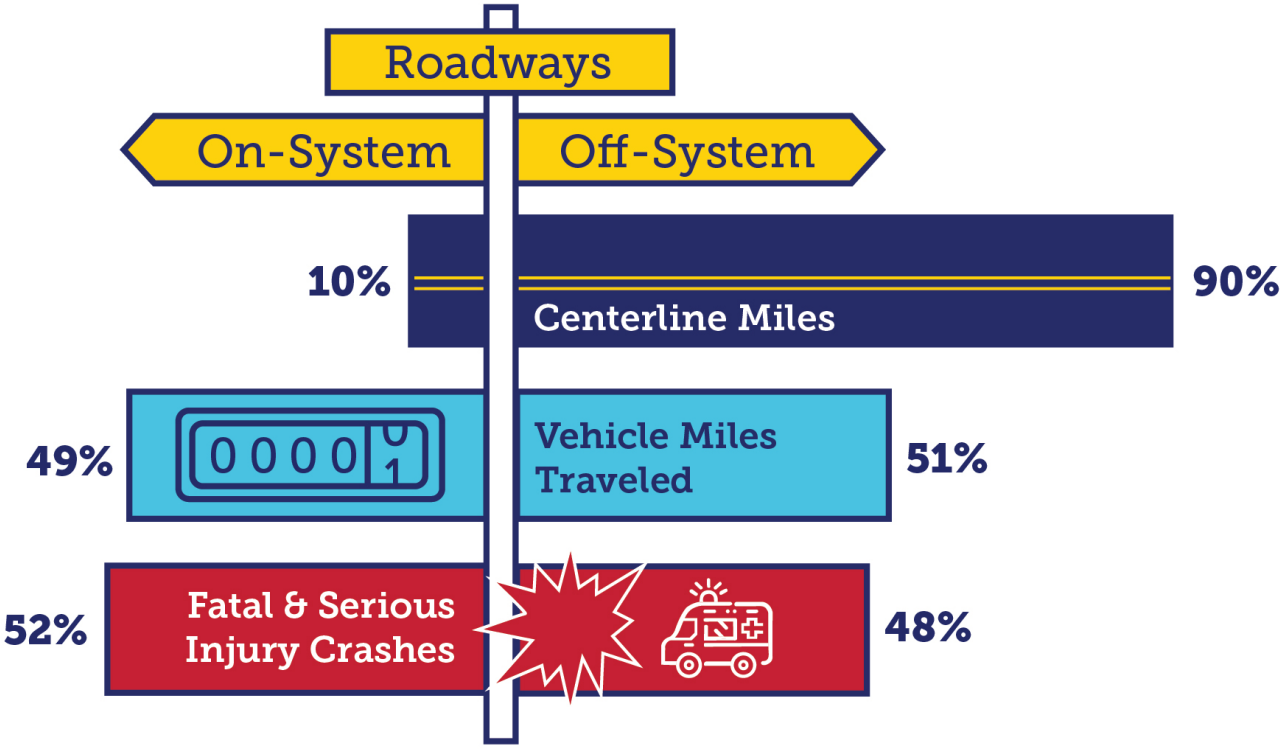



Figure 2-9: Centerline Miles, Annual Vehicle Miles Traveled, and Fatal and Serious Injury Crashes by On vs. Off-System Roadways

## Demographic Shifts

As Colorado's population grows and shifts, the state faces new challenges in ensuring roadway safety. Over the past decade, Colorado's population grew by 10%, adding approximately 52,000 new residents in 2023 alone. However, traffic-related fatalities and serious injuries increased by 24% during the same period—growing more than twice as fast as the population. With forecasts projecting another 26% increase in residents by 2050, addressing this widening gap between growth and roadway safety is critical.

Demographic changes are also reshaping travel patterns and crash risk. Older adults are becoming a larger share of Colorado's drivers, pedestrians, and bicyclists, which has direct safety implications (Figure 2-10). Older adults, especially pedestrians, are more likely to sustain severe injuries or fatalities in crashes. Older adults are less likely to survive a crash due to factors such as increased vulnerability, comorbidities (e.g., heart disease), medications that impair blood clotting, and delayed recovery. As the state plans for the future, it must accommodate aging populations and their mobility needs.

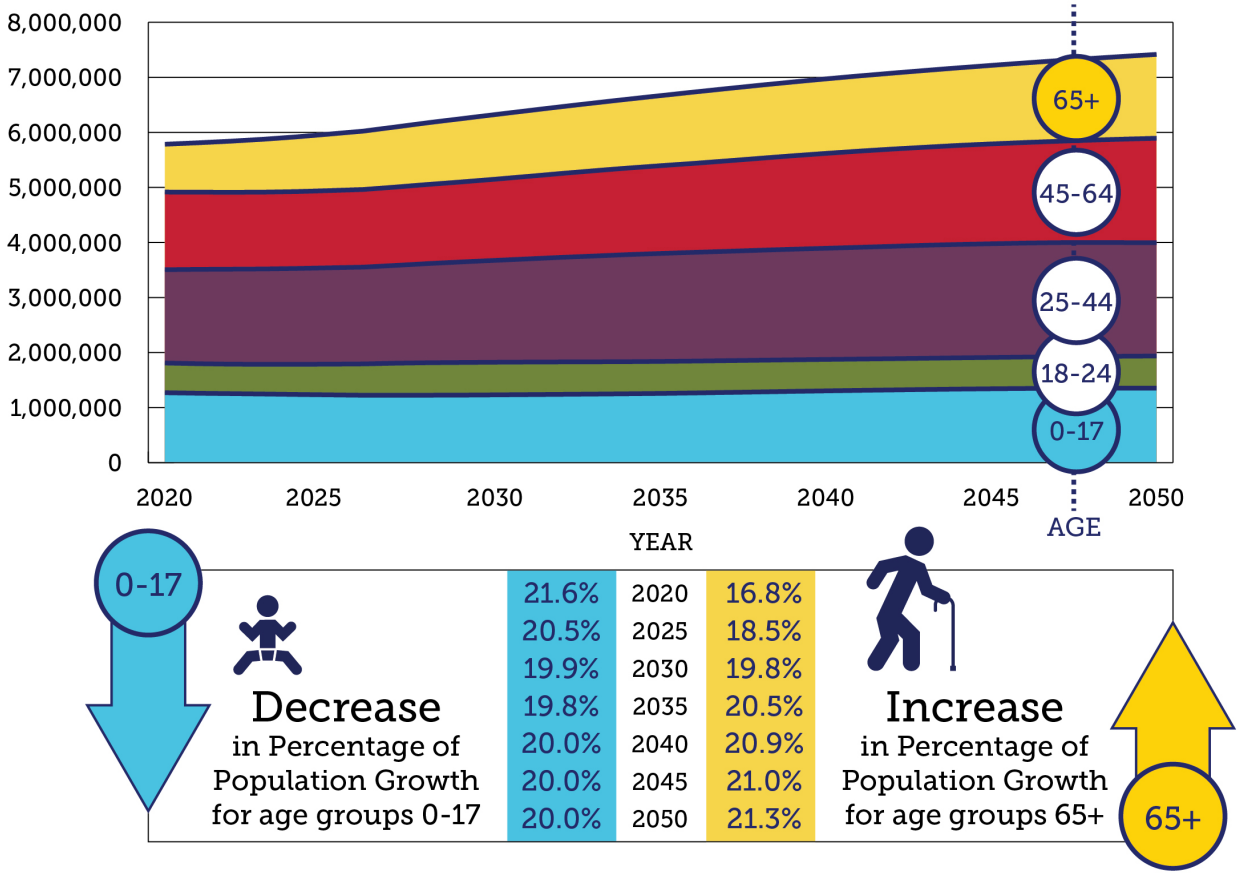



Figure 2-10: Population Growth in Colorado by Age Group (2020-2050)

Source: CO State Demography Office (https://demography.dola.colorado.gov/assets/lookups/county_sya_lookup.html)

Disparities in crash risk extend beyond age. National data shows that racial minorities are overrepresented in fatal crashes. Research also suggests that the location and quality of transportation infrastructure in communities play a significant role in crash risk. The next section overlays Colorado's crash data with more extensive details on the socioeconomic and demographic characteristics of those involved in crashes to analyze disparities.

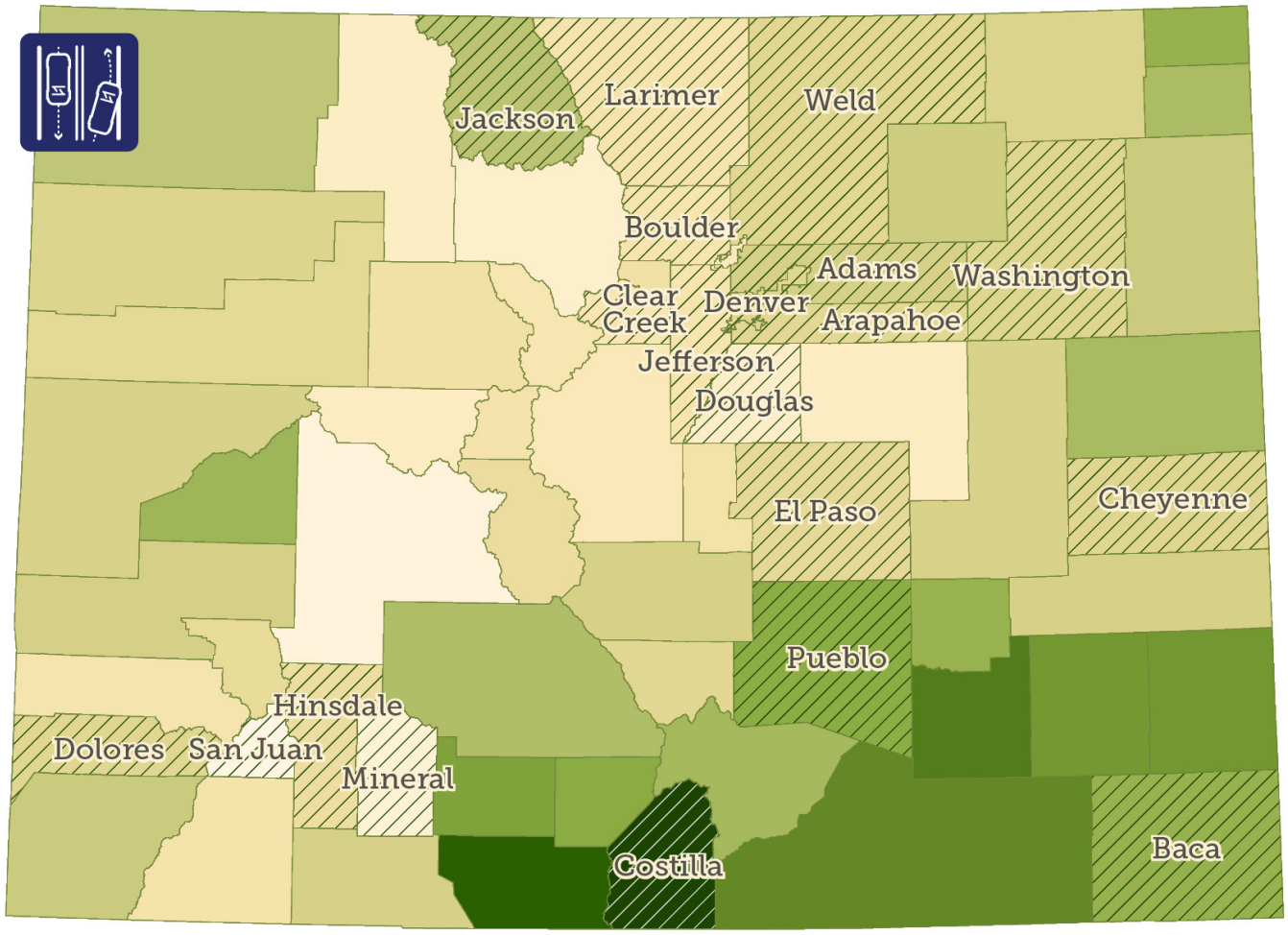
## County Transportation Data

This plan utilizes Transportation Disadvantaged Index (TDI) data developed specifically for Colorado. Adapted from a framework originally created by the North Carolina Department of Transportation (NCDOT), the TDI identifies areas with higher transportation needs by comparing local communities to county, regional, and statewide averages.

The TDI is calculated at the U.S. Census Block Group level. These calculations produce a cumulative TDI score, with higher scores indicating greater transportation need. For this plan, TDI scores are aggregated to the county level to provide a broader, policy-oriented view. The index considers factors such as population, age, income and other factors.

Each safety Focus Area (except those in the Safety Culture Emphasis Area) includes a Weighted TDI Map, displaying county-level TDI scores. Darker shades represent higher TDI values, indicating greater levels of transportation need. To further contextualize transportation need, the maps also identify the counties with the highest total fatalities and serious injuries and/or the highest fatality and serious injury rates per resident for the respective Focus Area.

Figure 2-11: TDI Map Example: Total Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | El Paso | Mineral |
| 2 | Denver | San Juan |
| 3 | Adams | Jackson |
| 4 | Jefferson | Cheyenne |
| 5 | Weld | Baca |
| 6 | Larimer | Hinsdale |
| 7 | Arapahoe | Costilla |
| 8 | Douglas | Washington |
| 9 | Boulder | Clear Creek |
| 10 | Pueblo | Dolores |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

# 2020 STSP Evaluation

The 2020 STSP identified 15 Tier I (High-Priority) Strategies for implementation. Collectively, the state accomplished most of the Tier I strategies identified in the plan. A few successes included:

- Naming a safety champion to lead a proactive safety program.
- Building a safety advocacy coalition (ATS).
- Institutionalizing safety roles/responsibilities.
- Coordinating with existing safety programs.
- Launching the Traffic Safety Summit initiative.
- Promoting consistent safety messages and campaigns.

These strategies and a number of the actions listed in the STSP continue to progress and have been incorporated into the SHSP strategies. The STSP created the ATS as a safety advocacy coalition, which has crafted a path for the future of transportation safety in Colorado. ATS has led the adoption of Colorado's Safe System Approach which changes the alignment of the focus areas identified in the previous STSP. These focus areas have been redeveloped under the emphasis areas of the SSA (Safety Culture, Safe Driving, Safe People, Safe Roads and Post-Crash Care). These emphasis areas have existing SME teams responsible for development, implementation and monitoring of strategies.

Moving forward with this SHSP, most of the focus areas identified in the STSP have been realigned to fit with the existing emphasis area working groups in the SSA. For example Aggressive Driving has been moved from the High-Risk Behavior emphasis area in the STSP to Safe Driving in the SHSP. The Programmatic focus area in the STSP has been moved to fit under each of the emphasis areas of the SSA in a more focused way. Stakeholders identified and data confirmed that most of the focus areas from the STSP should be continued into this plan, with the addition of several new focus areas, under the existing infrastructure of the SSA.

The 2020 STSP also aimed to reduce the number of traffic-related fatalities and serious injuries per 100 million VMT by 15%. While data reveals fatalities and are starting to trend downwards over the last few years, the goals of the STSP were not met as there was still an overall increase since the adoption of the STSP.

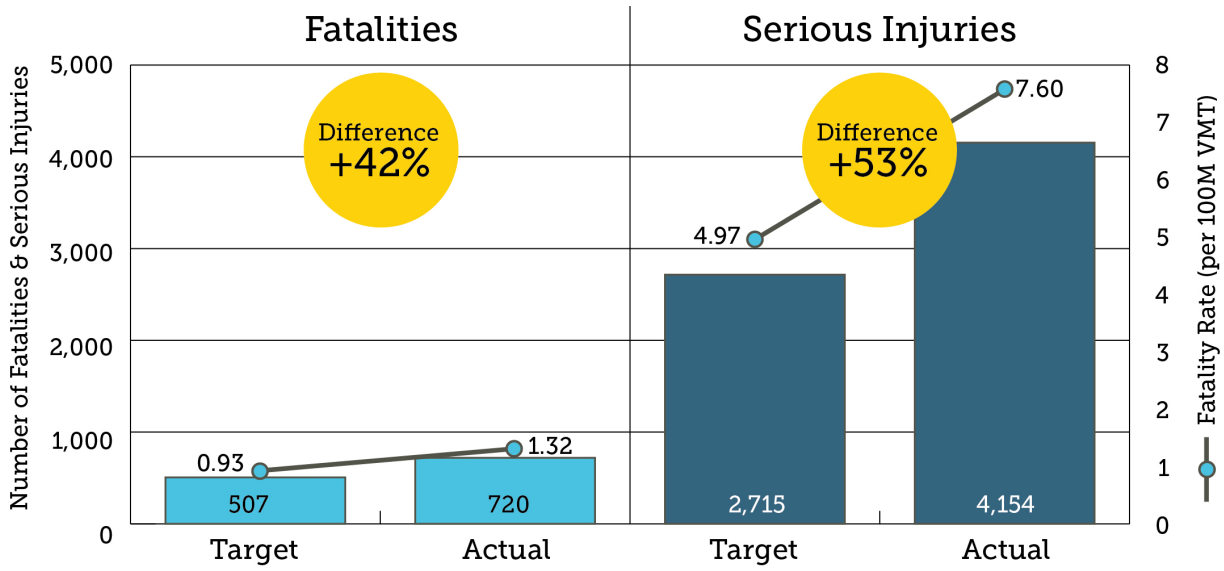



Figure 2-12: 2020 STSP Fatalities and Serious Injuries per 100 Million VMT Goals Versus Actual

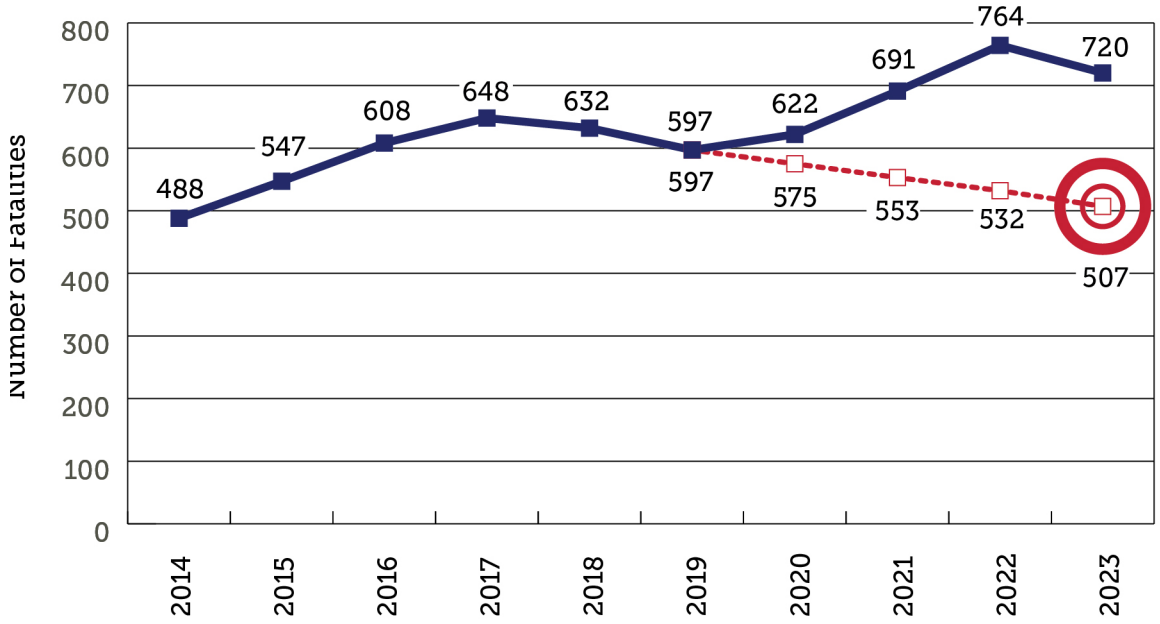



Figure 2-13: 2020 STSP Fatality Goals vs. Actual

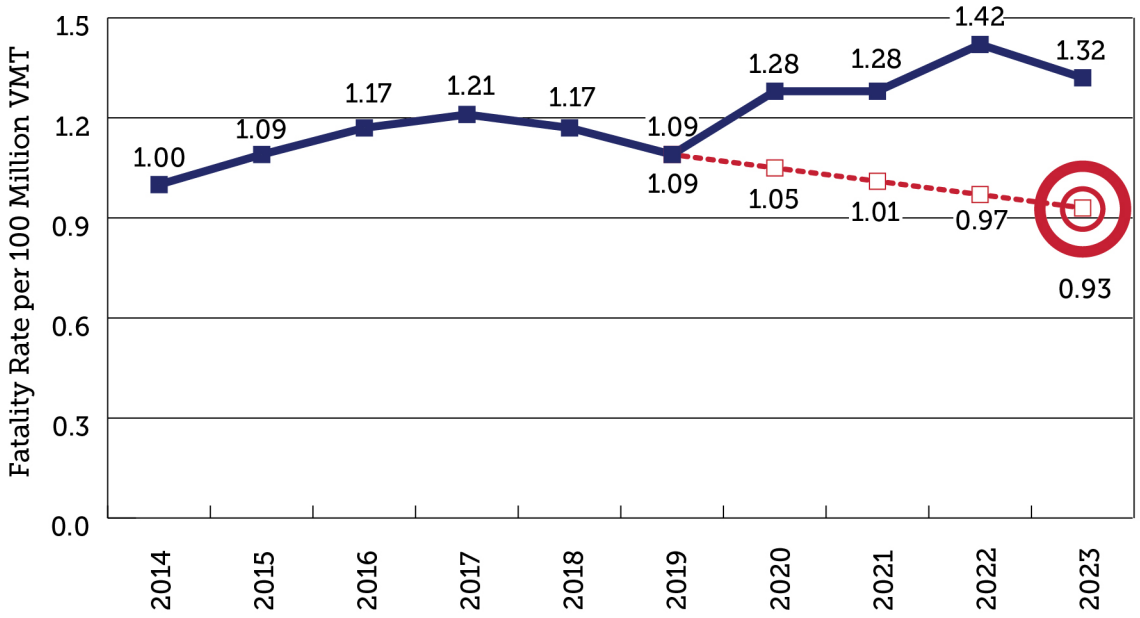



Figure 2-14: 2020 STSP Fatality Rate Goals vs. Actual

Note: 2023 VMT not finalized, projected .06% growth rate used

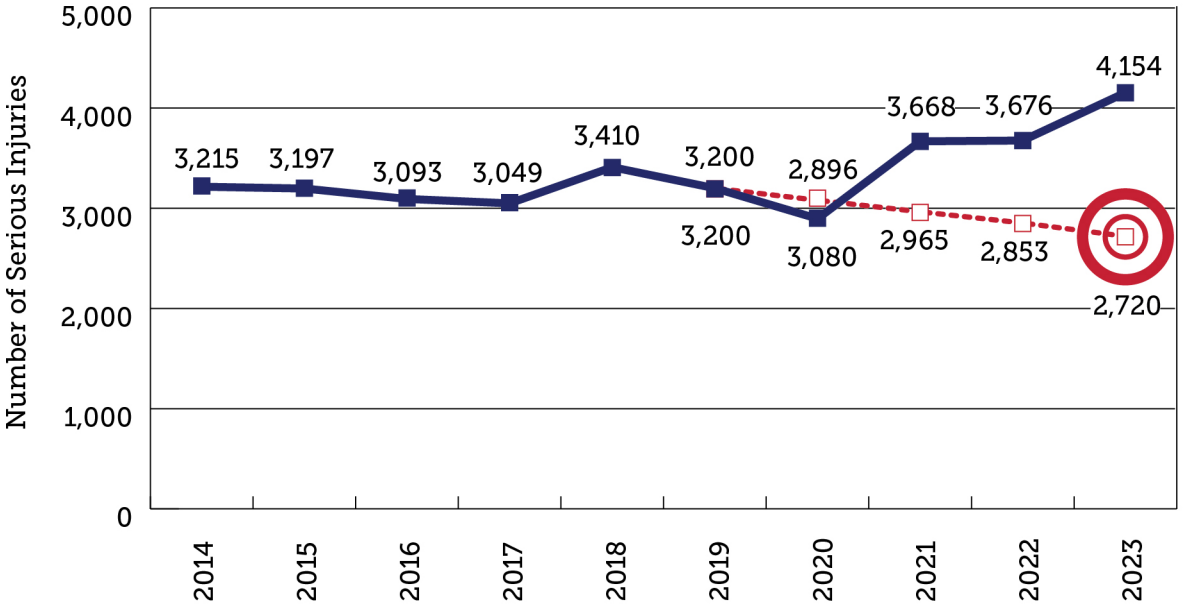



Figure 2-15: 2020 STSP Serious Injury Goals vs. Actual

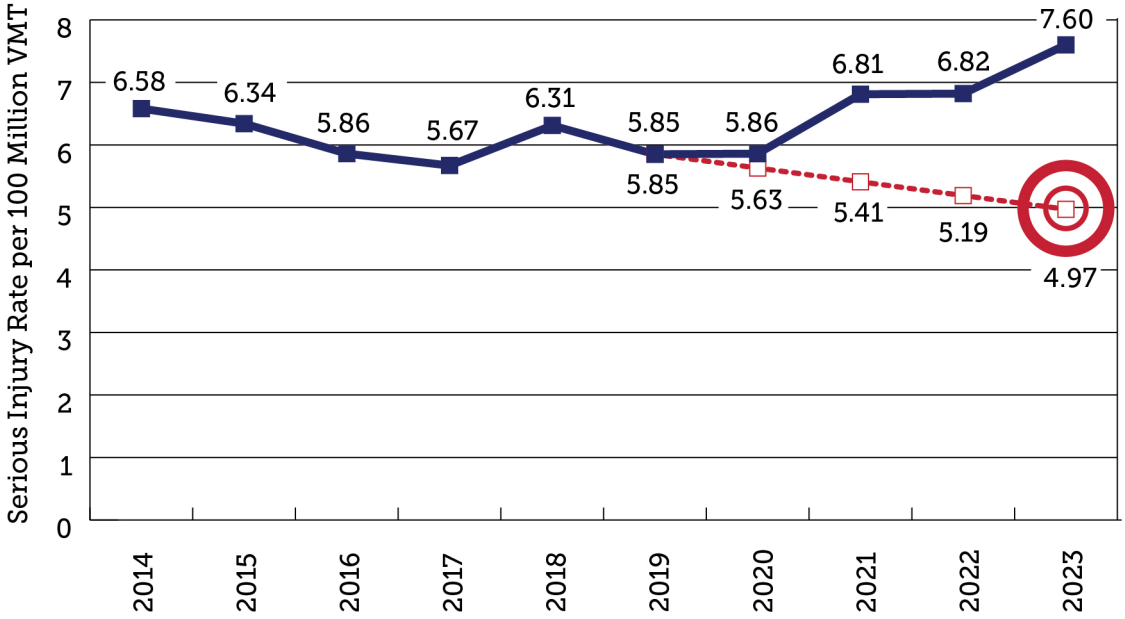
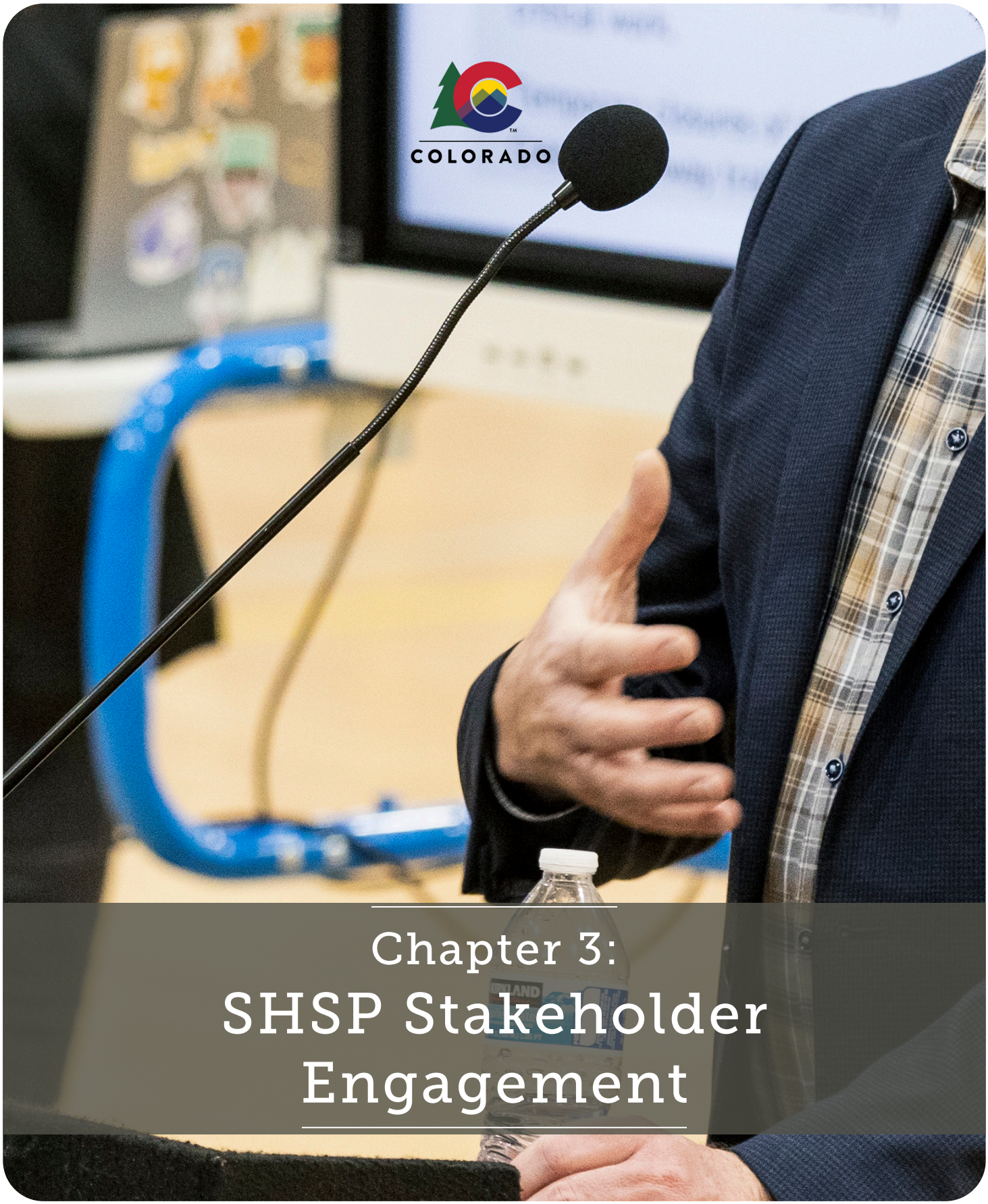



Figure 2-16: 2020 STSP Serious Injury Rate Goals vs. Actual

Note: 2023 VMT not finalized, projected .06% growth rate used




# Chapter 3: SHSP Stakeholder Engagement

Stakeholder engagement played a crucial role in shaping the Strategic Highway Safety Plan (SHSP). External and internal stakeholders alike came together to proclaim a shared vision for increasing transportation safety and shared commitment to realizing that vision. Their insights and expertise played a critical role in shaping the plan and addressing the safety needs of communities statewide. Every piece of feedback—whether gathered through meetings, workshops, emails, or online tools—helped refine strategies, enhance data analysis, and identify additional stakeholders to engage.

## Stakeholders Defined

- **Colorado Department of Transportation (CDOT) Internal Team:** Serving as a sounding board for the plan's development, this team provided input and guidance to align the plan with organizational objectives. Team members included the Highway Safety Office, Communications, Environmental Justice and Equity, Traffic Safety & Engineering, Division of Transportation Development, and Regional Traffic Engineers.
- **Steering Committee:** This group included representatives from Plan Signatories CDOT, Colorado State Patrol (CSP), the Department of Revenue (DOR), the Colorado Department of Public Health and Environment (CDPHE), the National Highway Traffic Safety Administration (NHTSA), and the Federal Highway Administration (FHWA) along with additional state agencies, advocacy groups and special interest organizations. The Steering Committee provided a statewide perspective and strategic direction throughout the planning process to guide Focus Area identification, strategy selection, and plan content.
- **Advancing Transportation Safety (ATS)/Subject Matter Experts (SMEs):** Leveraging the existing ATS framework from the 2020 SHSP, this group served as the SMEs for each of the Emphasis Areas (Safety Culture, Safe Driving, Safe People, Safe Roads, and Post-Crash Care). The members of the ATS Emphasis Area working groups and additional SMEs met monthly during the plan's development to review the work and recommendations of the Project Team related to topics such as data analysis, strategies, and priorities.

In addition to the partners above, stakeholder engagement spanned across the state gathering feedback from elected officials, non-profit special interest groups, bicycle and motor carrier organizations, transportation planners, tribal partners, and state and local law enforcement safety professionals. Local agency representatives and county transportation officials also demonstrated their commitment to safety, participating in large numbers both in-person and online. For the complete list of stakeholders see the Plan Acknowledgment.

## Engagement Opportunities

To support plan development and learn more about regional safety concerns, various engagement methods collected a diverse range of feedback and insight across the state. Primary engagement methods included a statewide kickoff meeting, regional in-person and virtual workshops, an online engagement platform, presentations to interested agencies and organizations, and one-on-one meetings. Additional engagement included regular meetings with the SHSP Steering Committee and ATS/SME Emphasis Area groups.

# Regional Workshops

After a statewide virtual kickoff meeting, a series of regional workshops were hosted across Colorado, with hybrid workshops held in Denver, Pueblo, Glenwood Springs, Greeley, and Durango, along with five subsequent virtual workshops. These five hybrid (in-person and virtual) and five virtual workshops attracted over 250 attendees. Stakeholders were invited through direct mail postcards, virtual flyers, and over 1,800 electronic invitations.

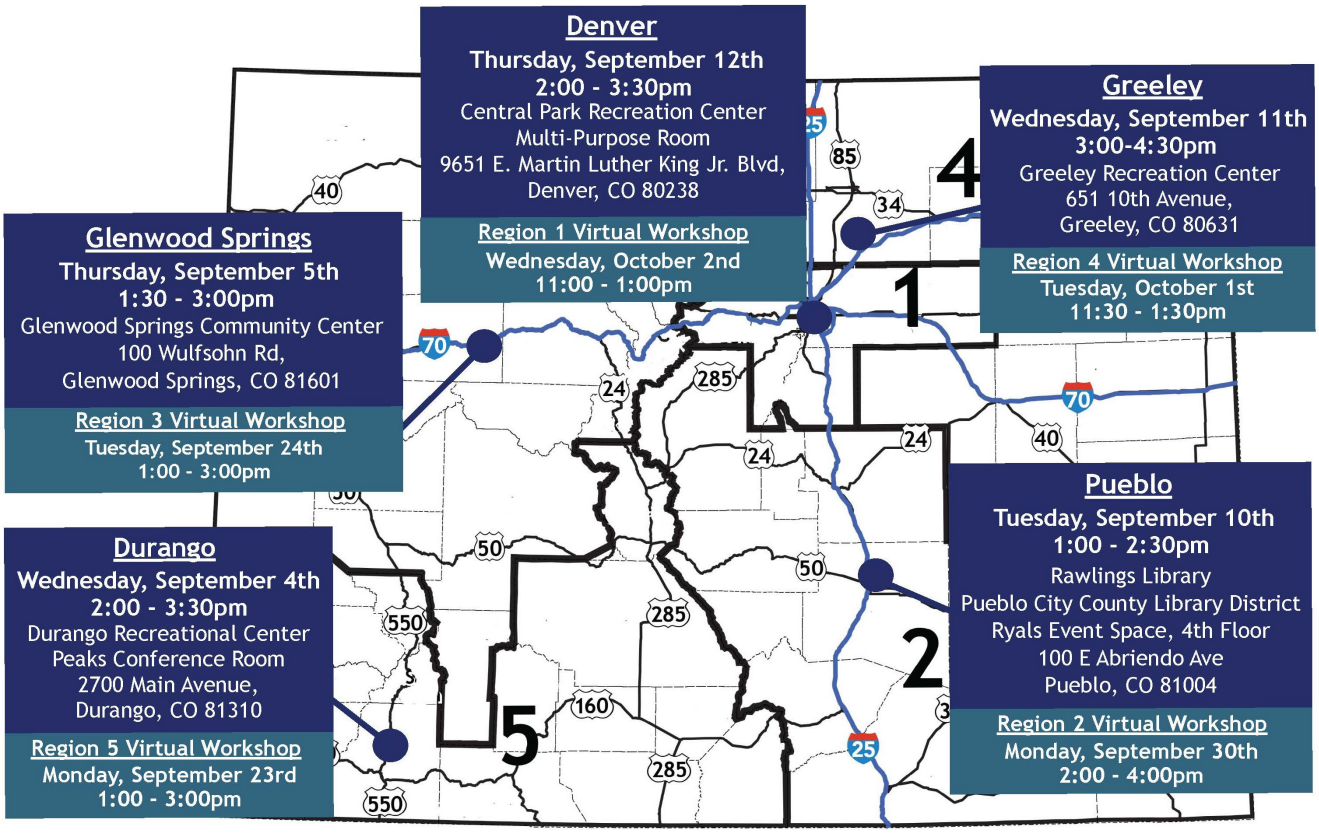



Figure 3-1: Colorado Department of Transportation Regions showing both in-person and virtual workshop meeting dates and times

## Workshop Goals

- Shaping transportation safety strategies.
- Assessing current conditions and gaps.
- Facilitating collaboration among agencies, communities, and stakeholders.
- Exploring funding opportunities.
- Collecting insights on local safety needs and challenges.


Figure 3-2: Collage of various workshops in Denver (Region 1), Pueblo (Region 2), Glenwood Springs (Region 3), Greeley (Region 4), and Durango (Region 5)

## Polling

To encourage discussions, meeting facilitators used live polling to capture participants' top transportation safety concerns. Stakeholders provided feedback specific to their regions; however, participants noted consistent concerns related to speeding, impairment, aggressive driving, Vulnerable Road Users (VRUs), and roadway design.


Figure 3-3: Word Cloud responses to "Using one word, what is your most significant transportation safety concern?" from Region 5 Durango Hybrid Workshop - most popular answers populated as largest on the screen

## Breakout Groups

Participants were divided into small groups to discuss key safety issues, resource gaps, and potential community-driven solutions. In-person attendees documented their ideas on large sheets of paper (Figure 3-4) while virtual participants provided input through online comment boards (Figure 3-5).

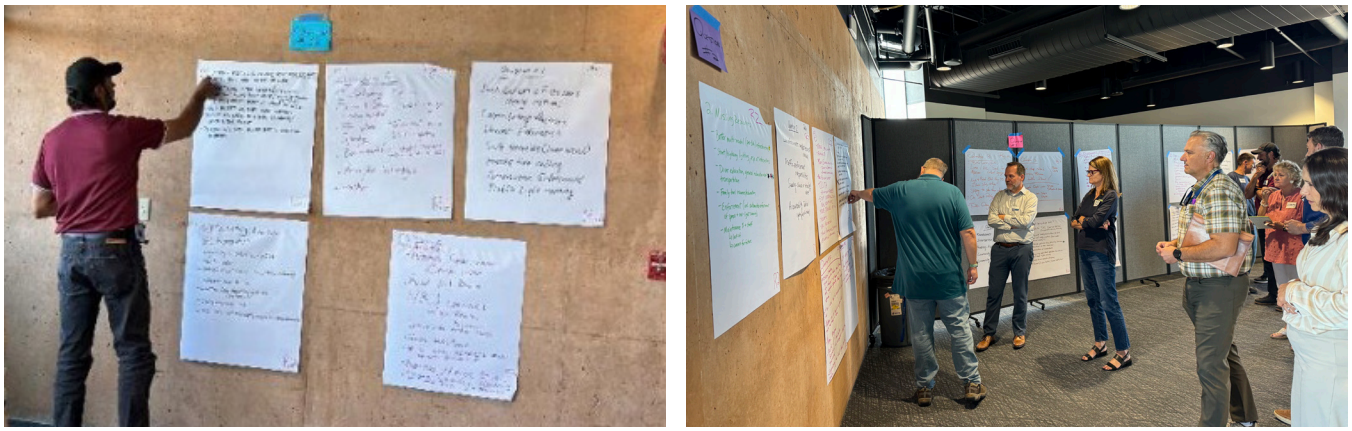


Figure 3-4: Stakeholders at Region 2 workshop in Pueblo sharing their response

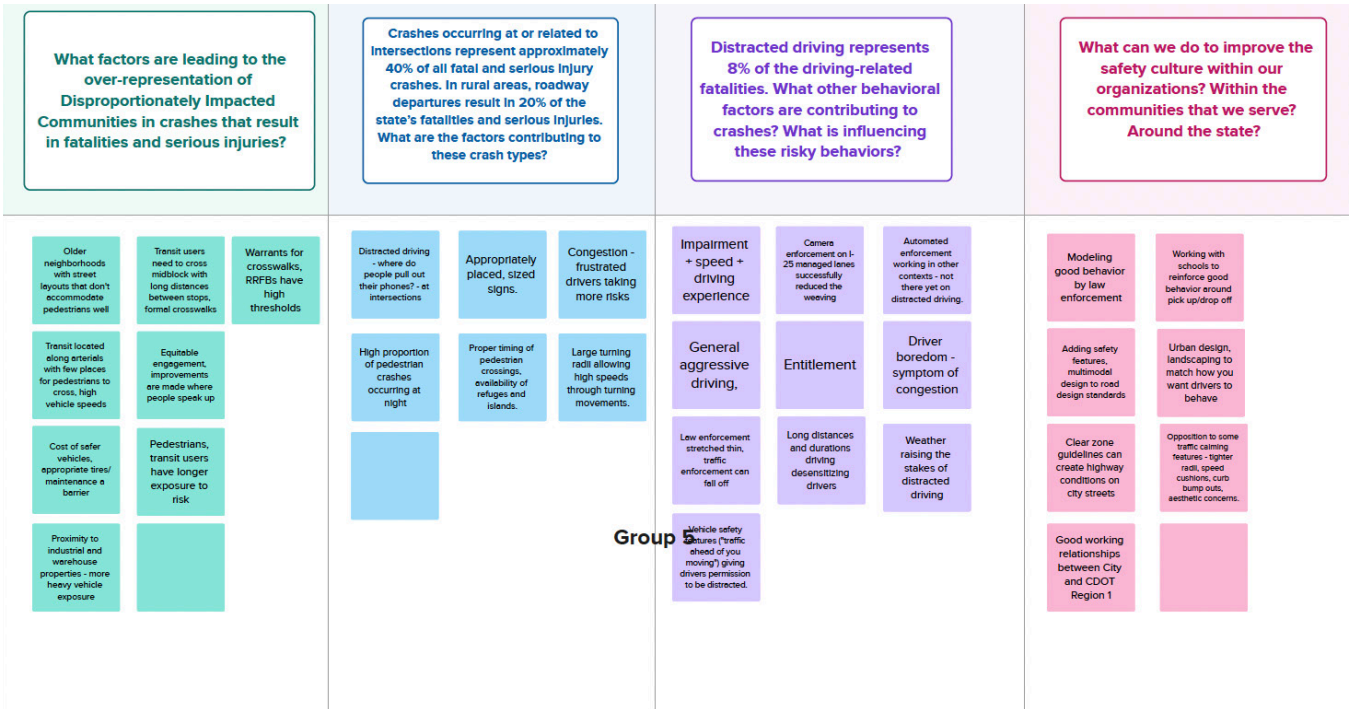



Figure 3-5: Region 1's online comment board

After group discussions, attendees reviewed responses from other groups and identified ideas they supported. Speakers then summarized key insights, concerns, and recommendations for the larger audience.

## Online Engagement

To expand outreach beyond in person events, a dedicated project email and an online engagement platform served as a mechanism for collecting additional stakeholder insight and feedback. Launched on June 25, 2024, the online engagement platform allowed stakeholders to engage in the SHSP process through an interactive comment map. Users could mark locations of concern and provide safety-related feedback.

The online engagement tool received hundreds of messages from stakeholders, which were tracked in a communications log, and included in the Appendix.

**313 comments were submitted through December 31, 2024.**

**17 counties and 35 municipalities represented in the feedback.**

**Comments were categorized by Emphasis Area: Safety Culture, Safe Roads, Safe People, Safe Driving, and Post-Crash Care.**

While most of the comments were site-specific safety concerns (Figure 3-6), key themes included concerns about speeding and speed limits, truck traffic, lack of shoulders, intersection improvements, and pedestrian safety. This feedback guided plan development with insight into the safety priorities of stakeholders. The online comments were also shared with CDOT Regional Traffic Engineers for further action as appropriate.

