Comprehensive

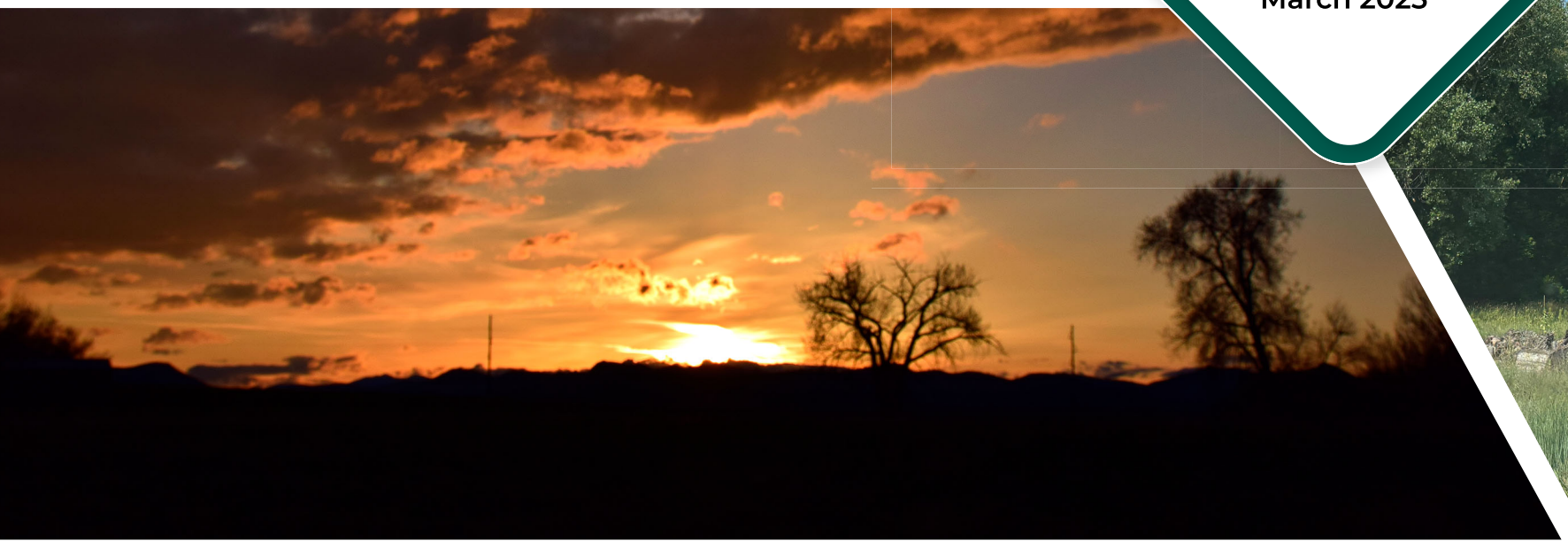
Safety Action Plan

March 2025

LARIMER COUNTY

Larimer on the Move

Safety. Mobility. Connections.



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ZERO is our goal.
A safe system
is how we get there.

1.Introduction

Transportation safety is a critical concern in Larimer County. Our primary goal is to eliminate fatalities and serious injuries as we identify and implement improvements across Larimer County. While the elimination of severe crashes is ambitious, it is attainable through dedicated commitment from a wide range of stakeholders. The **Larimer County Comprehensive Safety Action Plan (Safety Action Plan)** outlines this shared commitment and provides a clear roadmap for creating safer roads throughout unincorporated Larimer County.

This Safety Action Plan focuses specifically on the safety needs of Larimer County's unincorporated areas, and the mainline county roads that are owned and maintained by Larimer County. This plan was developed concurrently with Larimer County's Transportation Plan (Transportation Plan). The two plans are branded as "Larimer on the Move".

Larimer County has a long history of proactive safety efforts, beginning with the collection of crash data in the 1980s to identify safety issues. This was followed by the launch of a low-cost traffic safety program in the late 2000s and the production of an annual safety report starting in 2011.

Through continuous analysis of crash data and trends presented in this plan, we are working to build a vision for safer county roads. The Safety Action Plan is designed to address the unique challenges posed by unincorporated Larimer County's diverse contexts, ranging from the rural plains to mountainous areas to urbanizing areas surrounding the incorporated communities within the county. These area types each present unique safety challenges for the county road network.

To achieve the goal of eliminating fatalities and serious injuries, the Safety Action Plan employs the **Safe System Approach** as the foundation for reaching **Vision Zero**.

Vision Zero

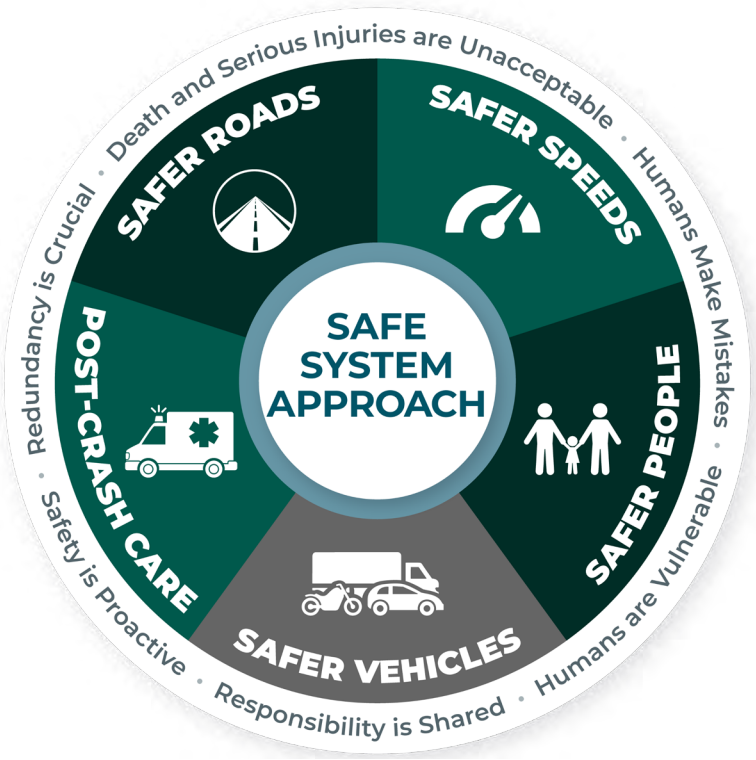
The Safety Action Plan is aligned with the Vision Zero goal and provides an actionable roadmap to eliminate traffic-related fatalities and serious injuries in Larimer County by 2040. Vision Zero aims to create a transportation system that is not only safe but also equitable and considers the safety of all users.

Achieving Vision Zero is a collective effort that requires commitment from each public agency, stakeholder, and resident. Given the scale and ambition of the Vision Zero goal, a structured framework is needed to guide the development and prioritization of projects, policies, and programs. The Safety Action Plan is organized around the five key Safe System objectives, which focus on infrastructure, human behavior, vehicle safety, and emergency response. The Safety Action Plan adopts these objectives as the foundation for its strategies:

- Safer People
- Safer Vehicles
- Safer Speeds
- Safer Roads
- Post-Crash Care

The Plan emphasizes actions to improve road safety, manage speeds, and protect people, recognizing that each of these strategies plays a crucial role in creating a safer, more efficient transportation system.

The specific actions recommended to implement the Safe System Approach and achieve Vision Zero, found in **Chapter 6** of the report, are based on an analysis of crash data, systemic safety issues, and input from the community and stakeholders. These recommendations are also informed by the successful strategies of other Vision Zero communities, ensuring we are building on proven best practices to create transformative changes.



The Safe System Approach

The Safe System Approach is the cornerstone of the Safety Action Plan, offering a comprehensive framework for road safety. This approach prioritizes the prevention of fatal and serious injuries by proactively minimizing crash risks across the entire transportation system, rather than merely responding after the fact. By focusing on high-risk locations, especially those involving vulnerable road users, it ensures safety improvements where they are needed most. The Safe System Approach is built on these essential principles:

- Death and serious injuries are unacceptable.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Safety is proactive.
- Redundancy is crucial.

Traditionally, traffic safety campaigns have focused on human behavior and awareness, often overlooking the critical role that road design plays in safety. Many roads were originally designed to prioritize speed and efficiency for motorists, resulting in wide cross-sections, multiple lanes, high travel speeds, and large intersections in urban and rural areas – features that enhance traffic flow but create safety concerns and discomfort for vulnerable road users. Roads in mountainous areas are often characterized by sharp curves with limited sight distance, steep grades, and narrow shoulders. The Safe System Approach, however, takes a holistic view of safety, recognizing that road design, along with driver behavior, must be addressed to effectively prevent crashes.

The planners, designers, builders, and maintainers of transportation infrastructure bear the responsibility of creating roads that prioritize safety. The U.S. Department of Transportation's (USDOT) adoption of the Safe System Approach sets a national standard for how transportation infrastructure, street design, vehicles, and users should work together to eliminate traffic fatalities and serious injuries. It anticipates human error and mitigates risk through both design and policy.

Related to this approach, the Complete Streets philosophy aims to make streets safer and more comfortable for all users by integrating features that calm traffic and reduce its impact. Traffic calming measures are used to transform roads into safer spaces for everyone. In urban and suburban areas, common traffic calming strategies include curb bulbouts, mid-block pedestrian crossings, and wider sidewalks. In mountainous areas, safety improvements may focus on adding shoulder width where feasible, clear sightlines, wider edge lines, and lower speed limits. By embracing these principles and practices, we can create safer environments for pedestrians, bicyclists, and drivers alike.

Safety at a Glance

Between 2019 and 2023, there were 155 crashes involving fatalities or serious injuries (KSI) in unincorporated Larimer County, resulting in 28 fatalities (from 26 fatal crashes) and 142 serious injuries (from 129 serious injury crashes). Although there has been a slight uptick in fatal and serious injury crashes in recent years, the dataset is relatively small, meaning the increase is modest overall.

The most common cause of these crashes was departing from the roadway and colliding with fixed objects, particularly on curves in mountainous areas. Distracted driving, driver inexperience, speeding, and impaired driving represent significant contributing factors. Additionally, conflicts between different modes of transportation, especially those involving motorcycles, are a concern, with 171 motorcycle crashes in the past five years.

A preliminary review of high-frequency crash locations evaluated the spatial distribution of severe crashes that occurred within the county. **Figure 1** illustrates the crash density for severe crashes occurring at intersections, and **Figure 2** depicts the crash density for severe crashes located on corridors.