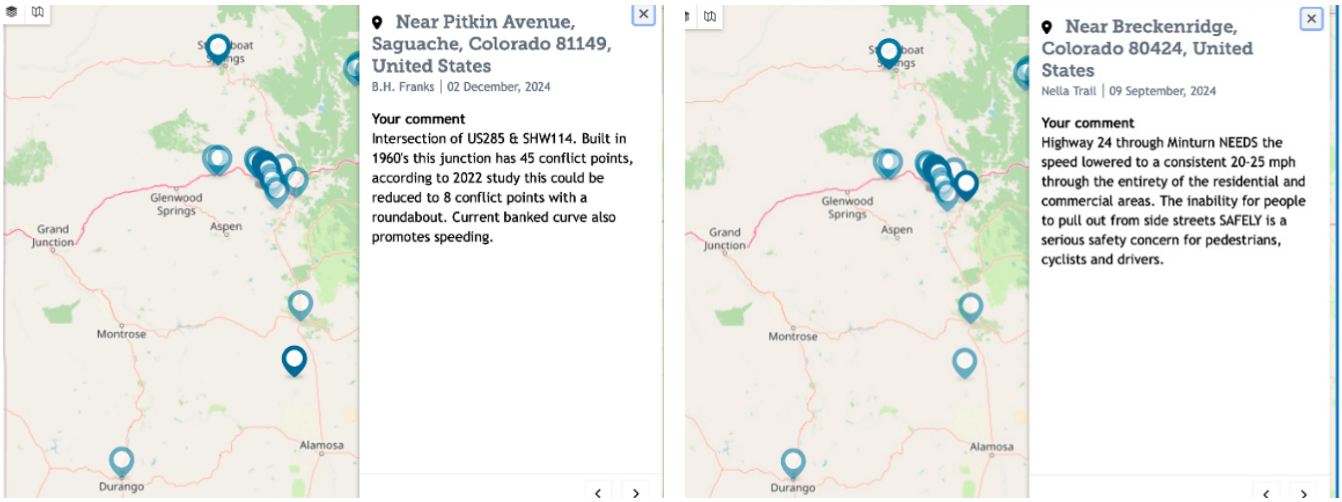



Figure 3-6: Map of Colorado with comment markers

The online comments were categorized by Emphasis Areas (Figure 3-7). Over 50% of the comments related to Safe Roads while 21% concerned Safe People and Safe Driving. Figure 3-8 shows a sample of specific comments related to Safe Roads and Safe Driving.

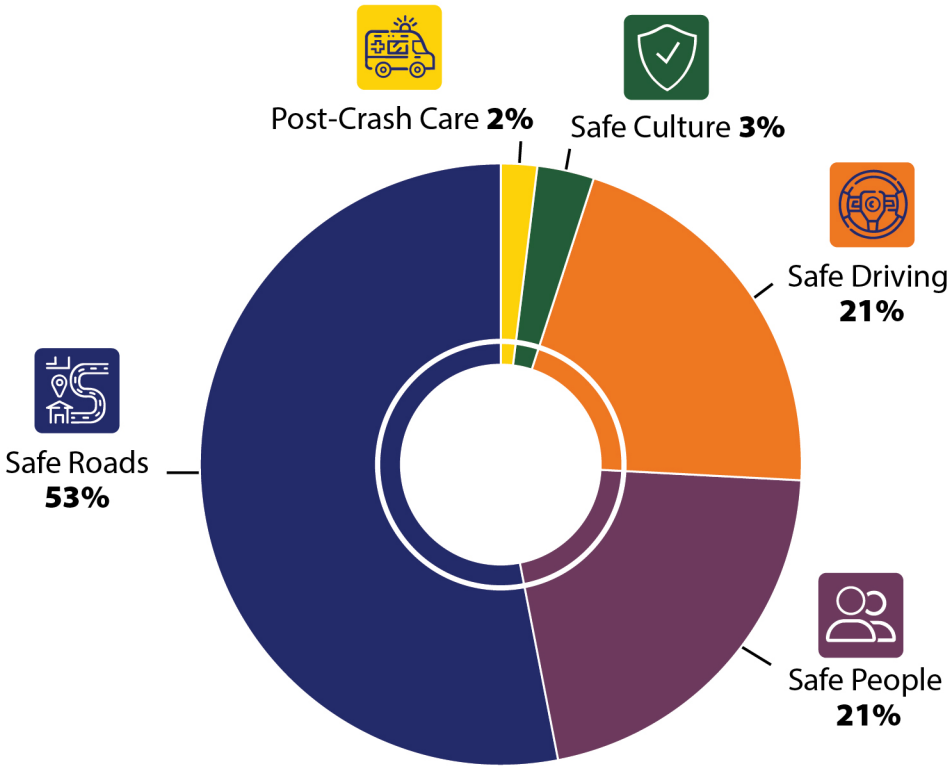



Figure 3-7: A chart showing percentage of online comments by Emphasis Areas


Figure 3-8: Comments from Social Pinpoint about Safe Roads and Safe Driving

## One-on-One Meetings

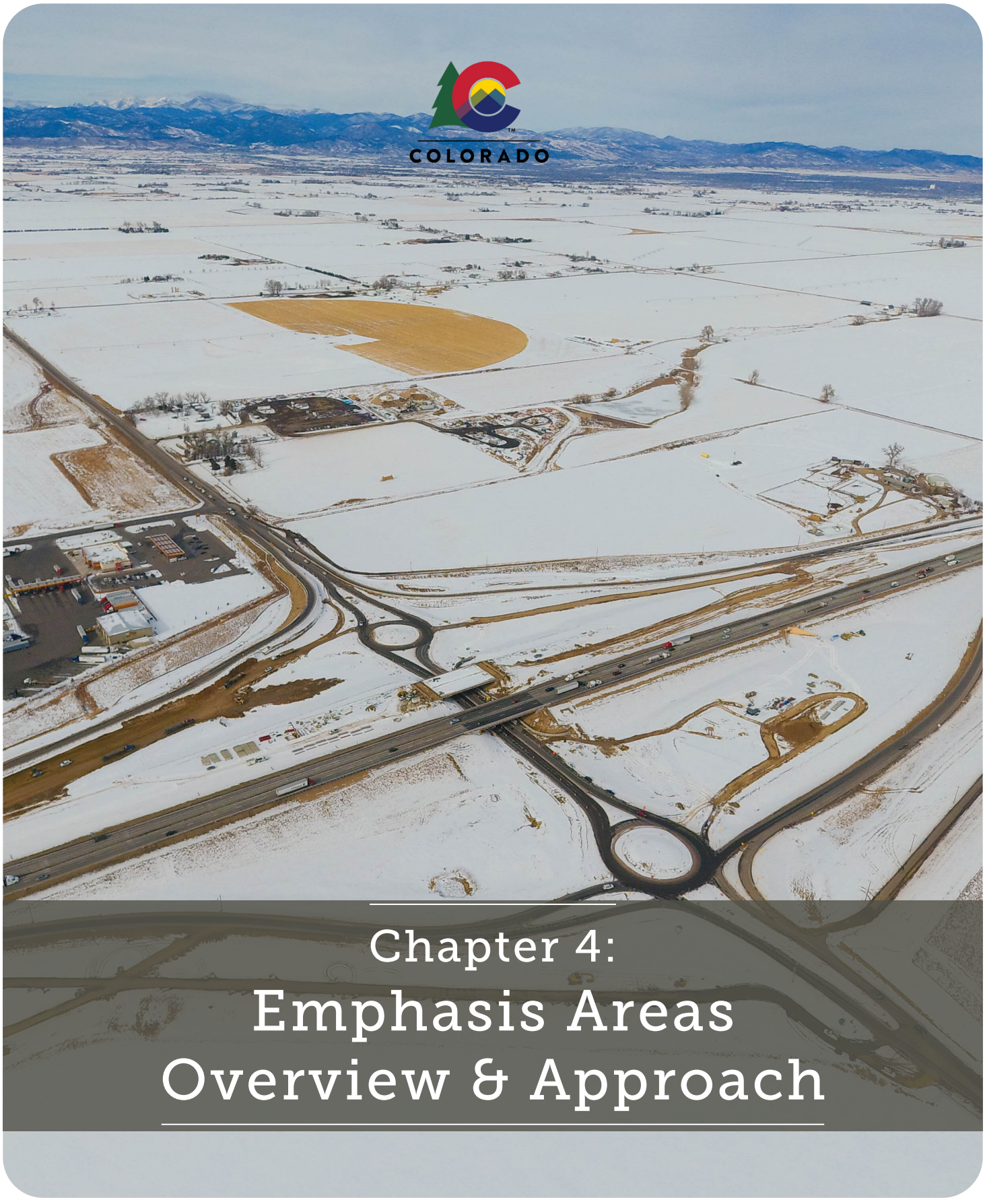
In addition to the kickoff meeting and the ten stakeholder workshops, one-on-one meetings were conducted with agencies and individuals as requested or needed.

## What We Heard

Participants shared similar themes across the workshops reflecting a statewide commitment to improving roadway safety and reducing fatalities and serious injuries in Colorado. The following points and key takeaways summarize the participant feedback on common safety issues, highlighting concerns, needs, and strategies to enhance safety.

- The need for mandatory, accessible driver's education programs for all ages, particularly in rural and under-resourced areas.
- Increased funding for law enforcement and safety initiatives.
- Recognizing that specific communities face heightened transportation safety risks due to unsafe infrastructure, economic pressures, and limited access to resources.
- The need for targeted safety interventions, such as addressing urban intersection crashes, rural roadway departures, and crash causation.
- The impact of driver behavior factors such as distracted driving, speeding, and unsafe cultural norms further exacerbate risks, highlighting the need for comprehensive education campaigns, stricter law enforcement, and innovative solutions.
- The value of stronger collaboration between CDOT, local agencies, and community organizations, including support for navigating grant funding opportunities.
- Building a culture of safety by engaging communities, prioritizing education, and strengthening policies.

Feedback included Region-specific feedback in addition to broader safety input. A full summary document of each of the workshops was provided to CDOT Regional Traffic Engineers and is included in the Appendix.




# Chapter 4:
# Emphasis Areas Overview & Approach

# Introduction

Colorado's Emphasis Areas, based on the Safe System Approach, include Safe Driving, Safe People, Safe Roads, Safety Culture, and Post-Crash Care. Subsequent chapters describe strategies to improve the priority Focus Areas in each Emphasis Area. General descriptions of these strategies for each Emphasis Area are described below.

- **Safety Culture:** focuses on strategies to grow safety culture in organizations and among the general public to support safer practices and behaviors.
- **Safe Driving:** focuses on strategies that influence safer driver behaviors and address key issues like impaired driving, distracted driving, aggressive driving, speeding, and occupant protection.
- **Safe People:** focuses on protecting Vulnerable Road Users (VRUs), which include pedestrians, bicyclists, motorcyclists, first responders, and roadway crews in work zones.
- **Safe Roads:** identifies and implements noteworthy practices to improve the built environment with leading edge infrastructure and designs that facilitate safe trips for all modes and all roadway users.
- **Post-Crash Care:** identifies strategies to increase survivability of crashes through timely emergency response, improved access to emergency medical care, safer conditions for first responders, and improved Traffic Incident Management (TIM) practices.


Figure 4-1: The Colorado Safe System Approach

## Emphasis Area Approach

The five Emphasis Areas include 20 Focus Areas described in Chapters 5 through 9 and five additional Focus Areas (see below for further details on: Double Down on Success Focus Areas).

Data analysis and stakeholder feedback from Subject Matter Experts (SMEs) were used to identify Focus Areas that had the highest potential to improve safety. Each Emphasis Area includes Focus Areas that comprise a large portion of fatalities and serious injuries. Guided by these Focus Areas, SMEs and the Steering Committee developed strategies to guide safety improvements.

Grouped by their respective Emphasis Areas, the 20 key Focus Areas are listed below:

### Safety Culture

- Organizational
- Public

### Safe Driving

- Occupant Protection
- Impairment
- Aggression
- Speeding
- Distraction

### Safe People

- Motorcyclists
- Aging Drivers
- Young Drivers
- Pedestrians
- Bicyclists
- Work Zones
- First Responders

### Safe Roads

- Lane Departures
- Off-System
- Intersections
- Speed Management

### Post-Crash Care

- Traffic Incident Management
- Emergency Medical Services

### Double Down on Success Focus Areas

Five (5) of the SHSP's Focus Areas (Vehicle Wildlife, Commercial Vehicles, Children Passenger Safety (Under 15), Winter Weather Related, and Highway-Rail Grade Crossings) currently have robust programs and policies in place to address crashes resulting in fatalities and serious injuries. These Focus Areas are already experiencing stable or improved crash outcomes. Safety improvement actions currently underway within these focus areas will continue to be supported through SHSP implementation.

Wildlife-Vehicle Collisions

Commercial Vehicles

Children Passenger Safety (under 15)

Winter Weather Related


Highway-Rail Grade Crossings

**Wildlife-Vehicle Collisions** Wildlife on roadways pose danger to drivers and wildlife alike. There were 132 fatal and serious injury wildlife-related crashes from 2019 to 2023 which is less than 1% of the total fatal and serious injury crashes during that time period. Countermeasures like installation of wildlife fencing, roadside animal detection systems, and wildlife overpasses can mitigate these crashes.

**Commercial Vehicles** Safe travel for commercial motor vehicles (CMV) throughout the state ensures both the health and wellbeing of roadway users, as well as the efficient operation of the freight network. Between 2021 and 2023, crashes involving CMVs made up 3% of the total fatal and serious injury crashes. The Colorado Freight Plan (2024) identifies nine safety-focused strategies that will continue to support CMV safety which includes strategies to enhance truck parking, rail safety, safety data, and communication efforts.

**Children Passenger Safety (Under 15)** Parents and caregivers are responsible for properly restraining children and may be ticketed if they fail to do so. In January 2025, the state updated Colorado's child passenger safety law to reflect the latest research-based recommendations on car seat, booster seat, and seat belt use for children. Resources are available to parents and caregivers including free car seat checks, inspection stations, and car seat fit recommendations.

**Winter Weather Related** Driving in Colorado winter weather can be dangerous if drivers are not prepared for unexpected conditions. From 2019 to 2023, winter weather-related crashes contributed to 4% of total fatal and serious injury crashes. Colorado employs various measures to increase winter weather driving safety including snow removal, avalanche control, traction and chain law enforcement, and various education and communication programs to promote safe driving behaviors.


**Highway-Rail Grade Crossings** The Colorado Public Utility Commission is responsible for safety at over 3,000 highway-rail grade crossings through education, enforcement, and engineering solutions. According to Federal Railroad Administration data, 14 fatalities occurred at Colorado highway-rail grade crossings from 2020 to 2024. Twelve (12) of these 14 fatalities occurred at public crossings, and 6 of the 14 fatalities involved motor vehicles at public crossings.

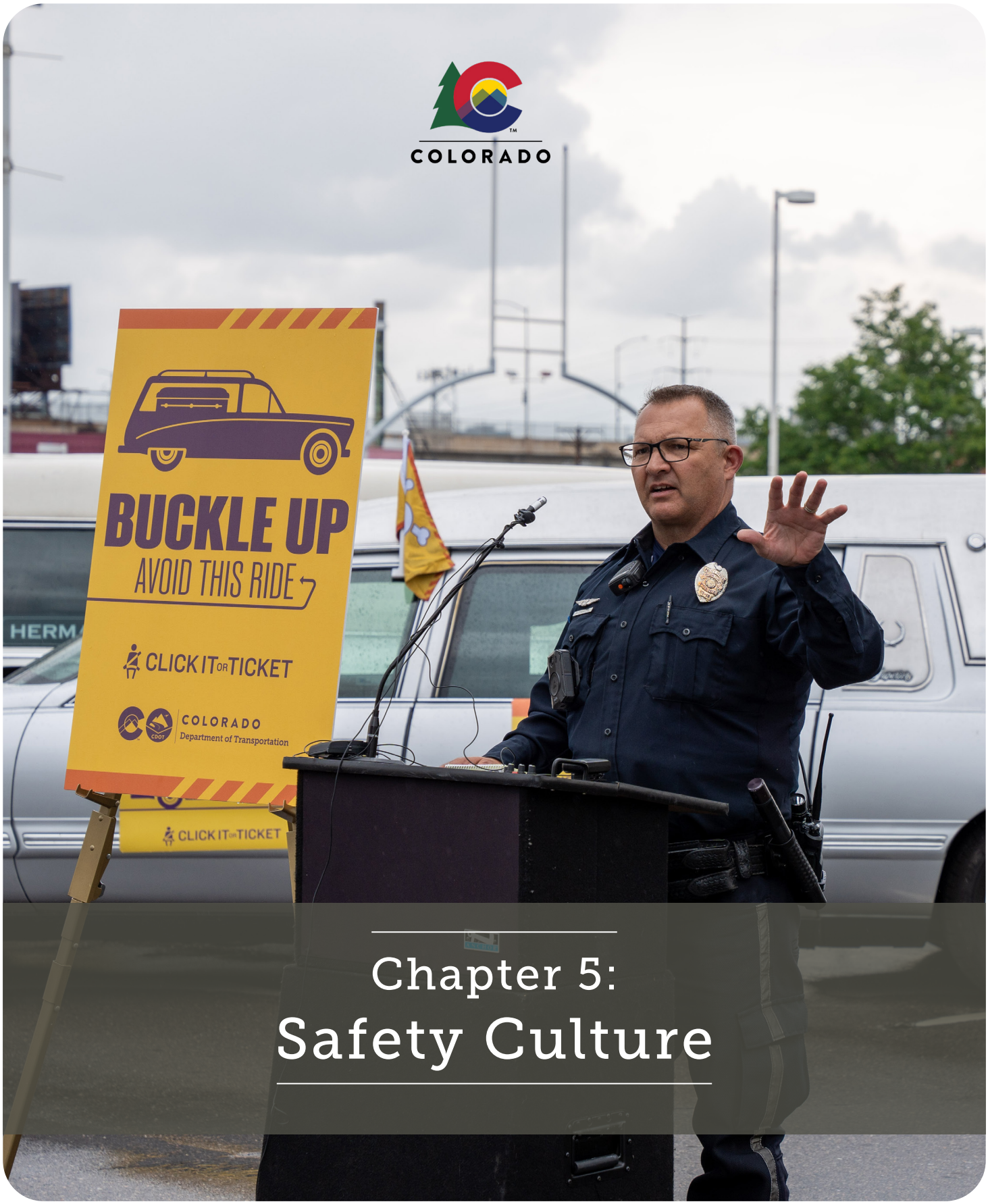
Winter weather and wildlife can catch unsuspecting drivers off guard, especially out-of-state drivers such as commercial vehicle drivers. While winter weather and commercial vehicles did not rise to the top in terms of related fatalities and serious injuries, these were noted as concerns during the stakeholder engagement and Colorado will continue efforts to address these concerns.

# Emphasis Area Roadmap

Each Emphasis Area and its associated Focus Areas and strategies are detailed in Chapters 5 through 9. Stakeholders can use the Emphasis Area chapters to better understand the Emphasis Area, the Focus Areas, and their associated crash characteristics, trends, and strategies for improvement. Below is a roadmap that summarizes what is included in each Emphasis Area chapter.

- **Introduction to the Emphasis Area and Focus Areas:** Describes the Emphasis Area and how it relates to the included Focus Areas.
- **Focus Area Definition:** Defines the crash type.
- **Focus Area Goal:** Defines a goal to reduce fatalities and serious injuries.
- **Focus Area Data Analysis:** Illustrates crash data analysis of the total fatalities and serious injuries from 2017 to 2023 compared to all crashes for each Focus Area. Due to Colorado's crash report form change in 2020, some Focus Areas only have data available from 2021 to 2023. This analysis also highlights the counties across Colorado with the highest number and per capita rate of fatal and serious injuries for that Focus Area. Unless otherwise noted, data that was utilized in the focus area analysis was sourced from Colorado's Statewide Crash Listings.[1]
- **Focus Area Strategies:** Lists the strategies with a brief description and how the strategy will improve safety.

1 https://www.codot.gov/safety/traffic-safety/data-analysis/crash-data




# Chapter 5:
# Safety Culture


# Introduction

A strong transportation safety culture is fundamental to achieving zero fatalities and serious injuries on Colorado roadways. CDOT defines transportation safety culture as the shared values and beliefs of a group of people that influences behaviors that impact transportation safety.[2]

Transportation safety culture recognizes that different outcomes (i.e., safer consequences as reflected in fewer fatalities and serious injuries) require changes in behavior. Changing behavior requires shifting beliefs (see callout below: Beliefs Influence Behaviors). Thus, growing transportation safety culture involves growing foundational beliefs supportive of safer behaviors that improve consequences.

## Beliefs Influence Behaviors

Decades of research has established that beliefs influence behaviors. Beliefs like:

- perception of risk (e.g., driving impaired increases the likelihood of crashing)
- what others expect (e.g., a young driver's understanding of what is acceptable to their parent or a worker's understanding of their supervisor's expectations)
- what is in our control (e.g., "I am comfortable asking someone else to use a seat belt.")

all have been shown to influence behavior.

This holds for driver behaviors (e.g., speeding) as well as behaviors by others involved in building a safe system such as planners, engineers, construction workers, law enforcement, leaders, elected officials.

Furthermore, this research has been used to develop interventions (e.g., training, coaching, rules/policies, media, countermeasures) to shift beliefs resulting in changes in behavior.

For example:

- Training on best practices to reduce potential conflicts at intersections grows the knowledge and skills engineers need to design safer intersections thus resulting in new behaviors by engineers.
- High visibility enforcement (HVE) supported by universal media increases the perception among drivers that they may be caught if they violate driving laws thus decreasing risky driving behaviors.
- Establishing family rules about always using a seat belt, never driving distracted or impaired, and following speed limits grows an understanding of what is acceptable and unacceptable thus increasing safer behaviors and decreasing risky behaviors.

Implementing the strategies described in this document requires growing beliefs supportive of various actions among many stakeholders. Collectively, these shared beliefs describe the transportation safety culture.

### Beliefs

**Transportation Safety Culture** - shared values and beliefs of a group of people that influence behaviors that impact transportation safety.

↓

### Behavior

↓

### Consequences

2 Adapted from National Academies of Sciences, Engineering, and Medicine. (2018). A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries. Retrieved from: https://nap.nationalacademies.org/catalog/25286/a-strategic-approach-to-transforming-traffic-safety-culture-to-reduce-deaths-and-injuries

A strong transportation safety culture embraces and champions safety at all levels including elected officials, state and local transportation related agencies, public and private organizations, and the general public. Laws (and their enforcement), policies and practices in both public agencies and private organizations, and behaviors by the public all impact safety consequences.


Because of the variety and number of stakeholders involved in improving transportation safety, the task of growing transportation safety culture can seem overwhelming. However, it can be broken down by group (e.g., elected officials, agency/organization leaders, transportation planners, engineers, law enforcement, schools, families, individuals) and by behavior. For example, Table 5-1 summarizes examples of supportive safety culture to foster the High-Impact Focus Area strategies identified in this plan (along with associated outcomes and safety consequences). For more details on High-Impact Focus Areas, see Chapter 10.

Table 5-1: High-Impact Focus Area Strategies, Examples of Supportive Culture, Outcomes, and Consequences

| Strategy | Examples of Supportive Culture | Examples of Outcomes | Consequences |
|---|---|---|---|
|  **Intersections**<br>» Reduce intersection conflicts.<br>» Perform Intersection Control Evaluations.<br>» Incorporate Vulnerable Road Users (VRUs) designs.<br>» Address high-risk locations.<br>» Improve traffic controls. | » Prioritization of safety.<br>» Knowledge about best practices.<br>  » To reduce intersection conflicts.<br>  » VRU designs.<br>  » Traffic controls.<br>» Shared expectations about using best practices. | » Intersections that reduce the likelihood of high-energy and side impact crashes.<br>» More separation in space and time of VRUs and vehicles. | » Reduction in intersection-related fatal and serious injury crashes. |
|  **Off-system**<br>» Local agency assistance.<br>» Community-specific safety plans. | » Greater shared responsibility for safety.<br>» Prioritization of safety.<br>» Knowledge and skills in using proven countermeasures.<br>» Knowledge and skills to complete safety plans. | » More local agencies using proven countermeasures.<br>» More local agencies prioritizing safety in planning/design/build/maintenance phases. | » Reduction in fatal and serious injury crashes on off-system roads. |
|  **Impairment**<br>» Polydrug impairment education.<br>» High-visibility enforcement (HVE).<br>» Address high-risk corridors. | » Greater shared responsibility for safety.<br>» Knowledge about polydrug impairment among key stakeholders and partners.<br>» Willingness, knowledge, and skills among law enforcement agencies and judicial systems to conduct HVE and adjudication. | » Increased knowledge about polydrug use and crash risk among public.<br>» Increased perception of getting caught for DUI.<br>» Fewer impairment-related crashes on corridors with high historical levels. | » Reduction in driving under the influence of multiple substances.<br>» Reduction in impairment-related fatal and serious injury crashes. |
|  **Lane Departures**<br>» Install traffic controls and safety barriers.<br>» Improve roadway geometry. | » Prioritization of safety.<br>» Knowledge and skills in traffic controls, safety barriers, and roadway geometry.<br>» Shared expectations about using best practices. | » More miles of roadways with controls and safety barriers.<br>» Fewer high-risk locations for lane departure due to roadway geometry. | » Reduction in run-off-the-road fatal and serious injury crashes. |
|  **Occupant Protection**<br>» Media campaigns regarding proper use.<br>» Education regarding a primary seat belt law. | » Knowledge about occupant protection and primary seat belt law among stakeholders and partners. | » Increase in beliefs supportive of always wearing a seat belt.<br>» Increase in seat belt use.<br>» More understanding of the benefits of a primary seat belt law. | » Reduction in unrestrained occupants killed or seriously injured in crashes. |
|  **Motorcycles**<br>» Motorcyclist safety training.<br>» Licensing and endorsement.<br>» Increase helmet use. | » Knowledge and skills on best-practices for motorcyclist safety training.<br>» Beliefs among motorcyclists of benefits of always using a helmet. | » Increase in safety skills and knowledge among motorcyclists.<br>» Increase in motorcycle endorsements.<br>» More motorcyclists always using a helmet. | » Reduction in fatal and serious injury crashes involving motorcyclists. |

# Colorado's Current Transportation Safety Culture

Transportation safety culture is challenging to measure because it involves people's values and beliefs. One way that Colorado monitors transportation safety culture among the public is through self-report surveys.

Since 2016, the Colorado Department of Transportation (CDOT) conducts an annual Driver Behavior Survey. This survey asks a representative sample of adult drivers in Colorado about their beliefs and self-reported behaviors regarding a variety of issues including seat belt use, speeding, distracted driving, impaired driving, motorcycle safety, and pedestrian safety. Observational data on seat belt use, distracted driving, and speeding provide additional understanding of road user behavior.

Concern of getting caught for violating traffic laws may reduce risky driving behaviors. Countermeasures such as high visibility enforcement seek to grow the perception of getting caught as a way to reduce risky driving behavior. Table 5-2 summarizes perceptions of getting caught from 2021 to 2024 gathered from the Driver Behavior Survey. The results indicate a decreasing trend for both lower- and higher-speed roads. For instance, the proportion of respondents with a perception of getting caught for speeding on a 65 mph road decreased from 53% in 2021 to 41% in 2024.

Table 5-2: Perception of Getting Caught

| Very Likely or Somewhat Likely to get a ticket / DUI | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| Not using a seat belt at all over the next 6 months | 50% | 39% | 40% | 42% |
| Driving consistently over the speed limit on a local road where the speed limit is 30 mph | 63% | 59% | 55% | 58% |
| Driving consistently over the speed limit on a road where the speed limit is 65 mph | 53% | 42% | 45% | 41% |
| Drinking alcohol and the amount of alcohol in their body was more than what the law allows for drivers | 72% | 70% | 68% | 72% |
| Using cannabis and the amount of marijuana in their body was more than what the law allows for drivers | 59% | 54% | 58% | 59% |

Source: CO Driver Behavior Survey: 2021 n=527, 2022 n=843, 2023 n=929, 2024 n=935

Another belief that may reduce risky driving is an individual's beliefs about how safe or dangerous the behavior is. Table 5-3 shows the percentage of Colorado adult drivers who strongly agree that they can drive safely under the influence of impairing substances (agreement with these statements potentially increases the likelihood of engaging in impaired driving). Unfortunately, the percentage has increased for those who believe they can safely drive under the influence of marijuana (from 9% in 2021 to 12% in 2024). On a positive note, the percentages have decreased for those who believe they can safely drive under the influence of alcohol (from 15% in 2021 to 9% in 2024) and prescription medications (from 16% in 2021 to 11% in 2024).

Table 5-3: Perception of Risk

| Agree (Strongly or Somewhat) | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| "I can safely drive under the influence of alcohol" | 15% | 9% | 9% | 9% |
| "I can safely drive under the influence of marijuana" | 9% | 14% | 11% | 12% |
| "I can safely drive after using certain prescription medications (other than marijuana)" | 16% | 11% | 8% | 11% |

Source: CO Driver Behavior Survey: 2021 n=527, 2022 n=843, 2023 n=929, 2024 n=935

Additionally, CDPHE conducts a biannual Healthy Kids Survey (https://cdphe.colorado.gov/hkcs) of high school students across Colorado. This survey measures self-reported behaviors such as texting while driving and impaired driving (Table 5-4) as well as related behaviors such as underage drinking and cannabis use (Table 5-5) which are associated with impaired driving. It also assesses beliefs predictive of risk (e.g., perception of harm) and protection (e.g., healthy expectations of important others such as parents).

Data reveal that self-reported traffic safety behaviors have remained stable or improved over the past decade, but that recent results indicate setbacks in driving while impaired (alcohol or cannabis) as well as texting while driving.

Table 5-4: Traffic Safety Behaviors Among Colorado High School Students

| High School Student Behaviors | 2013 | 2015 | 2017 | 2019 | 2021 | 2023 |
|---|---|---|---|---|---|---|
| Usually or always used a seat belt | 94% | 93% | 95% | 95% | 96% | 96% |
| Driving under the influence of alcohol in the past 30 days (among students who drive) | 8% | 7% | 6% | 6% | 4% | 7% |
| Driving under the influence of cannabis in the past 30 days (among students who drive) | 11% | 10% | 9% | 11% | 6% | 7% |
| Texted or emailed while driving in the past 30 days (among students who drive) | 36% | 36% | 36% | 37% | 32% | 33% |
| Rode with a driver in the past 30 day who had been drinking alcohol | 18% | 16% | 15% | 16% | 13% | NA |
| Rode with a driver in the past 30 day who had been using cannabis | 20% | 20% | 19% | 19% | 12% | NA |

Source: Healthy Kids Colorado High School Survey (https://cdphe.colorado.gov/hkcs)

Table 5-5: Substance Use Behaviors Among Colorado High School Students

| High School Student Behaviors | 2013 | 2015 | 2017 | 2019 | 2021 | 2023 |
|---|---|---|---|---|---|---|
| 30-day use of alcohol | 31% | 30% | 29% | 30% | 24% | 20% |
| Binge drinking (4/5 drinks in 2 hours) | 17% | 17% | 16% | 14% | 13% | 12% |
| 30-day use of cannabis | 20% | 21% | 19% | 21% | 13% | 13% |

Source: Healthy Kids Colorado High School Survey (https://cdphe.colorado.gov/hkcs)

These surveys provide greater understanding of Colorado's Transportation Safety Culture. Because these surveys are performed annually or biannually, they provide a way of assessing changes over time, identifying trends early, and evaluating potential effects of countermeasures.

# Focus Areas

The Safety Culture Emphasis Area includes eight strategies in two Focus Areas: organizational and public. These two Focus Areas were selected based on stakeholder input, their potential to achieve improvement, and their potential impact on safety consequences.

Unlike other Emphasis Areas, the Safety Culture Focus Areas do not include Transportation Disadvantaged Index (TDI) maps nor specific crash reduction goals. Rather, the Safety Culture Emphasis Area contributes to the strategies (and their associated goals) included in each of the other Emphasis Areas.

## Organizational Safety Culture

Strategies in this plan will be implemented by organizations at the state and local level. Therefore, successful implementation requires growing knowledge about this plan (and how organizations can contribute to strategies) and growing organizational safety culture. Organizations with strong safety cultures proactively elevate the importance of transportation safety by integrating safety into every aspect of programming and projects. For transportation-related organizations, safety is prioritized in the planning, scoping, design, construction, and maintenance of all projects and is a part of everyone's role regardless of job title. A key component is strong support from leaders, managers, and supervisors. Executive leadership must establish expectations prioritizing safety and hold those under them accountable to these expectations. Organizational leaders must translate safety into policies, practices, and every day behaviors and hold all staff accountable to these expectations.

### Organizational Strategies

The strategies in this section focus on growing organizational safety culture by conducting assessments, building capacity among organizations, and fostering ongoing sharing of trends, best practices, and innovations.

### SC1: Conduct organizational safety culture assessments

**Build traffic safety culture at the community level by growing traffic safety culture within influential organizations.**

Adoption of the strategies in this plan requires a strong safety culture among various organizations (transportation and non-transportation related). This strategy aims to grow safety culture among organizations by using an assessment to identify gaps and opportunities for improvement. Organizational safety culture assessments identify gaps in areas such as leadership, policy, training, and employee engagement and motivate improvement. Assessments provide organizations with concrete steps they can take to improve their safety culture and increase use of best practices to improve transportation safety. The Federal Highway Administration (FHWA) Organizational Safety Culture Self-Assessment Toolkit helps organizations adopt best practices to enhance safety, particularly in transportation-related activities.

### SC2: Support local agency programs (LTAP and Safety Circuit Rider)

**Continue to support the Local Technical Assistance Program (LTAP) and Safety Circuit Rider in their efforts to assist local agencies.**

A significant portion of fatal and serious injury crashes occur on off-system roads. The Colorado LTAP provides a wide range of support to local agencies while the Colorado Safety Circuit Rider's mission is to provide safety-related technical assistance to local agencies developing infrastructure safety improvement projects located off the state highway system. The LTAP and Safety Circuit Rider will facilitate growth of safety culture among organizations by supporting local safety assessments and improvement plans; fostering improved communication and collaboration among local, regional, and state partners; and growing the skills and knowledge of staff by providing training and technical assistance to support the adoption of best practices and access to federal and state resources.

The Safety Circuit Rider's mission is to work hand-in-hand, boots on the ground, with local agencies to identify, diagnose, and treat safety deficiencies on the local roadway system. Safety on locally maintained ("off-system") roads is a significant issue statewide, and many local agencies lack the resources or technical expertise to perform this work without outside assistance.

Figure 5-1: CDOT's Safety Circuit Rider Program Supports Local Agencies and Colorado's Rural Areas. Source: CDOT

### SC3: Expand public engagement

**By providing training and technical assistance, build the capacity of organizations to successfully engage the public in two-way, productive conversations to grow shared understanding and responsibility.**

Both roadway owners (e.g., state and local governments) and roadway users have a shared responsibility to improve transportation safety. Roadway owners are responsible for planning, design, education, and maintenance while users are responsible for the decisions they make using the system along with their engagement and support in its funding and design. Adopting shared responsibility is often inhibited by the separation between those impacting changes to the transportation system (owners) and those impacted by changes to the transportation system (users). Oftentimes, engaging in transportation planning and engineering conversations has required users to participate in limited ways (e.g., public meetings) and know certain terms/language and relevant data, excluding important community stakeholders from conversations about local safety concerns and projects. This strategy aims to build the capacity of organizations to successfully engage the public in two-way, productive conversations resulting in greater shared understanding and responsibility.

### SC4: Consider communities with below average safety outcomes when making transportation safety investment decisions

**Increase investment in communities with below average safety outcomes to reduce safety disparities by increasing awareness of community transportation safety needs and providing support to local agencies and organizations.**

This strategy aims to address safety disparities in communities disproportionately impacted by traffic safety challenges by increasing investment and building a network of support for local agencies. It focuses on improving the skills of local agencies to procure funding and enhance infrastructure and safety programming for communities including but not limited to Vulnerable Road Users (VRUs), young and aging drivers, and other transportation system users as defined in Section 24-4-109 of the Colorado Revised Statutes.

### SC5: Enhance collaboration and information sharing among traffic safety professionals

**Continue annual Colorado Traffic Safety Summits to engage, educate, and inspire Colorado transportation professionals from a wide variety of organizations to be safety champions and advance traffic safety culture in their organizations and communities.**

The Colorado Traffic Safety Summit is an annual event to engage, educate, and inspire Colorado transportation professionals from a wide variety of organizations to be safety champions and advance traffic safety culture in their organizations and communities. The Summit offers an opportunity for law enforcement, engineering, planning, education, public health, advocacy, emergency response, healthcare professionals and others to share recent trends, best practices, and innovative emerging approaches to improve transportation safety. The Summit grows shared knowledge, skills, and beliefs (i.e., transportation safety culture) supportive of this plan's strategies.

## Public Safety Culture

Communities with a strong safety culture have a shared understanding of their responsibility to be safe roadway users including understanding the risks and benefits associated with transportation decisions, choosing to make safe choices while navigating the transportation network. For instance, drivers and passengers in these communities are more likely to wear seat belts, use child safety seats, or wear helmets while operating a motorcycle. They recognize that their own driving behaviors can negatively impact others and choose to obey traffic laws, slow down at work zones, drive the speed limit, reduce distractions, and never drive impaired. They also support efforts within their community to improve transportation safety and create expectations within their families, neighborhoods, and workplaces that promote transportation safety.

### Public Strategies

#### SC6: Pilot community-level safety culture partnerships

**Utilize community-level pilot projects to learn and demonstrate effective safety practices.**

Behaviors related to engineering, post-crash care, law enforcement, and driving behaviors (e.g., impairment, speeding, distraction, seat belt use) have significant impact on fatal and serious injury crashes. Often, these behaviors can be most impacted at the community level. Somewhat new to transportation safety approaches, public health often uses community-level pilot projects to learn and demonstrate effective practices. These pilot projects may use different models (e.g., risk and protective factor models) engaging broad-based coalitions that address factors across the social environment (e.g., policy, law enforcement, funding, organizations, healthcare, schools, families, individuals) to improve safety. This strategy aims to improve transportation safety by partnering with public health on one or more pilot projects to grow traffic safety culture at the community level. Learning and demonstrating what's possible with a locally focused, public health project enables much broader and more effective programming in the future to reach more communities across Colorado.

## Locally-Based Transportation Projects

Public health has used locally-based projects for over two decades to address issues such as substance use among youth, mental health, violence, suicide, obesity, and cardiac health. These approaches typically form local coalitions with stakeholders representing a variety of sectors including schools, workplaces, law enforcement, non-profits, elected officials, media, and healthcare. These coalitions gather data about local consequences, behaviors, beliefs, and contextual factors (like alcohol outlet density or availability of healthy food). The data are used to identify risk and protective factors. Best practices to reduce risk factors and increase protective factors that are appropriate for the community are selected (from published research) and implemented. Implementation is monitored to assure fidelity to the way the practices were designed, and evaluations are used to track progress and assess outcomes. Over time, the process is repeated. Lessons learned are gathered and shared with other communities to facilitate replication.


Figure 5-2: Bike to Work Day Rider Appreciation Station. Source CDOT

### SC7: Educate through media campaigns

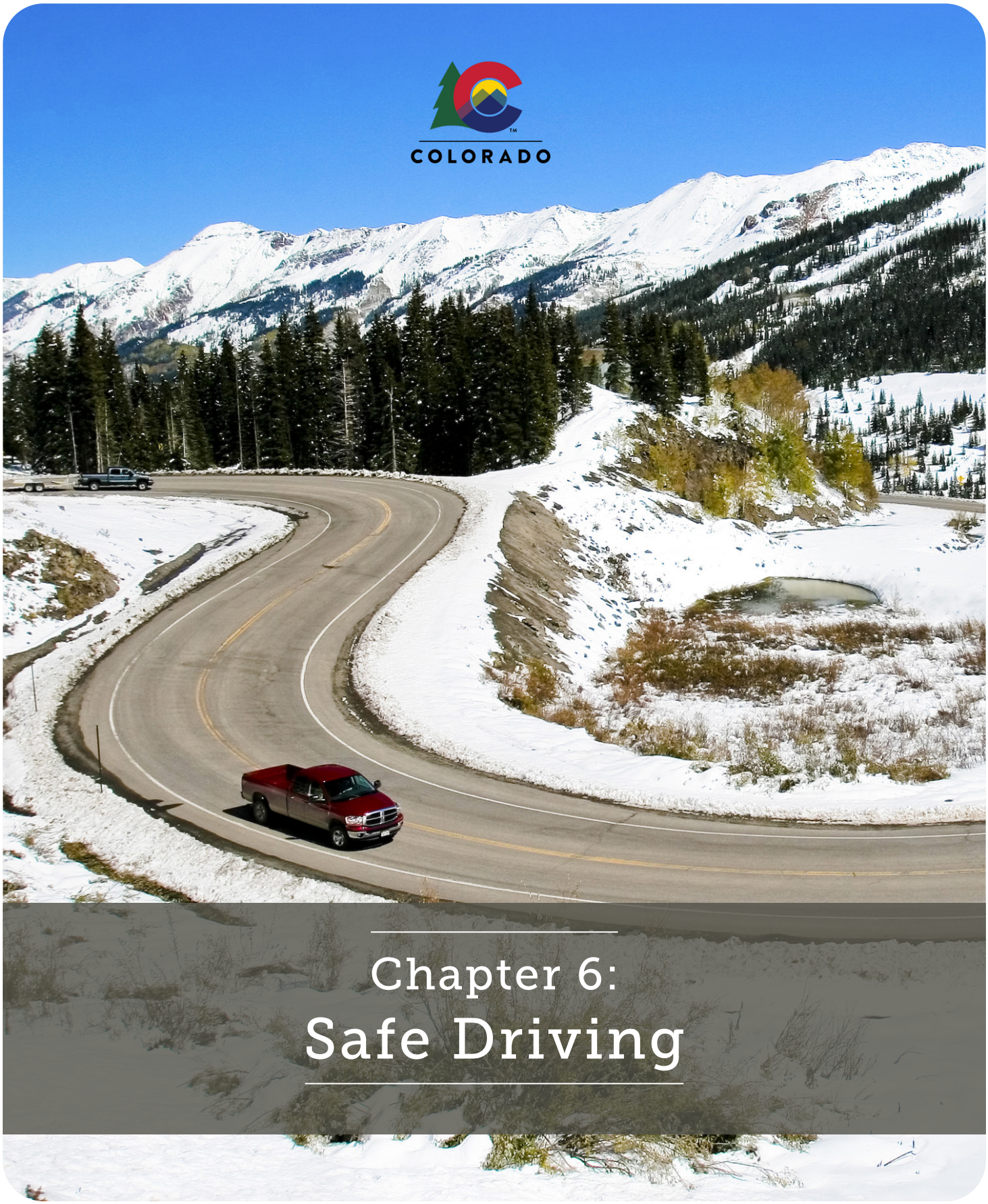
**Create and distribute universal education using media campaigns and resources.**

Educating the public about safe transportation practices, laws, risks, and benefits can be an effective way to grow transportation safety culture. This strategy develops, distributes, and promotes educational videos, stories, and information on a range of transportation safety topics including recently adopted laws, driver behavior, occupant protection, winter weather driving, and VRUs. This strategy includes partnering with new stakeholders and utilizes social media, billboards, videos, and school-focused materials.

### SC8: Build capacity among the public

**Expand on existing public engagement programming to build the capacity of the public to encourage two-way, productive conversations between everyday road users and government agencies by educating the public about ways to share concerns, transportation safety, and their role in growing a safer system.**

Improving transportation safety culture includes growing shared responsibility among transportation system owners and users, reflecting both the importance of safety in system design and the behavior of users. However, many transportation system users may not know how, have the right level of knowledge or language, or be comfortable sharing concerns or engaging in conversations. This strategy aims to expand on existing public engagement programming to build the capacity of the public to encourage two-way, productive conversations between everyday transportation users and government agencies by educating the public about ways to share concerns, transportation safety, and their role in growing a safer system.




# Chapter 6:
# Safe Driving


# Introduction

The Safe Driving Emphasis Area recognizes that driving behaviors are a key contributing factor in a significant proportion of fatalities and serious injuries that occur on Colorado's roadways. Safe Driving targets high-risk driving behaviors, including distraction, aggression, impairment, occupant protection (seat belts and/or helmets), and speeding.

The Safe Driving Emphasis Area is a critical component of the Safe System Approach (SSA), highlighting that humans make mistakes that can lead or contribute to crashes. High-risk driving behaviors, such as unrestrained and speeding, significantly contribute to the crash severity outcome. The Safe Driving Emphasis Area focuses on encouraging safe, responsible driving behaviors.

The primary objective of the Safe Driving Emphasis Area within this plan is to bring focus on better understanding and influencing human behaviors and actions by all road users. This effort seeks to promote actions that encourage safe driving behaviors, reducing contributing factors to a large proportion of fatal and serious injury crashes on the roadway.

## Focus Areas

The Safe Driving Emphasis Area identifies five Focus Areas:

Emphasis Area:

Safe Driving

Focus Areas:

Occupant Protection

Impairment

Aggression

Speeding

Distraction

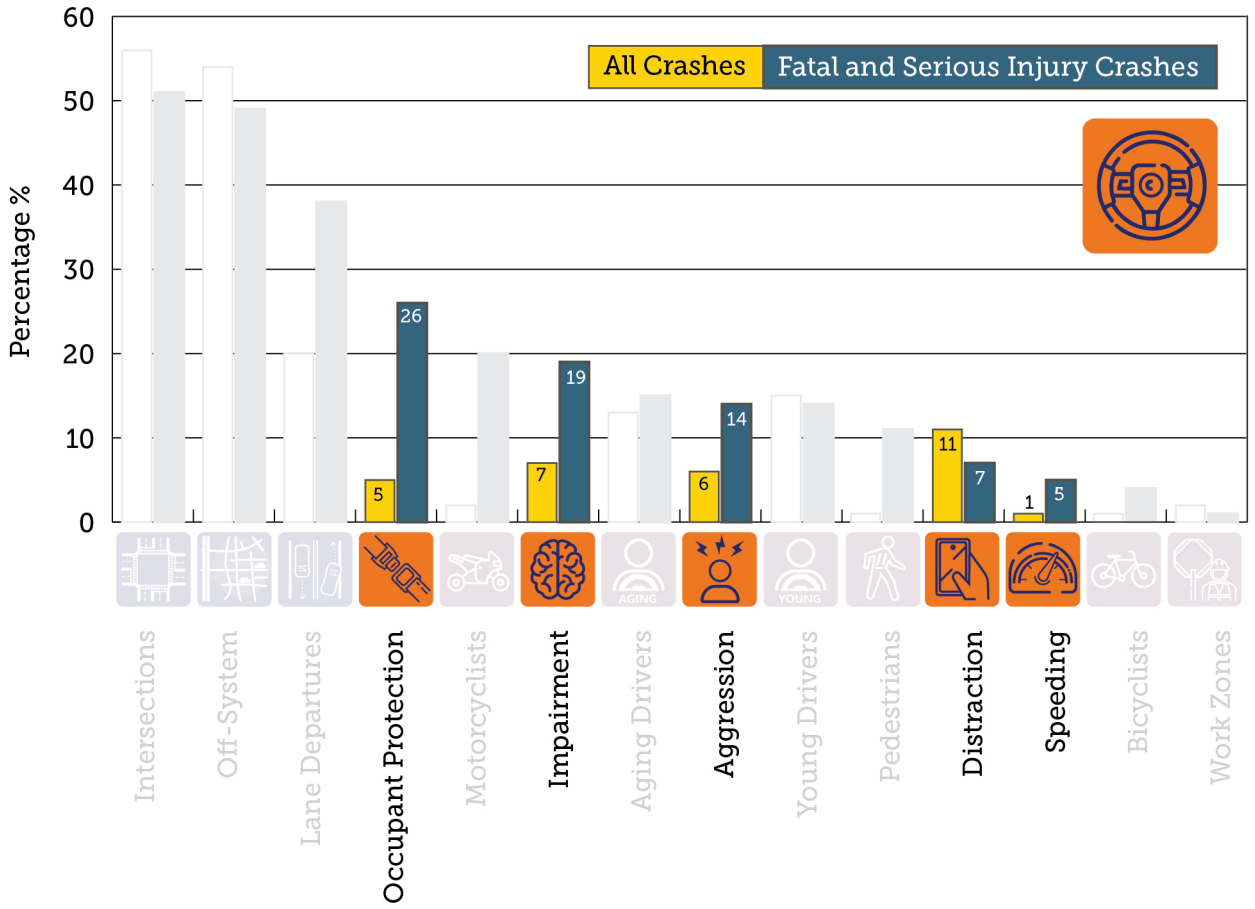



Figure 6-1: Percentage of Total & Fatal/Serious Injury Crashes Involving Focus Areas

The Safe Driving Emphasis Area focuses on different driver behaviors that result in severe crashes. The Focus Areas within this Emphasis Area have high potential for reducing or eliminating future severe crashes and include occupant protection, impairment, aggression, speeding, and distraction.

# Occupant Protection

**Focus Area Definition:** Crashes where safety restraints or helmets were not properly used by motor vehicle occupants.

**Focus Area Goal:** Reduce the number of severe crashes that involve improper restraint use or improper helmet use by five percent from the previous year through 2029.

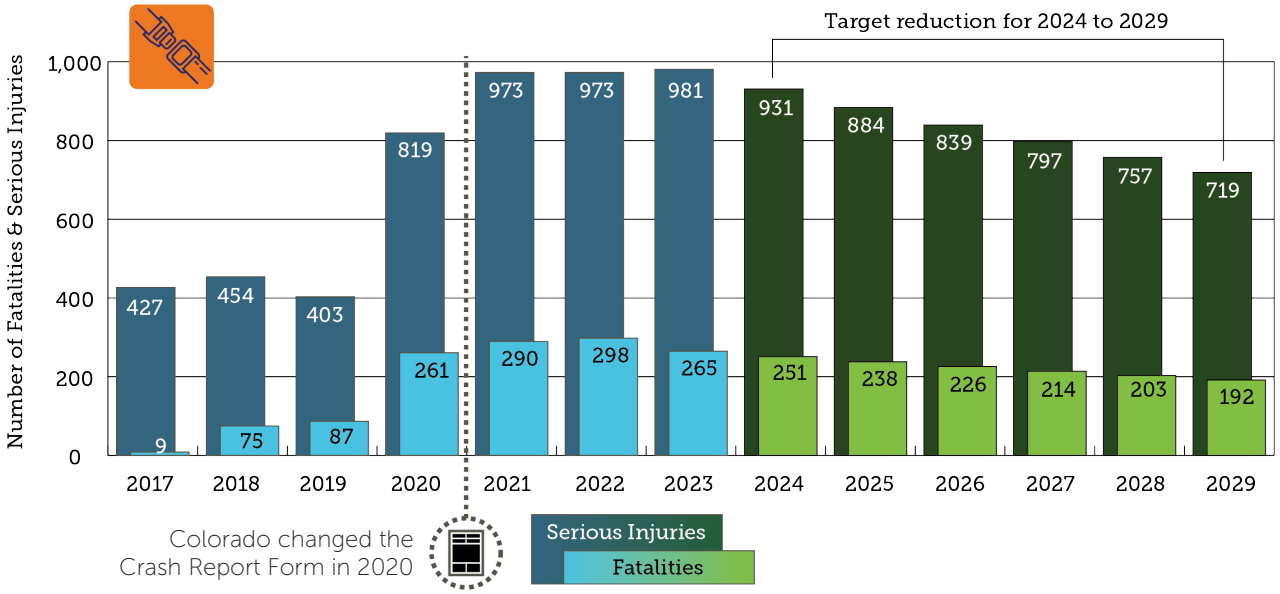



Figure 6-2: Occupant Protection-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Occupants not wearing or improperly using safety equipment (seat belts, helmets, etc.) were involved in five percent of the total crashes from 2019-2023, yet represent 26% of fatal and serious injury crashes, underpinning the severity of these crashes. The fatalities and serious injuries remain even between 2021 and 2023. Unrestrained fatalities and serious injuries occur more in rural settings (32%) compared to urban (23%), and 30% of the urban fatal and serious occupant protection-related crashes involved a motorcycle.

Restraint use reflects safety culture and starts with the driver. Detailed analysis into The National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS) national database found that driver restraint use is correlated with a reduction in unrestrained child deaths. Specifically, in crashes where a driver was unrestrained, 61% of children killed were also unrestrained. In crashes where a driver was restrained, 30% of children killed were unrestrained.[3] On a related positive note, CDOT's most recent Colorado Seat Belt Study (2024) observed an 88% seat belt usage rate, up 7% over the last decade.[4]

3 FARS, https://cdan.dot.gov/DataVisualization/DataVisualization.htm
4 CDOT releases seat belt study showing 7% usage increase since 2014 — Colorado Department of Transportation

Proven legislative countermeasures cited by NHTSA include primary enforcement seat belt use laws, increased fines, and strong child passenger safety laws. Effective high-visibility seat belt enforcement, specifically at nighttime, is another countermeasure that works to increase safety restraint use. Law enforcement is permitted to stop drivers under the age of 18 in the Graduated Drivers Licensing (GDL) program or stop a driver if they see a child under the age of 18 improperly restrained in the vehicle. Colorado does not have a primary seat belt law, meaning law enforcement cannot stop a driver over the age of 18 for not wearing a safety restraint. A citation may be given as a secondary offense.[5]

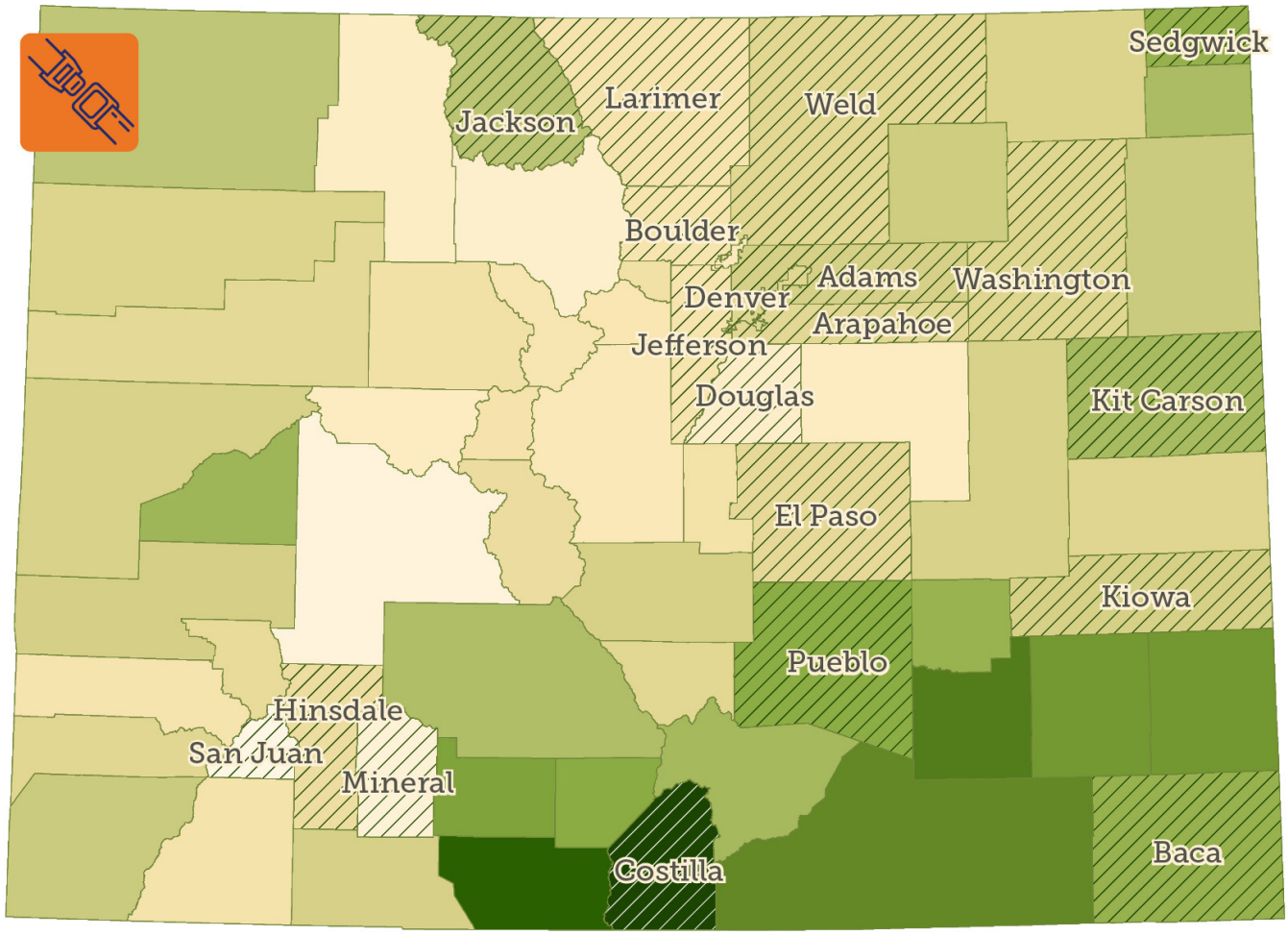
Increasing consistent and proper use of safety restraints presents an opportunity to have a significant positive impact on the fatalities and serious injuries in Colorado. The strategies identified in this Focus Area reflect proven effective actions implemented in other states. The goal is to promote awareness of the benefits of a primary seat belt law and increase support from citizens and legislatures to promote changes. Continued data-driven education, for occupants of all ages, will highlight the safety benefits of safety restraint use and shift the culture and acceptance.

The Colorado Occupant Protection Task Force advocates for best practices in occupant protection safety. Established to increase awareness of seat belt use and child passenger safety throughout the state, the task force works to develop collaborative relationships and partnerships towards the goals of increasing occupant protection restraint usage and educating about the importance of strengthening existing occupant protection laws.

Figure 6-3 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest occupant protection-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of occupant protection-involved fatalities and serious injuries are the counties along the Front Range. Top counties per capita tend to be rural counties to the north, east and southwest.

5 Seat Belts — Colorado Department of Transportation

Figure 6-3: Top Counties of Occupant Protection-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver | Mineral |
| 2 | Adams | Jackson |
| 3 | Arapahoe | San Juan |
| 4 | Jefferson | Costilla |
| 5 | Weld | Baca |
| 6 | El Paso | Kiowa |
| 7 | Larimer | Washington |
| 8 | Pueblo | Kit Carson |
| 9 | Boulder | Hinsdale |
| 10 | Douglas | Sedgwick |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

## Occupant Protection Strategies

### SD1: Promote proper use through media campaigns

**Continue to develop traffic safety media campaigns to support proper use of seat belts, child seats, and helmets.**

State agencies develop and promote educational videos, stories, and data stories on the importance of proper restraint use. This strategy focuses on partnering with additional stakeholders for more widespread dissemination for drivers and motor vehicle occupants.

### SD2: Educate on primary seat belt law

**Support educational efforts related to the importance of a primary seat belt law.**

This strategy promotes national research supporting the effectiveness of a primary seat belt law to educate legislators and safety partners. Collaboration with the Colorado Occupant Protection Task Force and similar safety partners is essential to advancing this strategy.

# Impairment

**Focus Area Definition:** Crashes where the driver is under the influence of alcohol, marijuana, or other drugs and is suspected, observed, or tested for impairment in the field by law enforcement.

**Focus Area Goal:** Reduce the number of severe crashes that involve impairment by five percent from the previous year through 2029.

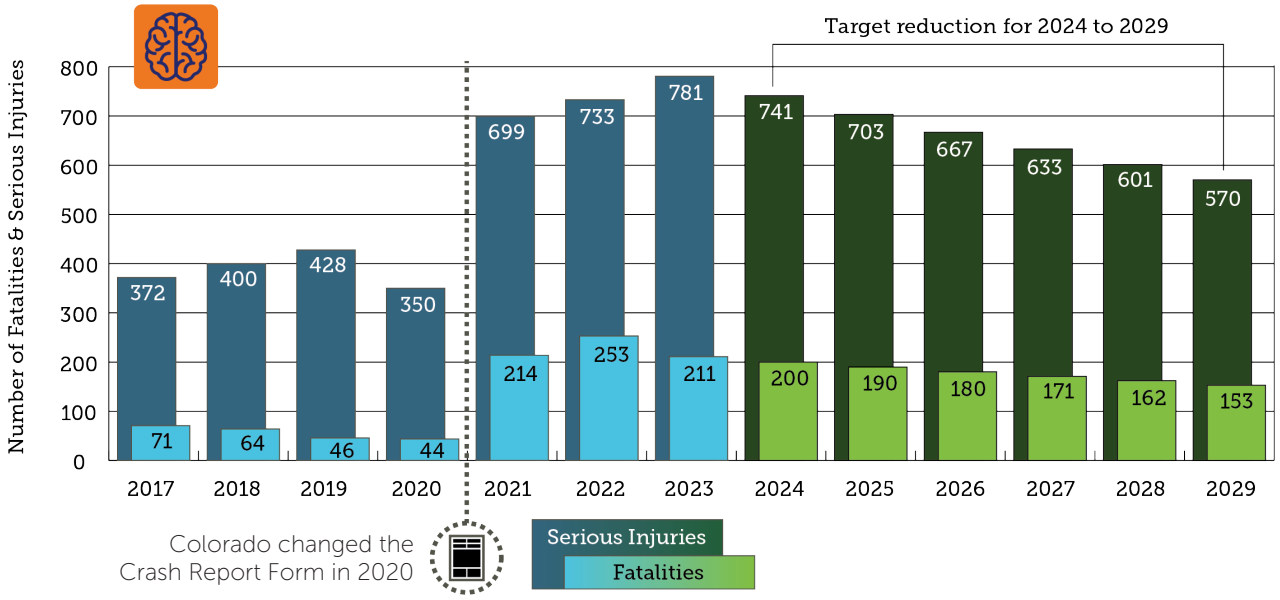



Figure 6-4: Impairment-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Impairment-involved fatalities and serious injuries increased 9% between 2021 and 2023, with the fatalities peaking in 2022 (Figure 6-4). Impairment was involved in 7% of all crashes but was involved in 19% of fatal and serious injury crashes, underscoring the severity of this Focus Area. Younger drivers, between the ages of 20 and 34, represent a higher proportion of the fatalities and serious injuries. Male drivers and motorcyclists are also overrepresented in the crash data. Motorcyclists make up 2.5% of all impairment-related crashes but 13.0% of the fatal and serious injury impairment-related crashes.

Although 68% of impairment-involved crashes occur in urban areas compared to 32% in rural areas, rural crashes are disproportionately severe—45% of all fatal and serious injury impairment-involved crashes take place in rural areas. In these impairment-involved crashes in rural areas, 76% of the fatalities and serious injuries are associated with lane departure crashes, and 47% occur on dark, unlighted roads. Impaired crashes most commonly occur on Friday, Saturday, and Sunday evenings between the hours of 6:00 p.m. and 1:59 a.m.

Driver impairment is reported based on the responding officer's judgment and, therefore, may be underreported in Colorado crash data. Fatal crashes are the exception, as toxicology is run on all fatal crashes in the state. Alcohol continues to be the primary cause of impairment, yet polydrug use (the combination of two or more drugs including medications) is a growing concern related to impairment in the state. The Colorado Department of Public Safety noted that polydrug detection among all driving under the influence (DUI) cases more than doubled from 2016 to 2020—rising from 8% to 18%.[6]

Legislative and licensing countermeasures such as lower Blood Alcohol Concentration (BAC) levels, minimum drinking age laws, and administrative license revocation or suspension can be employed to discourage impaired-driving behaviors. Law enforcement agencies are important participants in preventing impairment-involved crashes, with high-visibility saturation patrols, alcohol measurement devices, and sobriety checkpoints noted as proven strategies to reduce impairment-related crashes.[7] Community groups, such as Regional Impaired Driving Task Forces, can help to change the local safety culture regarding impaired driving, particularly in rural areas and resort locations.

Several safety stakeholders are currently working to address impaired driving challenges. The Colorado State Patrol uses historical crash data to identify dates and locations for high-visibility enforcement strategies to efficiently and effectively prevent impaired-involved crashes. Additionally, the Colorado Task Force on Drunk & Impaired Driving continues to monitor the emerging challenges associated with impaired driving. The strategies in the SHSP complement these partner efforts and promote continued education and enforcement.

The mission of the Colorado Task Force on Drunk and Impaired Driving is to support the prevention, awareness, enforcement, and treatment of drunk and impaired driving in Colorado through strong partnerships with public, private, and non-profit organizations. Members of the task force are designated by statute and represent various state agencies, the law enforcement and legal community, safety advocates, private businesses, and citizens.

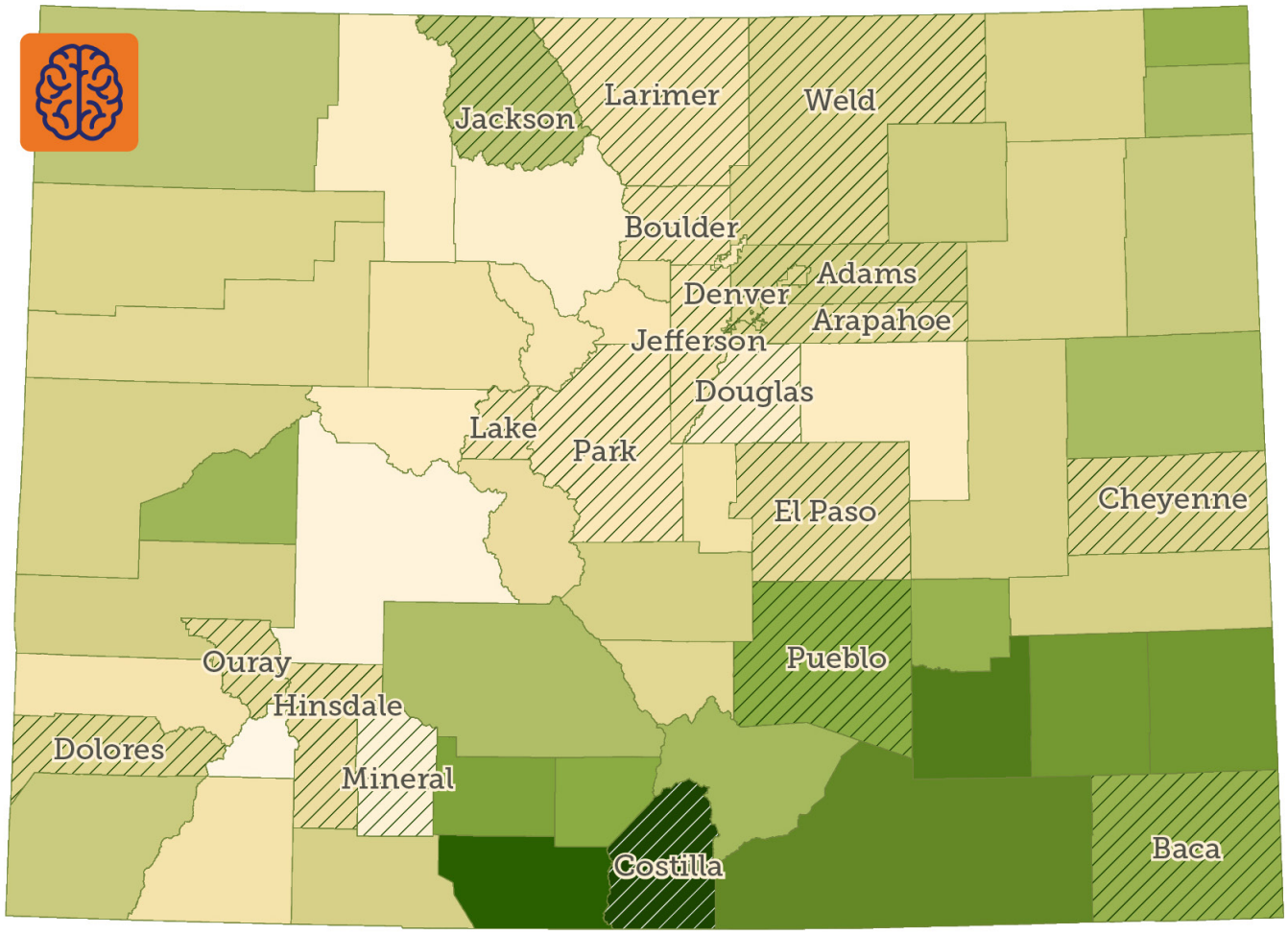
Figure 6-5 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest impairment-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of impairment-involved fatalities and serious injuries are counties along the Front Range. Top counties per capita tend to be rural counties in Eastern Colorado and Southwestern Colorado.

As with many of the Safe Driving Focus Areas, counties along the Front Range have the highest numbers of impairment-related fatalities and serious injuries while the more rural counties have higher rates per capita.

6 Rosenthal, A. (2023). "Driving Under the Influence of Drugs and Alcohol. A Report Pursuant to C.R.S. 24-33.5-520." Office of Research and Statistics, Division of Criminal Justice, Colorado Department of Public Safety.

7 Kirley, B. B., Robison, K. L., Goodwin, A. H., Harmon, K. J. O'Brien, N. P., West, A., Harrell, S. S., Thomas, L., & Brookshire, K. (2023, November). Countermeasures that work: A highway safety countermeasure guide for State Highway Safety Offices, 11th edition, 2023 (Report No. DOT HS 813 490). National Highway Traffic Safety Administration.

Figure 6-5: Top Counties of Impairment-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
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| 3 | Adams | Cheyenne |
| 4 | Arapahoe | Baca |
| 5 | Jefferson | Costilla |
| 6 | Weld | Lake |
| 7 | Larimer | Ouray |
| 8 | Boulder | Hinsdale |
| 9 | Pueblo | Dolores |
| 10 | Douglas | Park |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

## Impairment Strategies

### SD3: Provide polydrug impairment education

**Educate the public on the impacts of polydrug use.**

This strategy is focused on gathering more data linking polydrug use to driver ability to operate a vehicle and sharing these findings through public communication campaigns. Enhanced data will be useful to educate the public on the impacts of multiple drugs, including both prescription and recreational drugs, on the impacts of driving.

### SD4: Prioritize high-risk impaired driving corridors

**Identify high-risk corridors overrepresented in the crash data to make data-driven decisions to combat impaired driving.**

The purpose of this strategy is to geolocate impairment-involved crashes to continue to assist law enforcement agencies with enforcement efforts. The data mapping can also support additional partners to collaborate on area-specific educational campaigns.

### SD5: Continue high-visibility enforcement

**Continue to deploy data-driven high visibility impaired driving enforcement activities to deter impaired driving-related crashes.**

This is a proven effective strategy that state and local law enforcement agencies deploy across the state. High-visibility enforcement increases the perception of getting caught and arrested, and deters impaired driving. Employing this strategy requires continued emphasis on collaboration between state and local agencies.

# Aggression

**Focus Area Definition:** Crashes where the driver engaged in aggressive driving behaviors, such as tailgating, cutting off other drivers, weaving behaviors, and other careless driving actions like disobeying traffic laws.

**Focus Area Goal:** Reduce the number of severe crashes that involve aggression by five percent from the previous year through 2029.

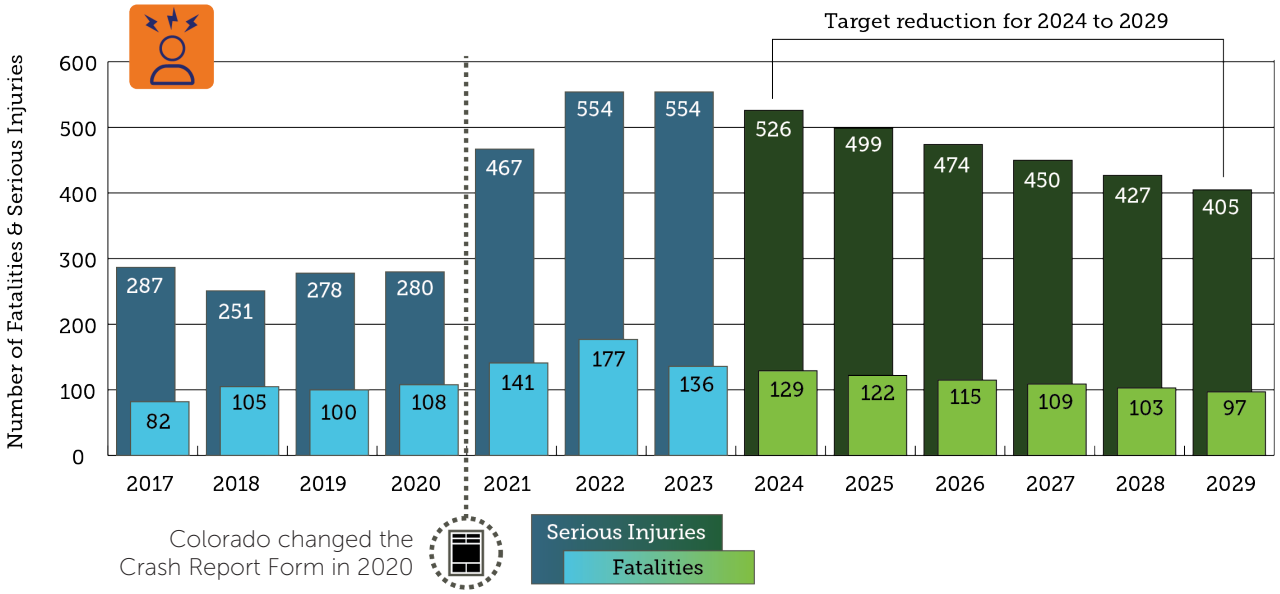
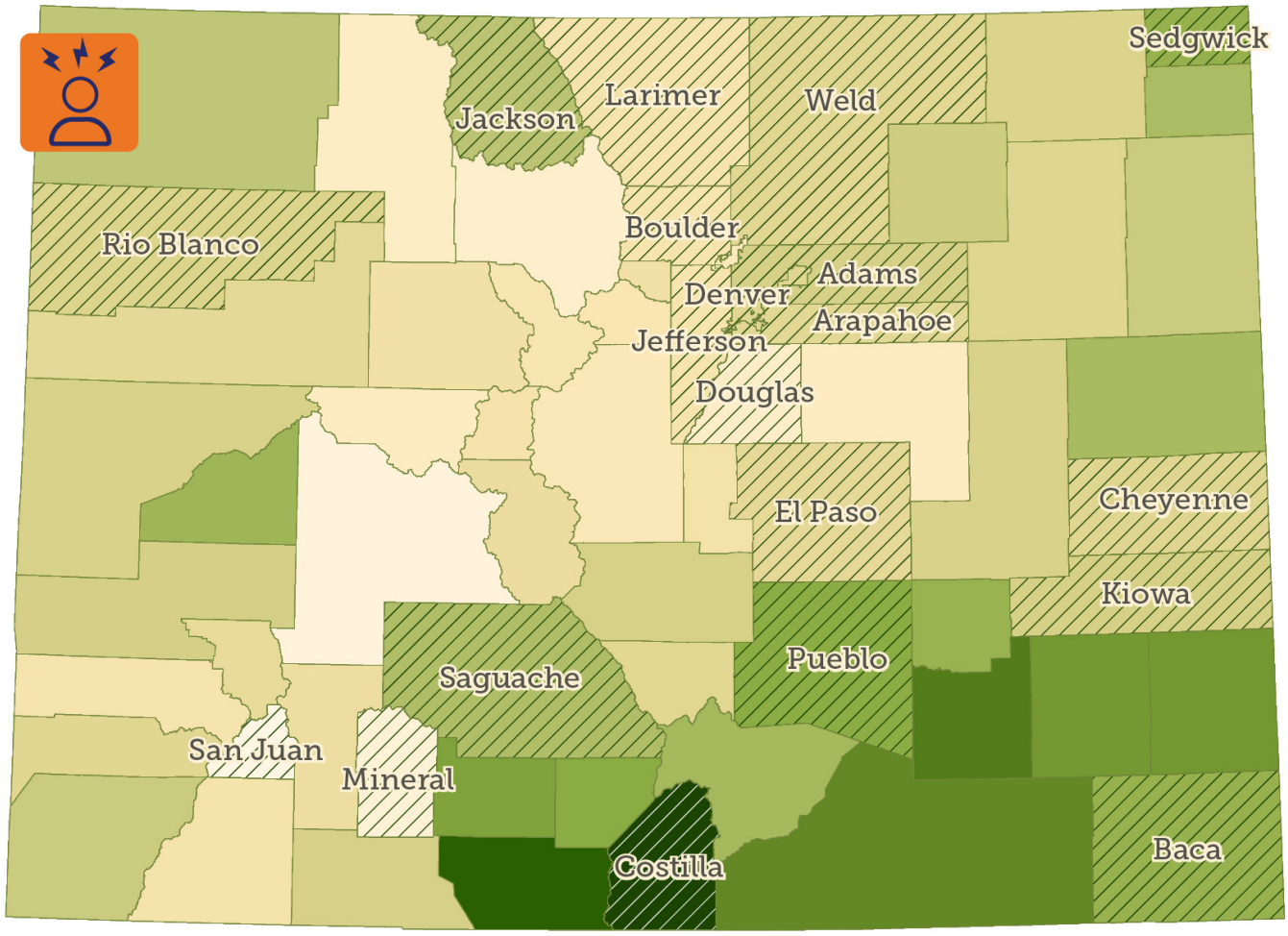



Figure 6-6: Aggressive Driving-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Aggressive driving accounts for 6% of all crashes but 14% of fatal and serious injury crashes. Figure 6-1 illustrates the seriousness of driver aggression, with aggression-involved fatalities and serious injuries increasing 13% between 2021 and 2023. Young drivers (ages 15 to 20) were involved in 19% of all fatal and serious injury crashes related to aggressive driving despite making up only 5% of licensed drivers in Colorado. This means they are nearly four times more likely to be involved in these types of crashes compared to their share of the driving population. Drivers aged 21 to 64 are involved in these crashes at rates proportionate to the share of licensed drivers. Older drivers (65 and up) make up 21% of licensed drivers, but were involved in only 8% of these crashes — meaning they are much less likely to be involved in aggression-related fatal or serious injury crashes.[8] Both aggression-involved crashes and those resulting in fatalities or serious injuries are shown to occur nearly equally in urban and rural settings. Just over 50% of the aggression-related crashes occurred off-system, and 47% occurred at intersections.

8 Federal Highway Administration, Highway Statistics 2023, Table DL-22

Figure 6-7: Top Counties of Aggression-Involved Fatalities and Serious Injuries

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| 5 | Weld | Baca |
| 6 | Jefferson | Sedgwick |
| 7 | Larimer | Kiowa |
| 8 | Pueblo | Costilla |
| 9 | Boulder | Saguache |
| 10 | Douglas | Rio Blanco |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 6-7 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest number of aggression-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of aggression-involved fatalities and serious injuries are along the Front Range, representing the most urban part of the state. When looking at fatalities and serious injuries per capita, the top counties are rural.

Improper use of occupant protection was involved in 10% of aggression-related crashes but 32% of the fatalities and serious injuries. Impairment was a contributing factor to 8% of all aggression-related crashes but 29% of the fatalities and serious injuries. Of the aggression-related crashes, speeding was involved in 2% of all crashes but 7% of fatal and serious injury crashes. Motorcyclists also represent a higher proportion of aggressive driving fatalities and serious injuries, representing 3% of all aggression-related crashes but 29% of the aggression-related fatalities and serious injuries.

These data points emphasize the confounding impact of other behavior-related contributing factors on the severity outcome of crashes. This Focus Area uses multi-prong strategies that address several behaviors. Countermeasures include enforcement efforts related to traffic laws covering speeds and lane changes as actions to address aggressive driving. Encroaching on other vehicles, disobeying traffic signals and signage, and making unsafe lane changes are other examples of aggressive behaviors that can be cited by law enforcement.

## Aggression Strategies

Strategies in this plan seek to highlight the importance of educating the driving public on the seriousness of aggression—both personally as a driver and as drivers in other vehicles avoiding or not engaging with an aggressive driver. Data collection on this type of crash continues to be important to identify specific corridors or regions with higher risk for aggression that can be addressed through enforcement and targeted educational efforts.

### SD6: Deploy anti-aggressive driving campaigns

**Develop anti-aggressive driving campaigns focused on populations overrepresented in the crash data.**

This strategy is intended to target educational and awareness campaigns to groups of drivers who represent higher proportions of aggression-involved fatalities and serious injuries. Drivers under the age of 34 and motorcyclists are overrepresented in crash data. Reducing aggressive driving behaviors in these populations provides the greatest opportunity to reduce the number of aggression-related fatalities and serious injuries throughout Colorado.

### SD7: Prioritize high-risk aggressive driving corridors

**Identify high-risk corridors overrepresented in the crash data to make data-driven decisions to combat aggressive driving.**

This strategy directs agencies to collect and analyze data to prioritize corridors where a higher percentage of aggression-involved crashes are occurring. Law enforcement agencies can use the data as appropriate to develop enforcement campaigns and employ other strategies in these high-risk corridors. Additionally, this could provide valuable information to identify root causes of behavior on why aggression may be occurring on certain roadways.

## Speeding

**Focus Area Definition:** Crashes where a motor vehicle was traveling over the posted speed limit or at speeds unsafe for conditions.

**Focus Area Goal:** Reduce the number of severe crashes that involve speeding by five percent from the previous year through 2029.

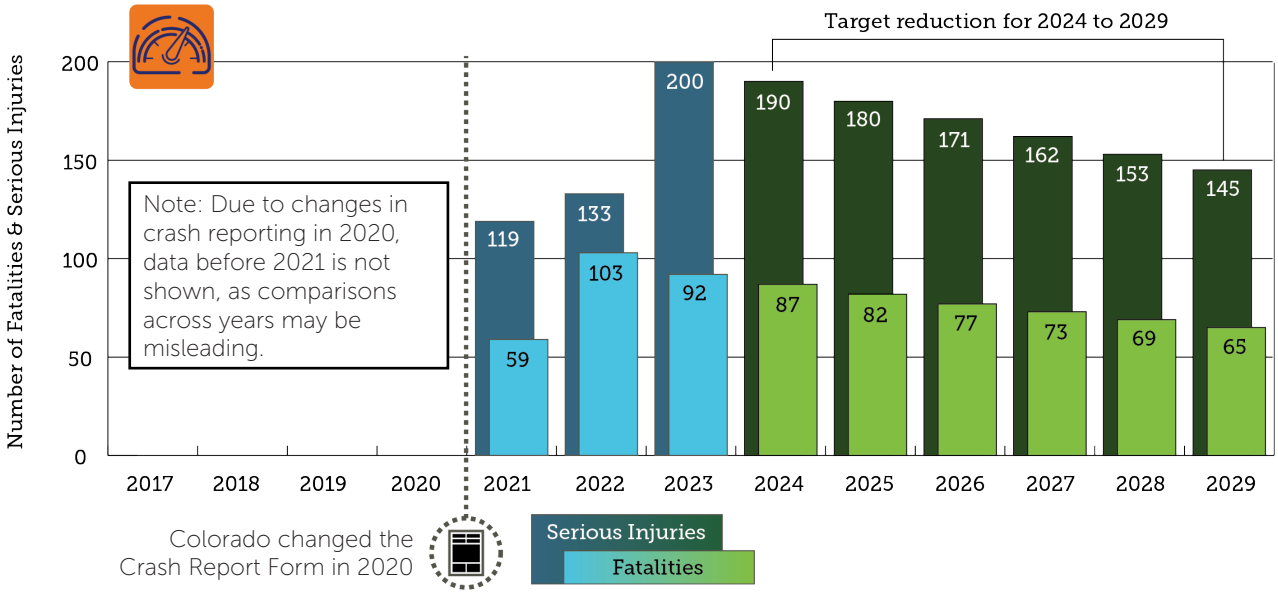



Figure 6-8: Speed-Involved Fatalities and Serious Injuries by Year (2021 to 2023)

Speeding is a topic that can be discussed through various lenses, including the choice to speed and how an environment encourages speeding behavior. The Safe Driving Emphasis Area focuses on the driving behavior, and the Speeding Focus Area emphasizes the driver's responsibility in selecting safe and appropriate speeds. The Safe Roads Emphasis Area (Chapter 8) discusses strategies related to speed management, infrastructure, and roadway environments to address speeding.

Between 2021 and 2023, speeding-involved crashes increased 60%, and fatalities and serious injuries increased 64% (Figure 6-8). These numbers represent one percent of total crashes and five percent of total fatalities and serious injuries in Colorado (refer to Figure 6-1 at the beginning of the chapter). It is important to note the significant data quality issues related to speeding-involved crashes. Crash data is limited to what is visible or known after a crash occurs, but it is thought that speeding is a significant contributor to many of the Emphasis Areas in this plan.

Speeding-involved crashes occur slightly more frequently in rural settings compared to urban, and drivers under the age of 34 are overrepresented in the crash data. Nearly half of the speeding-involved fatal and serious injury crashes occurred in rural areas, which is higher than the percentage of total speeding-involved fatal and serious crashes statewide (37.7%). Of the speeding-involved fatalities and serious injuries, 53% involved lane departure, 53% occurred off-system, 41% occurred at an intersection, and 22% involved young drivers from 15 to 20 years of age.

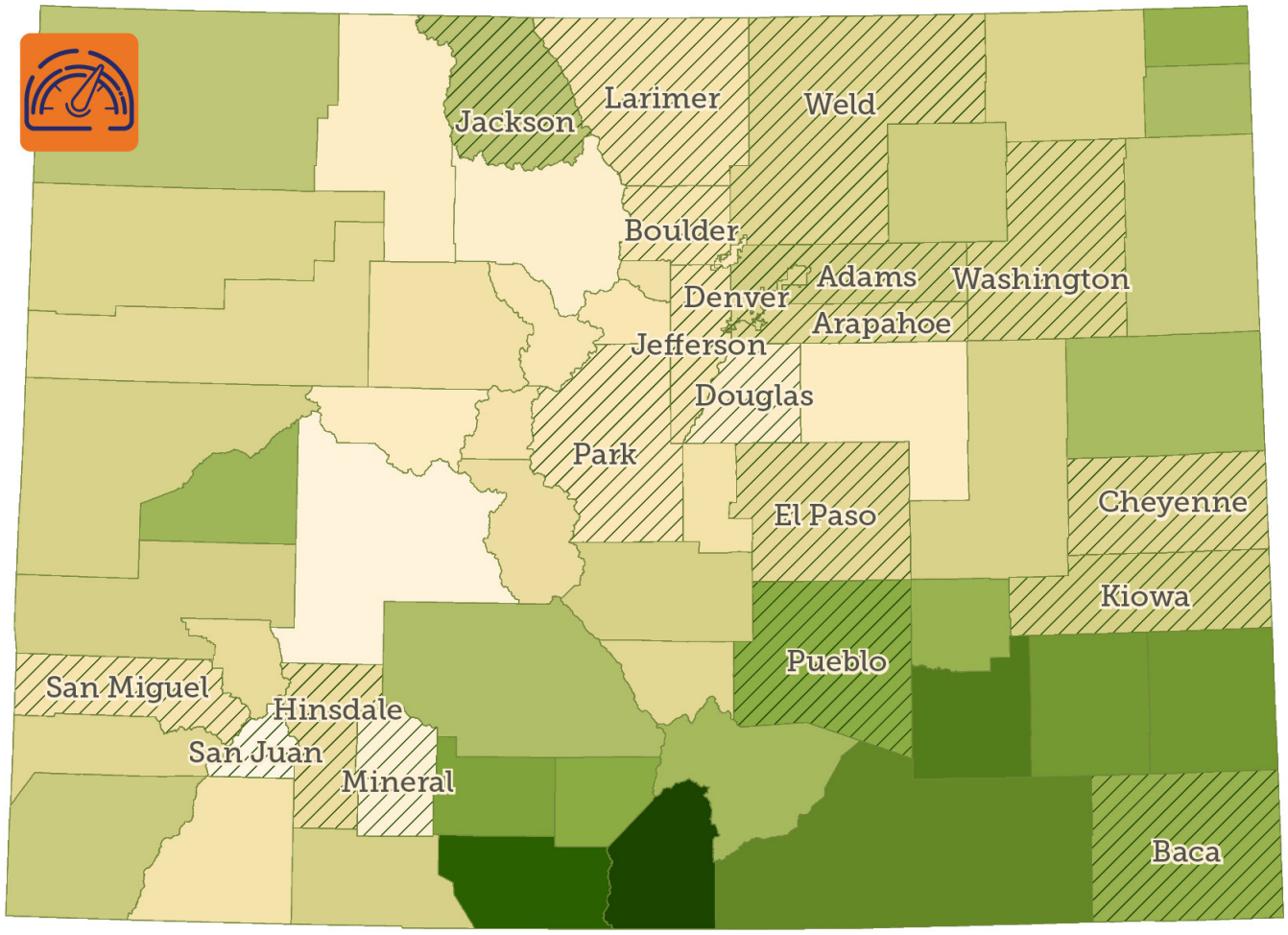
According to the 2024 Colorado Driver Behavior Survey, 69% of Colorado drivers said they drive over the speed limit on main highways, 48% speed on main city or town roads, and 26% speed on neighborhood roads. Of the drivers surveyed, 58% believed they would be stopped by law enforcement on local roads with speed limits of 30 mph, whereas 41% believed they would be stopped on roads with speed limits of 65 mph. This emphasizes that speeding on highways is perceived to be more acceptable. However, highlighting the SSA principle that humans are vulnerable; kinetic energy (which is significantly impacted by speed) is the top contributing factor to crash survivability. As the speed of a vehicle involved in a crash increases, so does the kinetic energy released and the likelihood of the crash resulting in a fatality or serious injury.