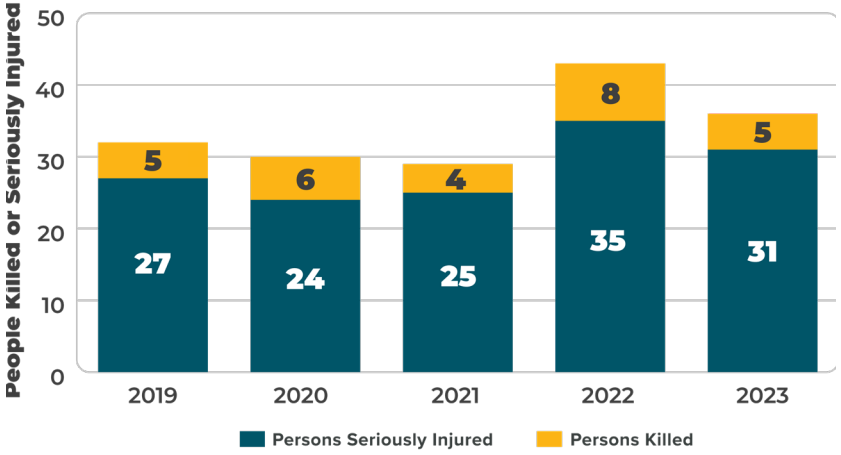


Figure 1. Crash Density of Severe Intersection Crashes

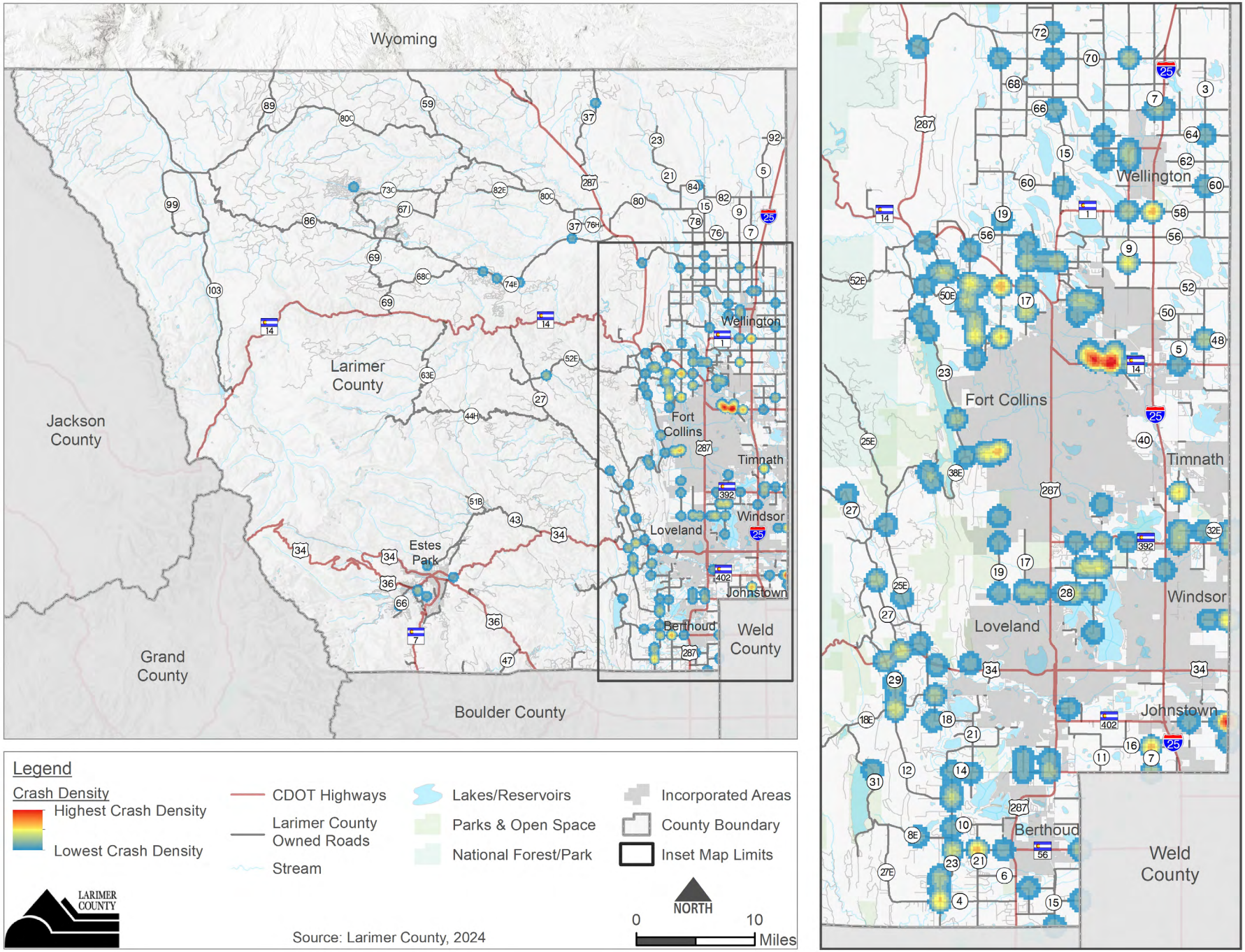
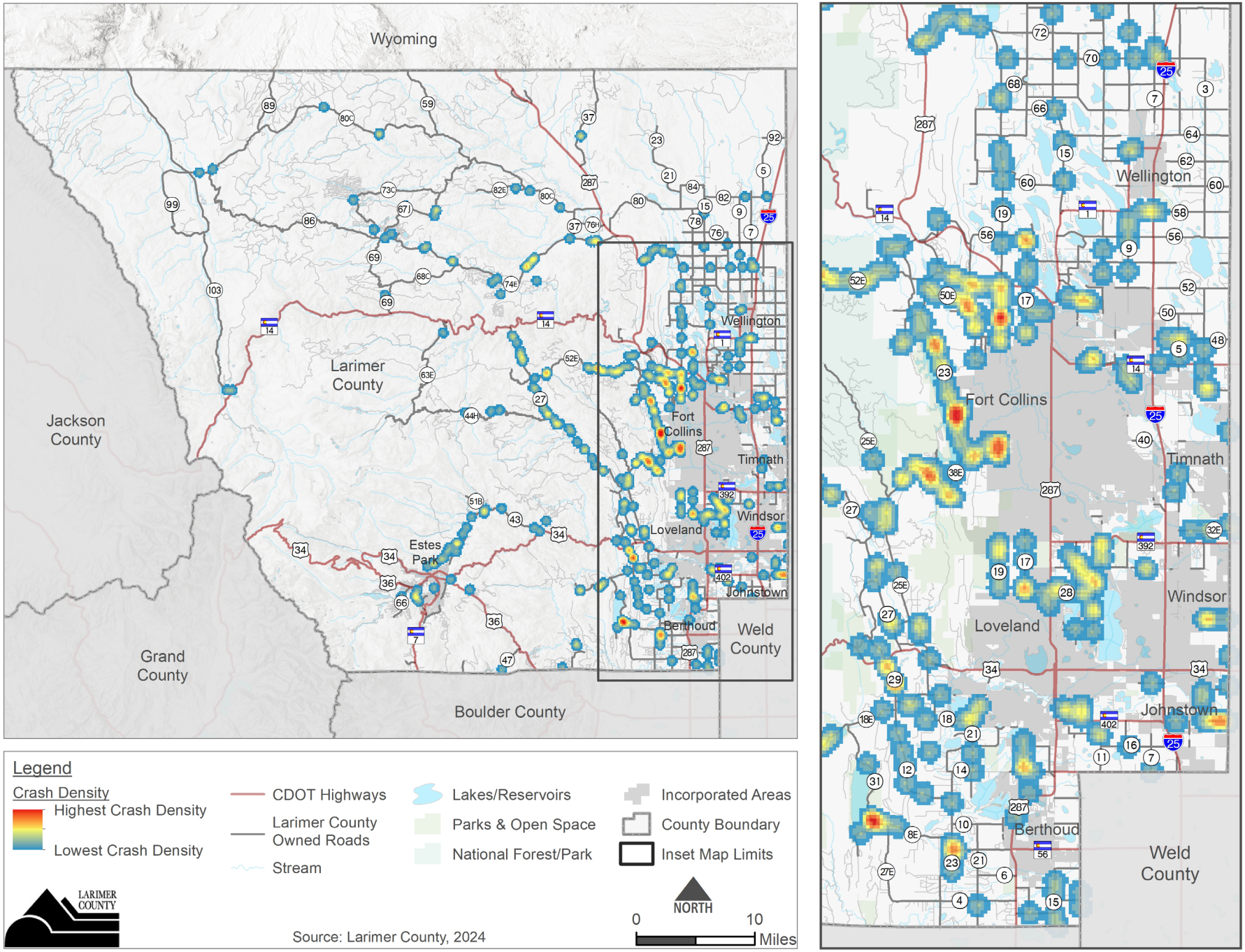


Figure 2. Crash Density of Severe Corridor Crashes



Action Plan Development

The development of the Safety Action Plan is the result of collaborative efforts by a group of core stakeholders. This document outlines leadership's commitment to the Safe System Approach and the process that has brought this plan to life. It highlights the establishment of clear safety goals, the formation of an oversight committee to guide progress, and the County's commitment to eliminating severe crashes.

Leadership Commitment

Larimer County has made a commitment to striving for Vision Zero through the Safe System Approach—a strategy designed to eliminate all traffic-related fatalities and severe injuries across the transportation network. This commitment is rooted in the belief that traffic deaths are preventable and that targeted safety improvements can dramatically reduce fatalities and serious injuries.

The County leadership's dedication to the Safe System Approach and Vision Zero is integral. Clear safety goals established early on serve as a foundation for outreach, messaging, and technical analysis throughout the process. These goals have guided the entire initiative, ensuring that the Safety Action Plan is aligned with the overarching mission of improving safety for all road users.

Oversight Committee

To ensure the Safety Action Plan stayed on track and true to its goals, an oversight committee was formed to monitor progress and build consensus. This committee brought together diverse representatives from across the county, ensuring that the perspectives of all stakeholders were heard and considered. Their involvement guaranteed that the plan remained aligned with the broader commitment to Vision Zero and that all voices had a role in shaping the future of transportation safety in Larimer County.

Vision Zero Commitment Statement

Larimer County will adopt the Vision Zero philosophy and commits to the following:

On roads and sidewalks under the jurisdiction of Larimer County, the goal is to eliminate traffic-related deaths by 2040 and traffic-related serious injuries by 2045.

It is important to recognize that the Safety Action Plan will be a living document, subject to periodic reviews and updates over the next 20 years. As circumstances evolve, the County may adjust these goals and targets to ensure the plan remains relevant and effective. Additionally, in consultation with the Federal Highway Administration (FHWA), the County may amend these goals to better serve the objectives of the Safe System Approach and Vision Zero, ensuring that Larimer County continues to lead the way in road safety.

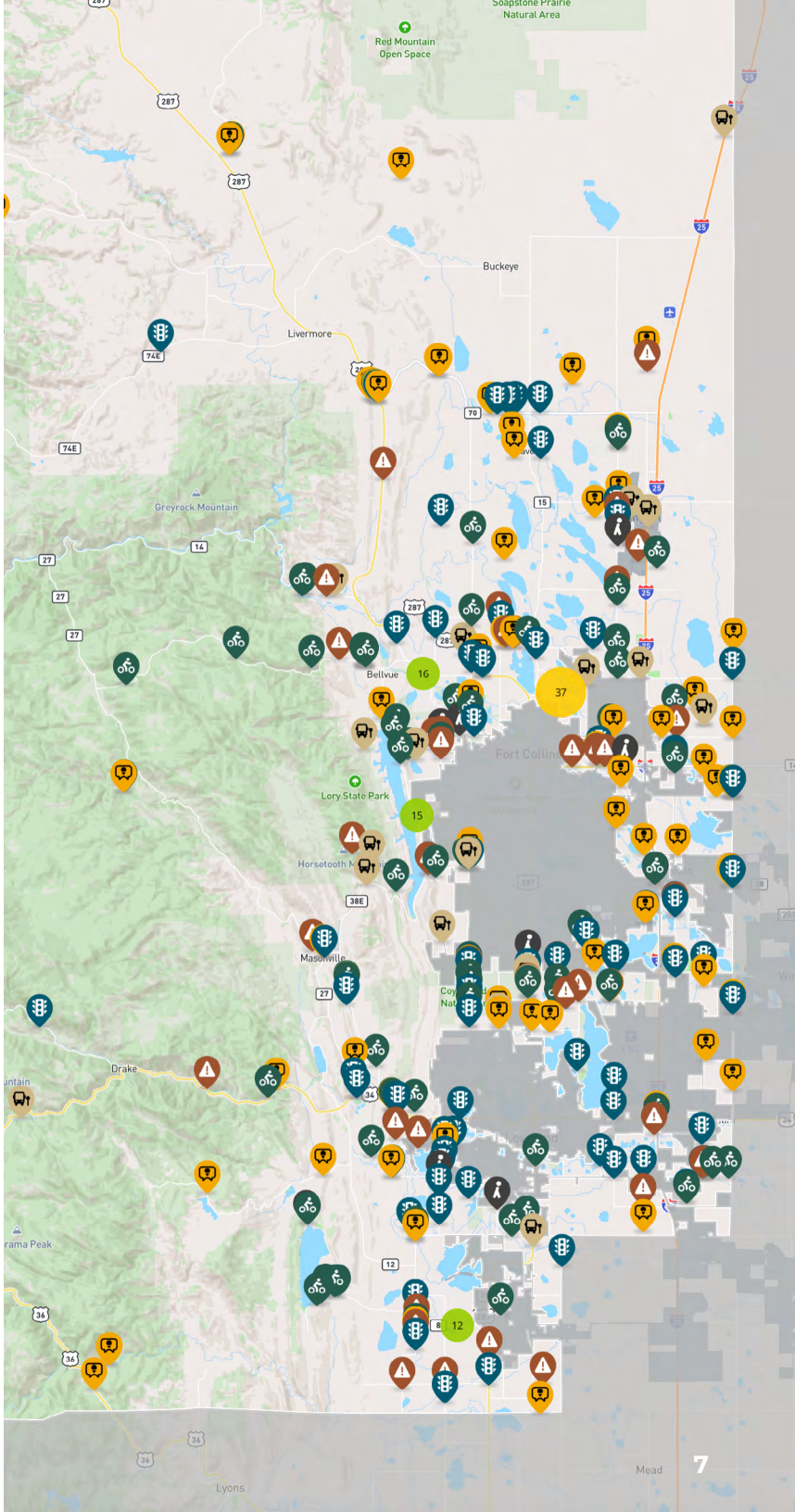
2. Engagement and Collaboration

Public engagement for the Safety Action Plan was concurrent with engagement conducted for *Larimer on the Move*. The engagement focused on gathering feedback from residents to inform the future safety and mobility vision for unincorporated Larimer County. The goals for the level of engagement are to inform and consult the public by obtaining their feedback and educating them about the process and its outcomes. Additionally, the process aims to involve key stakeholders throughout to ensure their concerns and aspirations are consistently understood and considered. Multiple methods were used to engage with the public, including pop-up events, an online map for comments, and a statistically valid survey.