NHTSA-promoted countermeasures include a combination of legislation, enforcement, and the use of technologies to address behavior change. The strategies in this plan are intended to help Colorado gain deeper insights into the contributing behavioral factors to speeding-involved crashes and utilize innovative methods for reducing speeding behaviors.

Strategies include geolocating crashes and combining datasets then disseminating data analysis results to safety partners, such as law enforcement, to use for their education and enforcement activities. Additionally, new technologies continue to emerge to assist with data collection and enforcement. This plan promotes using information gleaned from the CDOT's Automated Speed Enforcement Program to expand this Emphasis Area's future activities.

In 2023, the Governor signed into law SB23-200: Automated Vehicle Identification Systems. This act expands the methods by which the state, a county, a city and county, or a municipality (jurisdiction) may deliver a notice of violation when a traffic violation is detected through the use of an automated vehicle identification system. The "speed camera" bill offers an important tool for communities to encourage safe driving behavior. This was updated with SB24-195 which changed Colorado Revised Statute 42-4-110.5, adding additional clarification regarding the protection of Vulnerable Road Users (VRUs).

Figure 6-9: Top Counties of Speeding-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | El Paso | Mineral |
| 2 | Jefferson | Baca |
| 3 | Adams | San Juan |
| 4 | Denver | Jackson |
| 5 | Douglas | Hinsdale |
| 6 | Arapahoe | Kiowa |
| 7 | Larimer | Washington |
| 8 | Boulder | Cheyenne |
| 9 | Weld | San Miguel |
| 10 | Pueblo | Park |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 6-9 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest speeding-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of speeding-involved fatalities and serious injuries are the counties along the Front Range. Top counties per capita tend to be rural counties along the Eastern Plains and Southwestern Colorado.

## Speeding Strategies

### SD8: Prioritize high-risk speeding locations

**Identify high-speeding-risk corridors overrepresented in the crash data and evaluate overlap between speeding and other high-risk driving behaviors.**

This strategy is intended to increase collection and analysis of speeding-related data and improve understanding of the linkages to other Focus Areas and identify locations where speeding occurs more frequently. Data collected under this strategy can also assist with illustrating connections between speeding and other high-risk driving behaviors within identified corridors.

### SD9: Deploy speed safety camera systems

**Use the results of a speed safety camera pilot program to make data-driven decisions on future installations.**

Under Colorado Revised Statute 42-4-110.5, Automated Vehicle Identification Systems (AVIS) are permitted for detecting traffic violations. CDOT's Automated Speed Enforcement Program will establish a pilot program to reduce speeding and increase safety in specified corridors. Pilot locations include work zones with two or more lanes of traffic in one direction. This strategy will examine the results of the pilot locations to understand the scope of potential applications related to speeding-involved crashes.

# Distraction

**Focus Area Definition:** Crashes where the driver was distracted by factors either inside or outside the vehicle.

**Focus Area Goal:** Reduce the number of fatal and serious injury crashes that involve distraction by five percent from the previous year through 2029.

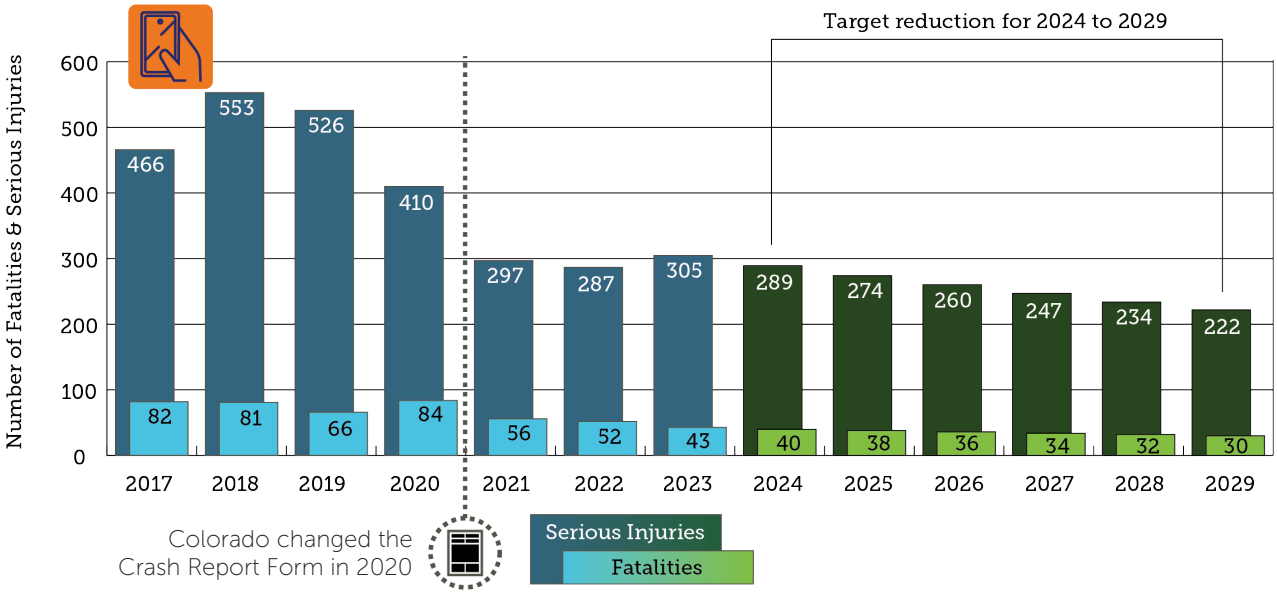
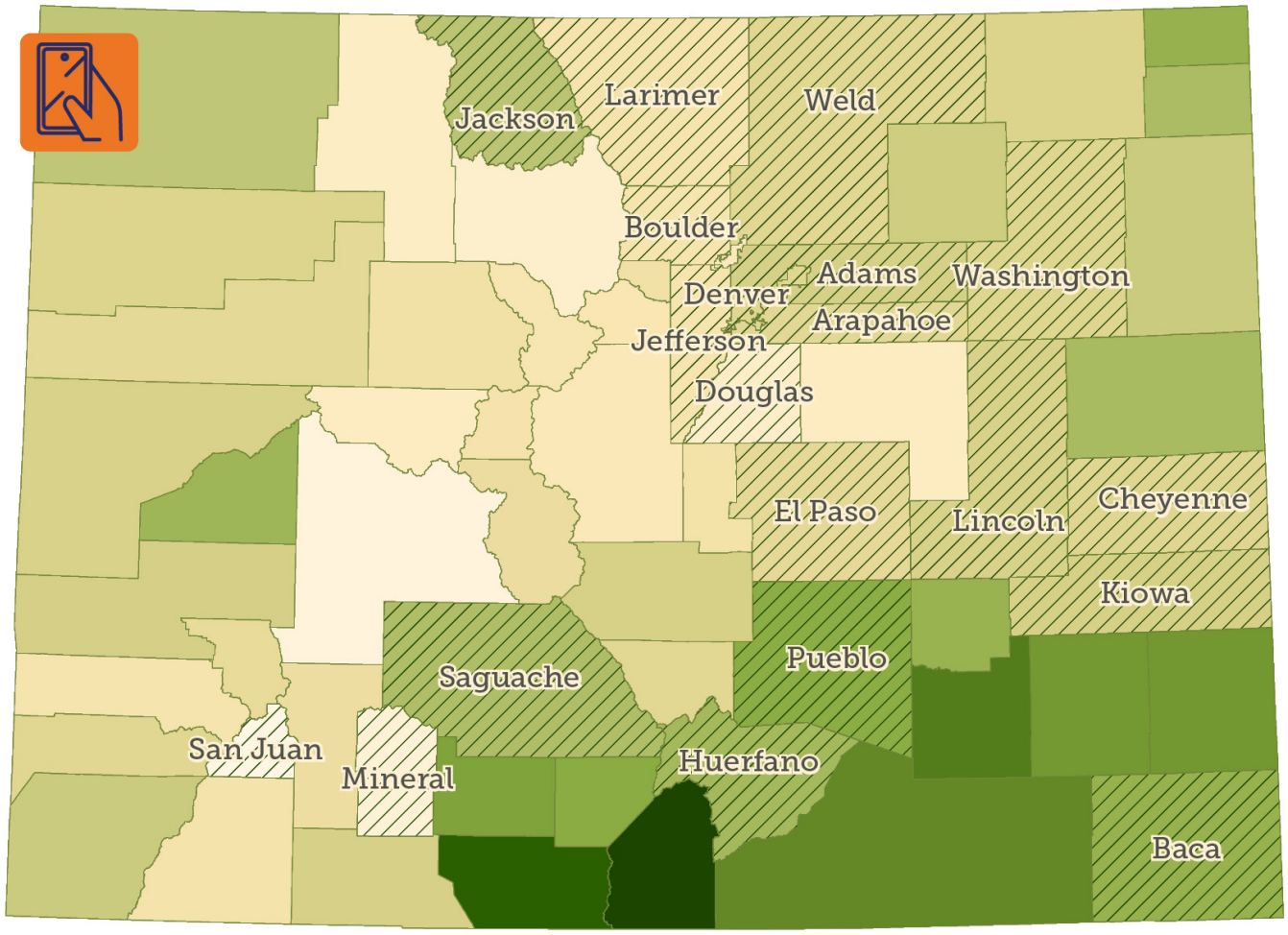



Figure 6-10: Distracted Driving-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Because distraction has to be observed by a responding officer for it to be reported on the crash form, distraction-involved crashes are likely underreported, particularly for crashes resulting in a fatality or serious injury. Figure 6-10 illustrates that crashes involving distraction resulting in a fatality have trended down over the past three years, while serious injuries have remained relatively stable. In 2023, 348 people were killed or seriously injured in distraction-involved crashes.

Figure 6-11 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest distraction-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of distraction-involved fatalities and serious injuries are along the Front Range, representing the most urban part of the state. When looking at fatalities and serious injuries per capita, rural Eastern Plains and Southwest Colorado counties are represented.

Figure 6-11: Top Counties of Distraction-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver | Mineral |
| 2 | Arapahoe | Kiowa |
| 3 | El Paso | Cheyenne |
| 4 | Adams | Washington |
| 5 | Weld | Jackson |
| 6 | Jefferson | Lincoln |
| 7 | Boulder | Huerfano |
| 8 | Larimer | San Juan |
| 9 | Douglas | Saguache |
| 10 | Pueblo | Baca |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

While distraction-involved crashes overall are more common in urban areas (75%), the most severe outcomes—fatal and serious injury crashes—occur disproportionately in rural areas. Nearly half (48%) of distraction-involved fatal and serious injury crashes occur in rural settings, even though rural areas account for only 25% of all distraction-involved crashes and 38% of all fatal and serious injury crashes. This indicates that distraction-related crashes are more likely to result in severe outcomes when they occur in rural areas. Figure 6-12 visualizes this disparity by comparing the urban and rural distribution of all crashes, fatal and serious injury crashes, distraction-involved crashes, and distraction-involved severe crashes. The top five distraction-related fatal and serious injury crashes are with a fixed object, rear-end, broadside, rollover or overturn, and with a VRU. These crashes also frequently overlap with other Focus Areas—53% occurring at intersections, 50% occur off-system, 18% involve a younger driver, and 17% involve lane departure.

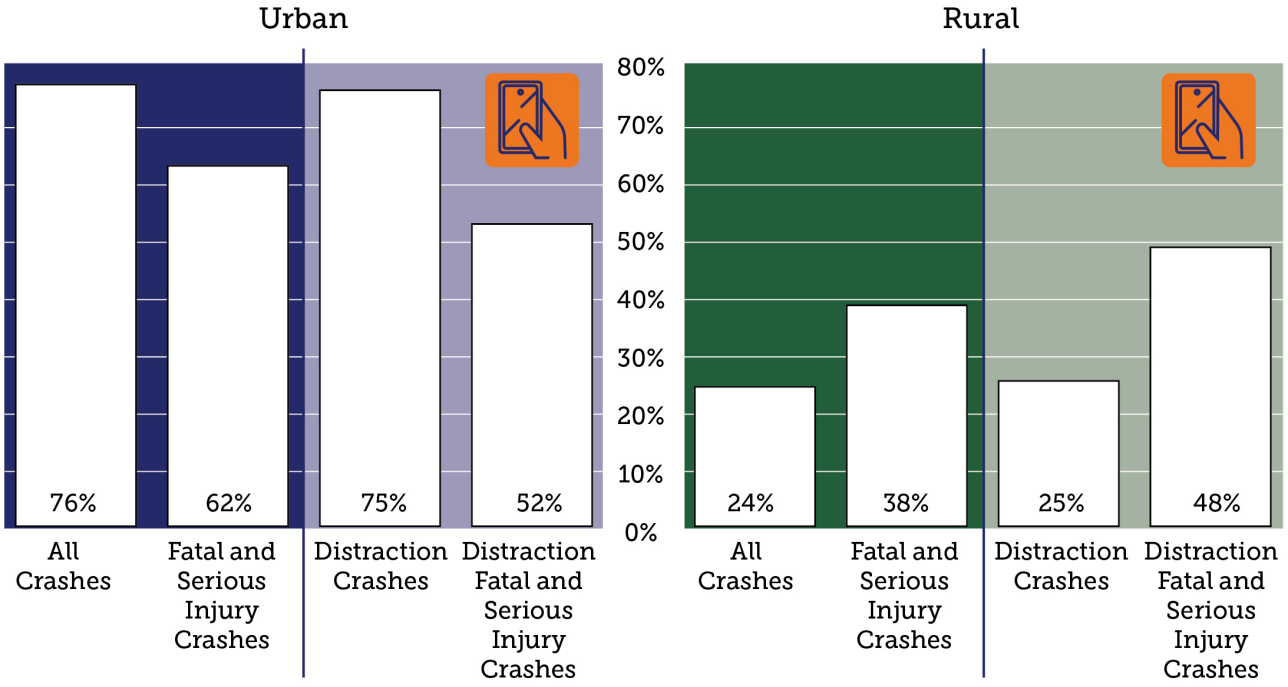



Figure 6-12: Urban and Rural Distribution of Distraction-Related Crashes (2017-2023)

The National Highway Traffic Safety Administration's (NHTSA) Countermeasures That Work highlights enforcement, legislation, and licensing as countermeasures that are proven to address distraction-involved crashes. Colorado has taken great strides in this direction by passing a state law that prohibits drivers from using mobile electronic devices while driving (hands-free technologies are permitted). The law went into effect on January 1, 2025, and therefore, strategies within this Focus Area will seek to monitor the impact of the law over the next five years.

While the strategies in this plan focus on education related to legislation and promoting safe driver choices around use of mobile phones while driving, there are many other influences that may impact a person's attentiveness to the driving task. For example, in the 2024 Colorado Driver Behavior Survey when drivers were asked what distractions were present in the last 7 days, 73% of respondents admitted to eating food or drinking a beverage while driving. Other influences, like visitors distracted by Colorado's beautiful vistas or distractions within the vehicle such as other passengers, are difficult to anticipate and prevent. Collecting more information to better understand the scope

of the problem is also important to this plan, as information gleaned from data will enhance future initiatives to address driver distraction.

## Distraction Strategies

### SD10: Provide education on hands-free law

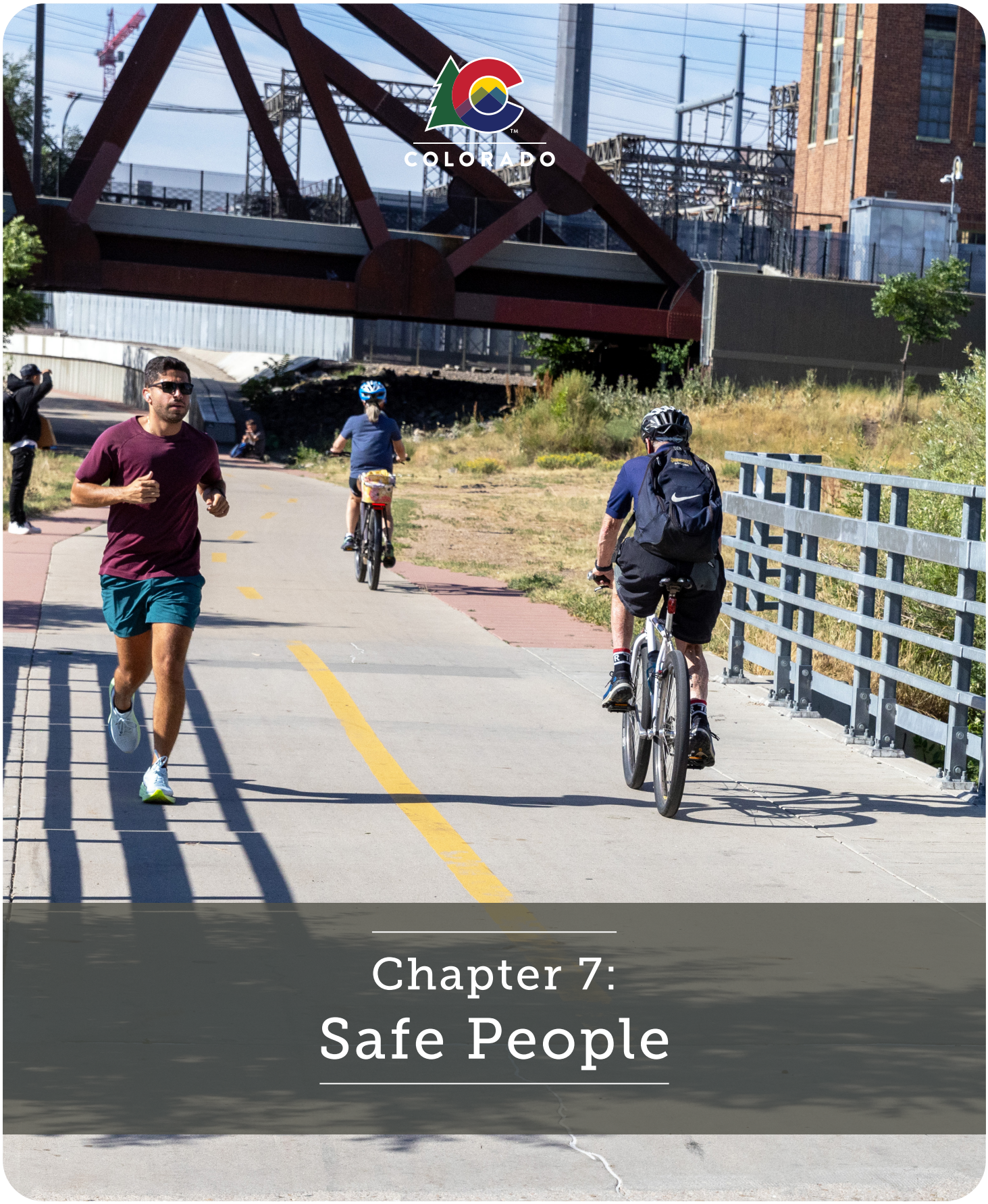
**Continue to educate the public on the hands-free law effective January 1, 2025.**

This strategy aims to promote information regarding the new hands-free law to partner agencies and drivers. Ongoing education for new drivers and licensed drivers alike are important in the first years of the law and beyond to maintain awareness and shift driver behavior.

### SD11: Enhance data collection

**Continue to enhance data collected related to distraction-involved crashes.**

Distraction may be an underreported contributing factor to crashes. With the passage of the hands-free law in January 2025, law enforcement agencies will be able to collect more information on citations related to using mobile phones while driving. Enhanced data on the number and locations of citations as well as the number and locations of both primary and secondary crashes related to distraction will support identifying next steps for reducing distraction-related crashes. This data collection will also support evaluating the effectiveness of the hands-free law.




# Chapter 7:
# Safe People

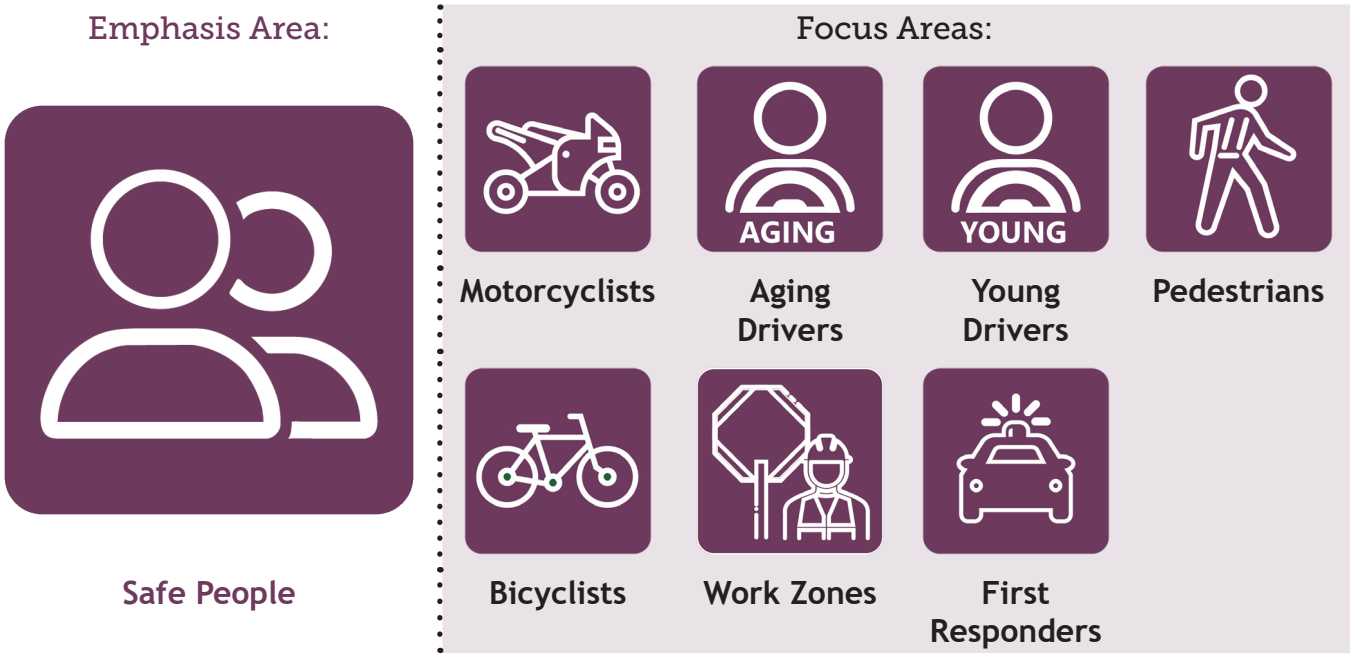

# Introduction

The Safe People Emphasis Area identifies evidence-based practices to improve roadway safety for Vulnerable Road Users (VRUs) and other road users that are at a high risk of traffic fatalities and serious injuries. A VRU is defined as an individual walking, riding bicycles and rideable toys (e.g., scooters or skateboards), using personal mobility devices (e.g., walkers or wheelchairs), or someone on foot working in work zones.

The Safe People Emphasis Area prioritizes targeted infrastructure upgrades, refining policies for safer transportation systems, expanding multimodal transit options, and promoting educational opportunities that encourage best practices to safeguard VRUs and other at-risk users. This Emphasis Area chapter contains the update to Colorado's VRU Safety Assessment.

## Focus Areas

The Safe People Emphasis Area identifies seven Focus Areas:



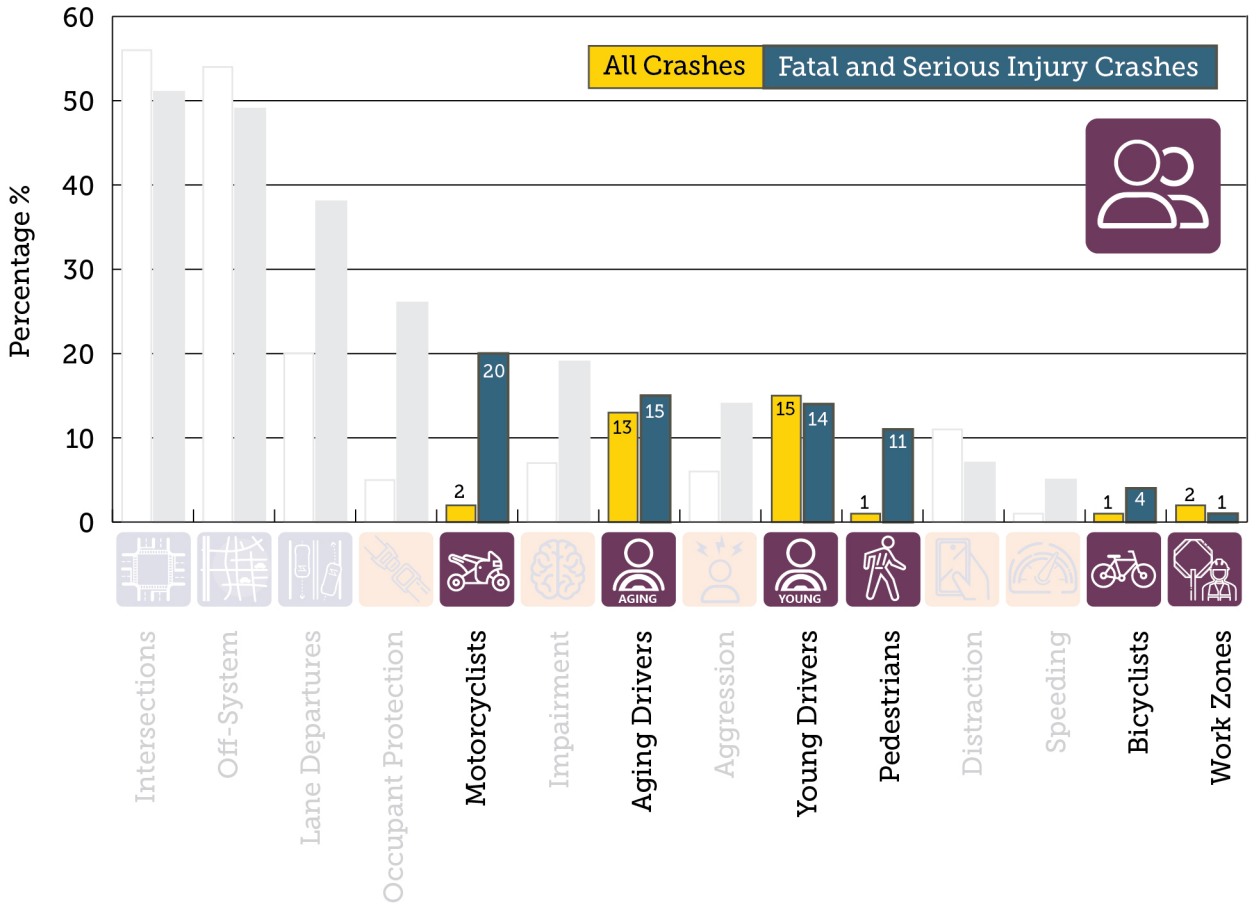



Figure 7-1: Percentage of Total & Fatal/Serious Injury Crashes Involving Focus Areas

The Safe People Emphasis Area focuses on road users most susceptible to fatalities or serious injuries, including motorcyclists, pedestrians, bicyclists, people in work zones, and first responders. This chapter also addresses younger and older drivers, who face a higher risk of serious crashes, as well as those needing personal mobility assistance.

## Motorcyclists

**Focus Area Definition:** Crashes involving motorcyclists.

**Focus Area Goal:** Reduce the number of severe crashes involving motorcyclists by five percent from the previous year through 2029.

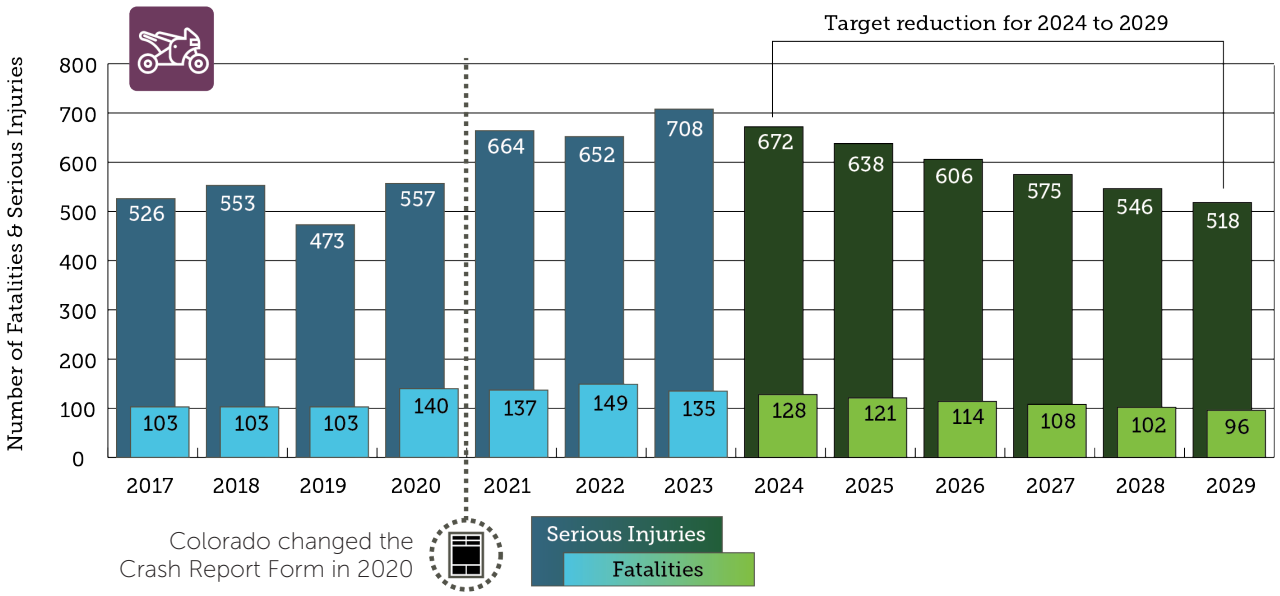
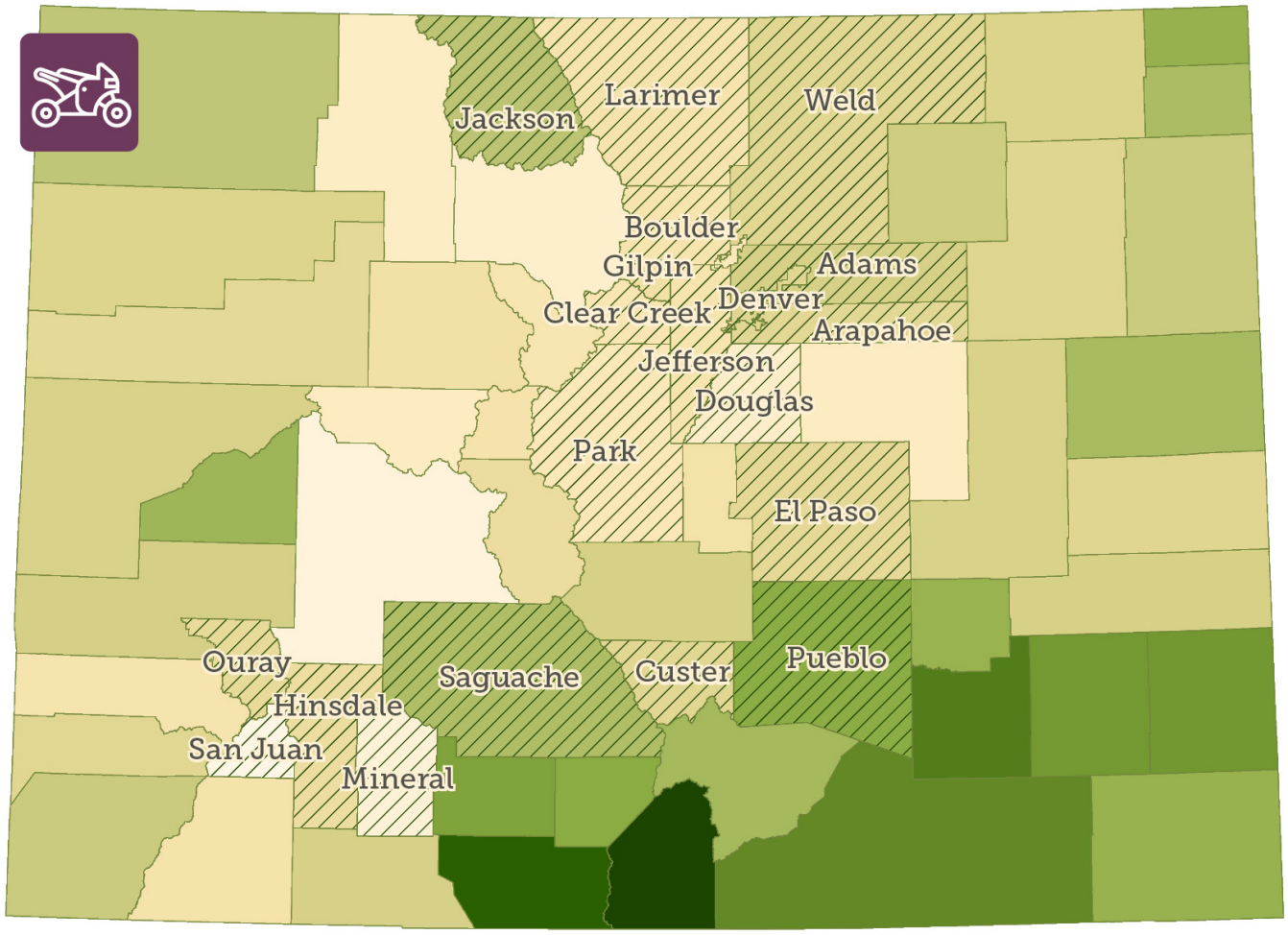



Figure 7-2: Motorcyclist-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Serious injuries among motorcyclists have steadily increased in recent years, despite a slight drop in fatalities in 2023. In 2023, 842 motorcycle fatalities and serious injuries were recorded. Motorcyclists face a disproportionate risk, accounting for 20% of all fatal and serious injury crashes, despite representing only 2% of total crashes and 1% of the total vehicle miles traveled in the state.

Figure 7-3 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest motorcyclist-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of motorcyclist-involved fatalities and serious injuries are along the Front Range, representing the most urban part of the state. When looking at fatalities and serious injuries per capita, Foothills and Southwest Colorado counties are represented.

Figure 7-3: Top Counties of Motorcyclist-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver | San Juan |
| 2 | El Paso | Jackson |
| 3 | Jefferson | Hinsdale |
| 4 | Adams | Mineral |
| 5 | Larimer | Custer |
| 6 | Arapahoe | Clear Creek |
| 7 | Boulder | Gilpin |
| 8 | Douglas | Park |
| 9 | Pueblo | Ouray |
| 10 | Weld | Saguache |

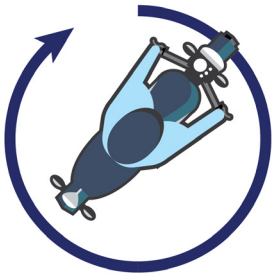
Map Legend

Weighted TDI Score

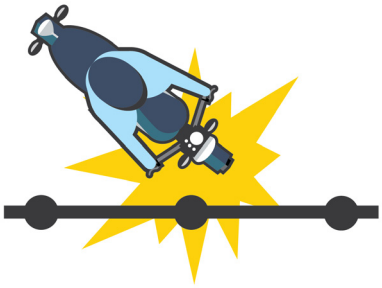
Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.



Overturning
51%



Fixed Object
39%

Motorcycle crash types vary based on whether the crash was a single-vehicle versus a multi-vehicle crash. When there is a single vehicle motorcycle crash, the most common crash types are overturning (51%) and fixed object crashes (39%) often involving lane departures or loss of control. In contrast, when there are multi-vehicle crashes involving motorcyclists, the predominant crash types are approach turn (28%), broadside crashes (24%), and rear-end (18%), typically occurring on the roadway.

## New Colorado Motorcycle Lane Filtering Law (2024)

Effective Date: August 7, 2024

Review Period: Law expires September 1, 2027, pending safety evaluation.

**What's allowed?** Motorcycles can filter between stopped vehicles when:

- Traffic is fully stopped (e.g., at a red light)
- Speed does not exceed 15 mph.
- Passing occurs within the same lane (not on the shoulder).

**What's not Allowed?** Lane splitting (moving between lanes of moving traffic) remains illegal.

Why? Reduces rear-end crash risks for motorcyclists.

In 2024, a major policy shift occurred as Colorado legalized lane filtering, allowing motorcyclists to pass between stopped vehicles in the same lane, traveling in the same direction. This legislation aims to reduce the numbers of motorcyclist fatalities and serious injuries resulting from rear-end crashes. In the years of 2019-2023, rear-end crashes resulted in 385 motorcyclist fatalities and serious injuries. Over the next few years, data will be closely monitored to assess the policy's effect on motorcyclist safety.

## Motorcyclist Strategies

### SP1: Expand motorcycle operator safety training

**Expand motorcycle operator safety training campaigns.**

Promote Motorcycle Operator Safety Training (MOST) courses among motorcycle riders and those who wish to learn how to ride a motorcycle. This strategy enhances and expands statewide MOST for both new and experienced riders and supports Colorado MOST's Mission to "provide a safe motorcycling program that supports motorcycle training and lifelong learning, along with motorcycle safety awareness to achieve reductions in motorcycle crashes and related injuries and fatalities."

### SP2: Increase public awareness of motorcycle safety

**Increase public awareness of motorcycle safety for all road users.**

This strategy is focused on increasing the general public's awareness of motorcycle safety around the state. Educating all other road users on changing laws and general motorcyclist safety prevents crashes that involve both motorcyclists and other road users.

### SP3: Improve motorcycle licensing and endorsement

**Increase the proportion of active motorcycle riders who are legally endorsed to ride in Colorado.**

This strategy aims to increase the number of riders who have an endorsement and have motorcycle safety training by promoting awareness and availability of motorcycle training and of the requirement for motorcyclists seeking to ride in Colorado to have completed training and acquired an endorsement. Increasing the skills of motorcycle riders reduces severe crashes where inexperience is a contributing factor.

### SP4: Increase helmet and other personal protective equipment (PPE) use

**Increase motorcyclist PPE use through education and enforcement.**

Helmets and other protective equipment are key to protecting motorcyclists. Through targeted outreach, this strategy promotes the use of PPE when riding a motorcycle. When motorcyclists properly utilize PPE, the risk of a higher-severity crash is reduced.

# Aging Drivers

**Focus Area Definition:** Crashes involving aging drivers aged 65 and older.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries involving aging drivers by five percent from the previous year through 2029.

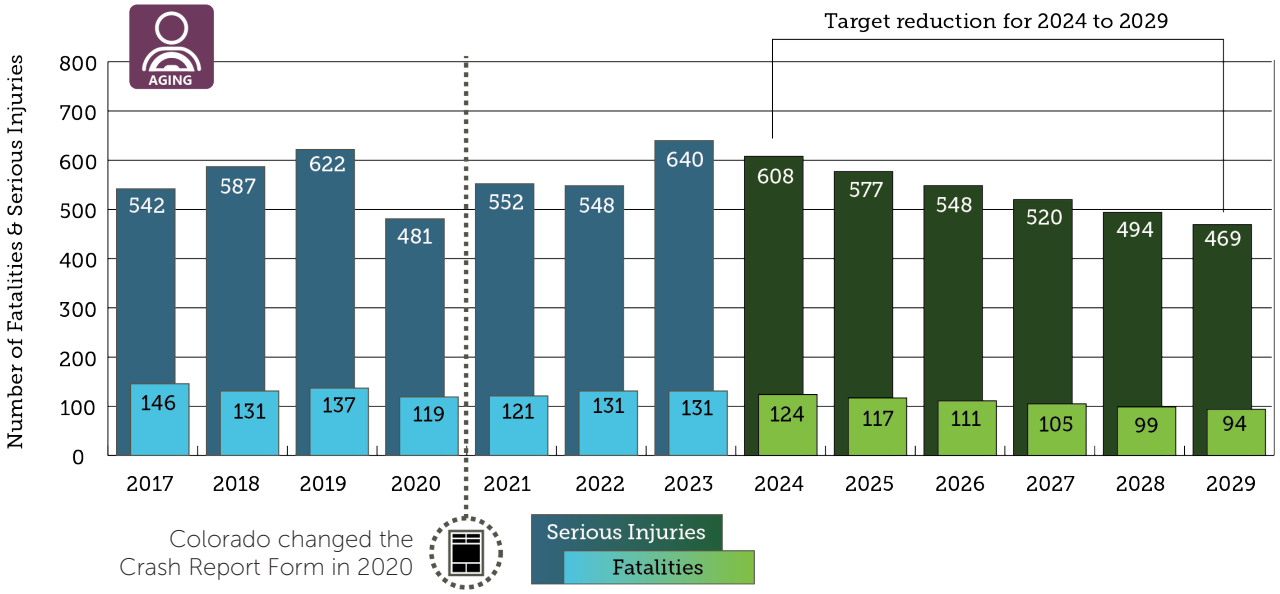
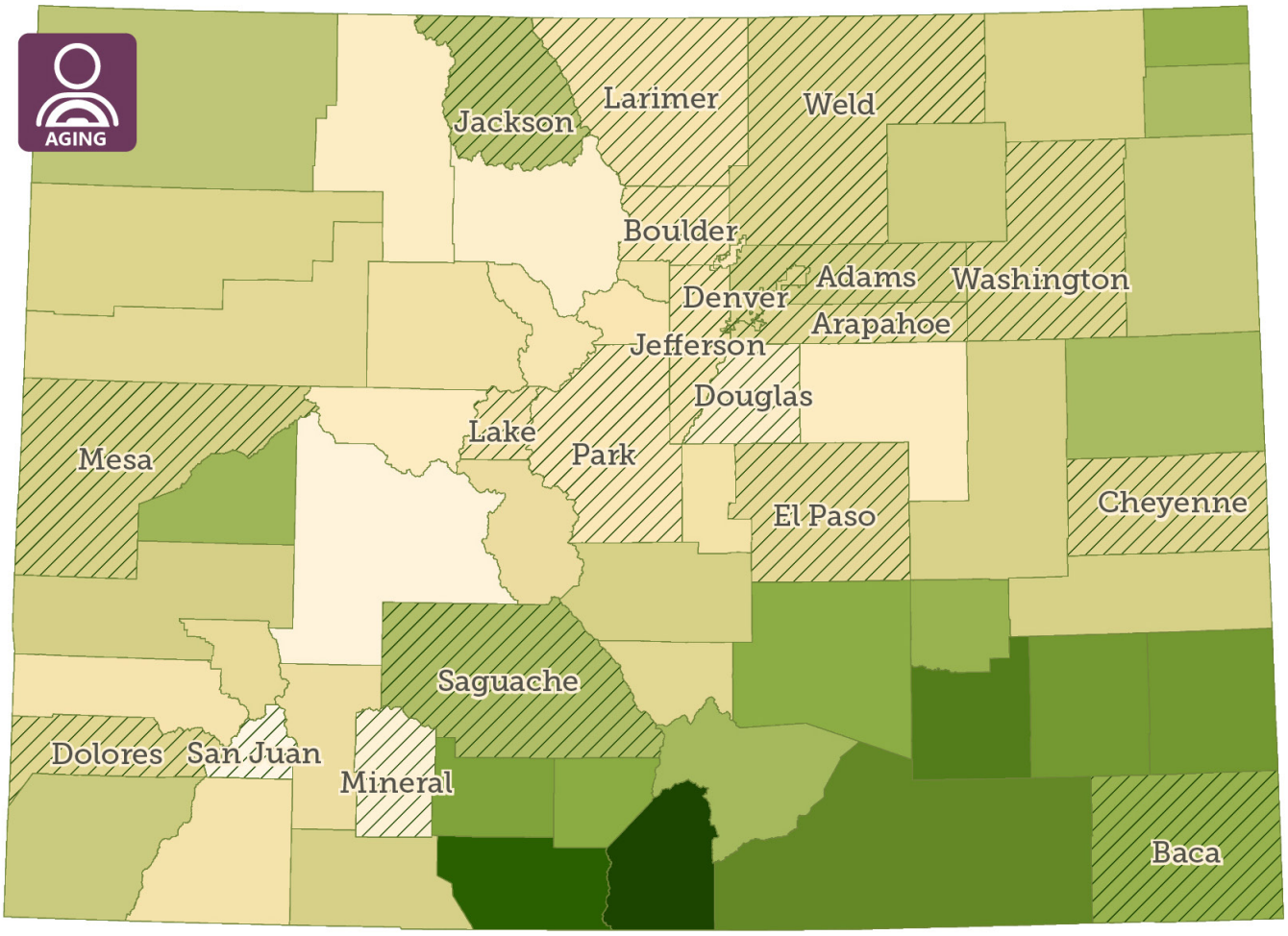



Figure 7-4: Aging Driver-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

As shown in Figure 7-4, fatalities and serious injuries among aging drivers (aged 65 and older) have increased in recent years reaching 771 in 2023. Drivers aged 65 and older make up 16% of the total fatalities and serious injuries, and make up 21% of all licensed drivers. While this does not raise concern for overrepresentation of aging drivers, with the aging population that is described in Chapter 2, it is essential to address safety concerns related to aging drivers to avoid overrepresentation of older drivers in the future.

"As drivers age, their physical and mental abilities, driving behaviors and crash risks all change, though age alone is not a determinate of driving performance. Many features of the current system of roads, traffic signals and controls, laws, licensing practices, and vehicles were not designed to accommodate older drivers." —NHTSA, 2020

Figure 7-5: Top Counties of Aging Driver-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver | San Juan |
| 2 | El Paso | Mineral |
| 3 | Arapahoe | Jackson |
| 4 | Jefferson | Washington |
| 5 | Boulder | Cheyenne |
| 6 | Adams | Baca |
| 7 | Larimer | Dolores |
| 8 | Weld | Saguache |
| 9 | Douglas | Park |
| 10 | Mesa | Lake |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 7-5 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest aging driver-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of aging driver-involved fatalities and serious injuries are along the Front Range, representing the most urban part of the state. When looking at fatalities and serious injuries per capita, rural Eastern Plains and Southwest Colorado counties are represented.

## Older Drivers and Pedestrians Special Rule

According to the Federal Highway Administration (FHWA), a state qualifies for the Older Drivers and Pedestrians Special Rule "if traffic fatalities and serious injuries per capita for drivers and pedestrians over the age 65 in a state increase during the most recent 2-year period for which data are available."

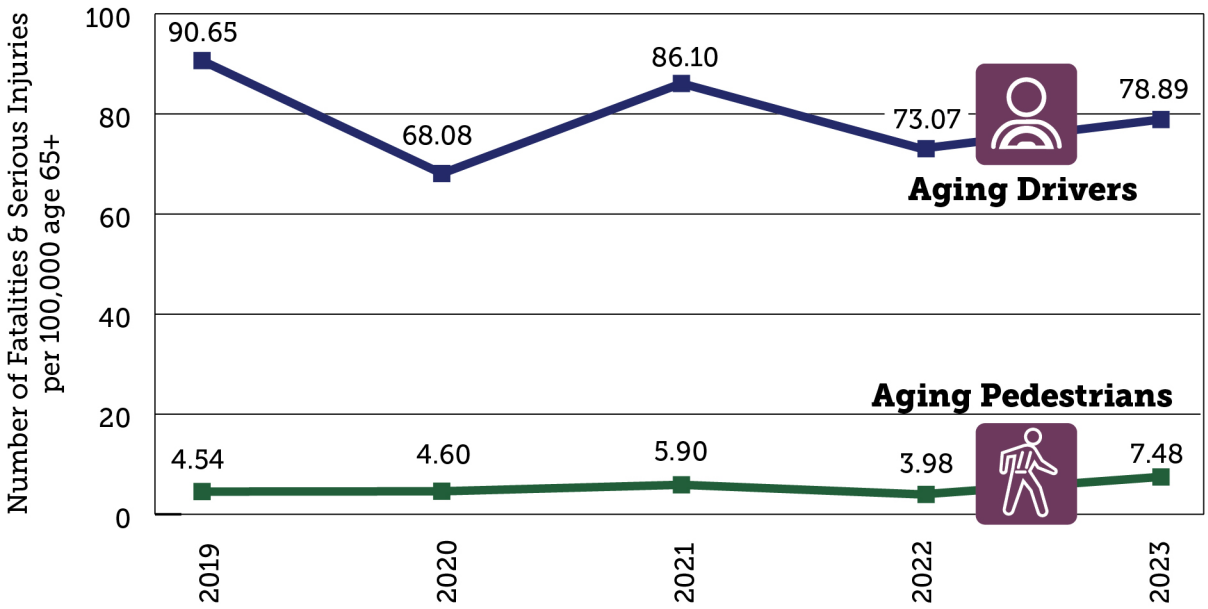



Figure 7-6: Aging Drivers and Pedestrians Fatalities and Serious Injuries Per Capita

Colorado qualifies for the Older Drivers and Pedestrians Special Rule, requiring strategies to address rising fatalities and serious injuries among those 65 and older. Aging driver fatalities have decreased from 2021-2023, while aging pedestrian fatalities have increased from 2021-2023.

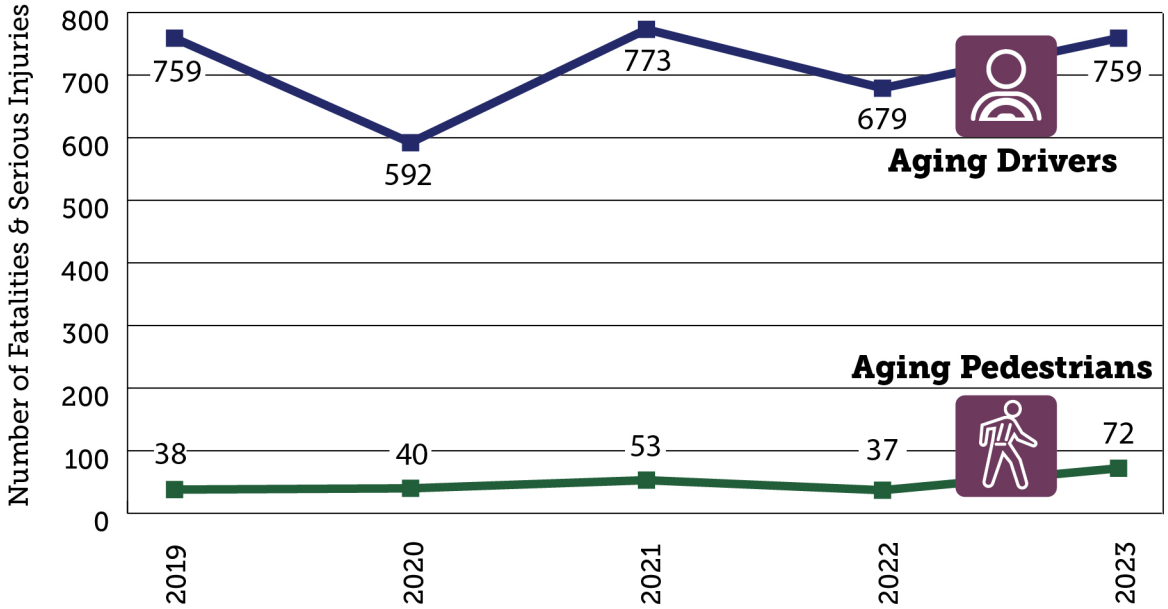



Figure 7-7: Aging Drivers and Pedestrians Fatalities and Serious Injuries

## Aging Driver Strategies

Strategies related to aging drivers and pedestrians are summarized in the following. For additional aging pedestrian strategies, refer to Chapter 8.

### SP5: Improve visibility of traffic control devices

**Enhance road safety by widening striping and markings on high-traffic roads and increasing the visibility of traffic signs to support aging drivers (Aging Drivers Strategy).**

Widening striping and increasing the visibility of traffic signs helps aging drivers navigate more easily, compensating for declines in visual acuity and low light contrasts which can be difficult to navigate. These measures enhance confidence, reduce confusion, and prevent crashes.

### SP6: Improve sight distances

**Improve intersection safety by providing proper intersection angles, intersection sight distance, and other design strategies that support aging drivers and pedestrians (Aging Drivers and Pedestrians Strategy).**

Improving intersection safety with proper angles, sight distances, and design strategies aids aging drivers and pedestrians to see and react to potential hazards, reducing the likelihood of crashes. These improvements enhance safety by providing clearer visibility and easier navigation, helping drivers and pedestrians make safer decisions.

### SP7: Expand community-based mobility options

**Establish and expand community-based mobility options such as bike-sharing, carpool programs, and on-demand shuttle services in underserved areas to improve access to transportation options for those unable to drive or who choose not to drive (Aging Drivers and Pedestrians Strategy).**

Establishing and expanding community-based mobility options, especially in underserved areas, provides essential transportation alternatives for individuals who cannot drive, choose not to drive, or can no longer drive safely, improving their access to jobs, healthcare, and other services. Aging drivers are more likely to cease driving if there are reliable alternatives. These options help reduce reliance on private vehicles, promote environmental sustainability, and improve access to mobility for all members of the community.

### SP8: Enhance and expand resources for aging drivers

**Strengthen programs for aging drivers by increasing the awareness, use, effectiveness, and quality of existing resources.(Aging Drivers Strategy).**

This strategy aims to enhance available resources for aging drivers and their families to evaluate and determine if a person is able to continue driving safely. Promote existing programs and educational opportunities such as individualized driver assessments, written guides for aging drivers and their families, and existing regulations on license testing and renewals for older drivers.


## Colorado Resources for Aging Drivers
Stay Safe, Stay Independent

Colorado offers programs to help aging drivers assess their skills and stay safe on the road:

**Fitness-Drive Evaluation**
Occupational therapy assessment for vision, reaction time, and adaptive driving solutions.

**Older Driver Safety Guide**
Self-assessment tools, safety tips, and legal info to help drivers make informed decisions.

**Drive Smart Colorado**
Workshop and resources to support safe driving habits.

**Learn more: drivesmartcolorado.com**

# Young Drivers

**Focus Area Definition:** Crashes involving young drivers (aged 15 to 20).

**Focus Area Goal:** Reduce the number of severe crashes involving young drivers by five percent from the previous year through 2029.

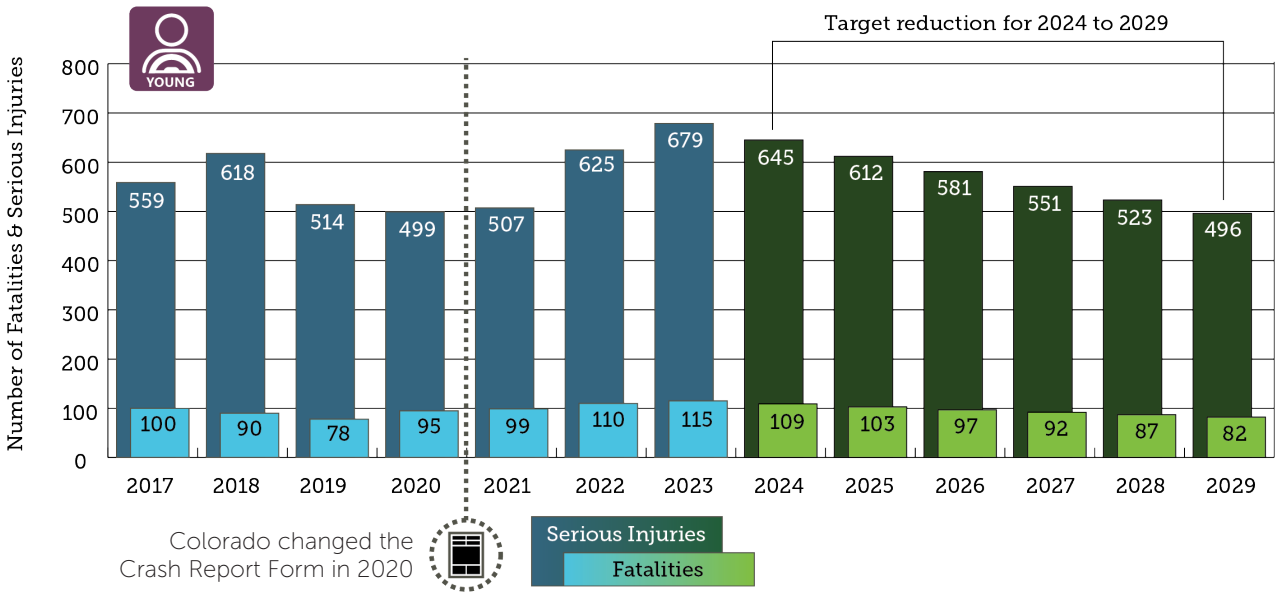


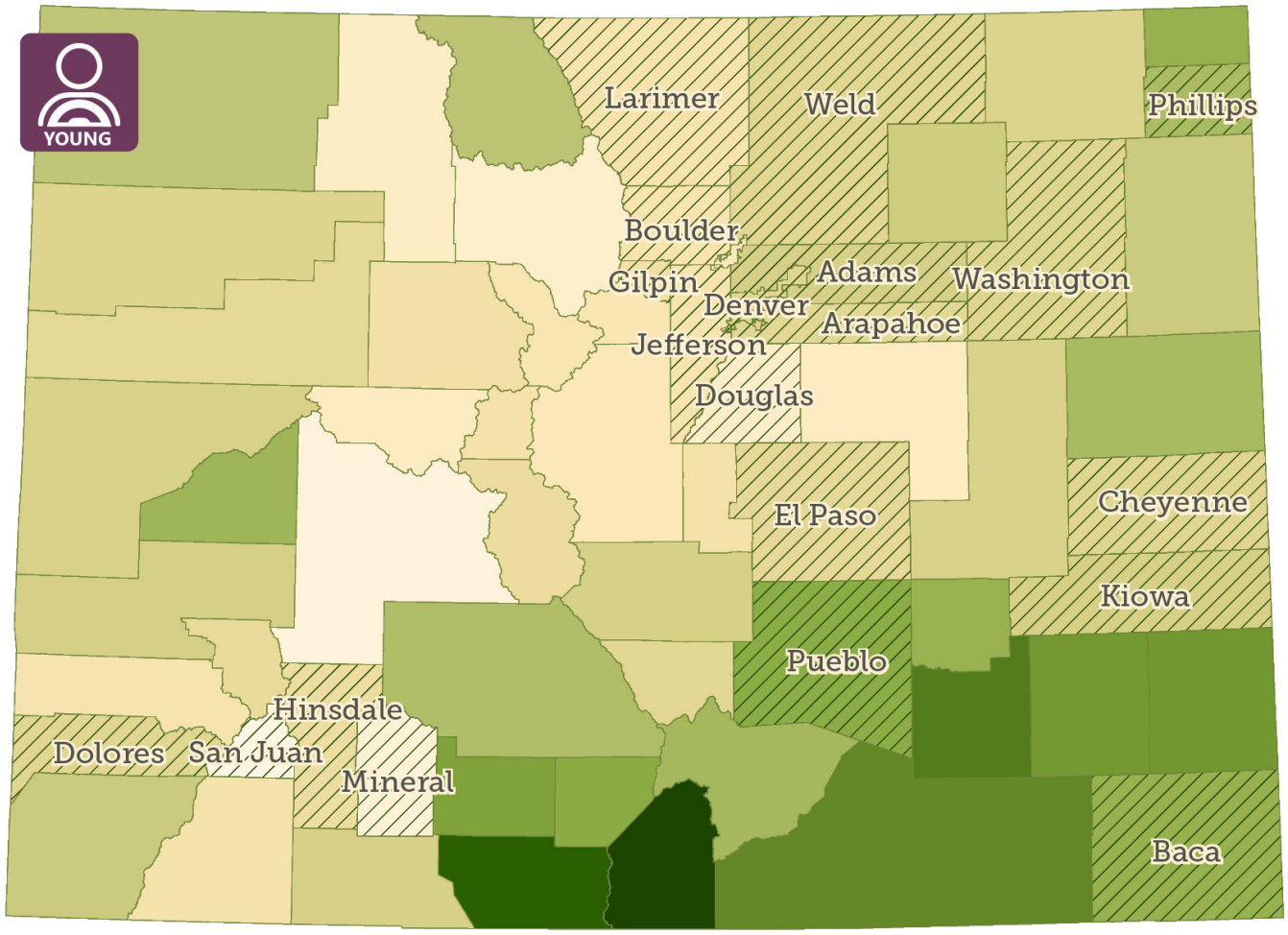

Figure 7-8: Young Driver-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

As shown in Figure 7-8, fatalities and serious injuries among young drivers have risen steadily since 2020, reaching 794 in 2023.

Young drivers, involved in 14% of severe crashes and 15% of all crashes statewide, face higher risks due to inexperience and limited awareness of driving hazards. Stakeholders have identified limited access to quality driver's education, especially in rural areas, as a key concern.

Overall, 40% of fatalities and serious injuries occur on rural roads. However, rural roads account for 47% of young driver-involved fatalities and serious injuries, indicating that young driver-involved fatalities are disproportionately high along rural roads. Young drivers aged 15-20 also tend to experience a higher proportion of overturning crashes compared to all drivers. Twenty-one percent (21%) of all young driver-involved fatalities and serious injuries result from overturning crashes compared to 11% for the overall population.

Figure 7-9: Top Counties of Young Driver-Involved Fatalities and Serious Injuries

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| 7 | Boulder | Washington |
| 8 | Larimer | Gilpin |
| 9 | Douglas | Phillips |
| 10 | Pueblo | Dolores |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 7-9 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest young driver-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of young driver-involved fatalities and serious injuries are along the Front Range, representing the most urban part of the state. When looking at fatalities and serious injuries per capita, rural Eastern Plains and Southwest Colorado counties are represented.

## Young Driver Strategies

### SP9: Expand access to driver's education

**Expand access to driver's education programs, particularly in rural areas, through partnerships with schools, online platforms, and community organizations.**

Limited access to driver's education, especially in Colorado's rural areas, makes it difficult for young drivers to receive proper training. This strategy aims to increase both availability and affordability of driver's education for all young drivers around the state. Expanding driver's education through partnerships with schools, online platforms, and community organizations increases opportunities for more young drivers in all locations around the state to gain the skills needed for safer driving.

### SP10: Improve quality of driver's education

**Improve the quality of driver's education programs, including incorporating defensive driving, distracted driving awareness, and active transportation considerations into the curriculum.**

Enhancing driver's education is of critical importance to reduce young driver crashes and improve overall roadway safety. By incorporating defensive driving and distracted driving awareness into the curriculum, this strategy addresses behaviors that disproportionately contribute to young driver-involved crashes. Additionally, increasing new drivers' awareness of active transportation safety may reduce crashes between young drivers and VRUs.

# VRU Safety Assessment

Table 7-1: VRU Fatalities and Serious Injuries Compared to Total Fatalities and Serious Injuries

| | 2019 | 2020 | 2021 | 2022 | 2023 | Percent Change (2019-2023) |
|---|---|---|---|---|---|---|
| VRU Fatalities and Serious Injuries | 540 | 468 | 595 | 630 | 833 | +54% |
| Total Fatalities and Serious injuries | 3,797 | 3,518 | 4,359 | 4,440 | 4,874 | +28% |
| VRU % of Total | 14.2% | 13.3% | 13.6% | 14.2% | 17.1% | +2.9% |

Vulnerable Road Users (VRUs) as a percentage of all fatalities and serious injuries has hovered around 14% over much of the past five years. Unfortunately, 2023 saw a sharp increase in the number of VRU fatalities and serious injuries indicating that Colorado's efforts to reduce VRU crashes has yet to result in a consistent trend reversal.

The stakeholder outreach efforts described in Chapter 3 SHSP Stakeholder Engagement provided many opportunities to consult with communities, subject matter experts and other entities on VRU-related topics. VRU safety was a recurring theme as the word cloud in Chapter 3 illustrates.

In 2023, 39 priority VRU "hot spot" locations were identified with recommended actions for each location. With the short time-frame since these locations were identified, the recommended actions were not able to be implemented. These priority locations were analyzed with updated crash data and a percent change of fatalities and serious injuries from the 2022 data collected in the VRU Assessment was identified. This can be found for pedestrians in Table 7-2 and for bicyclists in Table 7-3.

Some of the locations experienced an increase in fatalities and serious injuries while others experienced a decrease. Because the recommended actions have not yet been implemented, and the most recent safety trends indicate that VRU crashes continue to occur at these locations, it is recommended that the priority locations from the 2023 Vulnerable Road User Safety Assessment continue as part of the SHSP.

Table 7-2: Priority Locations Rolling Average of Fatalities and Serious Injuries for Pedestrians

| Project Name | 2017-2021 5-Year Average | 2019-2023 5-Year Average | Change in 5-Year Average |
|---|---|---|---|
| E. Colfax Avenue (40C) – N. Yosemite Street to N. Peoria Street | 10 | 9 | -1 |
| Downtown Denver Activity Center | 2.6 | 2.6 | 0 |
| S. Nevada Avenue (115A) – E. Navajo Street to E. Mill Street | 3 | 2.8 | -0.2 |
| E. Colfax Avenue (40C) – N. Clarkson Street to N. High Street | 2 | 2 | 0 |
| Main Street (287C) – Longs Peak Avenue to 17th Avenue | 2.4 | 4 | 1.6 |
| E. Evans Avenue – S. Jackson Street to S. Syracuse Way | 2.4 | 2 | -0.4 |
| S. Federal Boulevard (88A) – W. Iowa Avenue to W. Mississippi Avenue | 2.6 | 2.4 | -0.2 |
| S. Townsend Avenue (550B) – Odelle Road to N. 7th Street | 1 | 1.2 | 0.2 |
| Academy Boulevard – Hancock Expressway to E. Fountain Boulevard | 1 | 1.2 | 0.2 |
| N. Speer Boulevard – W. 11th Avenue to E. Colfax Avenue | 0.6 | 1.6 | 1 |
| N. Federal Boulevard (88A) and W. Howard Place / W. 14th Avenue | 1.6 | 0.8 | -0.8 |
| Sheridan Boulevard (95A) – W. Dakota Avenue to W. 1st Avenue | 1.2 | 1.6 | 0.4 |
| E. 6th Avenue (30A) – N. Potomac Street to N. Sable Boulevard | 1.2 | 0.8 | -0.4 |
| Canyon Boulevard (7B) – 9th Street to 19th Street | 0.8 | 0.2 | -0.6 |
| 72nd Avenue – Meade Street to N. Irving Street | 1.2 | 0.4 | -0.8 |
| S Parker road (83A) - E. Dartmouth Avenue to I-225 | 1.2 | 1.4 | 0.2 |
| Broadway Street (93A) - 15th Street to Canyon Boulevard | 0.6 | 0.4 | -0.2 |
| Wadsworth Boulevard (121A) - W. 19th Avenue to W. 26th Avenue | 0.8 | 1 | 0.2 |
| S. Federal Boulevard (88A) - W. Warren Avenue to 200’ North of W. Evans Avenue | 1.2 | 0.6 | -0.6 |
| S. Wadsworth Boulevard - W. Florida Avenue to W. Mississippi Avenue | 1.2 | 0.6 | -0.6 |
| E. Main Street (160A) - N. Beech Street to S. Veach Street | 1 | 0.8 | -0.2 |
| Academy Boulevard and Austin Bluffs Parkway | 1 | 1 | 0 |
| Carefree Circle and N. Academy Boulevard | 1 | 0.8 | -0.2 |
| 28th Street (36B) - Spruce Street to Valmont Road | 0.8 | 1 | 0.2 |
| Wadsworth Boulevard (121A) - W. 14th Avenue to E. Colfax Avenue | 0.2 | 0.4 | 0.2 |

| | | | |
|---|---|---|---|
| Main Avenue (550B) - E. Park Avenue to E. 21st Avenue | 0.6 | 0.2 | -0.4 |
| 30th Street - Arapahoe Avenue to Walnut Street | 0.2 | 0 | -0.2 |
| Folsom Street - University Heights Avenue to Dorm Parking Lot Entrance | 0.2 | 0.2 | 0 |
| Colorado Boulevard (2A) and E. Colfax Avenue | 0.8 | 0.4 | -0.4 |
| Diagonal Highway (119B) - Foothills Parkway to Independence Road | 0 | 0 | 0 |
| N. Lincoln Street - E. Colfax Avenue to E. 18th Avenue | 0 | 0 | 0 |
| Broadway Street - Violet Avenue to Yarmouth Avenue | 0 | 0 | 0 |
| 9th Avenue - Francis Street to Bross Street | 0 | 0 | 0 |
| E. Fountain Boulevard (24H) and S. Murray Boulevard | 0.6 | 0.4 | -0.2 |
| Havana Street and E. 16th Avenue | 0 | 0 | 0 |
| Arapahoe Avenue (7C) - Foothills Parkway to 48th Street | 0 | 0.2 | 0.2 |
| North Avenue (6B) and N. 1st Street | 0 | 0 | 0 |
| W. Morrison Road (8A) and S. Estes Street / S. Garrison Street | 0 | 0 | 0 |
| Sheridan Boulevard (95A) and W. 10th Avenue | 0 | 0.2 | 0.2 |

Table 7-3: Priority Locations Rolling Average of Fatalities and Serious Injuries for Bicyclists

| Project Name | 2017-2021 5-Year Average | 2019-2023 5-Year Average | Change in 5-Year Average |
|---|---|---|---|
| E. Colfax Avenue (40C) – N. Yosemite Street to N. Peoria Street | 0.2 | 0.6 | 0.4 |
| Downtown Denver Activity Center | 0.4 | 0.4 | 0 |
| S. Nevada Avenue (115A) – E. Navajo Street to E. Mill Street | 0.4 | 0.4 | 0 |
| E. Colfax Avenue (40C) – N. Clarkson Street to N. High Street | 1.4 | 0.8 | -0.6 |
| Main Street (287C) – Longs Peak Avenue to 17th Avenue | 0.8 | 1 | 0.2 |
| E. Evans Avenue – S. Jackson Street to S. Syracuse Way | 0.6 | 0.6 | 0 |
| S. Federal Boulevard (88A) – W. Iowa Avenue to W. Mississippi Avenue | 0.2 | 0.2 | 0 |
| S. Townsend Avenue (550B) – Odelle Road to N. 7th Street | 0.8 | 0.6 | -0.2 |
| Academy Boulevard – Hancock Expressway to E. Fountain Boulevard | 0.4 | 0.6 | 0.2 |
| N. Speer Boulevard – W. 11th Avenue to E. Colfax Avenue | 1 | 1 | 0 |
| N. Federal Boulevard (88A) and W. Howard Place / W. 14th Avenue | 0 | 0.4 | 0.4 |
| Sheridan Boulevard (95A) – W. Dakota Avenue to W. 1st Avenue | 0.2 | 0 | -0.2 |

| | | | |
|---|---|---|---|
| E. 6th Avenue (30A) – N. Potomac Street to N. Sable Boulevard | 0.2 | 0.2 | 0 |
| Canyon Boulevard (7B) – 9th Street to 19th Street | 0.6 | 0.8 | 0.2 |
| 72nd Avenue – Meade Street to N. Irving Street | 0.2 | 0.2 | 0 |
| S Parker road (83A) - E. Dartmouth Avenue to I-225 | 0 | 0 | 0 |
| Broadway Street (93A) - 15th Street to Canyon Boulevard | 0.6 | 0.4 | -0.2 |
| Wadsworth Boulevard (121A) - W. 19th Avenue to W. 26th Avenue | 0.4 | 0 | -0.4 |
| S. Federal Boulevard (88A) - W. Warren Avenue to 200' North of W. Evans Avenue | 0 | 0.2 | 0.2 |
| S. Wadsworth Boulevard - W. Florida Avenue to W. Mississippi Avenue | 0 | 0.2 | 0.2 |
| E. Main Street (160A) - N. Beech Street to S. Veach Street | 0 | 0 | 0 |
| Academy Boulevard and Austin Bluffs Parkway | 0 | 0 | 0 |
| Carefree Circle and N. Academy Boulevard | 0 | 0 | 0 |
| 28th Street (36B) - Spruce Street to Valmont Road | 0 | 0.4 | 0.4 |
| Wadsworth Boulevard (121A) - W. 14th Avenue to E. Colfax Avenue | 0.6 | 0.4 | -0.2 |
| Main Avenue (550B) - E. Park Avenue to E. 21st Avenue | 0.2 | 0.2 | 0 |
| 30th Street - Arapahoe Avenue to Walnut Street | 0.6 | 0.6 | 0 |
| Folsom Street - University Heights Avenue to Dorm Parking Lot Entrance | 0.6 | 0.8 | 0.2 |
| Colorado Boulevard (2A) and E. Colfax Avenue | 0 | 0 | 0 |
| Diagonal Highway (119B) - Foothills Parkway to Independence Road | 0.6 | 0.4 | -0.2 |
| N. Lincoln Street - E. Colfax Avenue to E. 18th Avenue | 0.6 | 0.2 | -0.4 |
| Broadway Street - Violet Avenue to Yarmouth Avenue | 0.6 | 0.2 | -0.4 |
| 9th Avenue - Francis Street to Bross Street | 0.6 | 0.6 | 0 |
| E. Fountain Boulevard (24H) and S. Murray Boulevard | 0 | 0 | 0 |
| Havana Street and E. 16th Avenue | 0.6 | 0.2 | -0.4 |
| Arapahoe Avenue (7C) - Foothills Parkway to 48th Street | 0.4 | 0 | -0.4 |
| North Avenue (6B) and N. 1st Street | 0.4 | 0 | -0.4 |
| W. Morrison Road (8A) and S. Estes Street / S. Garrison Street | 0.4 | 0.2 | -0.2 |
| Sheridan Boulevard (95A) and W. 10th Avenue | 0.4 | 0.2 | -0.2 |

The program of strategies to reduce the safety risks for VRUs is summarized within the following Pedestrians and Bicyclists Focus Area summaries. Specific VRU projects and actions are a part of the Action Planning Process described in Chapter 10 Implementation.

# Pedestrians

**Focus Area Definition:** Crashes that involve pedestrians being struck by vehicles.

**Focus Area Goal:** Reduce the number of pedestrian fatalities and serious injuries by five percent from the previous year through 2029.

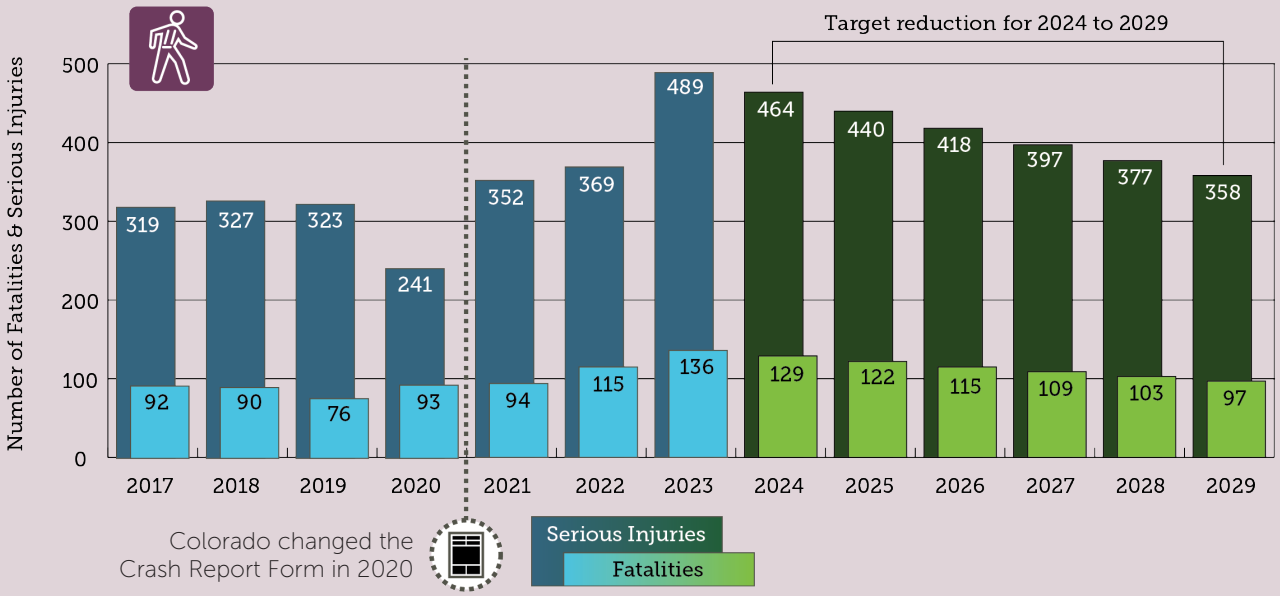
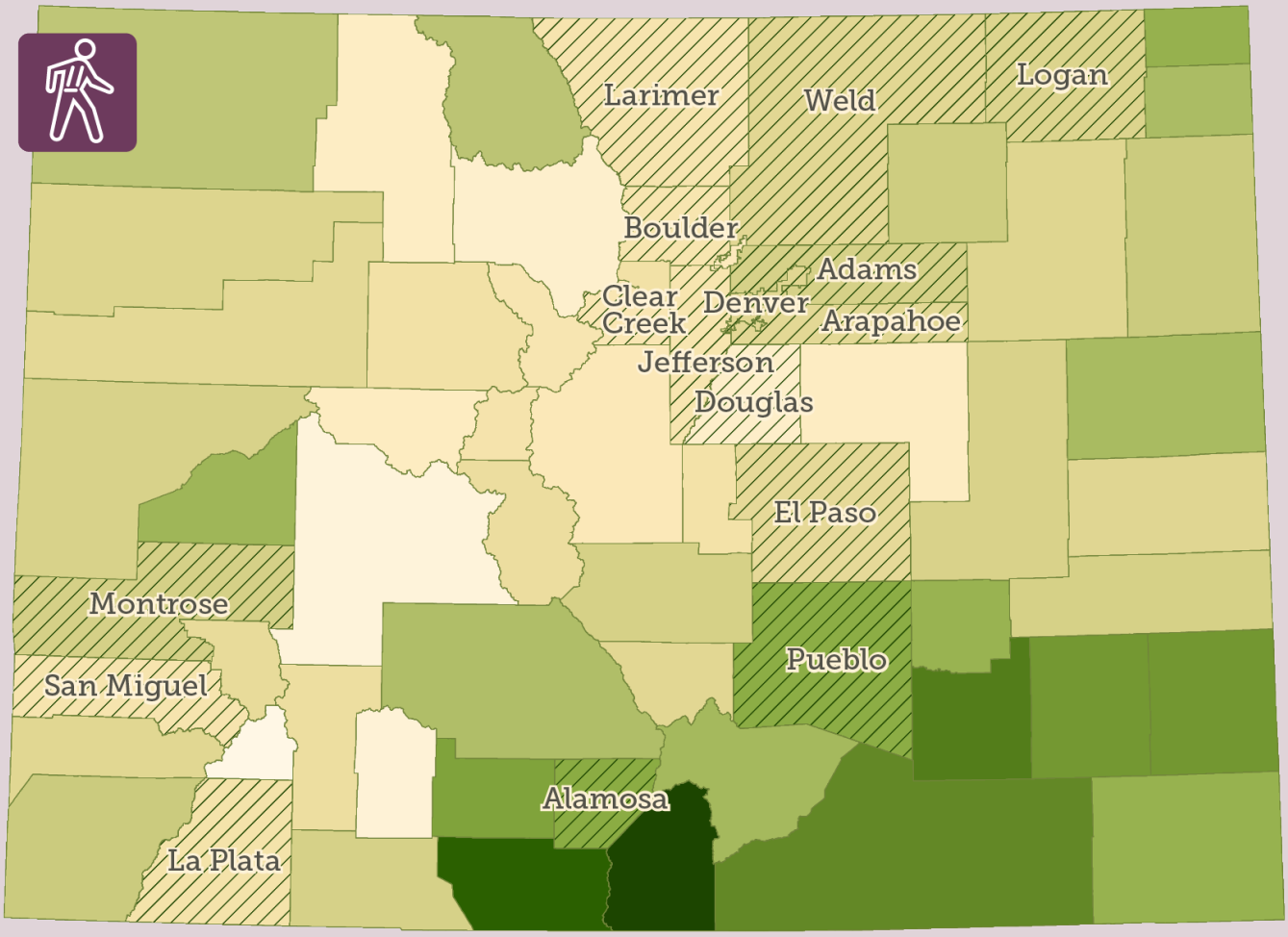



Figure 7-10: Pedestrian-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Pedestrian fatalities and serious injuries have steadily increased, reaching 625 fatalities and serious injuries in 2023 (Figure 7-10). Although pedestrians are involved in just 1% of crashes, they account for 11% (Figure 7-1) of fatal and serious injury crashes, underscoring the severity of these incidents. Reducing pedestrian crashes will directly lower overall fatalities and serious injuries statewide.

Figure 7-11: Top Counties of Pedestrian-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver* | Clear Creek |
| 2 | Arapahoe* | Denver* |
| 3 | Adams* | Pueblo* |
| 4 | El Paso | Alamosa |
| 5 | Jefferson | Adams* |
| 6 | Boulder | San Miguel |
| 7 | Pueblo* | Logan |
| 8 | Larimer | Montrose |
| 9 | Weld | Arapahoe* |
| 10 | Douglas | La Plata |

* represented in both top and per capita categories

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 7-11 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest pedestrian fatalities and serious injuries and the highest rates per capita. Counties with the highest number of pedestrian fatalities and serious injuries are the counties with more urban areas, mostly the counties surrounding Denver. Two counties of note are Pueblo and Alamosa as these are counties with higher TDI scores and higher levels of pedestrian fatalities and serious injuries.

About 50% of severe pedestrian crashes occur at intersections, and nearly 90% occur in urban areas, highlighting, in particular, that urban intersections are among the most high-risk locations. Working-aged adults (aged 21-64) account for the highest rate of fatalities and serious injuries per capita. There is insufficient pedestrian exposure data to truly identify the ages of pedestrians at the highest risk. As a result, one strategy is to build more complete data around pedestrian exposure.

Designers, pedestrians, and drivers all influence roadway safety, and a shared responsibility is essential to reducing crashes. According to crash reports, over 60% of fatal pedestrian crashes and 47% of serious injury pedestrian crashes involved instances where pedestrian facilities (e.g., crosswalks) were not used as designed. This shows the need for education for both drivers and pedestrians on the use of pedestrian facilities, as well as the need for improved pedestrian facilities that are easy and safe to use.

Pedestrian safety is influenced by many factors, including infrastructure design, vehicle speed, and access to safe crossings—elements that are especially important in urban areas and locations where a larger percentage of residents utilize active transportation modes. Targeted holistic improvements can support pedestrian safety including infrastructure improvements, education campaigns for both drivers and pedestrians, and policies that promote access to transportation options other than driving.

Because pedestrians are more vulnerable in crashes and face a higher likelihood of severe injury or death, minimizing pedestrian-vehicle conflicts—especially at intersections—is critical. Investing in safer crossings, traffic-calming measures, and community-driven safety programs can help reduce risks. Ensuring that safety improvements reflect the needs of target communities will help support effective safety solutions.

In 2009, Colorado adopted a new bicycle and pedestrian policy, Policy Directive 1602. This Policy Directive states “The needs of bicyclists and pedestrians shall be included in the planning, design, and operation of transportation facilities, as a matter of routine. A decision to not accommodate them shall be documented based on the exemption criteria in the procedural directive.” Moving forward, it is key that Colorado continues to address bicycles and pedestrians in all transportation facilities as a priority and not a second thought.

## Pedestrian Strategies

Strategies to improve pedestrian safety are combined with strategies to improve bicyclist safety. Refer to the following Bicyclists Focus Area for more details on pedestrian and bicyclist strategies.

# Bicyclists

**Focus Area Definition:** Crashes that involve bicyclists being struck by vehicles.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries that involve bicyclists by five percent from the previous year through 2029.

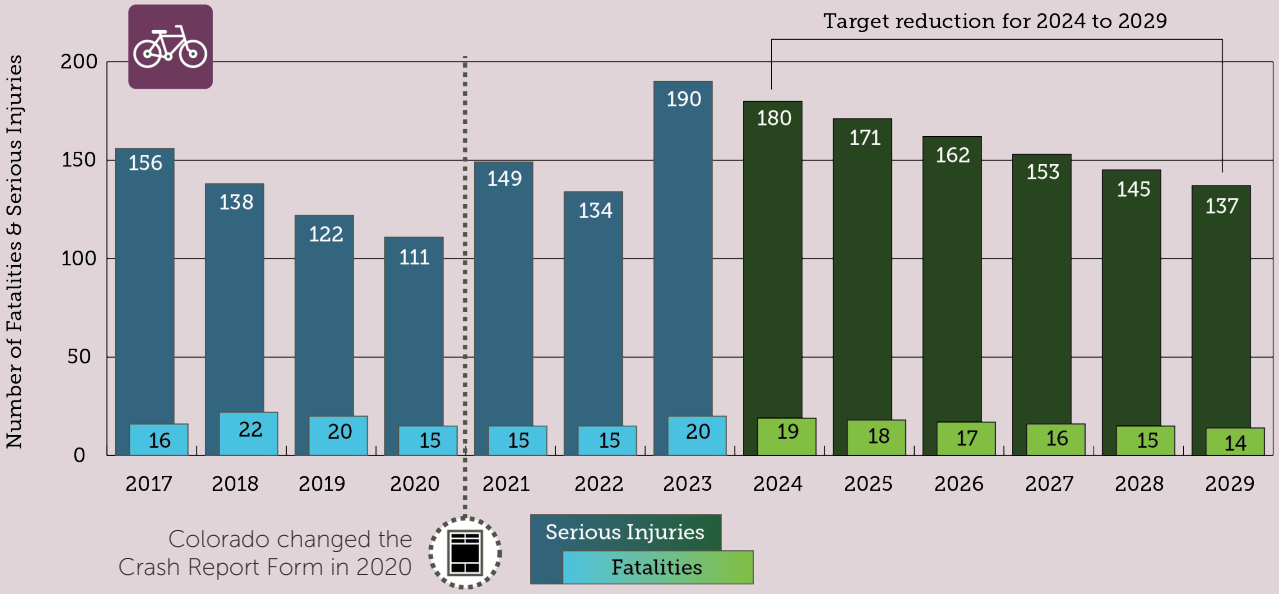



Figure 7-12: Bicyclist-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

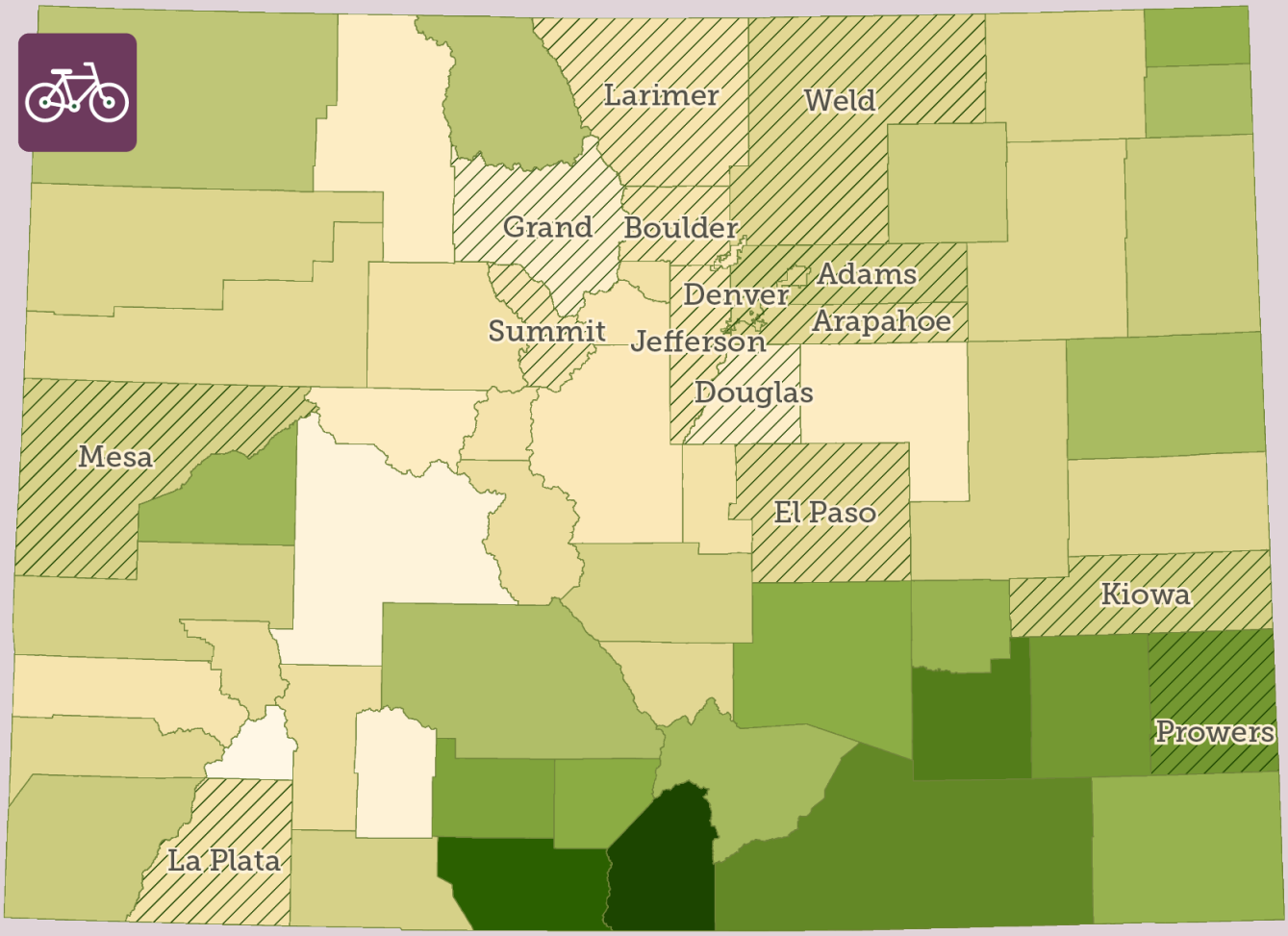
Figure 7-12 shows a sharp rise in bicyclist fatalities and serious injuries in 2023, totaling 210.