The feedback gathered highlighted key transportation improvement priorities and revealed locationspecific concerns with a focus on safety and related to bicycle and pedestrian infrastructure. The primary objectives of the first phase of engagement were to:

- Establish a vision for future safety and mobility
- Develop relationships with key stakeholders
- Gain insight into public support for safety investments and mobility improvements
- Understand the specific challenges, opportunities, and lessons learned from community partners
- Coordinate a multijurisdictional approach to implementing safety improvements

A broad cross section of the Larimer County community provided feedback during engagement events. One of the project's first point of community contact was through the Equity, Diversity and Inclusion Advisory Board Meeting. In addition, outreach was conducted across the county rather than to help ensure that all County community members had the opportunity to participate in the engagement process.



Methods of Engagement

The engagement events took place from June 26 to August 30, 2024. Notably, events were extended by several weeks to account for communication disruptions caused by the Alexander Mountain Wildfire. This extension ensured the public had the opportunity to participate and allowed for the collection of comprehensive feedback that accurately reflected the community's input. Various engagement methods were used to reach a broad audience.

- **Pop-up Events.** These were held at locations that included Red Feather Lakes, County Fair, LaPorte Community Conversations, Wellington Community Conversations, and Berthoud Market. A total of 135 people participated in these events, contributing to the discussion on transportation needs.
- **Online Map Comments.** An online platform was created for residents to leave location-based comments on transportation needs. Although, the intent of the location-based comments was to collect information specific to the unincorporated road system, there were a number of comments logged that were applicable to roads/streets inside municipal limits. This effort collected 106 comments, complemented by an additional 367 comments from the Transportation Funding Survey, which was conducted in April 2024 and asked similar questions about location-specific issues. Additionally, there were 78 "up votes" and 384 "down votes" on comments, serving as another indicator of participation beyond the total number of comments.
- **Statistically Valid Survey**. The objective of the statistically valid survey was to collect demographically representative, robust travel safety feedback regarding roads managed by Larimer County. The survey used three distinct methods to gather community input: a mail-back option with an online response alternative, text invites sent to registered voters, and an open link promoted by the project team and the county. This survey received 1,125 responses, ensuring representative understanding of community priorities.
- **County Stakeholder Meetings.** The project team attended and presented to various county stakeholders, including the Equity, Diversity & Inclusion Advisory Board, Board of County Commissioners, Environmental and Science Advisory Board, Larimer County Planning Commission, and project Stakeholder Advisory Committee consisting of representatives from partner agencies across the region.

Key Findings

Safety-Related Comment Themes

Based on the analysis of the open comment field, several insights regarding general safety, speeding issues, driver behavior, visibility, and other driving safety concerns in Larimer County can be gathered. **Figure 3** presents a map showing locations of safety concerns.

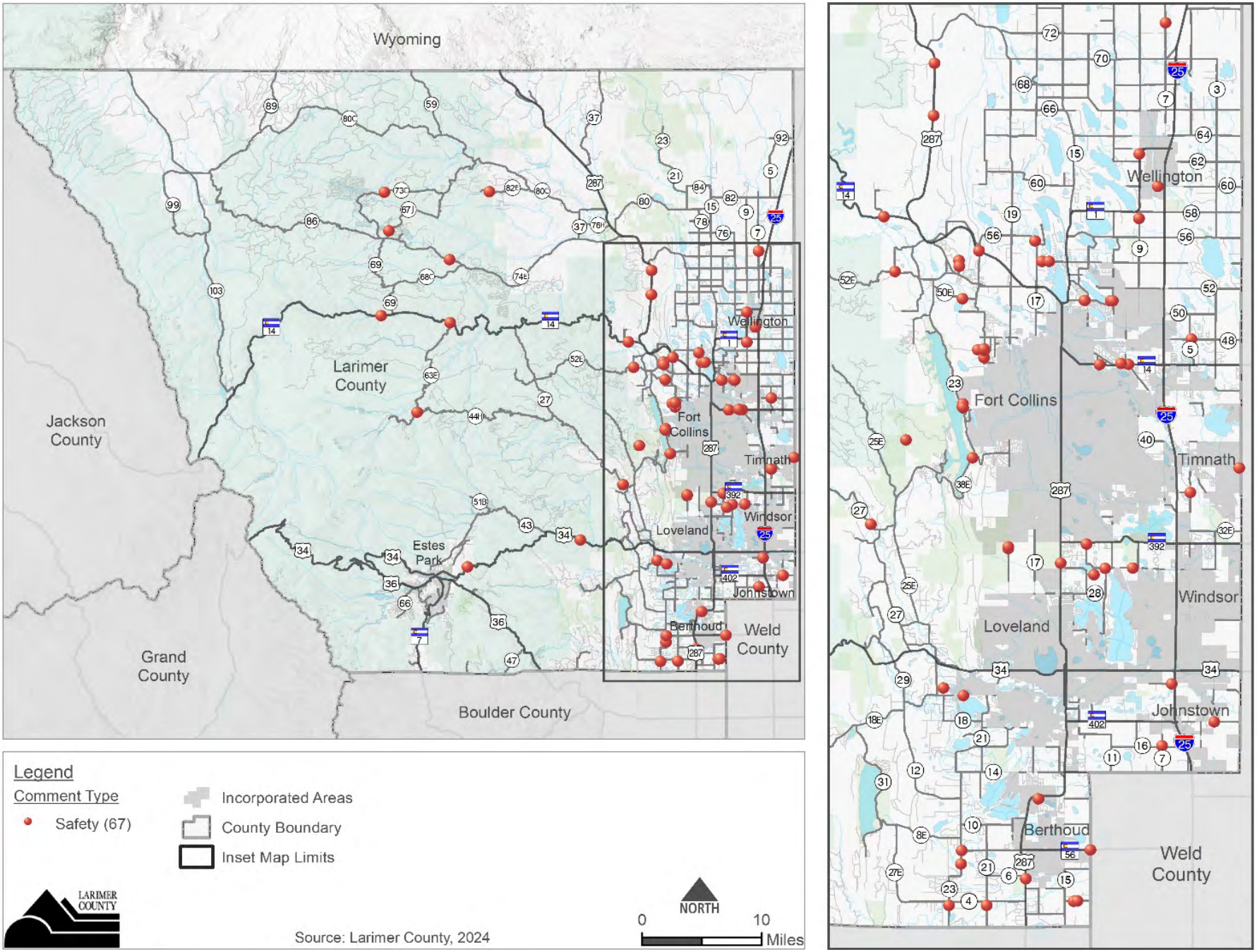
Key insights include:

- Speeding and aggressive driving are major concerns for the public, with many calling for lower speed limits and more enforcement.
- There is a perceived need for better signage, traffic control measures, and improved visibility to reduce accidents.
- Intersection safety, particularly at poorly lit or unmarked locations, was frequently mentioned, with suggestions for additional stop signs, traffic lights, and turning lanes.
- Pedestrian and cyclist safety emerged as a significant concern, with calls for improved infrastructure like protected bike lanes and crosswalks.
- The public expressed interest in better road maintenance, especially in areas where visibility is reduced by obstructions or where weather-related hazards are common.

From the Community:

"This is an extremely dangerous intersection when southbound CR 9 traffic has to look over their shoulders to see oncoming traffic on Hwy 1."

Figure 3. Map Comments – Safety Category



Bicycle-Related Comment Themes

From the analysis of the open comment field, several important insights can be gathered about the public's concerns and suggestions for bicycle improvements throughout unincorporated Larimer County. These insights reflect a strong community desire for safer, more connected, and better-maintained bicycle infrastructure. The public sees bicycling as a viable transportation option but recognizes that significant improvements are needed to make cycling safer and more accessible across the county. **Figure 4** presents a map showing locations related to bicycle concerns.

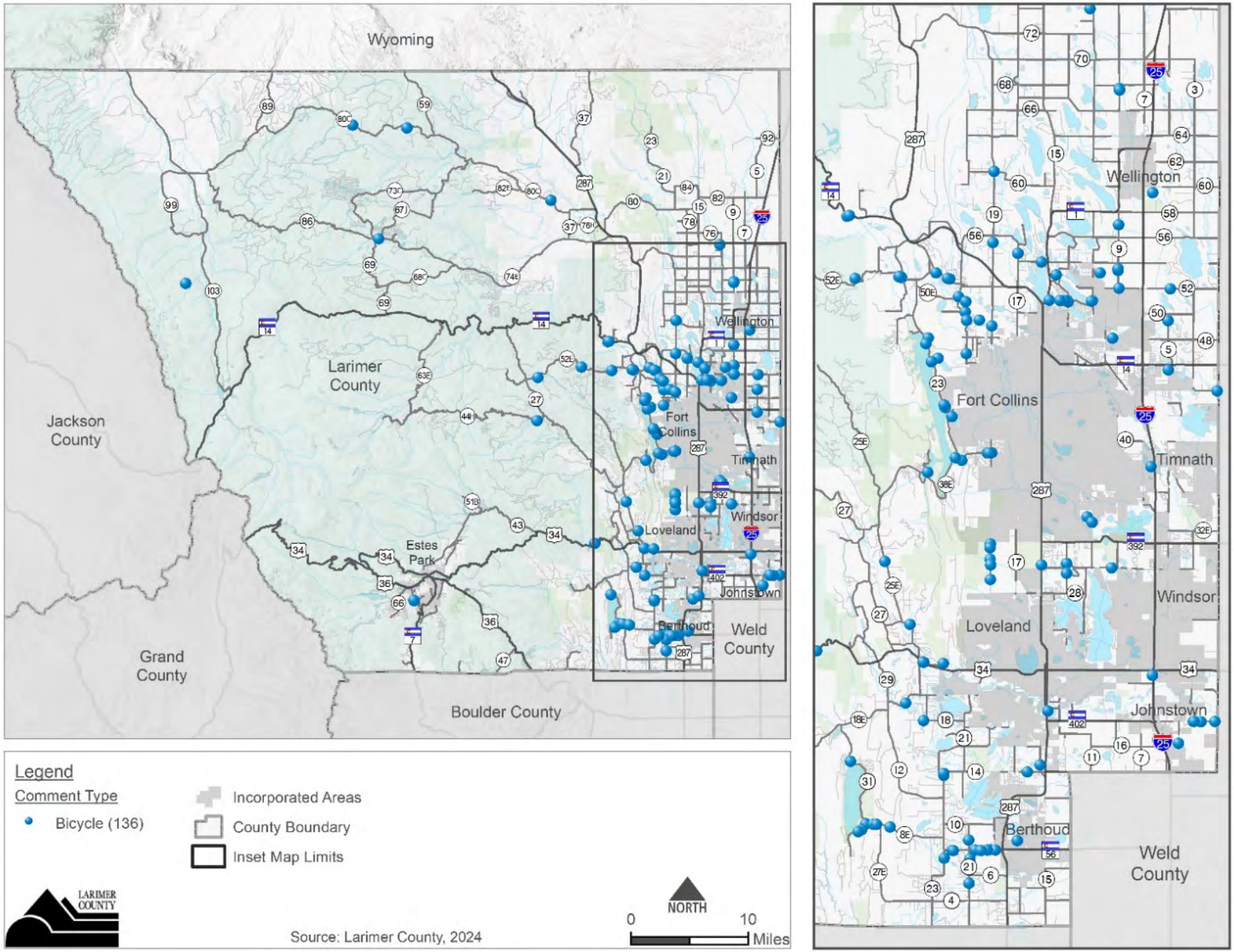
Key insights include:

- Dedicated spaces for people to bike are a top priority for the public, with calls for expanding the current network and adding bicycle facilities on busy or high-speed roads.
- There is a strong need to improve connectivity in the bicycle network, ensuring that bike lanes and trails are continuous and link major destinations such as parks, schools, and commercial areas.
- Maintenance of existing bike lanes is a concern, with many people asking for more attention to debris removal, pothole repairs, and general upkeep to keep lanes safe.
- Intersection safety for cyclists is a critical issue, with suggestions for bike-specific traffic signals, green-painted bike lanes, and more visible crossings at busy intersections.
- Off-street bike paths and multi-use trails are highly valued, with support for expanding these facilities to provide safer, car-free cycling options.
- Driver awareness and behavior is a major concern, with many cyclists feeling unsafe due to aggressive or inattentive drivers. The public suggested the need for education campaigns for drivers regarding safely sharing the road with cyclists.
- The public called for more bike parking at key locations such as shopping centers, parks, and transit stops, as well as secure storage options for cyclists who combine biking with public transportation.
- Traffic calming measures were proposed to slow down vehicle traffic on roads with high bicycle use, creating safer environments for cyclists.
- There is an interest in promoting public education for cyclists regarding safe riding practices, bike laws, and the benefits of wearing helmets and using proper safety equipment.

From the Community:

"Mary's Lake Road is a popular route for biking despite not having any bike lanes or shoulders. Due to its proximity to Rocky Mountain National Park and public and private campgrounds, it also receives significant motor vehicle traffic, including large RVs and tourists unfamiliar with the road. This creates a dangerous situation that could be alleviated with the addition of bike lanes."

Figure 4. Map Comments – Bicycle Category



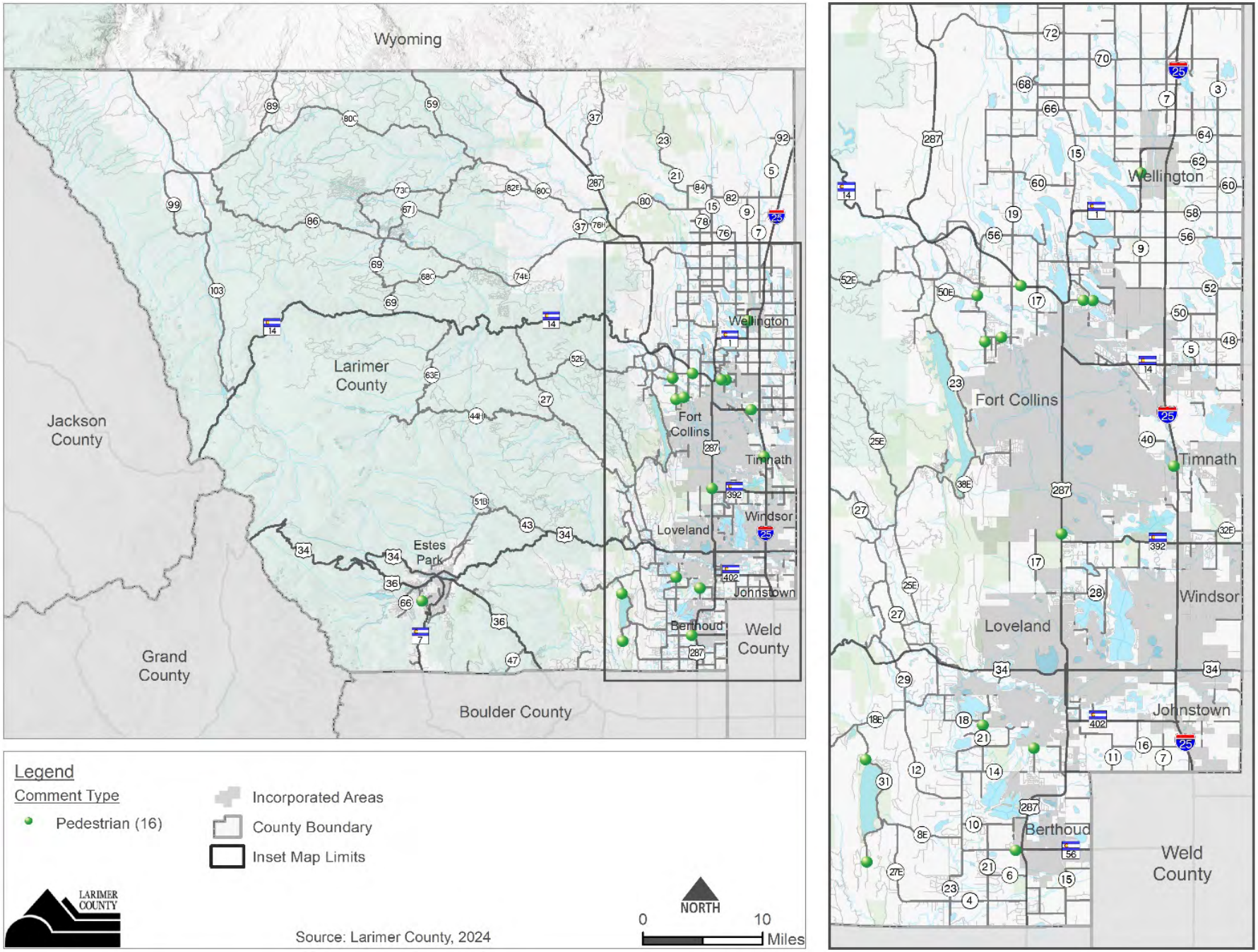
From the Community: *"I would like to see easier access for pedestrians on Larimer County Road adjacent to residential areas. The example I have in mind is Larimer County Road 21 west of Loveland."*

Pedestrian-Related Comment Themes

Based on the analysis of the open comment field, several themes emerge regarding public feedback on pedestrian improvements in Larimer County. Responses indicate that the public prioritizes safer, more accessible, and well-connected pedestrian infrastructure, particularly around key destinations like schools, parks, and transit, with a strong focus on improving visibility and protecting foot traffic in high-speed, high-volume areas. **Figure 5** shows that most comments (10 out of 16) were left in areas adjacent to urban areas (within 1 mile of an urban municipal boundary). Key insights include:

- Lack of sidewalks is a frequent concern, with many areas needing new or improved pedestrian pathways to ensure safe walking routes.
- Crosswalk safety and visibility improvements were commonly requested, with suggestions for better-marked crosswalks, flashing beacons, and raised crosswalks.
- Pedestrian access to schools, parks, and transit stops is a significant issue, with many residents wanting safer and more direct routes to these destinations.
- Traffic calming measures (e.g., speed bumps, lower speed limits) were suggested to improve pedestrian safety, especially in areas with high foot traffic.
- There is a need to address Americans with Disabilities Act (ADA) accessibility, including the installation of curb ramps, wider sidewalks, and the removal of obstacles that impede movement for people with disabilities.
- Lighting improvements were a major concern, with calls for better lighting along pedestrian routes and crosswalks to enhance nighttime safety.
- Pedestrian bridges and tunnels were proposed as solutions for crossing high-traffic roads, highways, and dangerous intersections.
- Comments highlighted the importance of connectivity in the pedestrian network, with calls for creating continuous and safe walking paths across neighborhoods and commercial areas.

Figure 5. Map Comments – Pedestrian Category



Statistically Valid Survey Summary

RRC Associates conducted a Statistically Valid Survey to collect demographically representative, travel safety feedback regarding roads managed by Larimer County. Community members were asked to discuss the mode they use to travel, perceived travel safety, traveler behavior and road feature safety issues, site-specific areas for safety improvement, prioritization of safety efforts, and more. Survey results were weighted to match Larimer County's demographics, and insights from historically disadvantaged or vulnerable groups were also assessed to capture a more inclusive perspective on transportation planning in the county. Over 1,100 usable responses were collected as a result.

Nearly all respondents (98 percent) use personal vehicles on unincorporated county roads, while smaller percentages walk, bike, or use other forms of transportation. Most feel safe in personal vehicles, but nearly half feel unsafe when biking or e-biking. The top safety concerns include speeding, distracted driving, and inadequate infrastructure such as missing bikeways, narrow shoulders, and poorly maintained roads. Respondents prioritize safety solutions like improved sidewalks, bike lanes, and multi-use paths (48 percent), as well as better road surface conditions (32 percent) and stronger policy enforcement (30 percent). A significant number of respondents are unfamiliar with the County's current safety efforts, with 56 percent not at all familiar, and 44 percent unsure of their effectiveness.

3. Equity Considerations

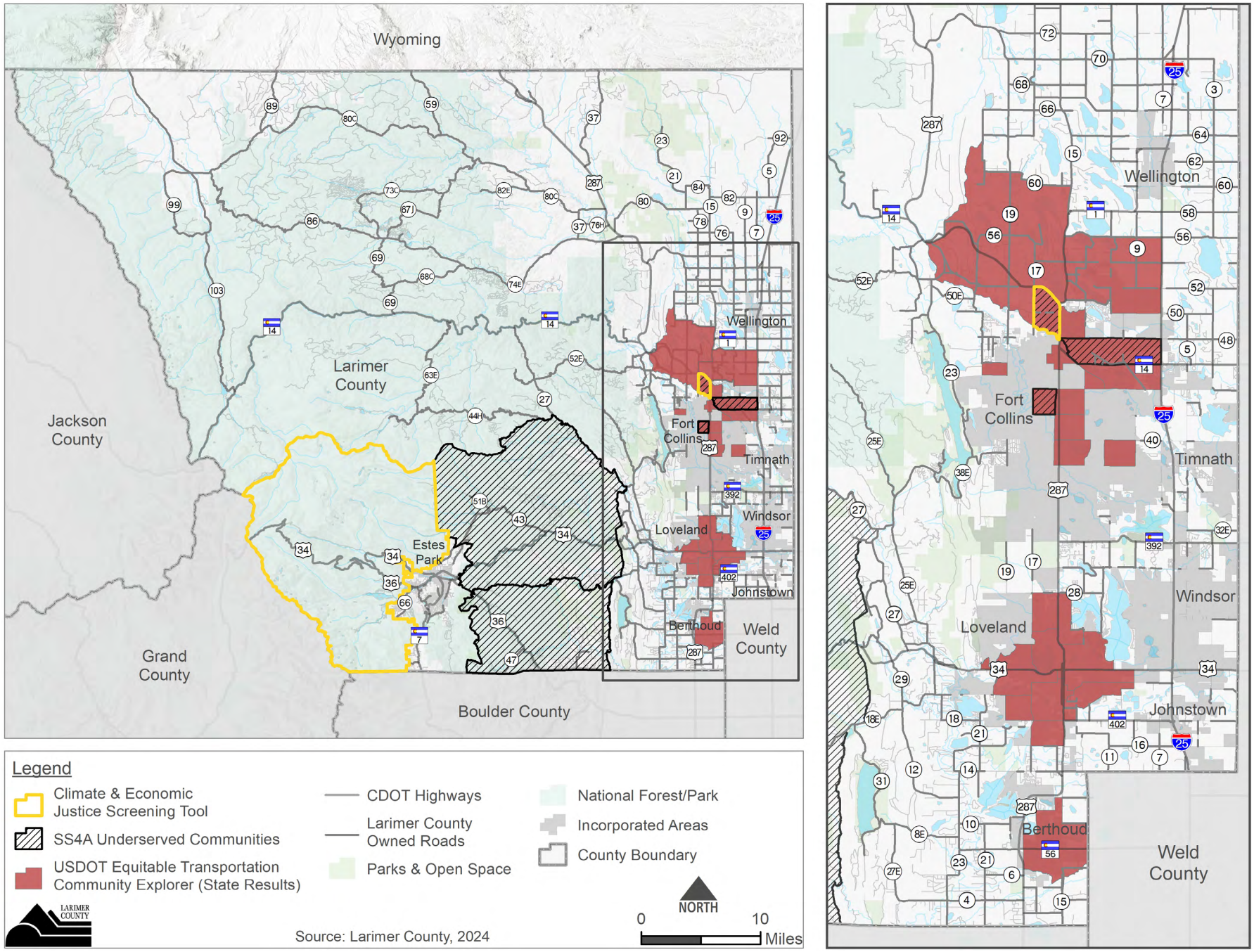
To understand the current gaps and needs in the transportation system, a critical first step is to assess the various communities that make up Larimer County recognizing how and who uses the various elements of the transportation system, as well as how it can be adjusted and expanded to better meet the needs of current and future residents. Historically underserved groups include communities of color, immigrant and refugee communities, low-income populations, older adults, people with disabilities, youth, populations with limited English proficiency, female-headed households, unhoused populations, and zero- and singlevehicle households. Importantly, these communities align with the index of populations that should be considered with additional resources, as determined by the North Front Range Metropolitan Planning Organization (NFRMPO) 2021 Environmental Justice Plan. An understanding of where communities reside in relation to safety risk can be further deepened by leveraging existing regional and statewide mapping tools and dashboards.