Figure 7-13 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest bicyclist fatalities and serious injuries and the highest rates per capita. Similar to the pedestrian crashes, the highest number of bicyclist fatalities and serious injuries are the counties with more urban areas, mostly the counties surrounding Denver. Prowers County is the only identified county with a high TDI score and high levels of bicyclist fatalities and serious injuries.

Intersections pose the highest risk for bicyclists, accounting for 59% of serious injury crashes and 67% of fatal crashes involving bicyclists. Nearly 90% of fatal and serious injury bicyclist crashes occur in urban areas, making them a priority for safety improvements.

Similar to pedestrians, bicyclists are more vulnerable in crashes and face a higher likelihood of severe injury or death; minimizing bicycle-vehicle conflicts—especially at intersections—is critical. Investing in improved bicyclist infrastructure, traffic-calming measures, separated bike lanes, and community-driven safety programs can help reduce risks. Additionally, ensuring that outreach efforts engage and reflect the needs of all communities, especially those that experience high rates of fatalities and serious injuries, will support more effective safety solutions.

Figure 7-13: Top Counties of Bicyclist-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver* | Kiowa |
| 2 | Boulder* | Boulder* |
| 3 | Jefferson* | Denver* |
| 4 | Larimer* | Larimer* |
| 5 | El Paso | Summit |
| 6 | Arapahoe | Grand |
| 7 | Adams | Prowers |
| 8 | Mesa* | Mesa* |
| 9 | Douglas | La Plata |
| 10 | Weld | Jefferson* |

* represented in both top and per capita categories

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

## Pedestrian and Bicyclist Strategies

Bicyclist safety strategies focus on infrastructure upgrades and education, aligning with pedestrian safety efforts due to shared challenges.

### SP11: Analyze pedestrian and bicycle crash types

**Apply the Pedestrian and Bicyclist Crash Analysis Tool (PBCAT) to enhance understanding of VRU crashes.**

This strategy applies the Pedestrian and Bicyclist Crash Analysis Tool (PBCAT) to better understand contributing factors and movements for VRU crashes and more accurately match a countermeasure to the safety issue. In addition, this strategy examines existing crash reporting data elements to identify opportunities to enhance the collection of data to better align with PBCAT entry fields.

### SP12: Improve VRU exposure data

**Improve exposure data to better understand areas at higher risk of VRU crashes.**

This strategy aims to improve the data around VRU exposure in order to identify high-risk locations for VRUs by collecting VRU counts in advance of Road Safety Audits (RSA) and Corridor Studies to assess the level of risk for these roadways. This strategy also aims to implement a large-scale active transportation count program or purchase "big data" VRU exposure and origin-destination data.

### SP13: Conduct Road Safety Audits (RSAs)

**Conduct VRU-specific and/or expanded Road Safety Audits.**

Establish an RSA process for the State of Colorado. For VRU specific RSAs, VRU exposure data will be collected prior to performing RSAs. RSAs should also include PBCAT or similar analysis of VRU crashes and an analysis of human and behavioral factors in safety improvement recommendations.

### SP14: Perform regional pedestrian/bicyclist studies

**Perform studies at the local and regional levels that focus on pedestrian and bicyclist safety.**

Perform studies at the regional level, such as those created by CDOT's Regions 1 and 4, or by regional organizations such as Transportation Planning Regions or Metropolitan Planning Organizations, and support local agencies in conducting pedestrian and bicyclist safety studies. This strategy creates a deeper understanding of the state of pedestrian and bicyclist safety through a regional lens, contributing to statewide active transportation programming.

### SP15: Analyze VRU crash demographic data

**Continue to utilize demographic data to identify community-level risk factors that may be contributing to VRU crashes.**

Perform demographic analysis of VRU crashes, and identify communities which are disproportionately impacted by these types of crashes. Relevant data regarding community-level data sources can help identify additional risk factors that may be contributing to high rates of VRU crashes in the specified communities. When considering VRU safety infrastructure improvement projects, these additional factors may be crucial for reducing crashes and relevant perspectives should be considered throughout all stages of project development.

### SP16: Conduct VRU before-and-after studies

**Continue to evaluate implemented safety projects and identify the most successful project types.**

This strategy aims to continue to evaluate VRU safety projects using before-and-after studies and offer support to local agencies to perform their own before-and-after studies. The overall goal of this strategy is to compile a statewide database to build a Colorado-specific list of countermeasures proven to work.

### SP17: Educate traffic safety professionals on VRU best practices

**Work to continually educate traffic safety professionals on new VRU concepts and design strategies.**

Bring VRU safety educational opportunities to Colorado such as CDOT and the Federal Highway Administration (FHWA) trainings on bicycle and pedestrian design, Complete Streets, and the Safe System Approach (SSA). Ensure jurisdictional personnel are provided with adequate time and support to attend and invite consultants to participate.

### SP18: Inventory VRU infrastructure

**Update and maintain the existing inventory of active transportation facilities on the state highway system and owned or maintained by local jurisdictions.**

This strategy aims to build an inventory of active transportation facilities on the state highway system. This includes surveying local jurisdictions to determine which ones maintain active transportation facility inventories and assisting jurisdictions who are not already maintaining an inventory of active transportation facilities in creating one.

### SP19: Expand VRU data sources

**Expand data sources in the VRU safety assessment to include all crash types to enable a proactive approach to VRU safety.**

In the 2023 Colorado VRU Safety Assessment, only VRU fatal and serious injury crashes were analyzed, which led to a much smaller dataset for identifying top contributing factors and priority locations and limiting other data analyses. This strategy aims to focus future VRU data analysis efforts on all VRU crash types enabling a more complete understanding of VRU safety around the state.

### SP20: Evaluate VRU priority locations

**Work to continually identify and address priority locations for VRU safety.**

This strategy focuses on continuing to identify priority locations for VRU safety and address the safety needs. This includes monitoring and analyzing the safety impacts of completed projects with VRU infrastructure improvements. This also includes utilizing FHWA's Proven Safety Countermeasures to address location-specific needs based on the PBCAT analysis, exposure data, land use, trip generators, and near-miss data.

# Work Zones

**Focus Area Definition:** Crashes occurring in work zones.

**Focus Area Goal:** Reduce the number of severe crashes occurring in work zones by five percent from the previous year through 2029.

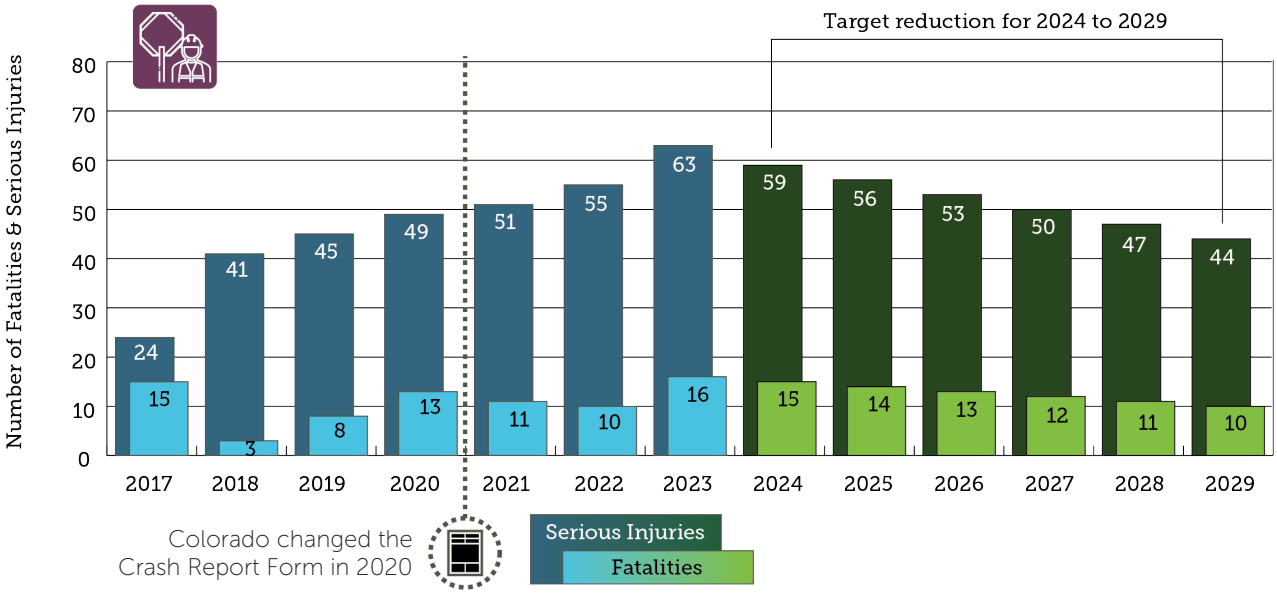
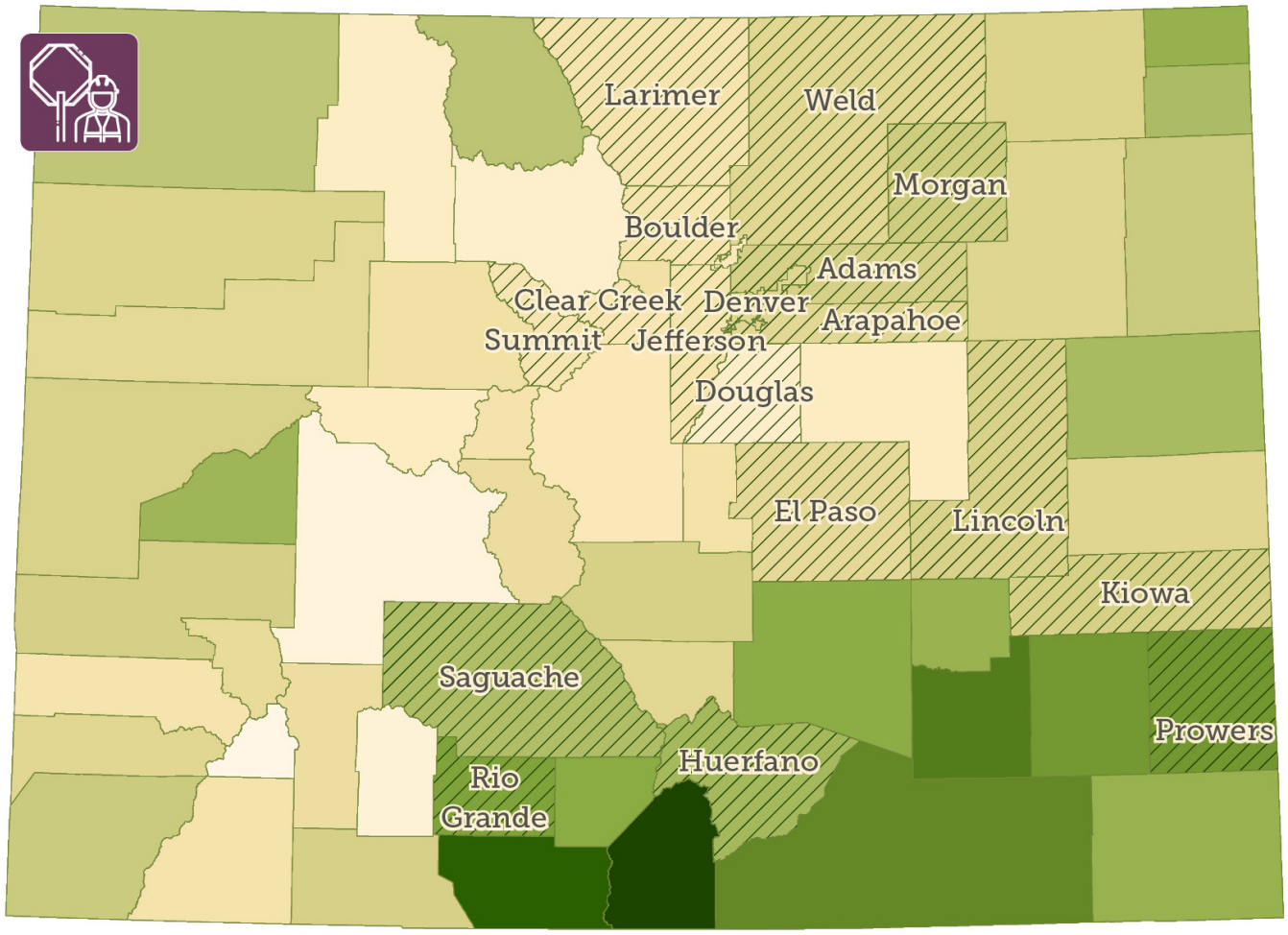



Figure 7-14: Work zone-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Work Zones are a area with limited available data, as Colorado's crash report form only began tracking work zone related crashes in 2021. Since that time, fatalities and serious injuries in work zones have steadily increased, reaching 79 in 2023, up from 65 in 2022 (Figure 7-14).

Figure 7-15 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest work zone-involved fatalities and serious injuries and the highest rates per capita. The highest number of work zone-involved fatalities and serious injuries tend to be urban counties.

Figure 7-15: Top Counties of Work Zone-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Larimer* | Kiowa |
| 2 | El Paso | Clear Creek |
| 3 | Douglas | Lincoln |
| 4 | Adams | Saguache |
| 5 | Denver | Huerfano |
| 6 | Weld | Morgan |
| 7 | Jefferson | Summit* |
| 8 | Arapahoe | Prowers |
| 9 | Boulder | Rio Grande |
| 10 | Summit* | Larimer* |

* represented in both top and per capita categories

MAP LEGEND

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Although work zone crashes account for fewer fatalities and serious injuries than other Focus Areas, their rapid increase is concerning. The primary causes remain unclear, but speed discrepancies and irregular traffic patterns are major contributors. A deeper understanding of these factors is crucial to addressing, mitigating, and reducing work zone crashes.

## Work Zone Strategies

### SP21: Create work zone safety committee

**Form a work zone safety committee to analyze available data, share lessons learned, and improve best practices.**

As work zone crashes become a growing traffic safety issue in Colorado and with the addition of this data point on the DR3447 Crash Form, this strategy aims to identify key contributing factors and develop effective solutions.

# First Responders

**Focus Area Definition:** Crashes involving first responders.

**Focus Area Goal:** Reduce the number of severe crashes that involve first responders by five percent from the previous year through 2029.

First responders are individuals that respond in a professional capacity to a public safety emergency. Examples include but are not limited to law enforcement, firefighters, and emergency medical technicians. Due to the dangerous environment where these individuals often work, such as high-speed roadways, this Focus Area promotes keeping first responders safe as they support others on the road. In 2023, Colorado expanded HB23-1123 Slow Down Move Over law to better protect individuals and vehicles on the roadside. This law requires all motor vehicle drivers to move to one lane apart from a stationary motor vehicle when the stationary motor vehicle has its hazard lights activated. If a driver cannot move to be one lane apart from the stationary motor vehicle, the driver must slow down and drive at a safe speed.[9]

The Colorado Standing Committee on First Responder Safety leads statewide efforts to enhance first responder protection through joint Traffic Incident Management training, improved quick clearance techniques, and public education on safe driving near roadside incidents. The strategies in this Focus Area continue supporting the committee's initiatives and collaboration with first responders to create safer roadways to ensure the safest possible roadway environment for all emergency personnel. For information regarding Traffic Incident Management, see Chapter 9 Post-Crash Care.

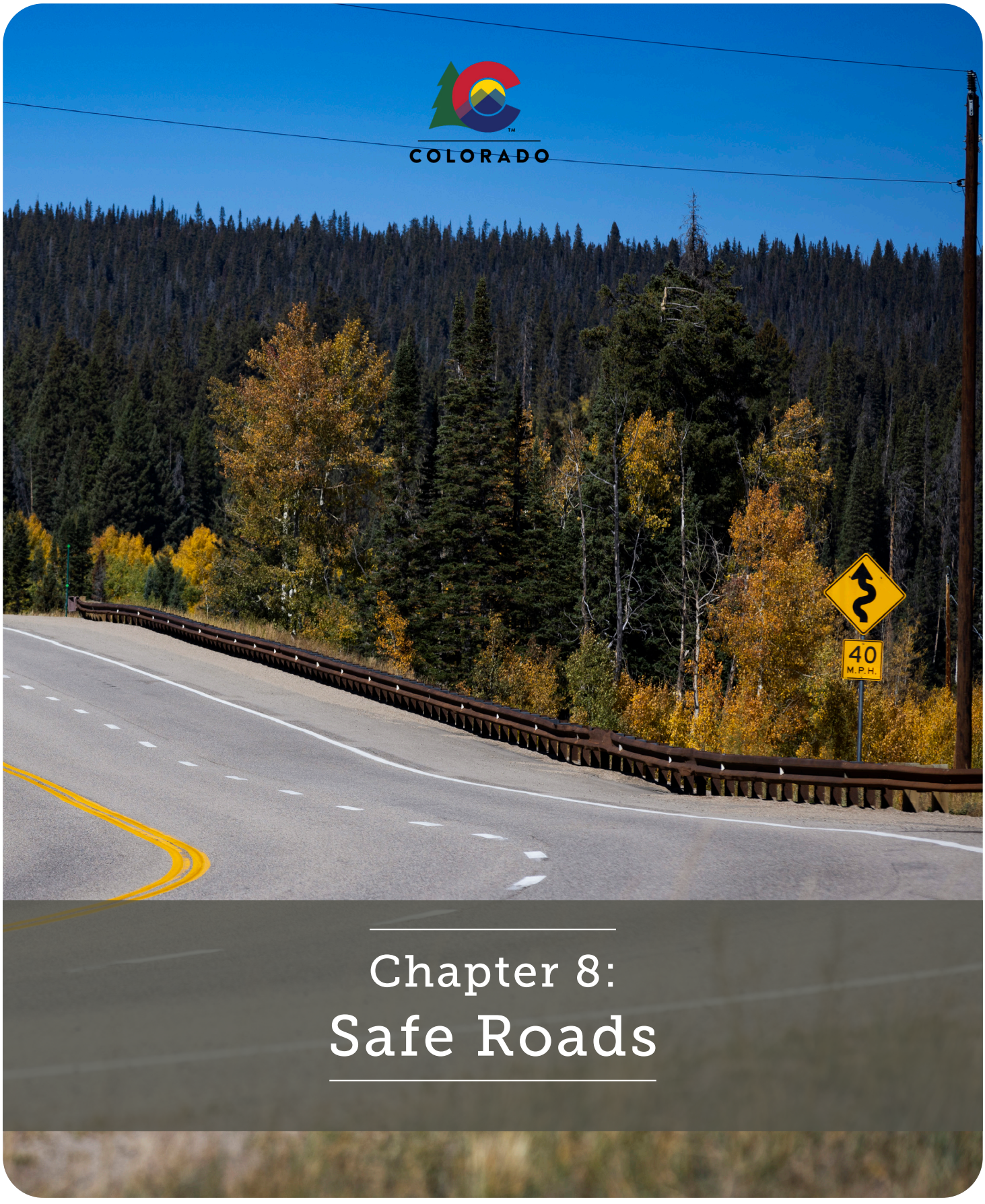
## First Responder Strategies

### SP22: Provide resources and support for first responders

**Continue providing resources and technical support to strengthen the Colorado Standing Committee on First Responder's efforts in improving first responder safety.**

The Colorado Standing Committee on First Responder Safety is responsible for the development and execution of the Traffic Incident Management Strategic Plan For Colorado, which was most recently updated in 2022. To avoid duplication of efforts, the SHSP supports the activities of the Colorado Standing Committee on First Responder Safety and the priorities outlined in the Traffic Incident Management Strategic Plan For Colorado.

9 Move Over or Slow Down Stationary Vehicle, HB23-1123 (2023). https://leg.colorado.gov/bills/hb23-1123




# Chapter 8:
# Safe Roads

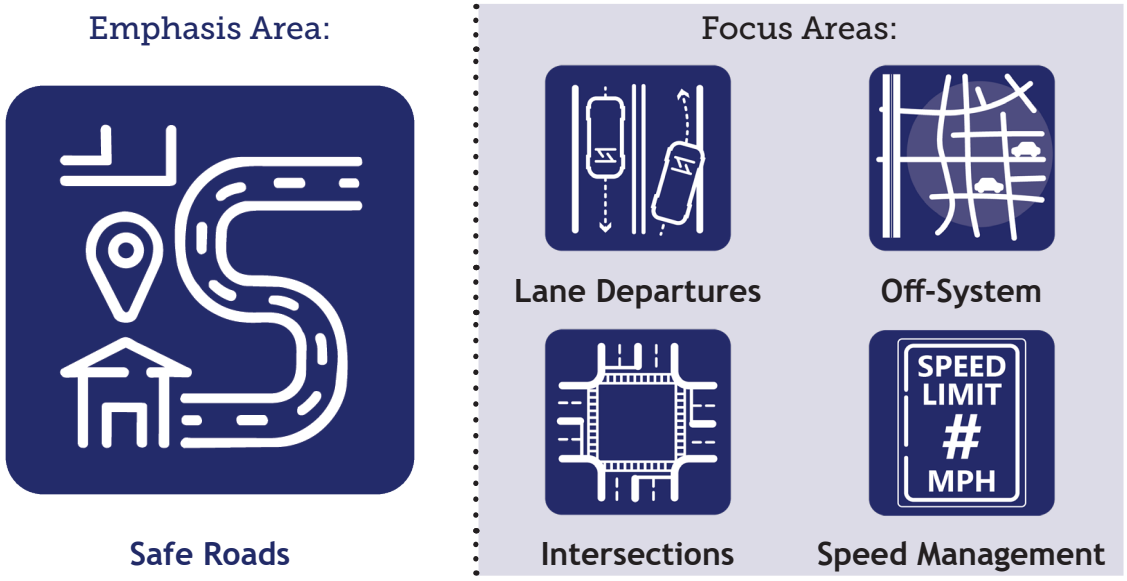

# Introduction

The Safe Roads Emphasis Area acknowledges that safety is proactive and that humans make mistakes. It focuses on designing and improving infrastructure to anticipate and reduce the impact of human errors, preventing fatalities and serious injuries.

The primary objective of the Safe Roads Emphasis Area is to identify and implement targeted roadway infrastructure improvements to reduce the occurrence of fatal and serious injury crashes on Colorado's roadways. Fundamental to this objective is the understanding that responsibility is shared, and local agency contributions are essential.

## Focus Areas

The Safe Roads Emphasis Area identifies four Focus Areas:



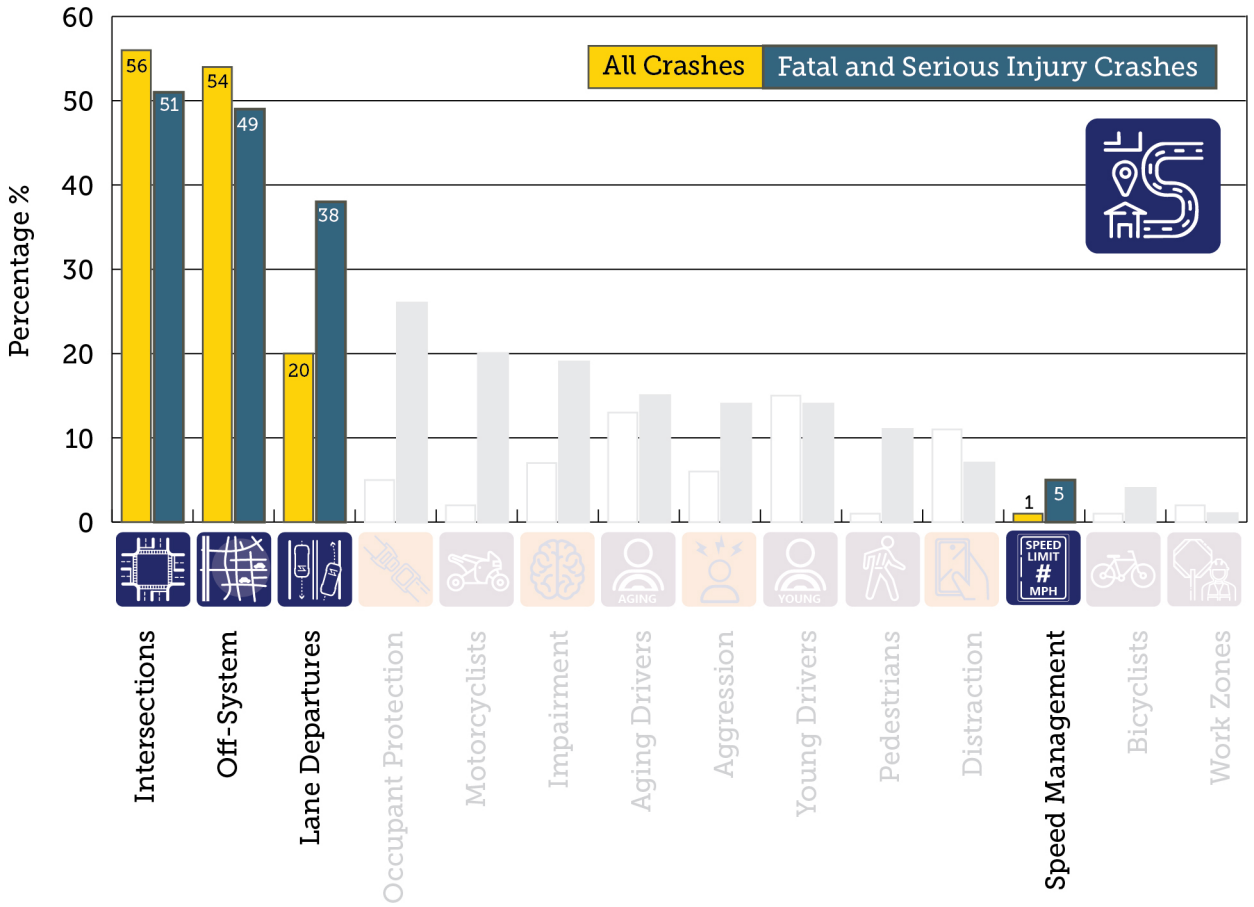



Figure 8-1: Percentage of Total & Fatal/Serious Injury Crashes Involving Focus Areas

The Safe Roads Emphasis Area focuses on different roadway environments where severe crashes occur. The Focus Areas within this Emphasis Area have high potential for reducing or eliminating future severe crashes and include intersections, lane departures, off-system roads, and speed management.

Additionally, the strategies identified in the Safe Roads Emphasis Area could all apply to High Risk Rural Roads (HRRR) depending on the safety needs of the given location.

# Lane Departures

**Focus Area Definition:** Crashes that occur due to a driver leaving their lane including run-off-road, fixed object, head-on, rollover, and sideswipe crash types.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries caused by lane departure crashes by five percent from the previous year through 2029.

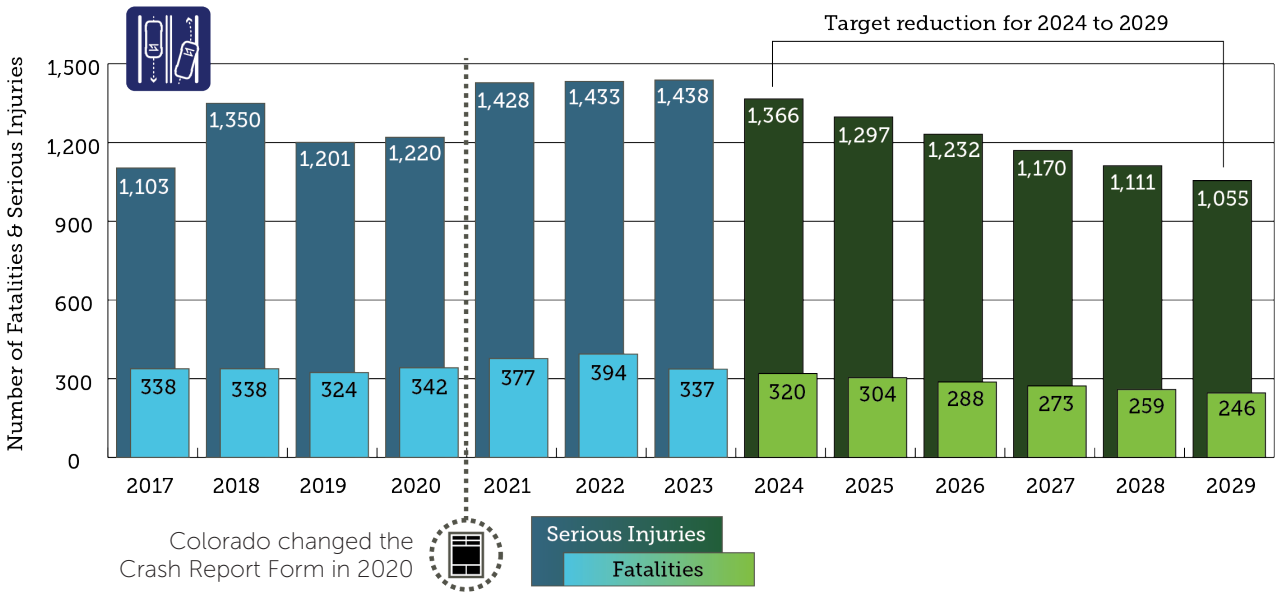
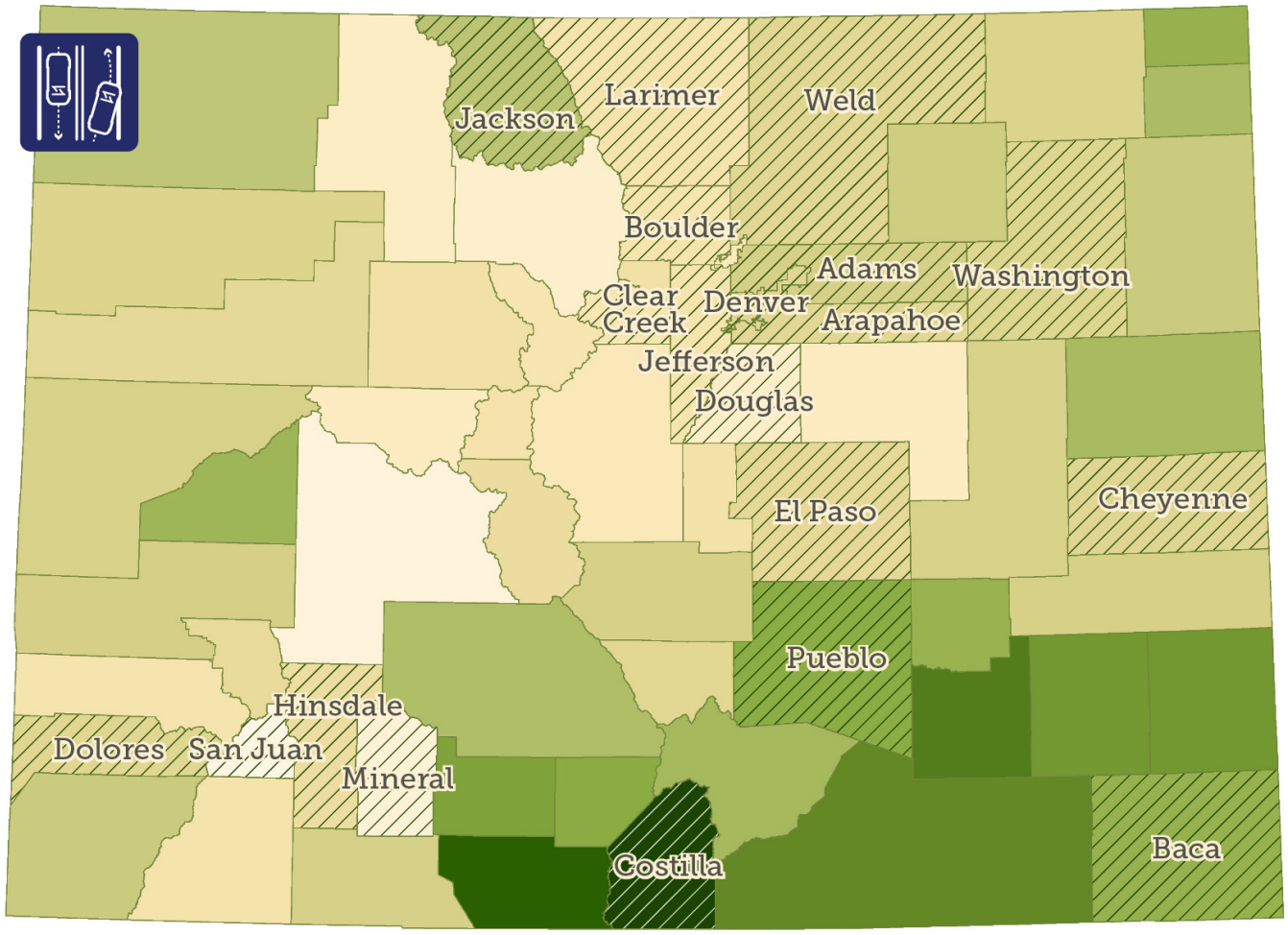



Figure 8-2: Lane Departure-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Figure 8-2 illustrates a relatively stable trend in lane departure fatalities and serious injuries. In 2023, there were 1,775 lane departure fatalities and serious injuries. Lane departure crashes occur more often in rural areas than in urban areas due to higher speeds and reduced lighting infrastructure, making lane markings more difficult to discern. Rural areas account for 62% of lane departure fatal and serious injury crashes, while only accounting for 38% of all crash types in the state. This disparity shows the need for addressing lane departures in rural areas.

Figure 8-3 shows a map identifying the counties with the highest transportation disadvantage, as well as the counties with the highest lane departure-involved fatalities and serious injuries and the highest rates per capita. Counties with the highest number of lane departure-involved fatalities and serious injuries are the counties along the Front Range. Top counties per capita tend to be rural counties along the Eastern Plains and Southwestern Colorado.

Figure 8-3: Top Counties of Lane Departure-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | El Paso | Mineral |
| 2 | Denver | San Juan |
| 3 | Adams | Jackson |
| 4 | Jefferson | Cheyenne |
| 5 | Weld | Baca |
| 6 | Larimer | Hinsdale |
| 7 | Arapahoe | Costilla |
| 8 | Douglas | Washington |
| 9 | Boulder | Clear Creek |
| 10 | Pueblo | Dolores |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

The three most common lane departure crash types are fixed objects, overturning, and roadside barriers, as depicted in Figure 8-4. While same direction lane departure crashes are problematic, data indicates that the most severe lane departure crashes involve vehicles veering off the roadway or into oncoming traffic.

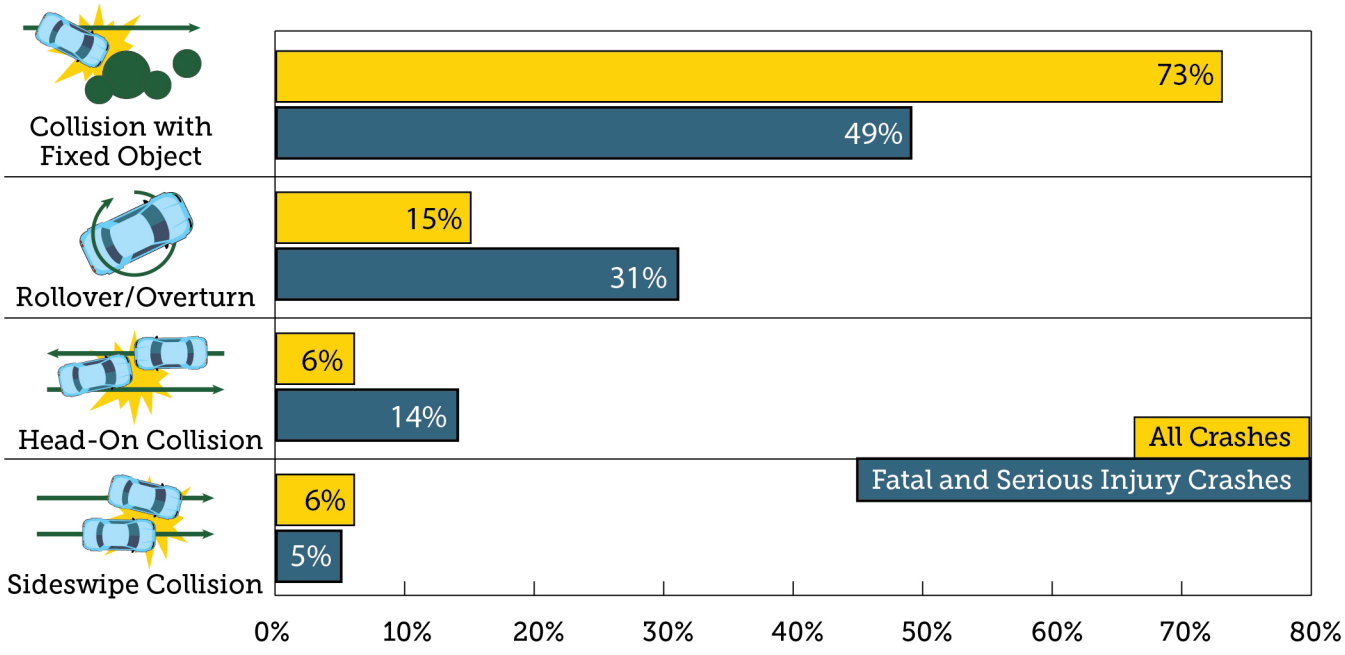



Figure 8-4: Lane Departure Severe Crashes by Crash Type (2019-2023)

## Lane Departure Strategies

### SR1: Install traffic controls and safety barriers

**Reduce fatal and serious injury crashes caused by lane departures by installing improved traffic control devices and safety barriers on high-risk road segments.**

The primary crash types associated with lane departures include fixed object collisions, overturning, and head-on crashes. Installing roadside barriers to keep errant vehicles on the road and enhancing traffic control to improve awareness of changing road conditions can reduce the frequency and severity of lane departure crashes.

### SR2: Improve roadway geometry

**Implement roadway geometric improvements to encourage or accommodate appropriate driving speeds, while providing a forgiving roadside condition that minimizes severe crashes along high-risk road segments.**

This strategy focuses on roadway design that accommodates the inevitability of human error, specifically when lane departures occur. In addition to forgiving roadside designs, aligning roadway design with realistic driving speeds can further mitigate the occurrence of severe lane departure crashes.

## Off-System

**Focus Area Definition:** Crashes that occur on public roadways that are not maintained by the State of Colorado.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries that occur on off-system roadways by five percent from the previous year through 2029.

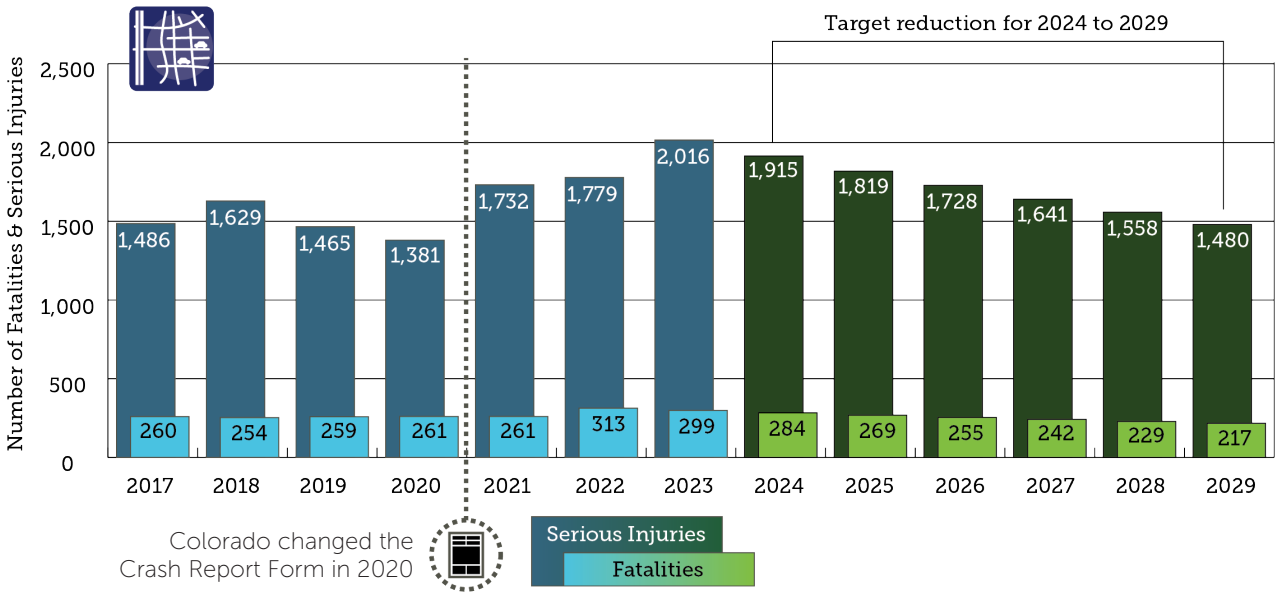


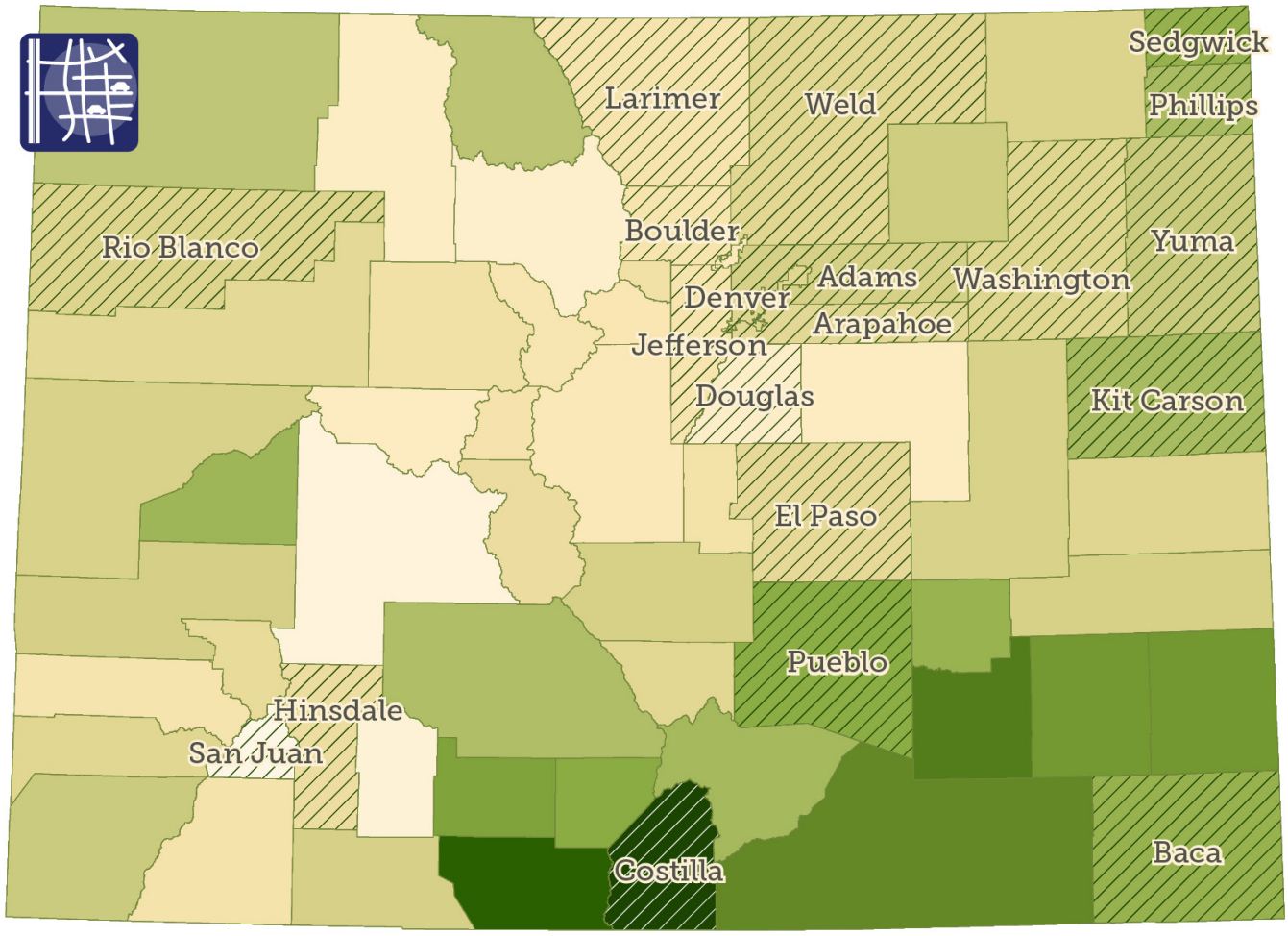

Figure 8-5: Off-System-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Off-system roadways refer to public roadways that are not maintained by the State of Colorado. This means that local jurisdictions (e.g., city, town, county) are responsible for the maintenance and operations of these roadways, including identifying and mitigating safety concerns. While the State is not directly responsible for these networks, safety improvements should be implemented in cooperation with state and local agencies to maximize crash reduction throughout Colorado.

Off-system roadways comprise approximately 90% of the total centerline miles and account for about half of the annual vehicle miles traveled (VMT). While 52% of fatal and serious injury crashes occur on state highways, 48% happen on off-system roadways. This emphasizes the importance of continuing to improve off-system roadways and emphasizing the Safe System principle that responsibility is shared across state and local agencies.

Figure 8-5 shows a steady upward trend in off-system fatalities and serious injuries. In 2023, there were 2,315 off-system fatalities and serious injuries, representing over half of the fatalities and serious injuries in the state. Prioritizing safety on these roadways is critical to reduce the number of fatalities and serious injuries.

Figure 8-6: Top Counties of Off-System-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver | San Juan |
| 2 | El Paso | Baca |
| 3 | Arapahoe | Hinsdale |
| 4 | Adams | Washington |
| 5 | Jefferson | Costilla |
| 6 | Larimer | Sedgwick |
| 7 | Boulder | Kit Carson |
| 8 | Weld | Yuma |
| 9 | Douglas | Phillips |
| 10 | Pueblo | Rio Blanco |

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 8-6 shows the counties that have the highest number off-system-involved fatalities and serious injuries. This graphic may seem surprising initially, as Denver County has the highest number of off-system-involved fatalities and serious injuries. This is due to most city streets in large cities and towns being off-system roadways, not all off-system roadways are rural roadways. The rural roadway representation can be seen in the top counties of off-system involved fatalities and serious injuries per capita with San Juan, Baca, and Hinsdale counties being the top counties per capita.

High Risk Rural Roads (HRRR) are important to note within the Off-System focus areas as they align in many cases. The Off-System strategy of providing assistance to local agencies can help local agencies identify HRRRs on their local systems and identify safety improvement projects to improve safety on these HRRRs.

## Off-System Strategies

Due to the shared responsibility of safety on off-system roadways, this Focus Area identifies strategies to support local jurisdictions in making safety improvements on local roadways.

### SR3: Provide local agency assistance

**Provide detailed guidance to local agencies on how to apply for state and federal safety funding and improve outreach to enhance awareness and participation in the Safety Circuit Rider Program, the LTAP, and other relevant assistance programs.**

This strategy aims to strengthen support for existing programs, like the Safety Circuit Rider, that provide technical assistance, training, and safety-program support to local agencies to enhance roadway safety across the state. Several different types of funding sources are available including the Highway Safety Improvement Program (HSIP), which is a core federal-aid program to states for the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads.

### SR4: Encourage community-specific plans

**Encourage local agencies to create community-specific safety plans and actively participate in their development, ensuring alignment with the Strategic Highway Safety Plan (SHSP) goals.**

This strategy increases outreach efforts and provides targeted support to help local agencies develop community-specific plans aligned with the goals of the Strategic Highway Safety Plan (SHSP). This alignment results in local safety plans that meet state and federal grant criteria, making it easier to secure funding for projects. Some examples of these community specific plans are Safe Streets for All (SS4A) and building Complete Streets toolkits to guide local governments in planning, designing and implementing roadway designs to accommodate all road users.

# Intersections

**Focus Area Definition:** Crashes occurring at intersections or are intersection-related.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries that occur at intersections by five percent from the previous year through 2029.

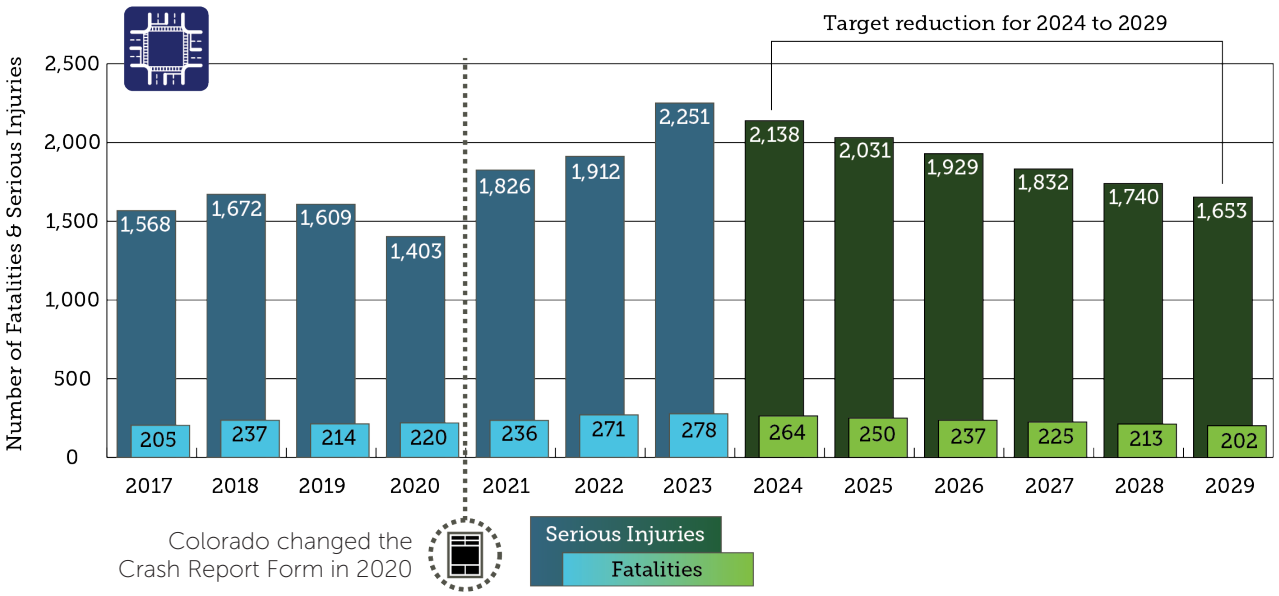
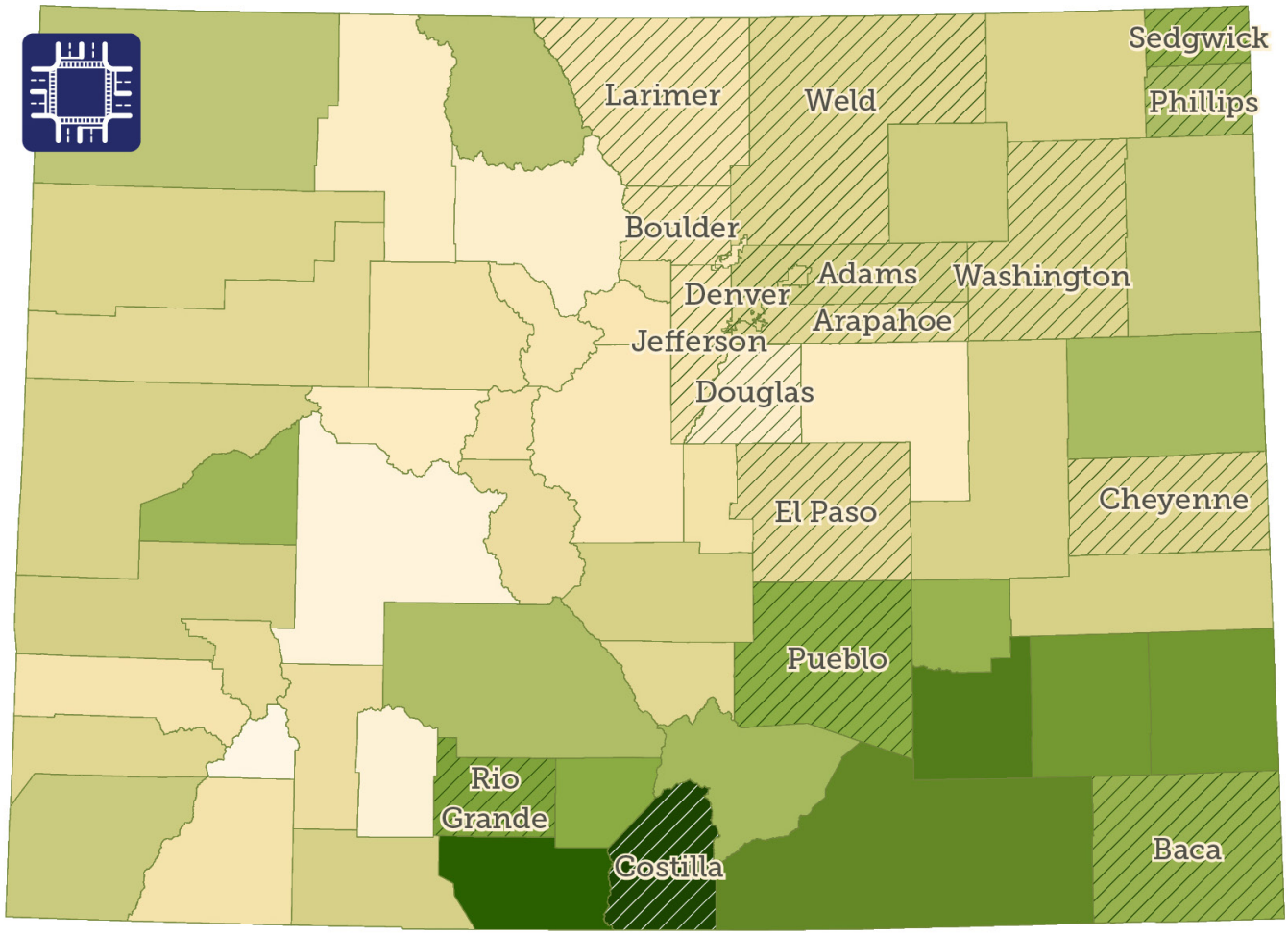



Figure 8-7: Intersection-Involved Fatalities and Serious Injuries by Year (2017 to 2023)

Intersections are points where two or more roads cross or meet, bringing together different road users and increasing the chance of collisions. Figure 8-7 defines intersection related crashes as crashes that occur at intersections, but does not include driveway access related crashes. The severity of a crash depends on factors like the angle of impact, speed, and the size of the vehicles involved. Intersections account for 56% of all reported crashes and 51% of all fatal and serious injury crashes in Colorado (Figure 8-1). From 2017-2023, there has been a consistent upward trend in the number of fatalities and serious injuries occurring at intersections (Figure 8-7). In 2023, intersection crashes resulted in 278 fatalities and 2,251 serious injuries. Addressing intersection-related crashes is critical to reducing the overall number of severe crashes statewide.

Figure 8-8: Top Counties of Intersection-Involved Fatalities and Serious Injuries




| Rank | Top Counties Overall | Top Counties per Capita |
|---|---|---|
| 1 | Denver* | Phillips |
| 2 | El Paso | Denver* |
| 3 | Arapahoe | Sedgwick |
| 4 | Adams* | Baca |
| 5 | Jefferson | Washington |
| 6 | Boulder* | Boulder* |
| 7 | Weld | Costilla |
| 8 | Larimer | Rio Grande |
| 9 | Douglas | Adams* |
| 10 | Pueblo | Cheyenne |

* represented in both top and per capita categories

Map Legend

Weighted TDI Score

Low — High

Diagonal Striping = Top 10 overall and/or per capita counties

This map shows the Transportation Disadvantage Index (TDI) and labels the top 10 counties for total fatalities and serious injuries, along with the top 10 counties with the highest per-capita impact among relevant demographics. The table provides rankings for both categories.

Figure 8-8 shows the counties that have the highest number of intersection-involved fatalities and serious injuries. Top counties overall tend to be the more highly populated urban areas, which also have a higher density of intersections along the transportation network. On a per capita basis, Denver, Boulder, and Adams county are represented as well as rural counties to the east and south.

The three most prevalent crash types at intersections are broadside, approach-turn, and VRUs. Targeted efforts to raise awareness and reduce these crash types are key to mitigating intersection-related crashes.

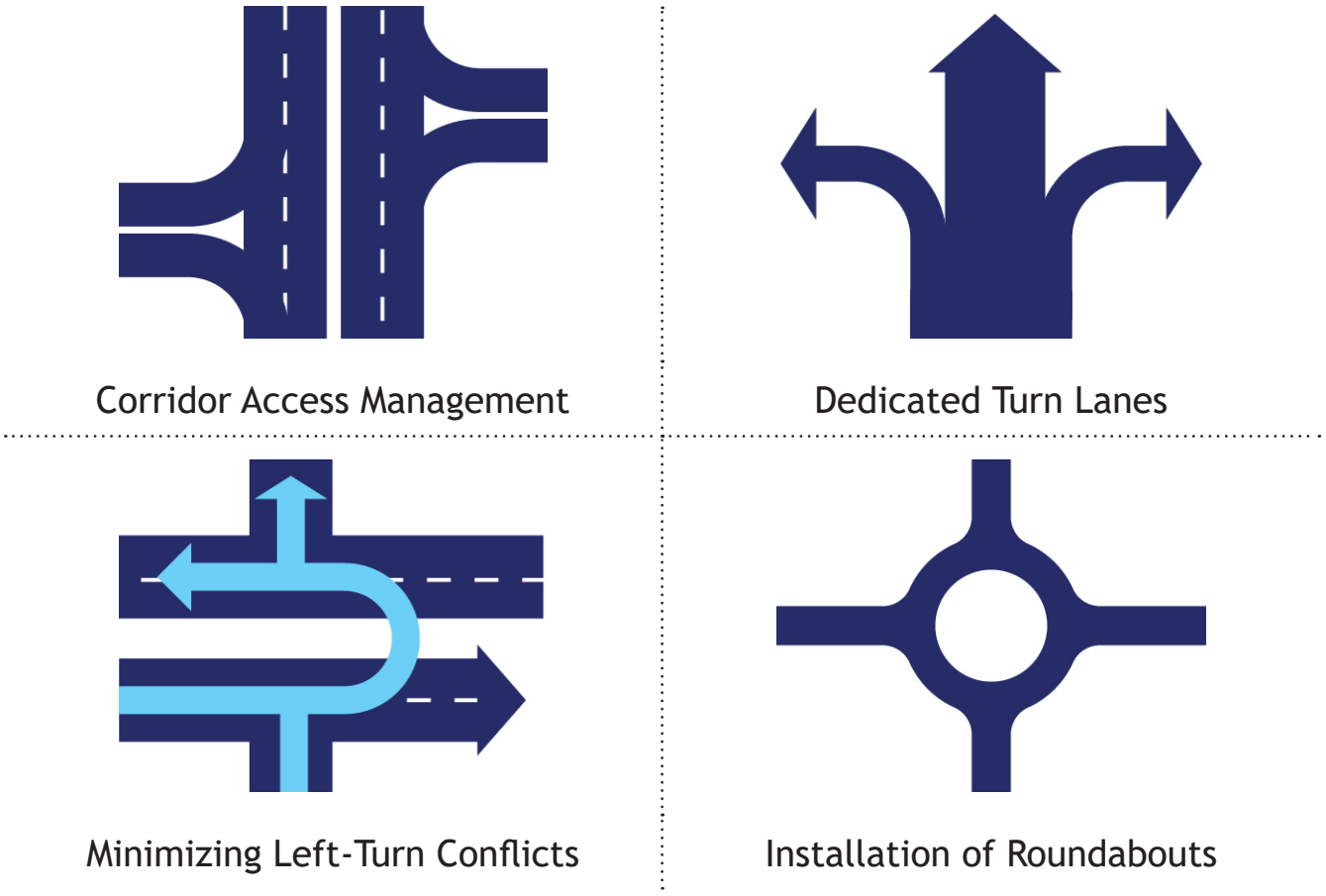



Figure 8-9: Key Safety Countermeasures to Reduce Intersection-Related Crashes

According to the U.S. Department of Transportation (USDOT), corridor access management, dedicated turn lanes, minimizing left-turn conflicts, and roundabouts are safety countermeasures proven to reduce intersection-related crashes. These proven countermeasures reduce crash severity by managing impact forces on drivers, occupants, and all other road users. Not all intersection types are familiar to road users; education and training can help individuals properly navigate intersections safely.

## Intersection Strategies

### SR5: Reduce intersection conflicts

**Implement design and operational improvements that reduce the number of conflicts at intersections, especially those experiencing a high number of severe broadside and approach-turn crashes (Aging Pedestrian Strategy).**

This strategy aims to reduce intersection conflicts that often result in broadside or approach turn crashes, accounting for 54% of all fatal and serious injury crashes. Good access management principles reduce or eliminate these conflicts at intersections by combining accesses, reducing the allowable movements at intersections, or implementing alternative routes such as service roads on high-traffic roadways. Alternative or innovative intersection types can have fewer conflicts by design.

### SR6: Perform Intersection Control Evaluations (ICE)

**Perform ICE prior to upgrading or constructing intersection improvements.**

This strategy emphasizes the importance of preemptively addressing crashes through the application of a data-driven, performance-based framework to screen intersection alternatives and select an optimal solution.

### SR7: Incorporate VRU designs

**Incorporate project design elements to improve safety for Vulnerable Road Users (VRUs) where there is a high number of fatal/serious injury VRU crashes (Aging Pedestrian Strategy).**

Intersections create additional risk for pedestrians and bicyclists. Traditionally, intersection design has prioritized motorists over VRUs. This strategy shifts focus to designing intersection improvements that enhance safety for VRUs, particularly pedestrians, utilizing proven safety countermeasures.

### SR8: Prioritize high-risk intersection locations

**Improve safety at high-risk intersections by addressing design deficiencies such as inadequate lighting, insufficient sight distance, and substandard turning radii.**

Data analysis identifies over 3,000 severe crashes at intersections with poor lighting or insufficient visibility, with pedestrian crashes disproportionately common. This strategy addresses intersection deficiencies to enhance driver and pedestrian safety. FHWA identifies having greater sight distances at an intersection as a proven countermeasure that can greatly improve safety at an intersection.

### SR9: Implement improved traffic controls

**Implement improved traffic controls at intersections with a high frequency of broadside, approach turn, and rear-end fatal and serious injury crashes (Aging Drivers & Pedestrians Strategy).**

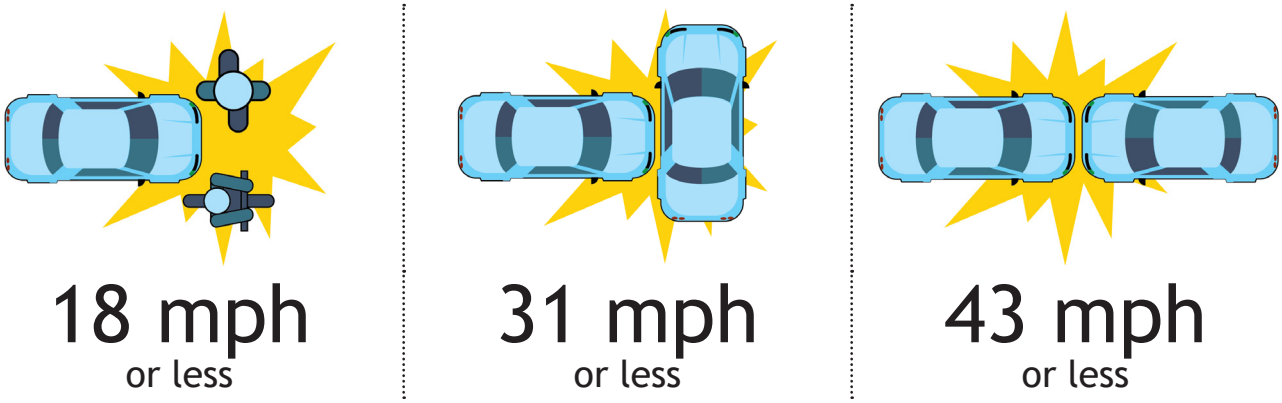
In situations where physical improvements are infeasible, this strategy focuses on cost-effective traffic control measures to reduce the frequency of severe crashes. Targeted improvements include enhanced striping and signage, signal systems, and other traffic control measures to mitigate crash risk.

## Speed Management


**Focus Area Definition:** Roadway safety issues that are related to speed fostered by the roadway environment.

**Focus Area Goal:** Reduce the number of fatalities and serious injuries occurring at high speed by five percent from the previous year through 2029.

Vehicles traveling at higher speeds increase both the probability and severity of crashes. Higher speeds reduce the available time for a driver to perceive and react to an unexpected event. Further, higher speeds result in larger kinetic energy transfer to the human body during a crash, leading to more severe crash outcomes.




According to the World Road Association (PIARC) Road Safety Manual, the distinction of what makes a safe speed varies by crash type.[10] Vulnerable road users (VRUs) such as pedestrians and bicyclists have the best chance of surviving a crash at impact speeds of 18 mph or less. Passenger car occupants involved in angle crashes or head-on crashes have the best chance of surviving at impact speeds of 31 mph and 43 mph or less, respectively.

Figure 8-10: Maximum Survival Speed by Crash Type

Driver speed is a psychological factor and driver, vehicle, roadway, and environmental characteristics are all factors that influence driving speeds. This Focus Area promotes roadway infrastructure design elements that encourage lower speeds, thus reducing crash risk and severity. Because Colorado's crash report does not provide detailed roadway characteristics, a crash summary is not available for the Speed Management Focus Area.

Most drivers will select a speed they consider appropriate for the conditions. This decision is dependent on several factors, including the driver's perception of risk, traffic flow (i.e., the speed of other vehicles around them), and road design. Specific roadway design characteristics that influence driver speed choice include cross-sectional elements (e.g., number of lanes, lane width, shoulder width, and median type), access point density and intersection spacing, horizontal curvature, vertical grades, roadside conditions, and sight distance.

10 The Safe System Approach," The Safe System Approach | Road Safety Manual - World Road Association (PIARC), accessed December 13, 2024, https://roadsafety.piarc.org/en/road-safety-management/safe-system-approach.

Roadways have two primary transportation functions: mobility and access. Roadway classification describes where different categories of roadways fall within these functions. Very high mobility roadways (e.g., freeways and expressways) permit less access to adjacent land while minor roads (e.g., residential local streets) have much lower mobility but a high level of access. Arterials and collectors fall between these two extremes with arterials providing a higher level of mobility and collectors providing a higher level of access.

Principal Arterial and Minor Arterial roadways account for nearly 60% of all fatal crashes (Figure 8-11), while only accounting for 40% of the total vehicle miles traveled (VMT). Crashes on these roadway types are disproportionately high when exposure is considered. In Colorado, interstate highways account for 15% of all fatal crashes, while accounting for 28% of all VMT. On a miles traveled basis, interstate highways are safer than arterials. The Principal Arterial and Minor Arterial roadway environment and how it contributes to speeding and other crash contributing factors are key subjects of this Focus Area.

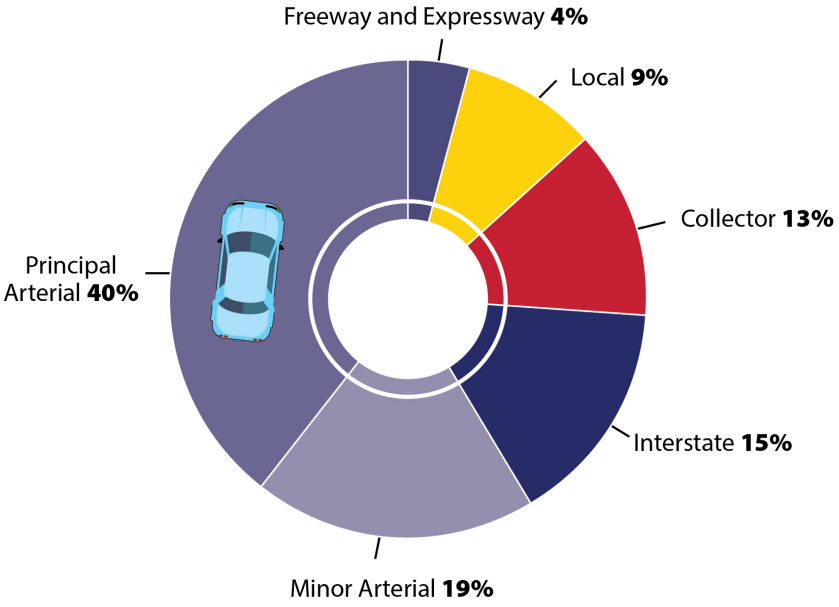



Figure 8-11: Fatal Crashes by Roadway Classification

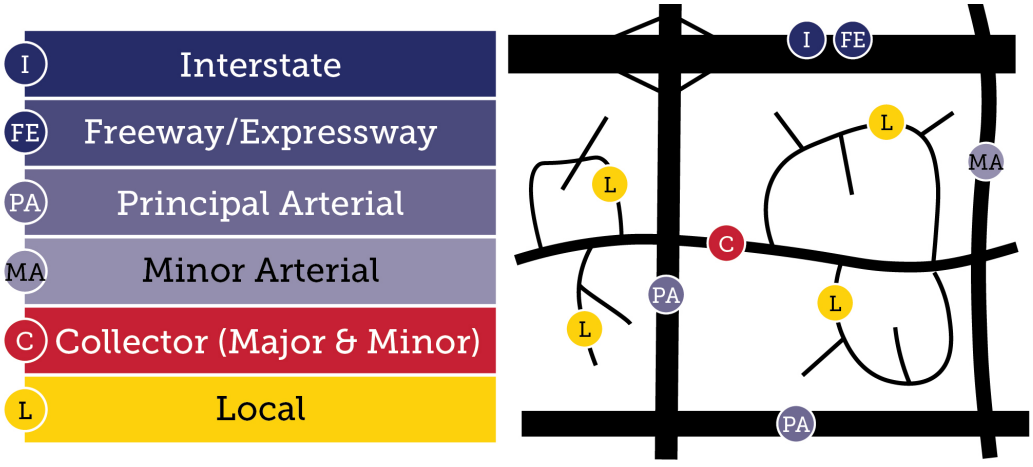



Figure 8-12: Typical Features of Roadway Functional Classifications

## Speed Management Strategies

### SR10: Promote appropriate speeds

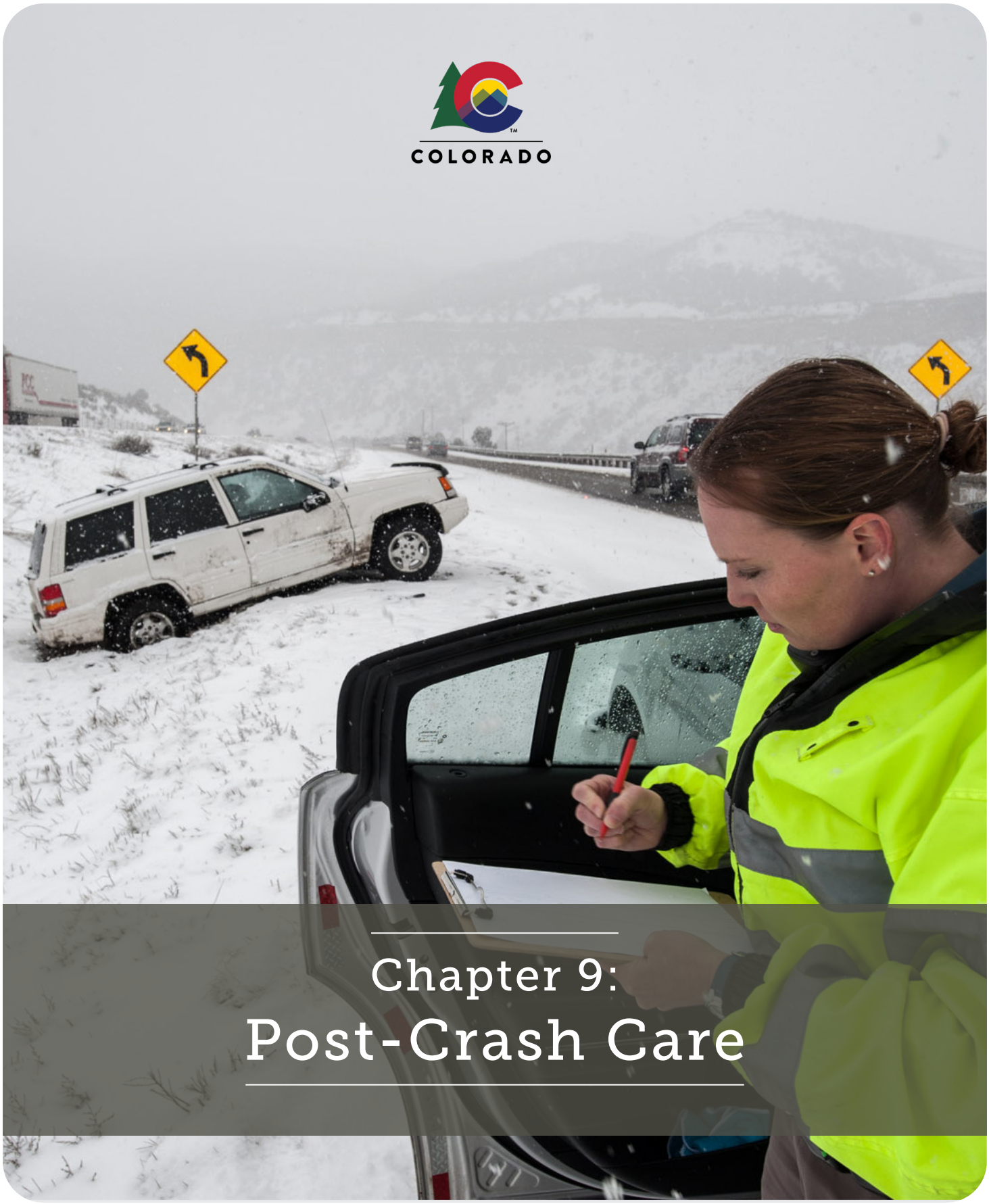
**Modify the transportation system to promote appropriate vehicle speeds at locations where higher speeds contribute to severe crashes.**

Higher speeds carry more kinetic energy and decrease response times by drivers, which results in higher crash severities, especially in crashes involving VRUs. This strategy considers the design of the roadway environment and how it contributes to driver behavior. The goal is to implement transportation system improvements that encourage safer speeds. Some examples include bump-outs where there are pedestrian crossings or narrowing the perceived width of a roadway on high-speed segments.

### SR11: Set safe and realistic speed limits

**Set safe and realistic speed limits by considering contextual factors such as road function, land use, traffic volume, active transportation activity, crash history, environmental conditions, and road design.**

This strategy encourages the use of context-sensitive speed limit setting practices. Context-sensitive speed limits consider factors such as road function, land use, traffic volume, pedestrian activity, crash history, environmental conditions, and road design. While lower speed limits generally improve crash outcomes, areas where drivers feel comfortable traveling at higher speeds require careful consideration to prevent speed differentials that contribute to increased crash risk.



# Chapter 9:
# Post-Crash Care


# Introduction

Post-Crash Care refers to the collective ability to increase survivability of crashes by responding to crashes in a timely manner, minimizing the severity of injuries, preventing secondary crashes, and providing a safe environment for those responding to crashes. All actions in providing effective care for the injured are time-sensitive, starting with activating the emergency care system, continuing with care at the scene, then transporting to a health care center, and finally caring for the victim(s) at the medical facility.

## Focus Areas

Post-Crash Care includes two Focus Areas:

Emphasis Area:

**Post-Crash Care**

Focus Areas:

**Traffic Incident Management**

**Emergency Medical Services**

Strategies in the Post-Crash Care Emphasis Area address both Focus Areas.

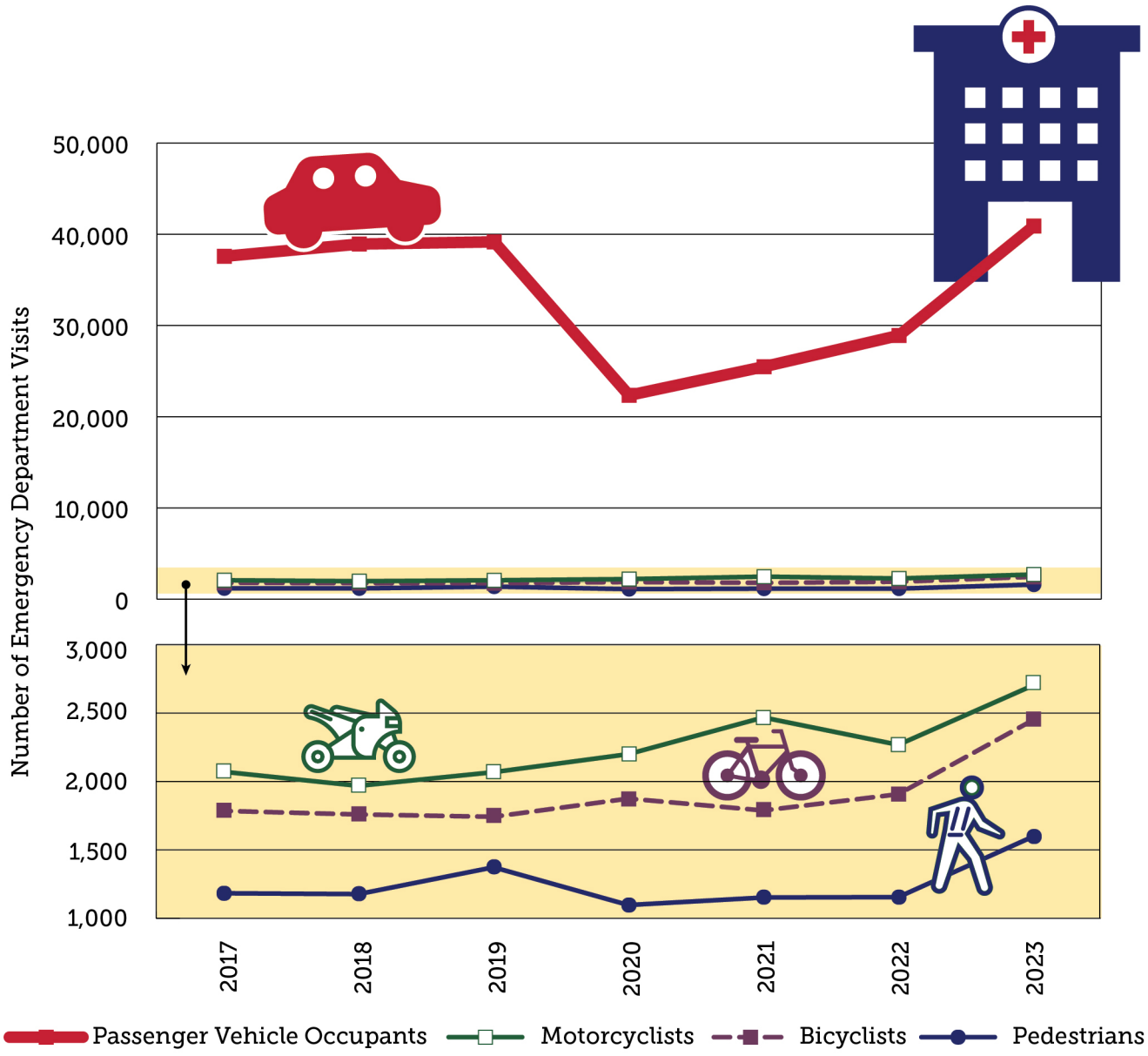



Figure 9-1: Emergency Department Visits by Mode (Source: CDPHE)

According to Colorado Department of Public Health and Environment (CDPHE) data, the number of emergency department visits from roadway crashes have steadily increased across all modes, but particularly for pedestrians, bicyclists, and motorcyclists. From 2017 to 2023, the number of emergency department visits increased by 35% for pedestrians, 37% for bicyclists, and 31% for motorcyclists. In comparison, the number of visits for passenger vehicle occupants increased by 9% over the same period.

## Traffic Incident Management

Traffic crashes happen daily on Colorado's roads, necessitating a coordinated effort from all first responders including law enforcement, emergency medical services (EMS), and towing companies to manage the aftermath safely and efficiently.

These teams collectively engage in Traffic Incident Management (TIM) with the objectives of reducing crash duration, restoring normal traffic flow, and maintaining safety at the crash scene. According to crash data, there were 4,679 secondary crashes in Colorado from 2021 to 2023, resulting in 177 serious injuries and 28 fatalities. A secondary crash is defined as a crash occurring within an incident scene area or within a traffic queue, including the opposite direction, resulting from an original crash. Such crashes are particularly dangerous for crash response teams.

To improve safety at crash sites, Colorado is actively enhancing training programs, expanding the use of technology for better communication with drivers and responders, and increasing public awareness through campaigns. Colorado has a statewide TIM program to coordinate efforts and to facilitate continuous dialogue on best practices.

## Emergency Medical Services

The effects from a crash linger well beyond the initial impact. EMS are vital in this life-saving process through rapid response and appropriate care.

According to 2018-2022 data from the Fatality Analysis Reporting System (FARS) published by the National Highway Traffic Safety Administration (NHTSA), 60% of fatalities from Colorado crashes died at the scene, while five percent died en route to medical services, and 35% succumbed to their injuries later. Immediate medical intervention is critical, as it often determines whether a crash results in an injury or escalates to a fatality.

To deliver the highest standard of care and minimize injury severity and long-term costs, it is essential that EMS systems are adequately staffed and equipped. According to the CDPHE, 911 response calls increased 13% from 2019 to 2022, and interfacility transport has increased by 17%, both of which are higher than the 2.9% statewide population growth in the same period. The expansive geography of Colorado and the disparate density of services between urban and rural regions result in a wide variability in response time and consistency of care. Enhancing EMS effectiveness involves developing a comprehensive trauma system, elevating the level of care provided by trauma centers, and standardizing EMS practices to reduce variability in care. Colorado's EMS efforts are led by the State Emergency Medical and Trauma Services Advisory Council (SEMTAC).

## Post-Crash Care Strategies

The following five strategies help to advance the standard of practice for both TIM and EMS activities across Colorado and promote multidisciplinary coordination.

### PC1: Improve collection of post-crash care data

**Improve data collection, analysis, and dissemination procedures to allow for increased integration of data between safety partners.**

Quality data are needed to inform practitioners on the process and outcomes of activities that address post-crash care. Data enables a better understanding of the impact of timely response, quality of care, and adherence to performance metrics. For example, post-crash care practitioners can review 911 data to analyze the elapsed time between notification and the dispatch of field resources. Since agencies vary in size and sophistication, there is a range in data capabilities and metrics across Colorado. Activities for this strategy include examining methods to improve data integration and standardization.

### PC2: Improve quality of care

**Develop processes to improve quality of care for those involved in crashes from onset of crash through treatment.**

Agencies and organizations involved with post-crash care understand the programs and initiatives that need to be performed to improve quality of care; however, implementation is challenging. Documented processes that include prioritized actions and milestones to track progress are needed. The SEMTAC is an existing collaborative group that can facilitate prioritized activities to improve quality of care.

### PC3: Provide education on post-crash care best-practices

**Implement programs to educate practitioners and the public on best practices on post-crash care activities.**

It is important for practitioners to receive the necessary training and education to fully understand the challenges that limit progress on addressing post-crash care and the promising activities that can help to overcome these concerns. Furthermore, education and opportunities to collaborate with other partners can help to identify efficiencies. Organizations like the SEMTAC could help to establish and monitor an improved post-crash care education program.

### PC4: Enhance programs in light of differences in post-crash care outcomes

**Evaluate opportunities to improve post-crash care environment and determine opportunities to enhance programs and activities.**

A major gap in providing quality post crash care is the notable difference between urban and rural areas in the time between a crash and when a victim arrives at a hospital. The remoteness of crash locations and the lower density of EMS providers and facilities in rural areas contribute to longer response times. Activities such as implementing new technologies can help to address these challenges.

### PC5: Support statewide traffic incident management (TIM) activities

**Continue to support statewide TIM activities.**

Colorado has an extensive statewide TIM program that includes activities that provide education and training opportunities, deploy safety patrols, and host an electronic resource library. This strategy focuses on continuing and enhancing these existing activities and strengthening the connection between incident management with the other Emphasis Areas. Education and training also can reduce secondary crashes on the roadway as activities are optimized and resources are shared between agencies and organizations.

EMS professionals are often first responders in emergencies, where they encounter patients suffering from severe trauma, hemorrhage, or other critical conditions requiring immediate medical intervention. Transfusions administered closer to the time of injuries using whole blood increase the chance of survival. Whole blood contains all blood components – red blood cells, platelets, and plasma. The integration of whole blood into pre-hospital care enhances the capacity of EMS to save lives and improve outcomes in emergency situations. Colorado has a Whole Blood Coalition with the mission to implement whole blood programs statewide.


# Chapter 10: Implementation

Effective implementation of the Strategic Highway Safety Plan (SHSP) requires coordination and collaboration among all stakeholders. The SHSP defines a system, organization, and a process to achieve an enhanced level of roadway safety by integrating the work of the disciplines and agencies involved. Strategies and implementation efforts provide a structured framework to integrate efforts from local, county, regional, state, Tribal, and federal agencies, along with private sector and advocacy groups. This multidisciplinary approach unites all stakeholders in a shared mission to enhance roadway safety. This chapter outlines approaches to implementing the SHSP through action planning, collaborating, and monitoring.

# Focus Area Categorization

The SHSP identified Focus Areas that could have the greatest impact on fatalities and serious injuries over the next five years. In this section, Colorado looked deeper at the data trends within individual Focus Areas to identify commonalities that allow them to be grouped into categories to illustrate the underlying trend. The Focus Area categorization helps inform the development of effective actions based on these data trends.

Focus Area categories include:

- **Safety Culture:** Focus Areas that are overarching and aim to grow safety supportive beliefs and behaviors among organizations and the public.
- **High-Impact:** Focus Areas with the highest proportion of fatalities and serious injuries. Effective strategies in these areas will lead to greater impacts in reducing fatalities and serious injuries. Strategies and actions under the High-Impact Focus Areas will prioritize efforts proven to have a positive impact on safety. Engineers, planners, and other stakeholders can look to these Focus Areas to identify opportunities to have the greatest impact on reducing fatalities and serious injuries.
- **Emerging and Monitoring:** These areas are experiencing increasing numbers of fatalities and serious injuries or other external factors such as policy changes or emerging technologies. Strategies and actions under the Emerging and Monitoring Focus Areas will evolve and be more flexible in response to the monitoring efforts. The strategies and actions will also be supported by data-driven successes while also being open to piloting new approaches.
- **Double Down on Success:** Focus Areas where severe crash reduction is actively being addressed, and fatalities and serious injuries are stable or decreasing. These areas may have programs and policies in place or have active stakeholder initiatives supporting safety improvements. The Double Down on Success Focus Area strategies and actions replicate, adopt, and adapt activities with previous demonstrated success in improving safety.

Figure 10-1 illustrates the categorization of each Focus Area. Strategies within each Focus Area align with the overall category to encourage effective and efficient implementation. For example, strategies within Focus Areas under the Emerging and Monitoring category emphasize monitoring data trends and adjusting efforts to reflect the changing landscape of the safety challenges. In comparison, strategies under the Doubling Down on Success category aim to build on previous successes and expand effective programs and projects.