Federally recognized disadvantaged communities can help Larimer County identify areas with higher transportation needs and where more federal grant opportunities may be considered. **Figure 6** shows a map of each area identified with the tools listed below.

The methodologies of the federally recognized tools, in addition to the NFRMPO 2021 Environmental Justice Plan, have been used to develop a more detailed equity analysis using Census Block Groups to identify disproportionately impacted communities within Larimer County. This assessment can be referenced during each phase of the planning process and will be used to inform the project prioritization methodology. The analysis provides an overview of Larimer County's population composition, including a summary of historically underserved and overburdened communities such as low-income populations, household cost burden, female-headed households, people with disabilities, zero-vehicle households, single-vehicle households, youth (under 18), older adults (over 65), populations with limited English proficiency (LEP), and people of color.

Providing a focused lens for historically underserved and overburdened communities is important in being able to plan for an equitable and accessible transportation system moving forward and will ensure community members of all ages and abilities can use transportation options throughout the county. Identifying demographic factors can reveal disparities in transportation access, uncover safety risks, and highlight current mobility challenges. This approach enables tailored interventions and policies to address diverse community needs, fostering a more equitable and inclusive transportation system for Larimer County.

Figure 6. Federally Identified Disadvantaged Communities



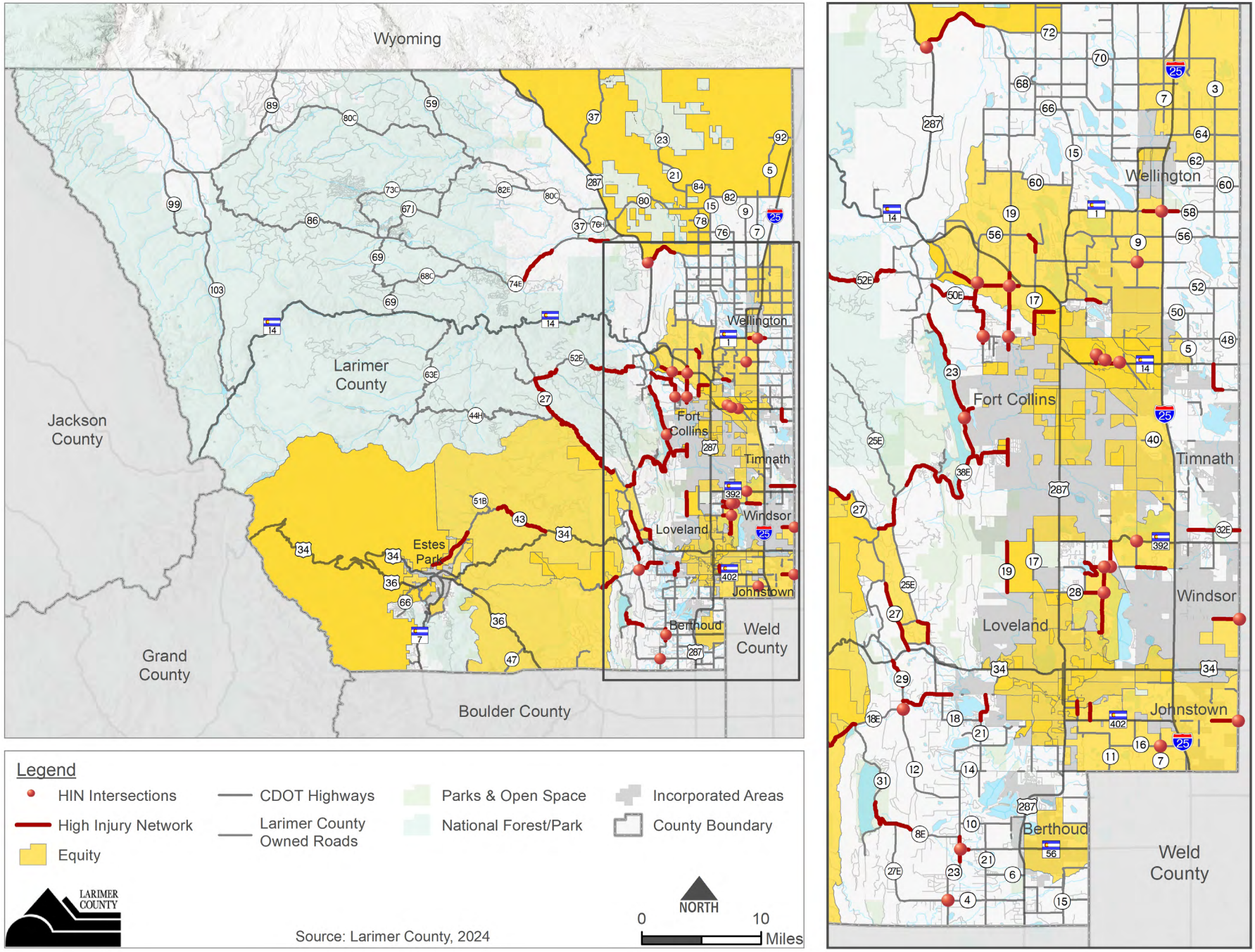
Equity Areas and the High Injury Network

The High Injury Network (HIN) for the top 21 intersections, 35 urban/rural corridors, and 14 mountain corridors was mapped alongside the established equity areas developed for Larimer County. The equity areas include the federally identified disadvantaged communities as well as the highest scoring Census Block Groups for communities that may experience mobility barriers, economics barriers, or have a large percent of community of color. Analyzing both datasets together reveals that most of the top 15 intersections are adjacent to census blocks with equity populations.

While HIN corridors do not consistently overlap with all equity areas, most high-injury intersections align with high-injury corridors. Therefore, improving safety measures along these corridors and engaging with affected equity populations will be essential to developing informed, community-driven solutions for better safety and accessibility.

The insights from mapping the HIN alongside Larimer County's equity areas provide essential direction for prioritizing projects in locations where safety improvements are needed and where historically underserved and overburdened communities are most affected. This combined analysis highlights specific intersections and corridors that extra consideration for safety upgrades. By focusing on these locations, the County can develop projects that not only enhance safety but also address longstanding accessibility and equity concerns to ensure that future improvements are both community-driven and impactful.

Figure 7. Larimer County Equity Index and the High Injury Network



4. Safety Trends and Data Analysis

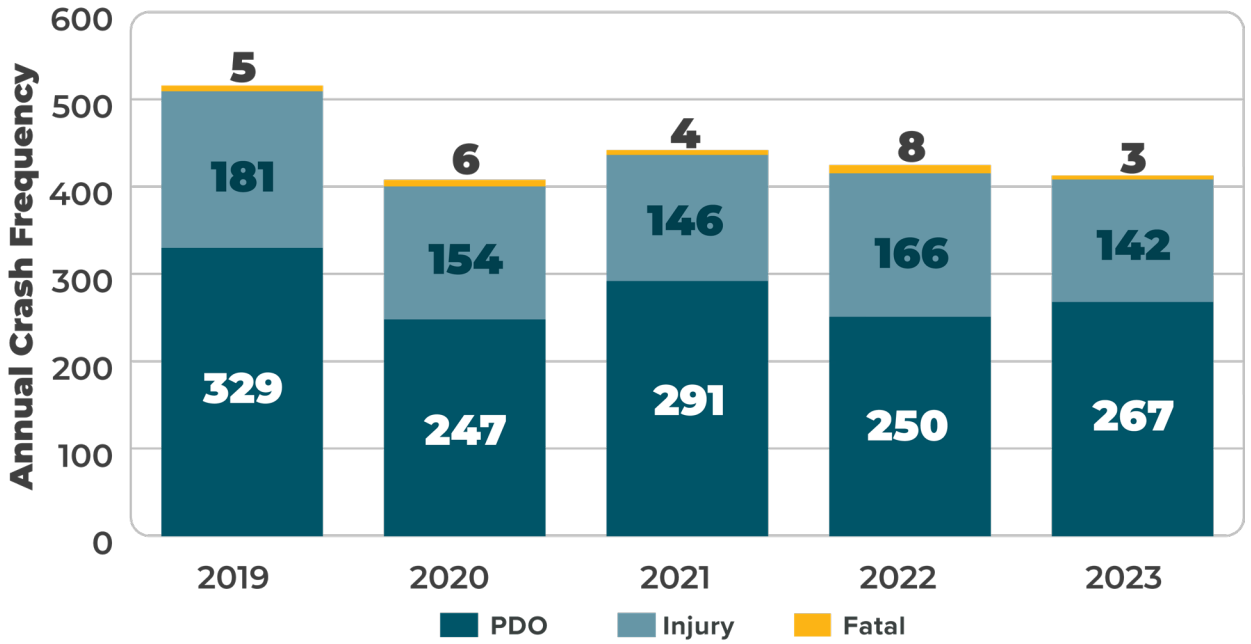
This section centers on analyzing safety trends and crash data to enhance road safety on the unincorporated mainline county road system. The analysis primarily targets severe crashes—those that result in minor to serious injuries or fatalities, as well as KSI (killed or seriously injured) crashes. Examining patterns in these more serious incidents, including those involving vulnerable road users such as pedestrians, bicyclists, and motorcyclists, offer crucial insight into the evolving landscape of traffic safety in the county.

The crash analysis explores various types of crashes, driver behaviors, and contributing factors, uncovering valuable information that can guide targeted interventions to improve road safety. This analysis directly contributes to the creation of the HIN, which identifies the most dangerous areas within the county's roadway system, those with a higher frequency of injury and fatal crashes. By mapping crash density and identifying trends in severe crashes, the HIN allows the County to allocate its resources effectively, focusing efforts on areas where they will have the greatest potential to reduce severe crashes.

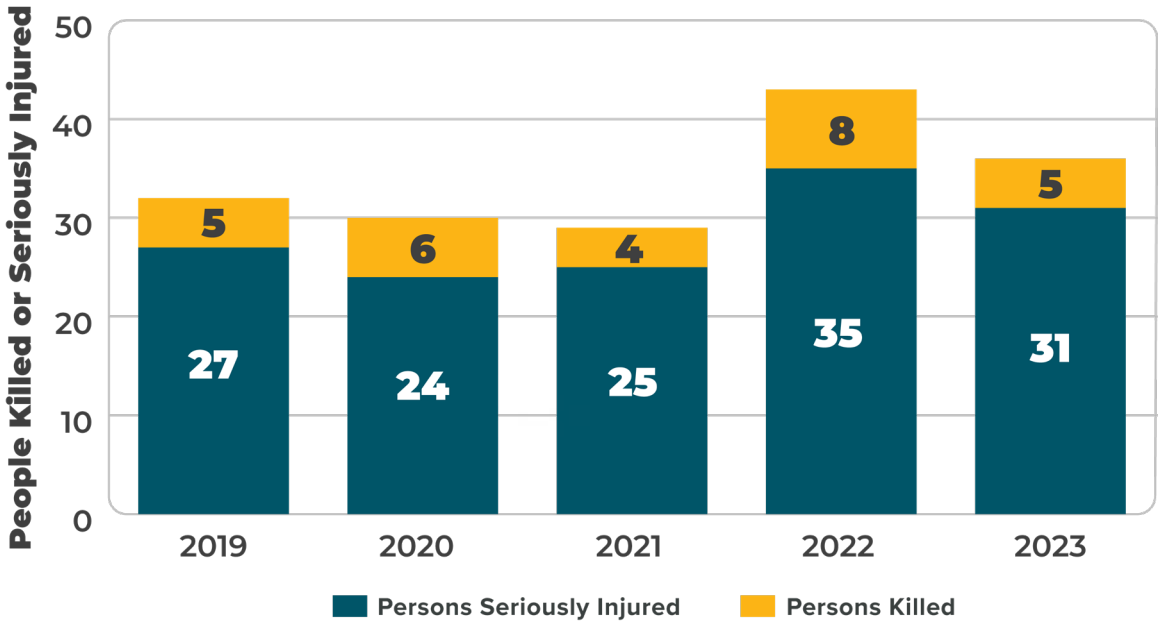
General Trends

Between 2019 and 2023, nearly 2,200 crashes occurred in unincorporated Larimer County, averaging about 440 collisions annually and equating to roughly 1.2 crashes every day. Of the 2,200 crashes, 1,384 caused property damage only (PDO), 789 were injury crashes, and 26 crashes resulted in fatalities.

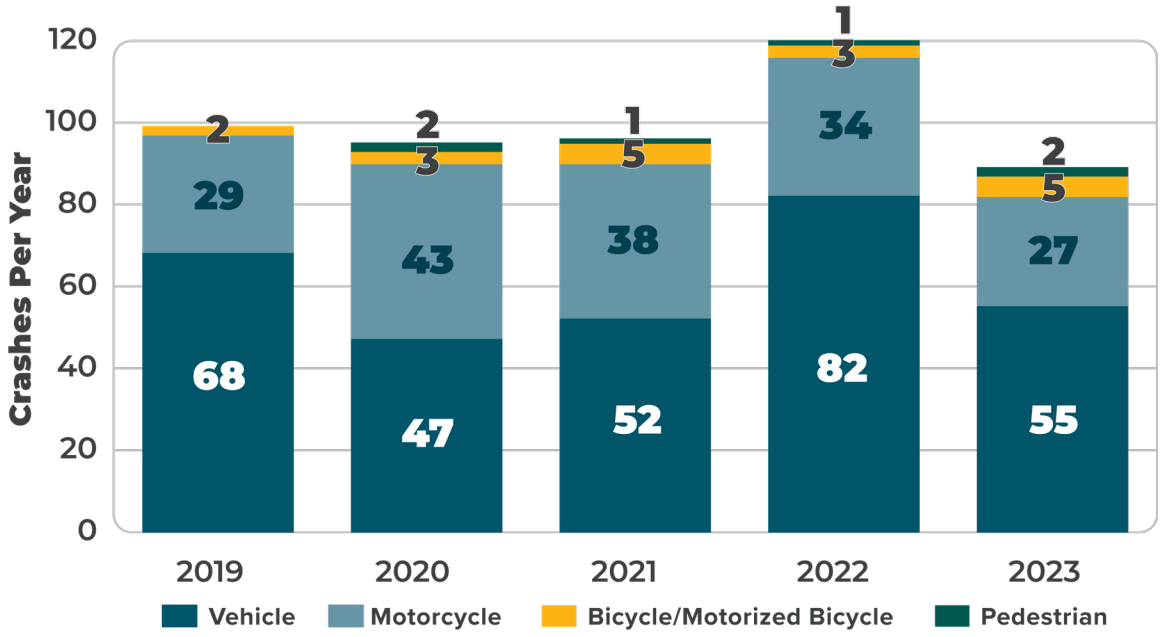
Severe crashes represent those that result in minor or serious injuries or fatalities. KSI crashes are a subset of severe crashes and include those where a person has been seriously injured or killed. The following exhibits provide a closer look at the trends in severe and KSI crashes in Larimer County.



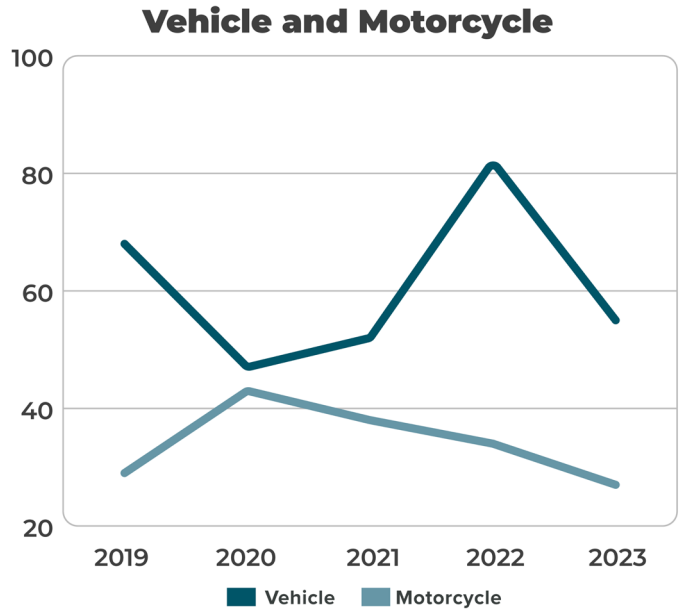
The following graph shows the number of people seriously injured and the number of people killed between 2019 and 2023. Of the 129 serious injury crashes, 142 people were seriously injured, and of the 26 fatal crashes, 28 people were killed. On average, more than 28 people are seriously injured each year, while nearly 6 people are killed each year.

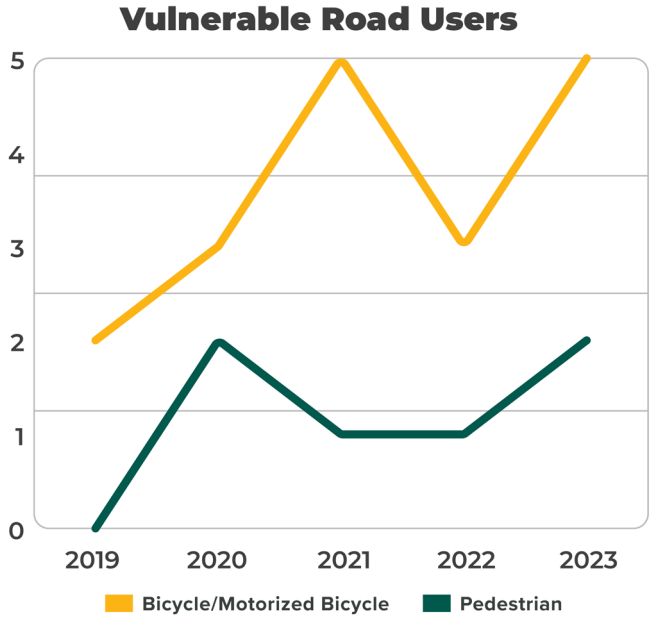


The following graph shows the number of severe crashes by travel mode between 2019 and 2023. Out of the 499 severe crashes, motorcycles were involved in 171, making up the largest share. Bicyclists accounted for 18 crashes, while pedestrians were involved in 6.

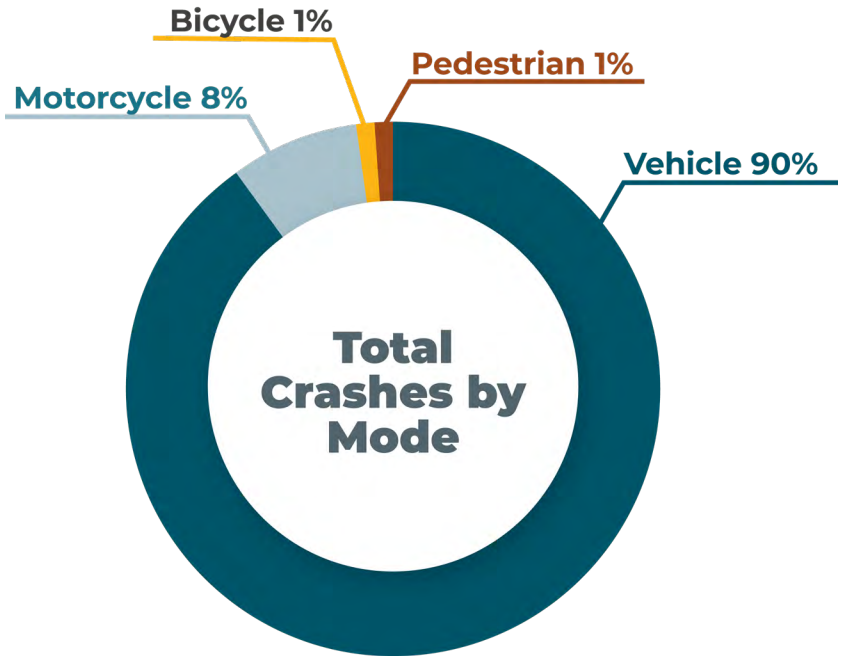


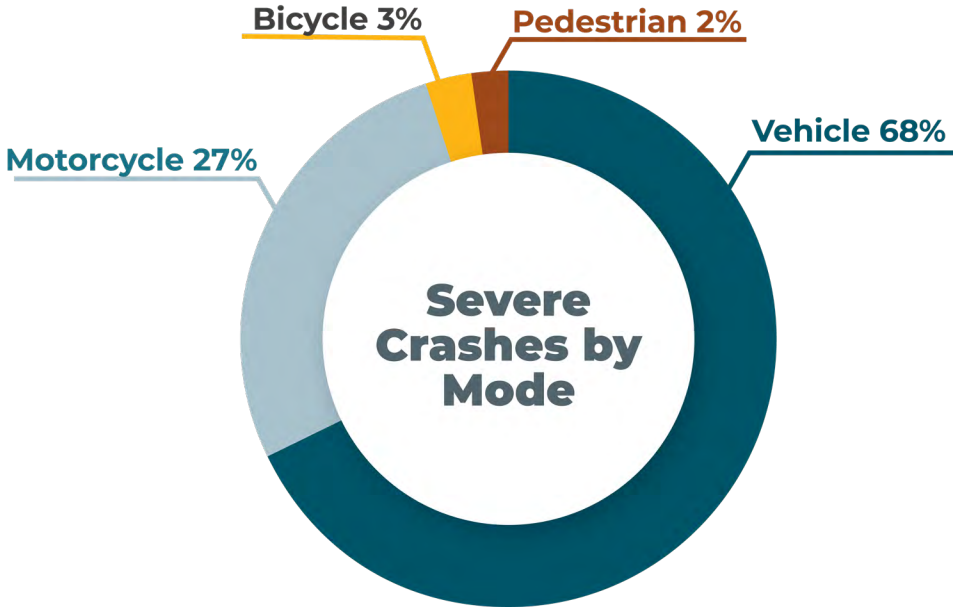
The following graphs present crashes by mode. The severe crashes involving vehicles and motorcycles are generally declining, while those involving pedestrians and bicyclists remain relatively low in unincorporated Larimer County.





The following charts break down the crash percentages by travel mode. While vehicle-related crashes represent most crashes, accounting for 90% of all crashes and 68% of severe ones. Crashes involving pedestrians and bicyclists are less frequent, making up 2% of total crashes, however, when it comes to severe crashes, this figure rises to 5%. What stands out is the sharp increase in motorcycle-related crashes, which jump from 8% of total crashes to 27% of severe crashes, highlighting a significant risk for riders.





The trends in severe and KSI crashes between 2019 and 2023 show some notable patterns. While the number of severe crashes involving vehicles has decreased, the percentage of severe crashes involving vulnerable road users, particularly motorcycles, remains relatively high. Although vehicle-related crashes continue to represent the majority of severe incidents, the higher percentage of crashes involving motorcycles highlights the need for targeted safety measures. This data suggests that continued efforts to improve road safety are important in reducing both the frequency and severity of crashes on the unincorporated county road system.

Safety Analysis

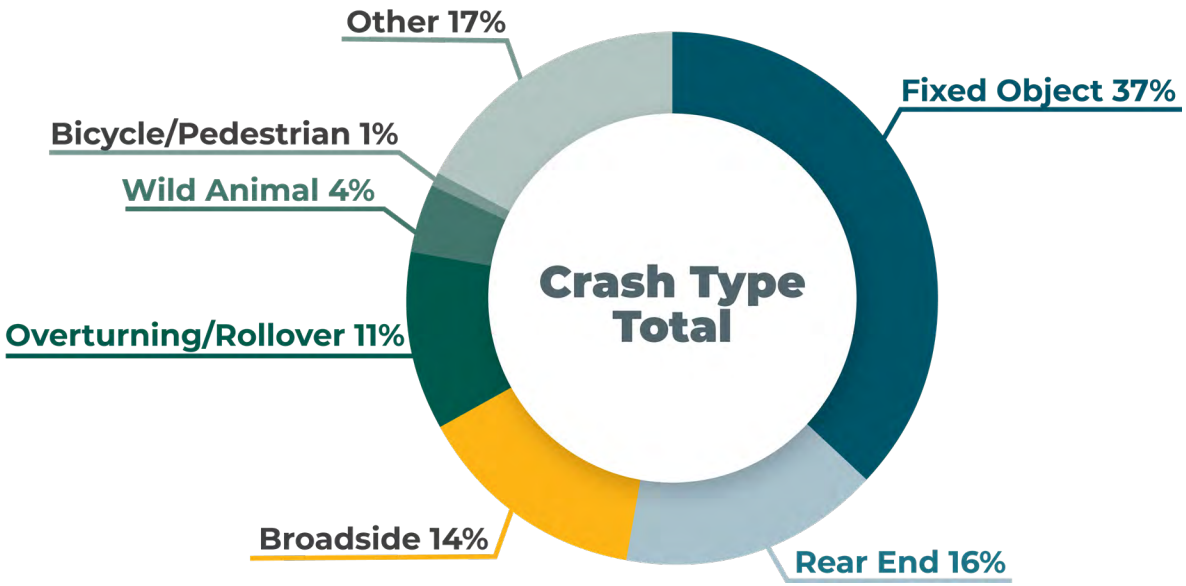
Between 2019 and 2023, a variety of crash types contributed to the total number of traffic collisions in the region, with Fixed Object crashes being the most common, accounting for 37 percent of all crashes. However, certain crash types were more likely to result in severe outcomes, such as injuries or fatalities. For instance, Overturning/Rollover crashes, although representing 11 percent of total crashes, make up 24 percent of severe crashes, highlighting a disproportionate risk of severe consequences. Other factors, such as driver behavior, crash location, and environmental conditions, also play significant roles in influencing the severity of crashes. This analysis examines the relationship among crash types, contributing factors, and crash severity to better understand the risks and inform future safety measures.