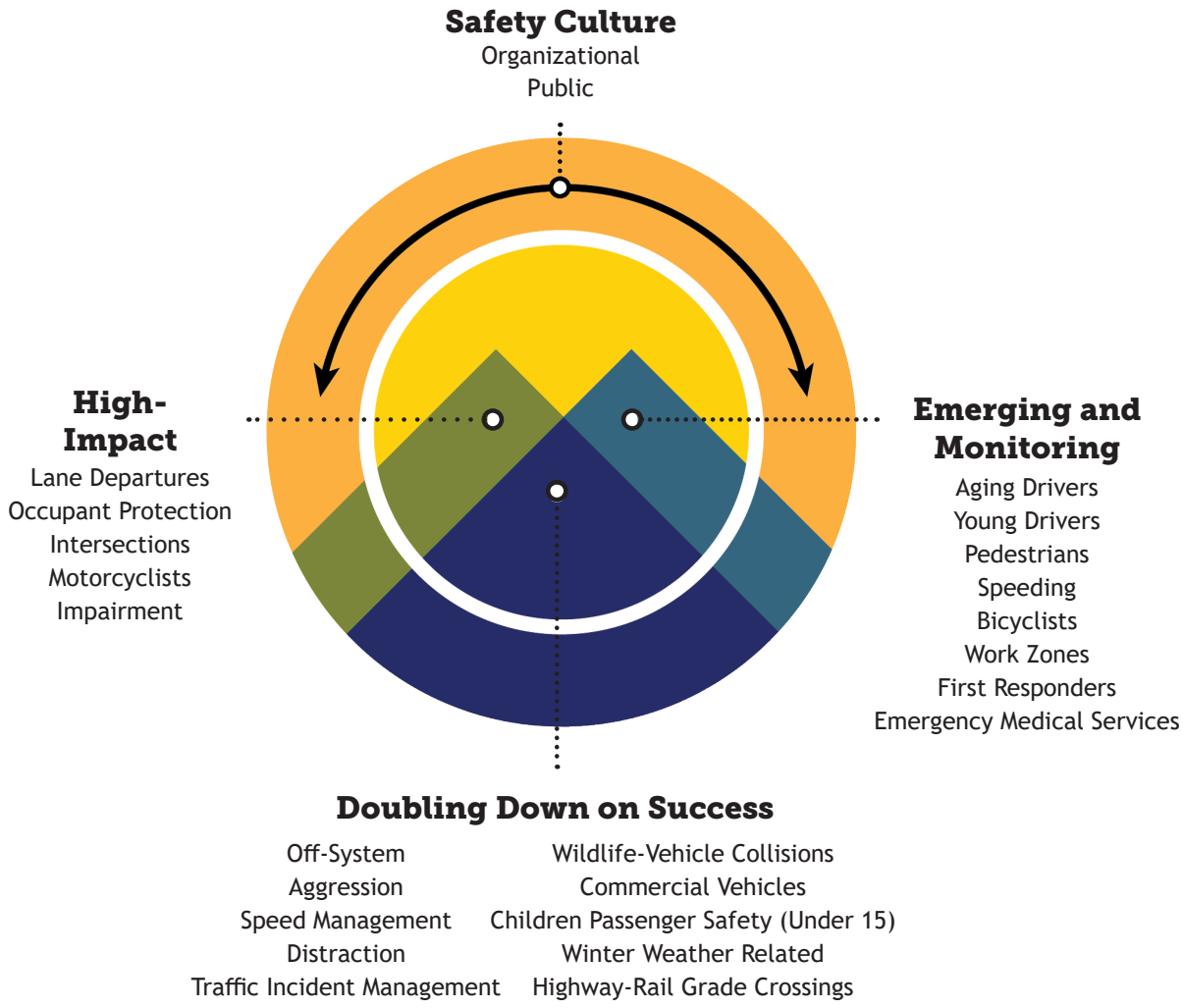



Figure 10-1: Focus Area Categorization

# Action Plans

Successful SHSP implementation will result in transportation safety improvements that save lives and reduce injuries. The SHSP is implemented through the objectives, strategies, and Annual Action Plans developed for each Emphasis Area.

Annual Action Plans are updated through the ATS initiative and identify next steps for selected strategies, assign implementation champions and establish timelines to turn SHSP concepts and ideas into a reality.

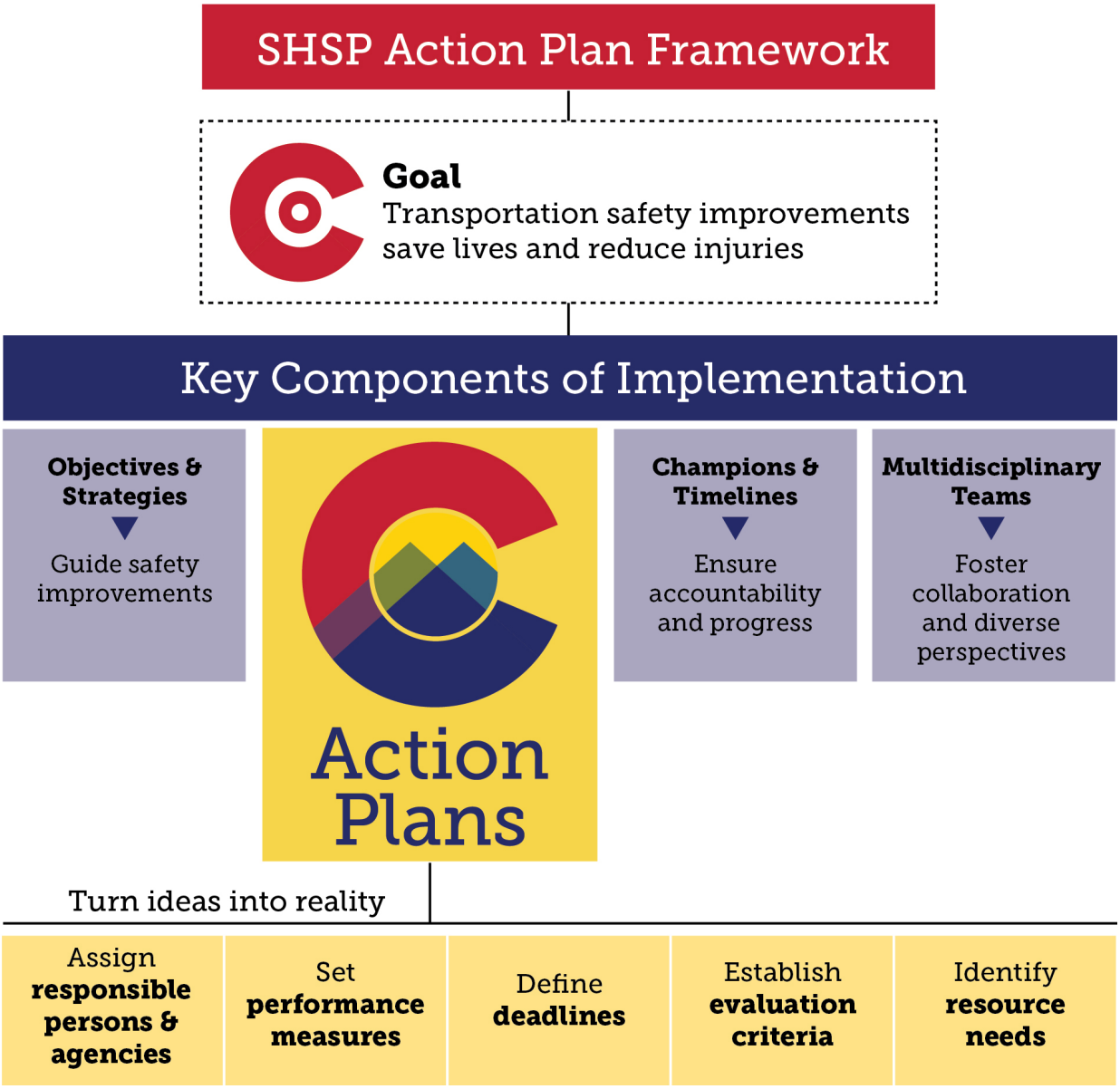



Figure 10-2: SHSP Action Plan Framework

The Emphasis Areas, Focus Areas, and strategies outlined in the SHSP create the framework for reducing fatalities and serious injuries. Action planning transitions from planning to effective implementation. The action planning framework is illustrated in Figure 10-2. The priority of action planning is to advance efforts within each Focus Area to reach the SHSP goals.

Annual Action Plans promote effective and efficient implementation as individual safety improvement actions are refined and improved over time. Changes in transportation safety are often unpredictable and require flexible strategies and actions. The SHSP is updated every five years, allowing five years for potential changes in areas such as legislation, technology, public health, planning and engineering, and best practices. For example, the recent introduction of the Colorado hands-free law, introduced a need for additional education and media outreach.

## Develop an Action Plan

The Advancing Transportation Safety (ATS) initiative develops Annual Action Plans that provide a blueprint for implementation of the SHSP. In order to produce, implement, and refine Annual Action Plans, ATS engages Emphasis Area Working Groups that meet monthly. At quarterly working group meetings, action champions report out on progress of each specific strategy.

The 2025 SHSP's inaugural Annual Action Plan will be informed by members of the ATS Emphasis Area Working Groups and finalized and adopted by the ATS Steering Committee by the end of Federal Fiscal Year (FFY) 2025. The Annual Action Plan is a living document with formal updates and reporting occurring at 12-month intervals over the life of the SHSP. Annual Action Plans will include assessment of strategy readiness and identification of funding sources, resources available, cost effectiveness, champions, inter-agency partnerships, performance measures, and timelines.

When identifying actions, ATS establishes the following:

» **Champion(s): Determine the stakeholder(s) to lead or support implementation.**

This process requires ATS members to identify which individuals will be responsible for a specific strategy or action.

» **Partnerships: Determine the long-term 'owner(s)' of the strategy.**

Many of the strategies selected for implementation benefit from collaboration across organizations and agencies. Members of ATS enlist support for the Champion(s) during implementation, often based on historical partnerships and shared safety improvement priorities. Other agencies may advance strategies independently through their own strategic planning or programming. In such cases, ATS maintains communication with the lead agencies to collect periodic updates and tracking information. Identifying who is the long-term owner and engaging them early fosters sustainability.

» **Effectiveness: Determine the potential impact on fatalities and serious injuries.**

The ATS initiative identifies the potential impact of each action on SHSP overall goals and Focus Area goals, and the cost-effectiveness of each action. Cost-effectiveness evaluations weigh the expense of implementing an action against its effectiveness in reducing fatalities and serious injuries measured in monetary terms using approved data sources, like Federal Highway Administration's (FHWA) Proven Safety Countermeasures, National Highway Traffic Safety Administration's (NHTSA) Countermeasures that Work, and the CMF Clearinghouse as well as evaluation results from peer states. For HSIP and other safety funding programs, formal cost-effectiveness of individual projects is developed at the time of grant application following the Benefit Cost Analysis (BCA) processes outlined in those programs. ATS also develops theories of change that define the needed skills/knowledge/beliefs and behaviors to achieve the desired outcomes, increasing the likelihood of timely and effective implementation.

» **Level of Effort: Determine the ease of implementation.**

This includes identifying the resources in place to support implementation or identifying and characterizing current and future challenges. Resources may include funding streams, staffing availability, policies, and political will.

The Annual Action Plans compile inputs for the above elements and determine a Readiness Score for implementation of SHSP strategies. The resulting scores identify strategies with the structures in place for immediate implementation and the greatest impact.

Strategies may also be categorized as mid-term (two-to three years) and long-term (four to five years). For example, mid-term strategies have supporting elements, such as proven effectiveness, but lack sustained champions or resources. Actions for mid-term strategies may focus on securing needed resources or selecting a champion to increase the strategy's readiness. Actions for long-term strategies may include additional groundwork such as identifying financial support, educating stakeholders, growing support among leaders, and identifying potential champions.

The ATS Annual Action Plan process allows the ATS to codify a focused implementation roadmap that stays current and adapts over the five-year implementation period of the SHSP.

## Action Plan Reporting and Evaluation

Led by the groundwork conducted to measure strategy readiness and identify powerful actions, Annual Action Plans and Annual Reports serve as the mechanism to report and measure success in SHSP implementation. Annual Reports evaluate the current status of actions within each strategy, and analyze data to determine progress on the performance measurement targets identified in the SHSP at the Focus Area and Statewide levels. Annual Reports are utilized by the Emphasis Area Working Groups and Steering Committee to develop and refine the subsequent Annual Action Plan. Annual Reports will be completed alongside development of the Annual Action Plan.

Regular meetings with ATS members provide an opportunity for reporting on the progress of assigned strategies and actions, supporting continuous improvement and collaborative problem solving. Additionally, Annual Action Plans evaluate the effectiveness of ATS, identifying which strategies and actions were successfully implemented and which outstanding strategies and actions need to be incorporated into the next year's Annual Action Plan.

This evaluation process also provides opportunities for action items to be reassigned, redirected, or removed. Implementation efforts are intended to be flexible to reflect the changes and progress in highway safety-related challenges. Annual Action Plans are nimble and proactive, allowing for ATS and other partners to take on strategies and action items suitable to the implementation environment. Successes illuminate opportunities to double down on what works—both continuing along the forged path as well as applying new concepts to other Focus Areas to test applicability. Challenges or setbacks are opportunities to learn, adjust, and try again.

Readiness Score: Members of ATS review strategies for existing partnerships, anticipated effectiveness, estimated level of effort, and existing champions. The exercise results in a Readiness Score that identifies strategies best primed for early implementation. Annual Action Plans document this process annually to identify the strategies ready for implementation each year.

## Promote Additional and Alternative Strategies

While the SHSP is intended to be a holistic roadmap for saving lives, not all elements of traffic safety are featured explicitly within the plan or its strategies. The SHSP prioritizes areas where the State of Colorado can see the largest improvement in safety, and while these are crucial for realizing the SHSP Vision, the plan recognizes that other smaller or tangential efforts also contribute to reducing fatalities and serious injuries.

There is flexibility within SHSP implementation to adapt to new and changing priorities, specifically in support of proven countermeasures, programs, and policies. Implementation efforts are not limited to the strategies identified in the SHSP. The SHSP encourages safety partners to promote and implement strategies to advance transportation safety across the state, including innovative strategies. The SHSP is a tool for identifying regional challenges and expanding opportunities to implement data-driven solutions.

## Align With Regional and Local Safety Planning Efforts

The SHSP's Vision and Mission recognize that achieving zero fatalities and serious injuries requires collaboration with agencies and partners across Colorado. Aligning regional and local safety planning efforts with the SHSP furthers the Safe System Approach tenet that responsibility is shared. Regional and local jurisdictions are encouraged to participate in statewide safety planning initiatives such as ATS, Emphasis Area Working Teams, the Safety Summit, transportation safety task forces, and support safety related legislative efforts. The Statewide Safety Champion, ATS, and Safety Circuit Rider Program are resources for local and regional safety improvements and strategy implementation.

## Identify Funding and Resources

The SHSP must be updated every five years to maintain Colorado's eligibility for federal Highway Safety Improvement Program (HSIP) funding. Each state receives HSIP funds to implement safety programs and projects to improve safety on their roadways. In turn, each state must submit an annual report summarizing the implementation and effectiveness of those safety programs and projects. Colorado's safety expenditures are not limited to HSIP funds, and this section outlines funding resources local agencies can use to address the safety Focus Areas in this plan.

While HSIP funding supports infrastructure improvements, NHTSA focuses on human behavior-related safety initiatives. NHTSA requires Colorado to submit a Triennial Highway Safety Plan (3HSP) and promotes highway safety awareness programs and initiatives. The SHSP's safety priorities align with both the HSIP and 3HSP. Related NHTSA safety improvement initiatives include Section 402 and Section 405 funding programs.

Local agencies can apply for several discretionary grants based on community needs. The Infrastructure Investment and Jobs Act (IIJA) established the Safe Streets and Roads for All (SS4A) program, allocating $5 billion from 2022 to 2026. Communities receiving SS4A grants are first tasked with developing a safety action plan and can then apply for implementation grants.

Additional discretionary grants are available to improve transportation safety, including Safe Routes to School, Infrastructure for Rebuilding America (INFRA) Grant Program, Railroad Crossing Elimination (RCE) Grant Program, and the Tribal Transportation Program Safety Fund (TTPSF). Colorado's Local Technical Assistance Program (LTAP) offers assistance with securing funding for local roadway safety improvements.

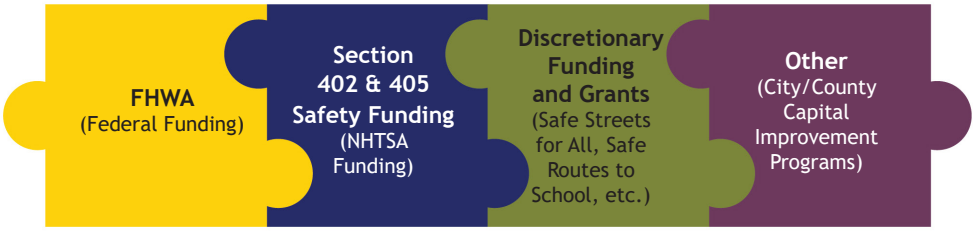



Figure 10-3: Grant Funding Programs and Sources

# Implement the Safe System Approach

The implementation process utilizes the Safe System Approach (SSA) as a guide for holistic safety improvements across Colorado. The SHSP and identified strategies reflect the needs within the Safe System elements (Safety Culture, Safe Driving, Safe People, Safe Roads, Post-Crash Care) and implementation processes will rely heavily on realizing the principles of the SSA. The mechanisms for realizing these principles are highlighted below.

## Death and Serious Injuries are Unacceptable

Implementing the principle that "Death and Serious Injuries are Unacceptable" in Colorado requires a comprehensive vision centered on zero traffic-related fatalities and serious injuries. Each Focus Area within the SHSP sets targets to contribute to the overall goal, with the High Impact Focus Areas having the greatest potential to reduce fatalities and serious injuries. Assessing the effectiveness of these strategies is crucial, and the ATS Annual Action Plan Readiness Score is an essential tool in this regard. Strategies with high Readiness Scores may have success in reducing crash severity and frequency in the near term, subject to sustainable funding and staffing. By focusing implementation efforts on strategies that have a high Readiness Score, Colorado capitalizes on efforts likely to yield "quick wins," while simultaneously working to improve the readiness of equally important longer term strategies.

## Humans Make Mistakes

This SSA principle involves designing and operating a transportation system that accommodates human errors, preventing common mistakes from leading to deaths or serious injuries. Recognizing that mistakes are inevitable, the SHSP strategies and actions focus on creating forgiving road environments that increase safety redundancy and minimize the consequences of human errors. This involves implementing roadway infrastructure that prevents or minimizes the impacts of crashes if mistakes do occur and exploring advanced technologies to assist roadway users and operators. Colorado's approach is adaptive and reflects regional needs—whether addressing the high speeds common in rural areas or managing the high volumes of pedestrians and bicyclists in urban areas. By integrating these safety measures and applying a data-driven approach, Colorado remains committed to a context-sensitive approach that includes redundancy to prioritize human life when mistakes occur.

## Humans are Vulnerable

Recognizing that human bodies have finite tolerance for crash forces, the SHSP addresses separating users in time and space and reducing speeds and speed-related behaviors to minimize the impact of

crashes and increase chances of survival. Infrastructure design, lighting, advanced technologies, road signage, and other improvements included in the SHSP improve safety for all users with an emphasis on Colorado's Vulnerable Road Users (VRUs) including pedestrians, bicyclists, and older road users. The state aims to build a transportation system inherently protective of human life and resilient to human vulnerabilities, so that even in the face of errors, fatalities and serious injuries are significantly reduced.

## Safety is a Shared Responsibility

Safety is a shared responsibility involving various stakeholders including planners, designers, public health representatives, first responders, the court system, and road users. Each partner has a unique perspective of the larger system. Primary leaders in implementing the SHSP and sharing the responsibility include the ATS initiative, the Statewide Safety Champion, and agency plan signatories.

ATS:

- Led by state agency leaders and comprises federal, state, regional, Tribal, and local stakeholders.
- Evaluates program outcomes annually.
- Establishes policies, reviews progress, addresses challenges, and promotes collaboration.
- Develops and implements annual action plans for implementation of SHSP strategies.
- Meets regularly to track progress and develop performance measures.
- Provides quarterly progress reports and recommendations to the ATS Steering Committee and to CDOT's Transportation Safety Sponsor Committee.

### Organizational Safety Culture: Transportation Safety Sponsor Committee

The Transportation Safety Sponsor Committee, led by CDOT's Chief Engineer, is a committee of CDOT leaders committed to improving traffic safety and fostering safety culture at the organizational level. It is composed of CDOT executive leaders such as the Deputy Director, Chief of Staff, Regional Transportation Directors, and Division Directors for Maintenance and Operations, Communications, and the Office of Transportation Safety. Staff from various CDOT divisions involved in safety give regular updates and receive guidance from the committee.

Statewide Safety Champion:

- Manages SHSP coordination and evaluation.
- Serves as the communication link between the ATS Steering Committee and Emphasis Area teams.
- Oversees safety events and provides analytical support.
- Reviews progress and coordinates SHSP updates.

Plan Signatories:

- Promote the pillars identified in the SHSP Partner Pledge: Shared Ownership, Mutual Agency, and Accountability.
- Lead strategies and action steps relevant to each agency or organization.
- Engage in events, meetings, and initiatives that support the SHSP's success.
- Provide resources and expertise to advance the SHSP's implementation.
- Advocate for a culture of safety by promoting the SHSP whenever possible.

## Safety is Proactive

Implementing a proactive approach to safety requires forward-thinking strategies that anticipate and address safety risks before they result in crashes. The proactive approach includes continuous monitoring of data trends to identify and address emerging safety challenges promptly, rather than waiting for the next five-year plan cycle. Additionally, the SHSP emphasizes risk-based applications like the early identification of high-risk areas and targeted enforcement campaigns to mitigate specific behaviors such as distracted, speeding, or impaired driving. By creating a dynamic system that quickly responds to new data and evolving conditions, Colorado commits to a safety culture where proactive measures continuously improve road safety and prevent crashes from becoming more severe.

## Redundancy is Crucial

As demonstrated throughout the SHSP, Focus Areas often have overlapping safety concerns and strategies. While overlapping strategies may feel redundant, this redundancy is crucial for maintaining a safe transportation system. If one part fails, other parts of the system can prevent fatalities and serious injuries and fulfill the SHSP Vision. This redundancy is present among SHSP strategies and the bodies responsible for implementation. This principle is best illustrated using the "Swiss cheese model" where elements of the roadway network and contributing factors are aligned in layers. When a gap or failure occurs, the next layer of the system intervenes to prevent the failure from leading to a fatality or serious injury.

In the Swiss cheese model, the risk of a crash occurring can be modeled as a series of slices of Swiss cheese. If each slice of cheese represents a layer of defense (for example, wearing a seat belt, driving defensively, a well-maintained vehicle), then each hole represents a weakness in the system. A fatal or serious injury crash occurs when a hole in each slice momentarily aligns, permitting a system failure to occur. More layers of protection (redundancy) reduces the likelihood of a fatal or serious injury crash.

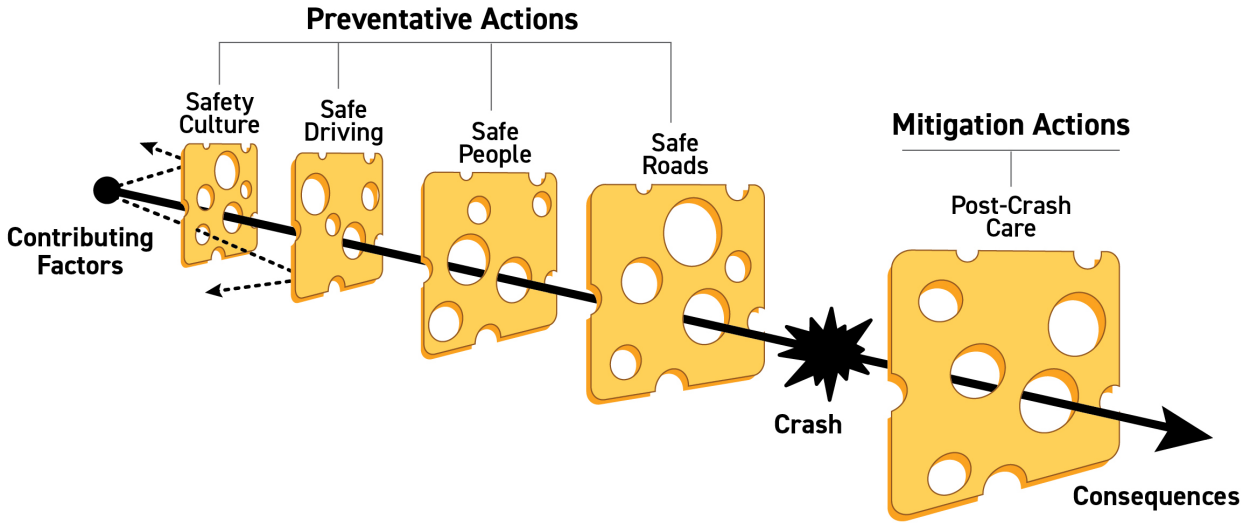



Figure 10-4: Safe System Swiss Cheese Graphic

# Performance Measures and Evaluation

The SHSP aims to reduce fatalities and serious injuries on Colorado's roadways. It sets performance targets for 2025–2029, relying on lead agencies to implement strategies and allocate resources effectively. The SHSP performance measures align with the 10-year Statewide Plan and Policy Directive 14, which identifies a goal of a 5% reduction in fatalities and serious injuries on a year-over-year basis.

The same performance targets apply for all fatalities and serious injuries, including VRUs. Each Focus Area in the plan will be monitored to identify progress and areas needing additional attention.

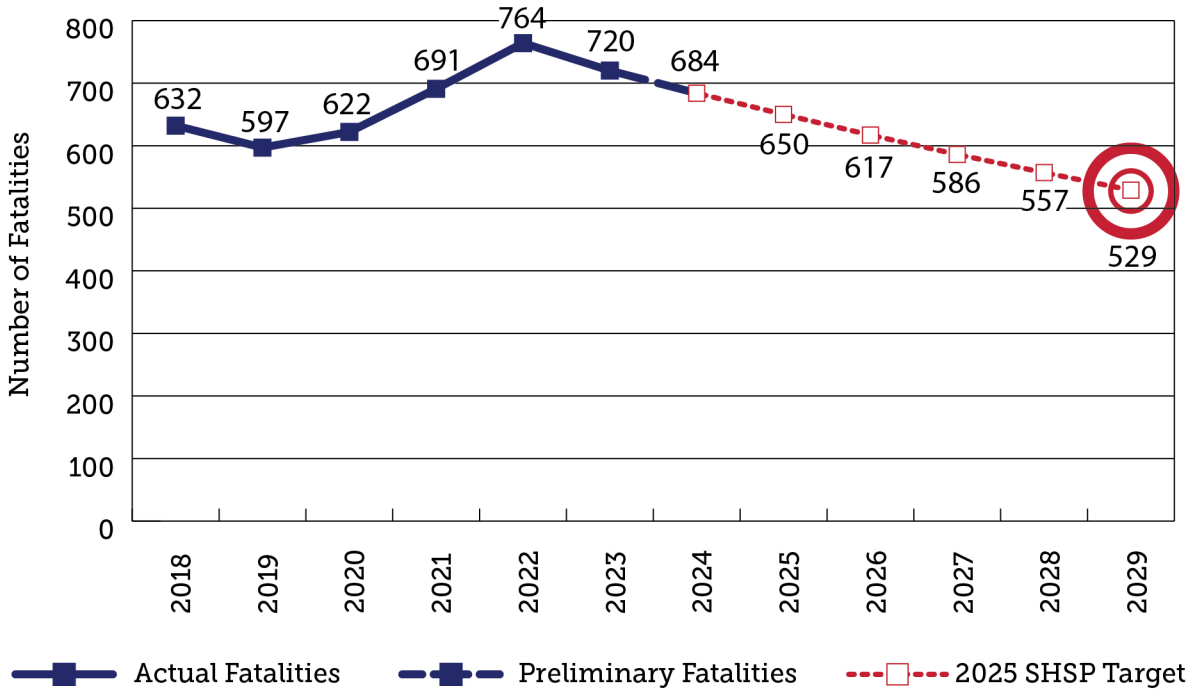



Figure 10-5: Fatalities Performance Measure Goal

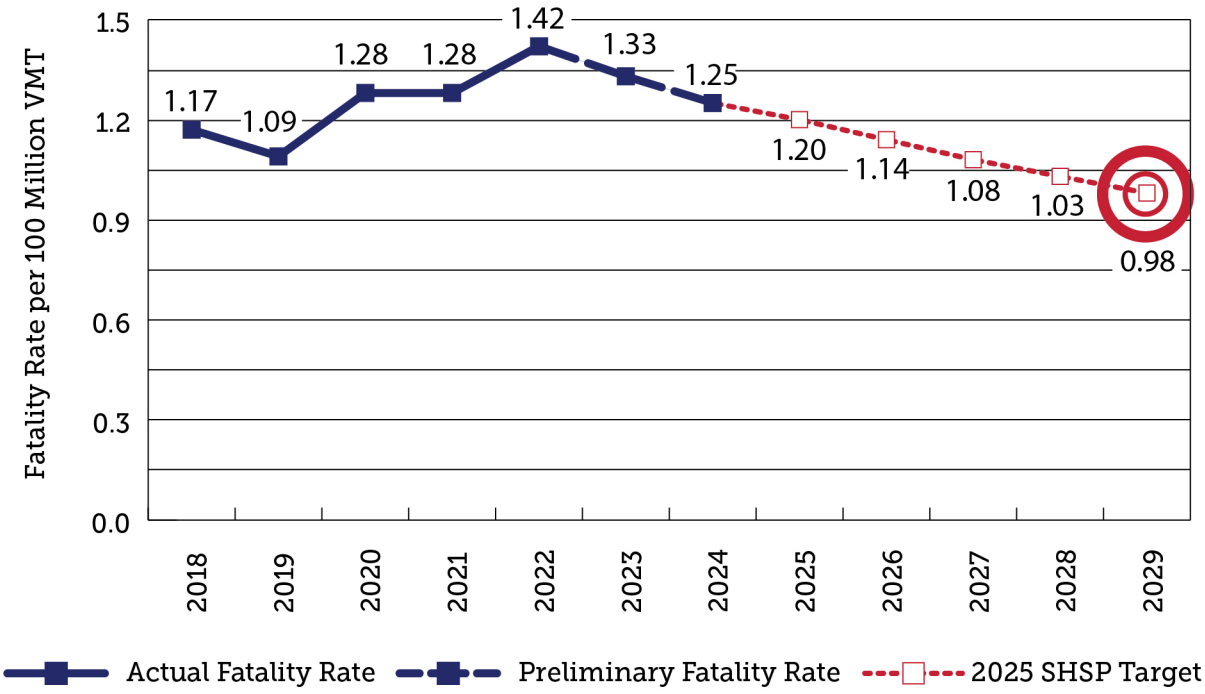



Figure 10-6: Fatality Rate Performance Measure Goal

Note: 2023/2024 VMT Miles not finalized, projected .06% growth rate used.

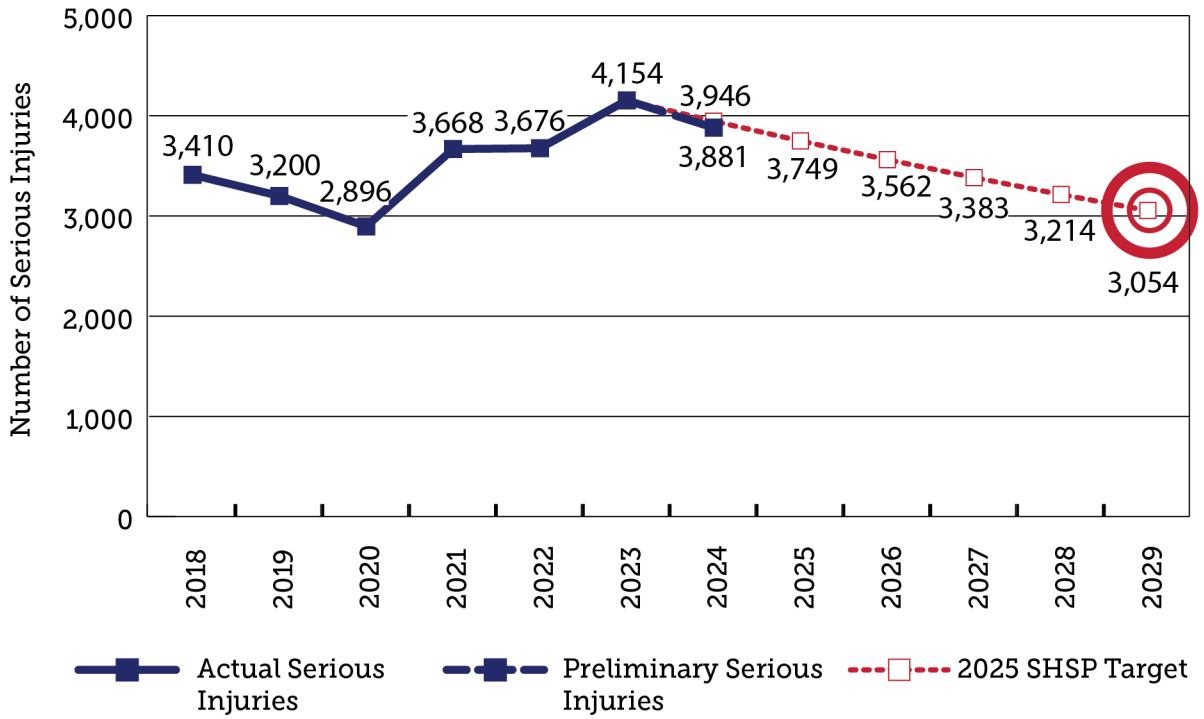



Figure 10-7: Serious Injuries Performance Measure Goal

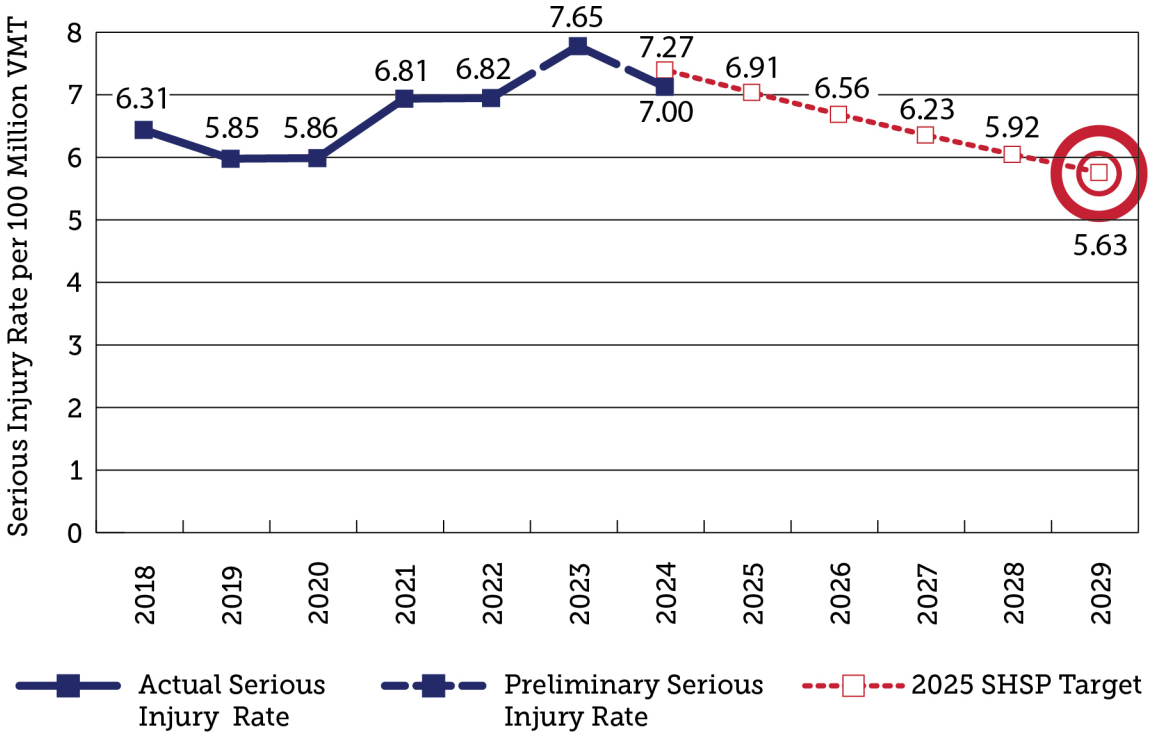



Figure 10-8: Serious Injury Rate Performance Measure Goal

Note: 2023 VMT Miles not finalized, projected .06% growth rate used.

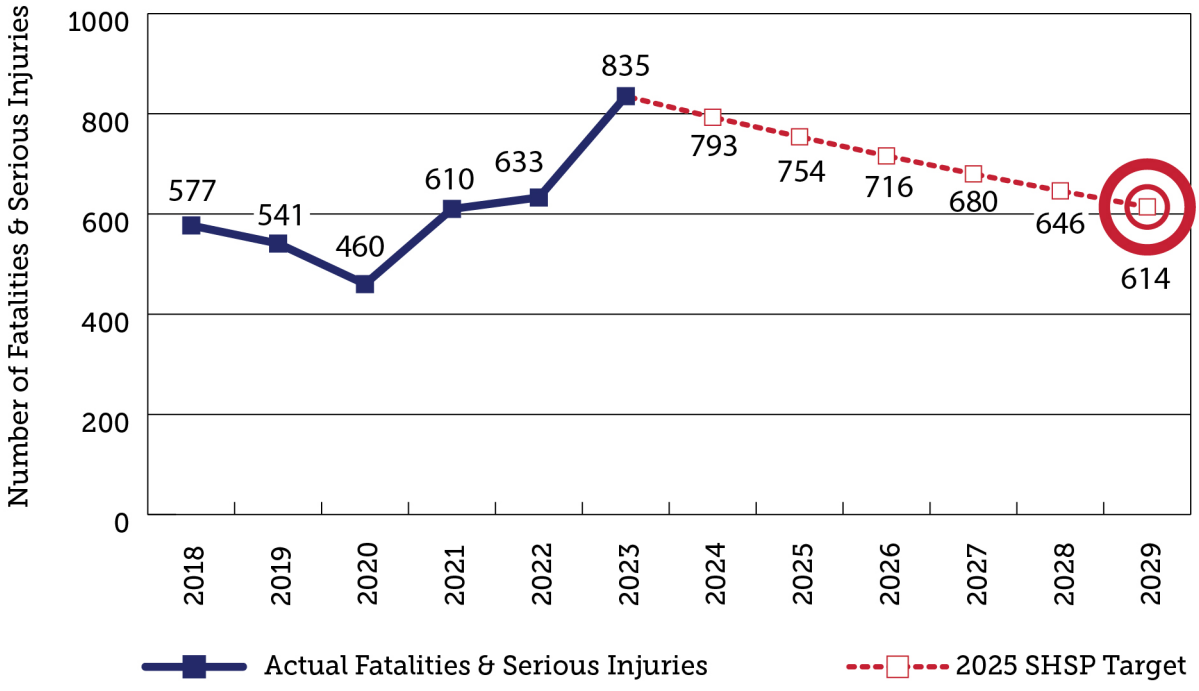
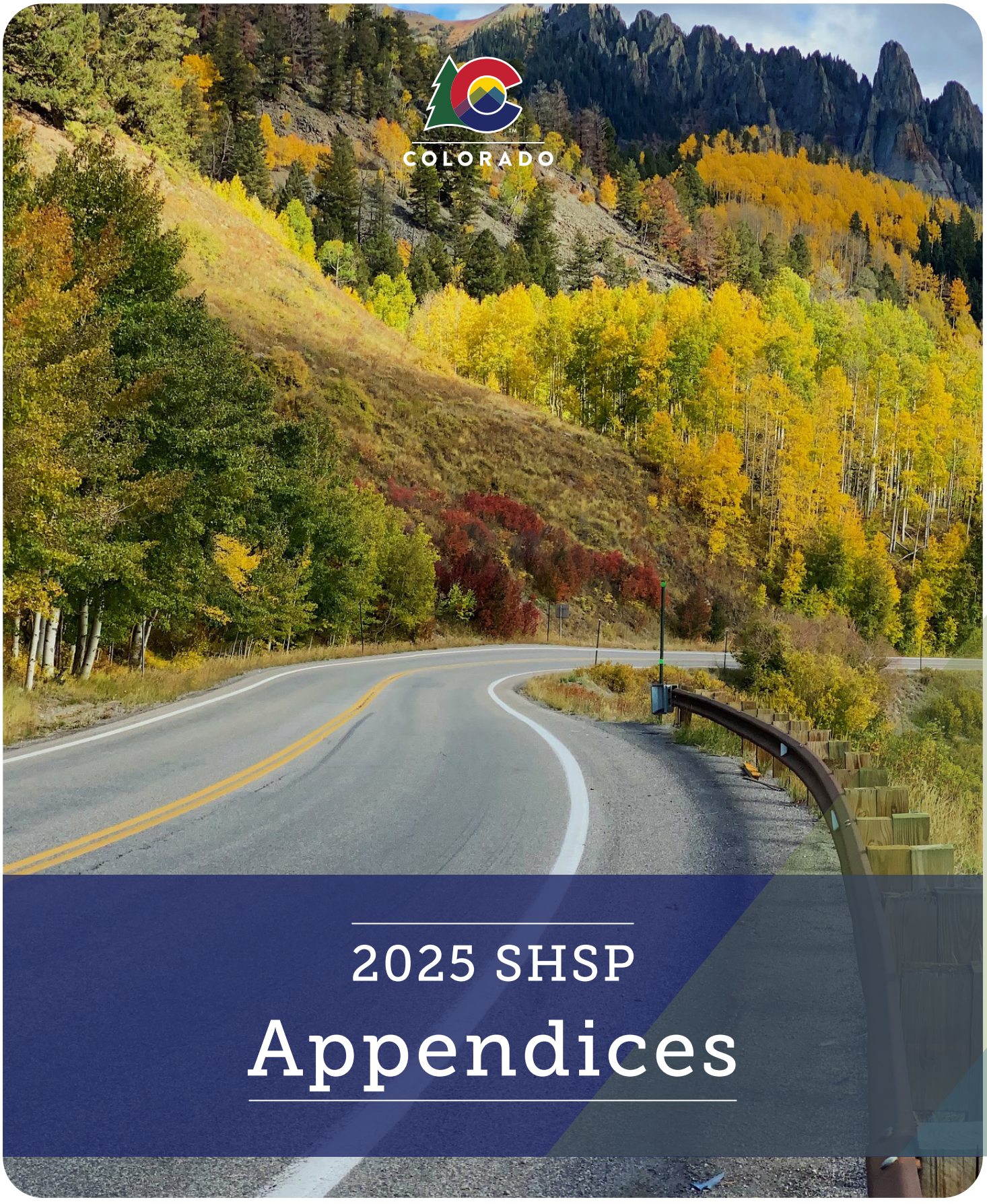



Figure 10-9: Pedestrian and Bicyclist Fatalities and Serious Injuries Performance Measure Goal

## Alignment with Other Performance Measures (WIGS, PD-14, HSP)

Several statewide plans align with the SHSP, reinforcing shared transportation safety goals.

- Wildly Important Goals (WIGs): The Governor of Colorado requires all state departments to establish WIGs. Colorado's WIG for transportation safety aims to reduce traffic fatalities and serious injuries by 22.5% from 2023 to 2027. The WIGs are more aggressive and follow a shorter timeline to coincide with the Governor's term. In contrast, the SHSP has a longer term vision, extending through 2029.
- Policy Directive 14.0 (PD-14): PD-14 establishes the framework for developing and implementing Colorado's 2050 Statewide Transportation Plan and 10-year plan by establishing performance goals and targets to help guide strategic transportation investments, advance transportation safety, fix our roads, and sustainably increase transportation choice.
- Triennial Highway Safety Plan (3HSP): Developed by CDOT's Highway Safety Office, the 3HSP establishes hundreds of performance measures, many of which align with the SHSP. Ensuring consistency between the next major 3HSP update and the SHSP will help unify statewide safety goals.
- Colorado Highway Safety Improvement Program (HSIP) Manual: Developed by CDOT's Traffic Safety Engineering Branch, the HSIP Manual identifies what HSIP is, how to apply for HSIP funds, and how projects will be prioritized to receive HSIP funding. Projects that apply for HSIP funding will be prioritized based on their alignments with the strategies identified in the SHSP and actions identified in the accompanying action plan. This plan and the HSIP Manual work hand in hand to assist agencies in applying for HSIP funds for projects that align with SHSP.




# 2025 SHSP
# Appendices

For more information:

Appendix A: Plan Alignment Exhibit

Appendix B: Strategies Table

Appendix C: Data Sources

Appendix D: Workshop Summaries

Appendix E: Virtual Engagement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