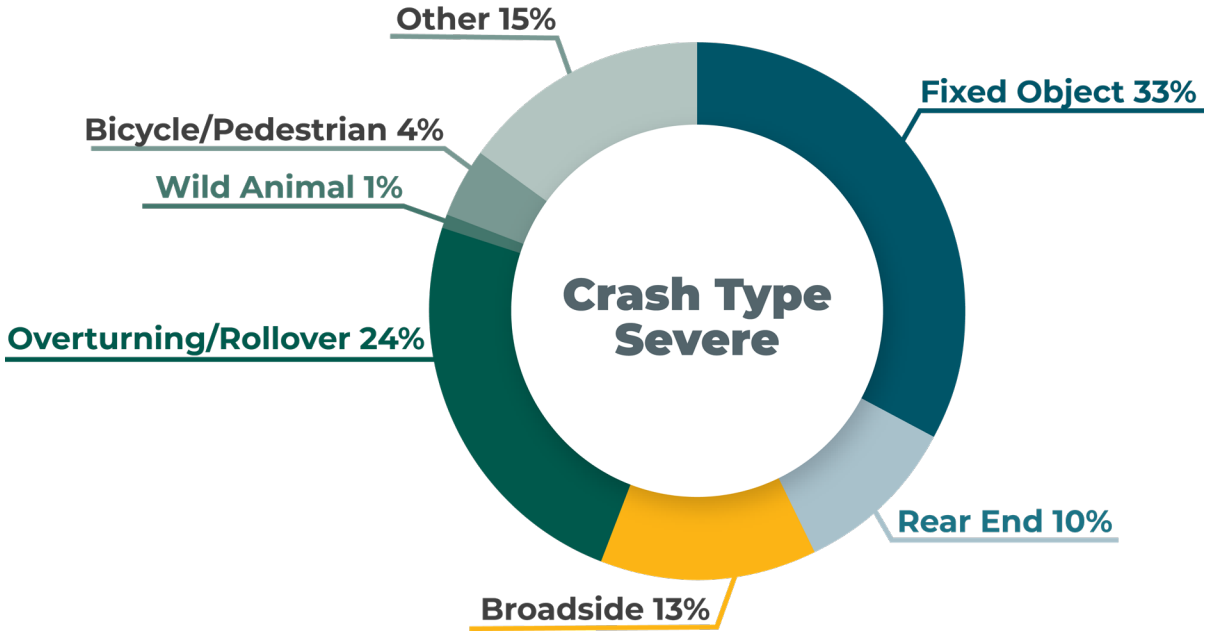
Crash Type

Fixed object crashes were the most common type, making up 37% of all crashes. Following them, rear-end, broadside, and overturning/rollover crashes accounted for the next highest frequencies. However, when we look at the distribution of total versus severe crashes, there's a notable difference in which types of crashes are more likely to result in serious injuries or fatalities. For example:

- Overturning/rollover crashes, while representing 11% of total crashes, account for a disproportionate 24% of severe crashes, suggesting that this type of crash carries a higher risk of serious harm.

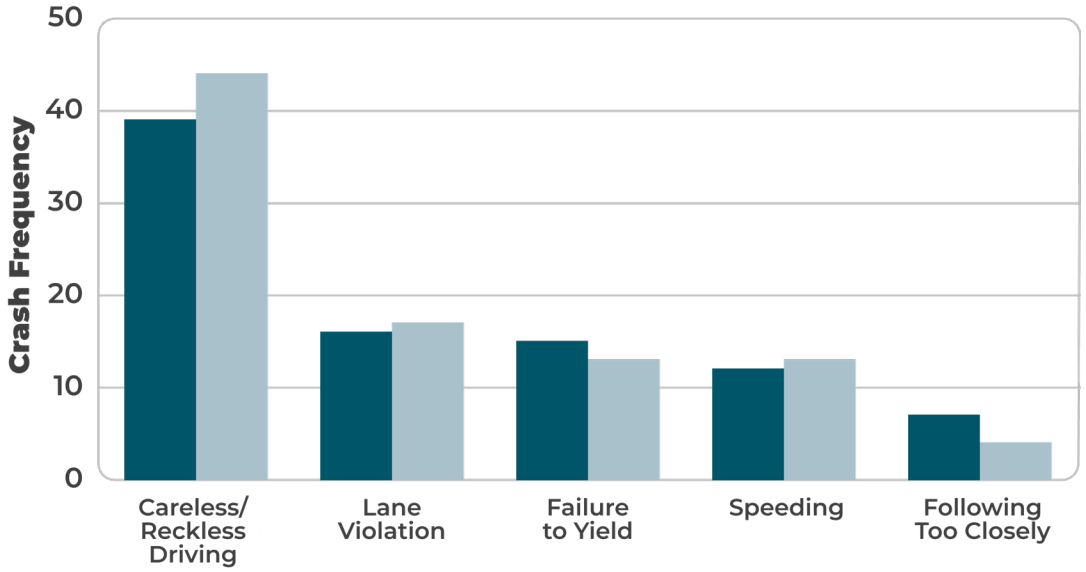
- Bicycle and pedestrian crashes, although just 1% of total crashes, make up 4% of severe crashes, highlighting the vulnerability of these road users.





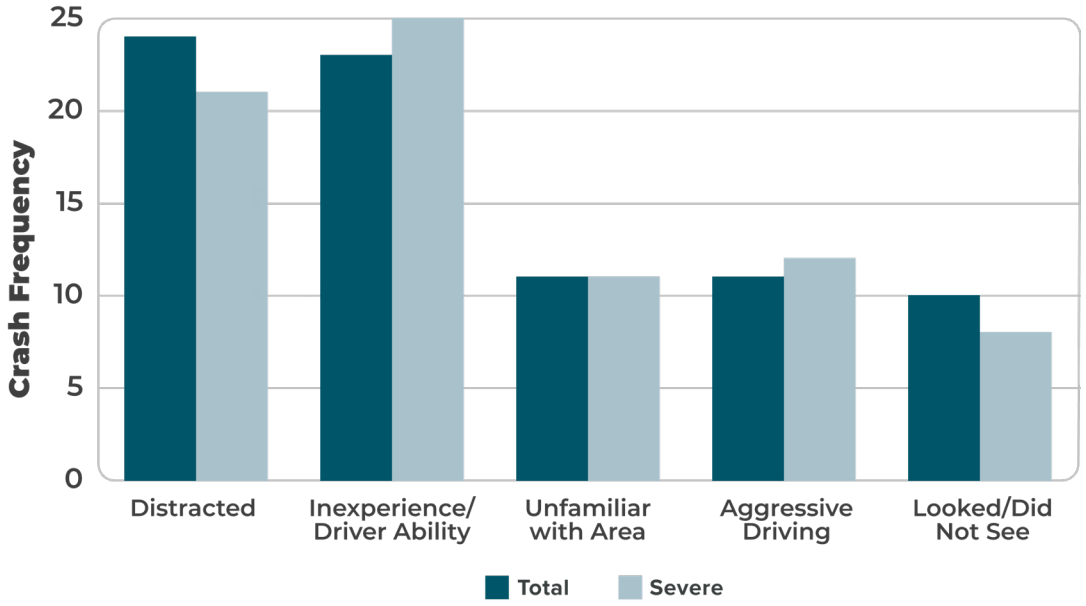
Driver Action

Careless or reckless driving is the most frequently cited driver action contributing to crashes, accounting for 39% of all crashes (717 crashes) and 44% of severe crashes (213 crashes). It's important to note that careless driving is often cited by law enforcement when there is insufficient evidence to attribute a crash to a more specific traffic violation, making it a catch-all term for a range of unsafe behaviors. However, other driver actions, such as lane violations and speeding, are more likely to cause severe crashes. In fact, lane violations and speeding play a significant role in increasing the potential for severe crashes.



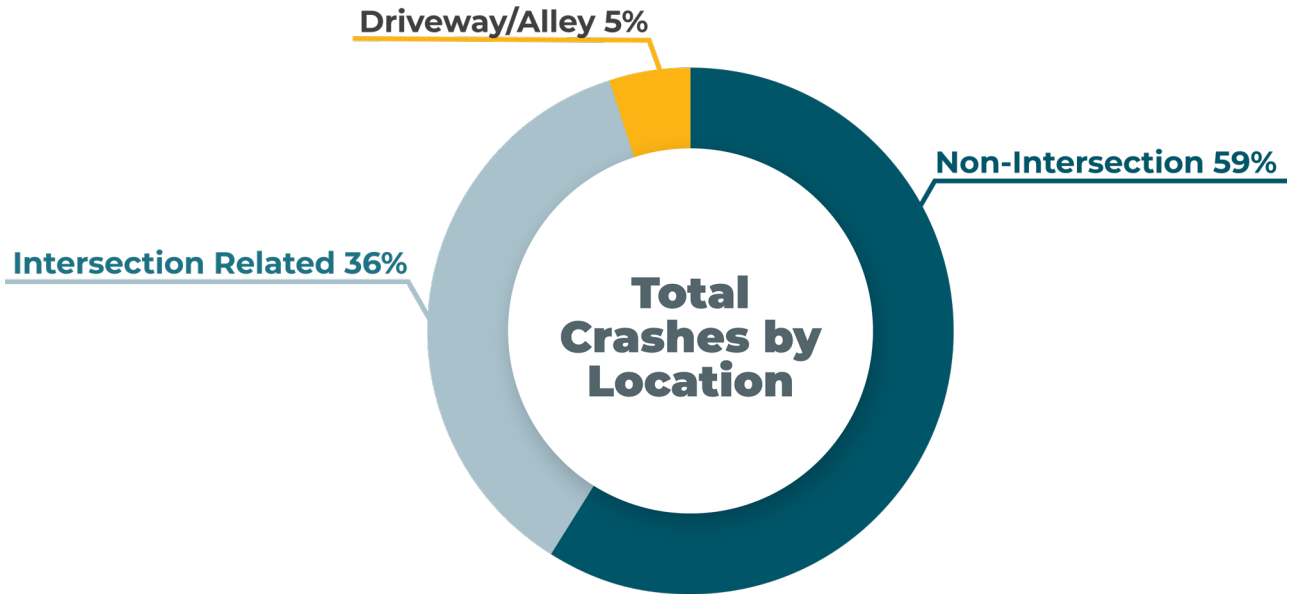
Driver Contributing Factors

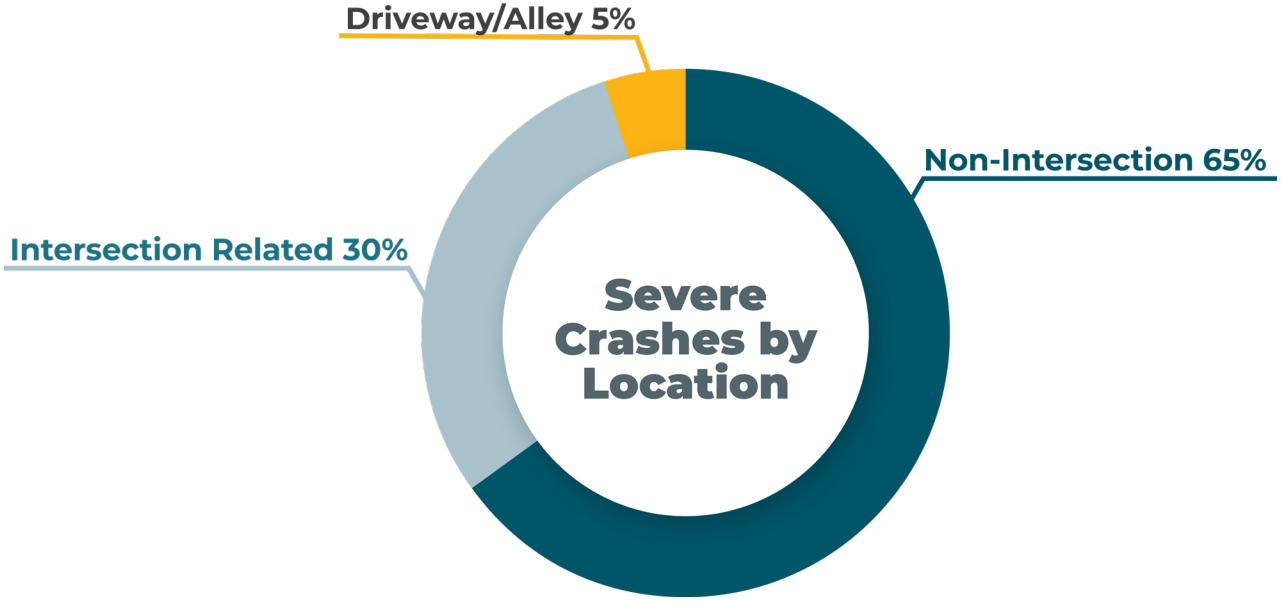
Distracted driving is the most frequently cited factor contributing to crashes, accounting for 24% of total crashes (304 crashes) and 21% of severe crashes (74 crashes). In addition to distracted driving, other factors such as inexperience or driver ability, aggressive driving, and fatigue or sleeping at the wheel contribute more frequently to severe crashes.



Crash Location

Non-intersection crashes account for 59% of total crashes (1,416 crashes) during the study period and 65% of severe crashes (351 crashes). This indicates that crashes occurring outside of intersections are not only more frequent but also more likely to result in severe outcomes, including injuries and fatalities.

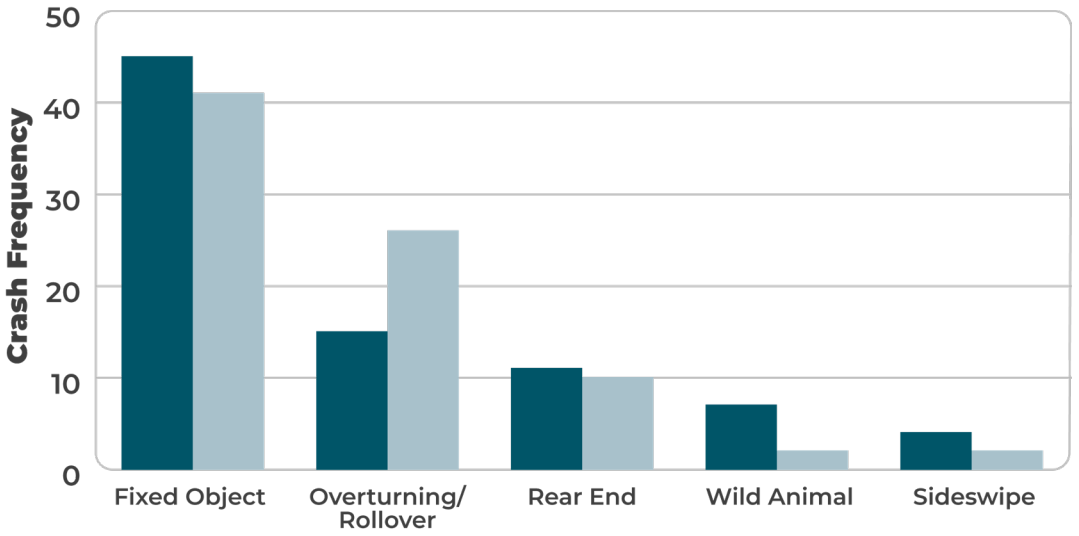




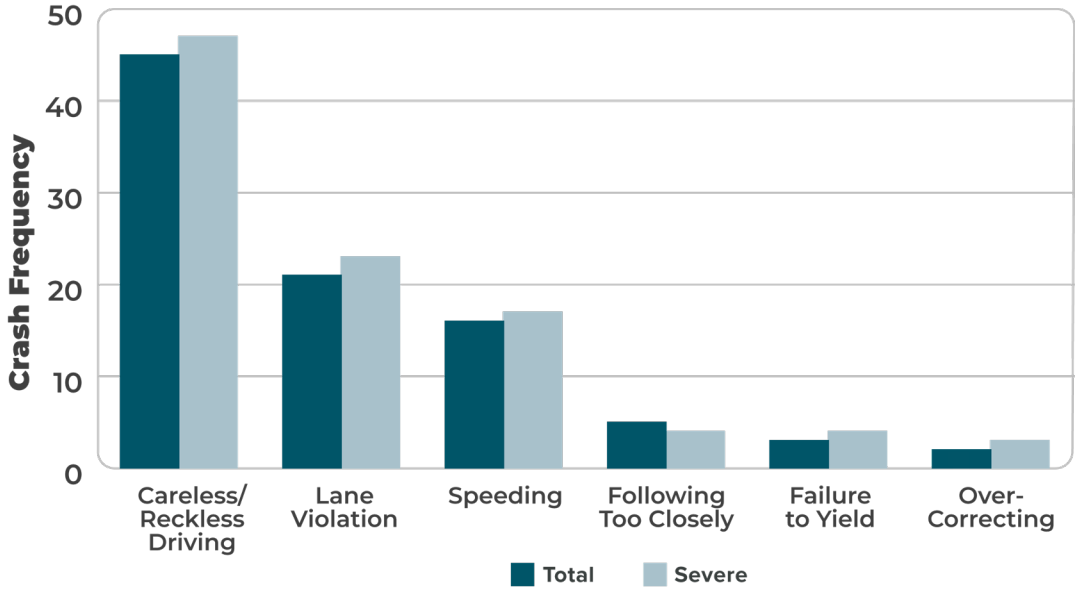
Non-Intersection Crash Types and Driver Action

The most common type of crash at non-intersections is Fixed Object crashes, which account for 45% of total crashes (641 crashes) and 41% of severe crashes (143 crashes). Additionally, the most frequently reported driver action at non-intersections is Careless or Reckless Driving, responsible for 45% of total crashes (491 crashes) and 47% of severe crashes (156 crashes). This suggests that unsafe driving behaviors are particularly prevalent at non-intersections and contribute significantly to both the frequency and severity of crashes.

Crash Type - Non-Intersection

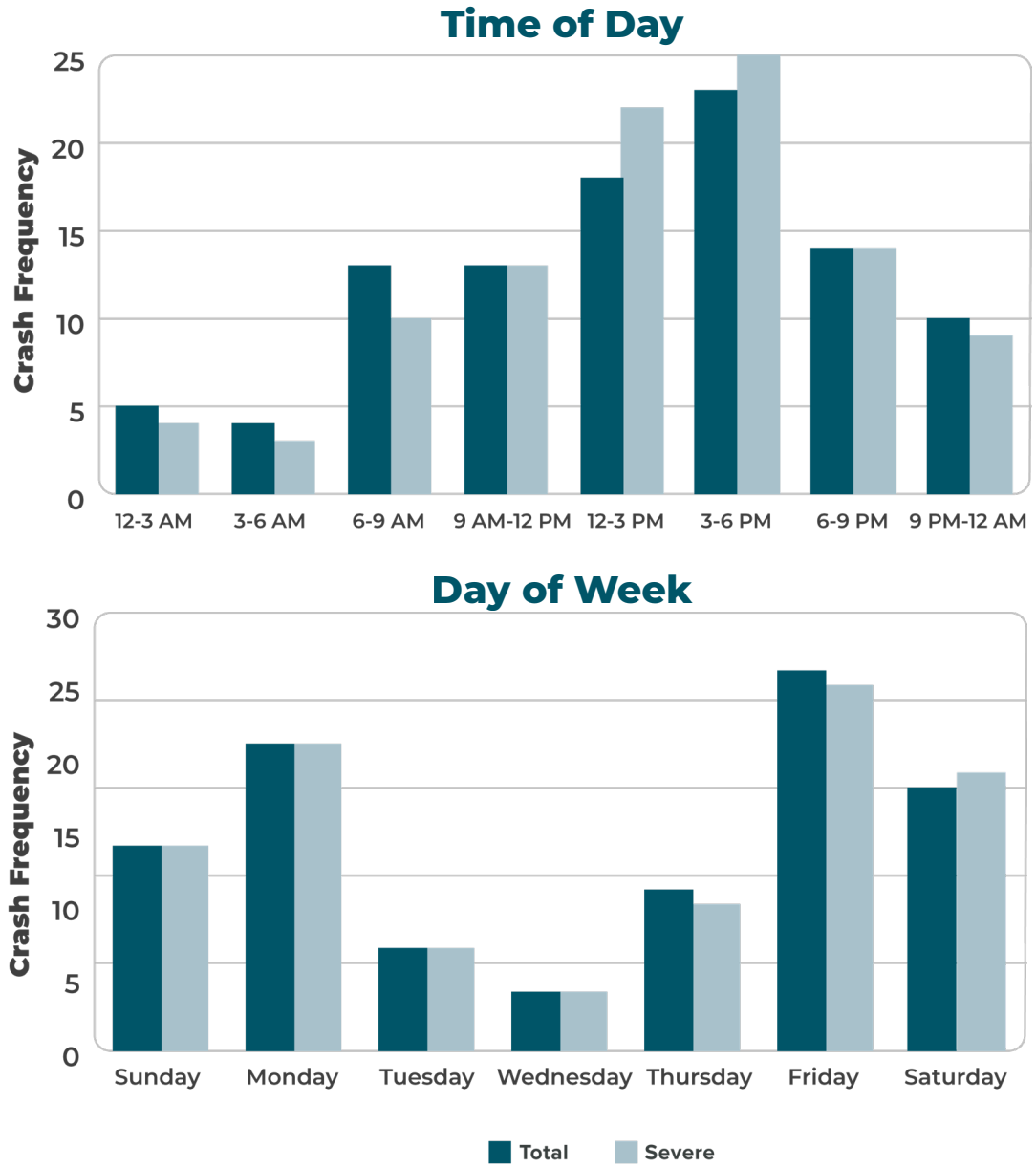


Driver Action - Non-Intersection



Time of Day and Day of Week

Crash frequency peaks during the critical time period of 3 to 6 PM, accounting for 23% of total crashes (503 crashes) and 25% of severe crashes (127 crashes). Furthermore, Friday emerges as the day with the highest crash frequency, representing 26% of total crashes (2,199 crashes) and 25% of severe crashes (499 crashes).

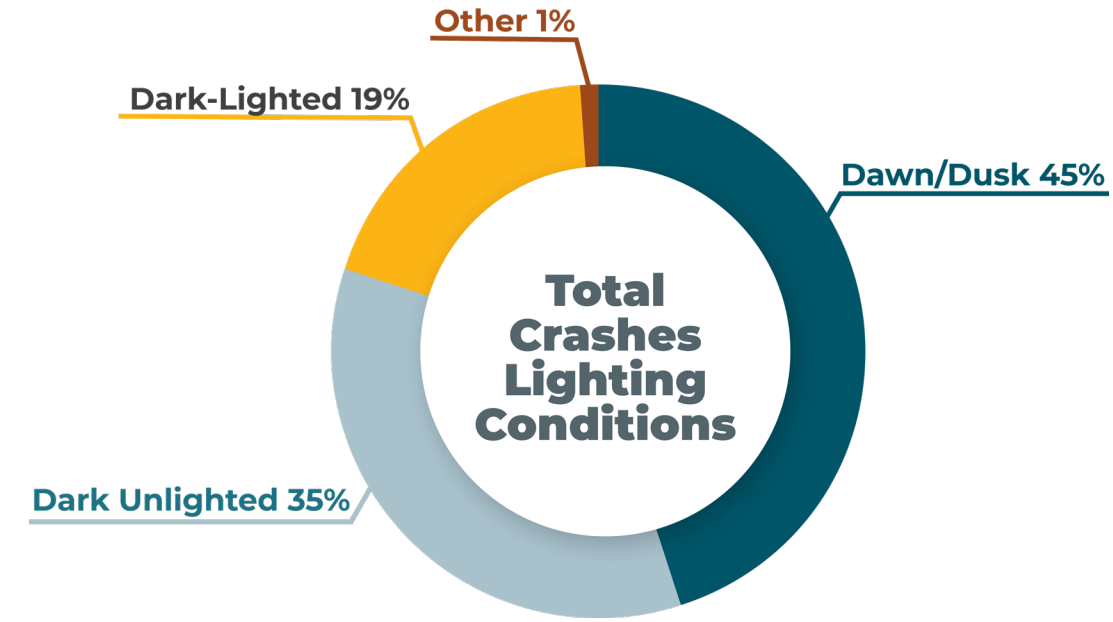


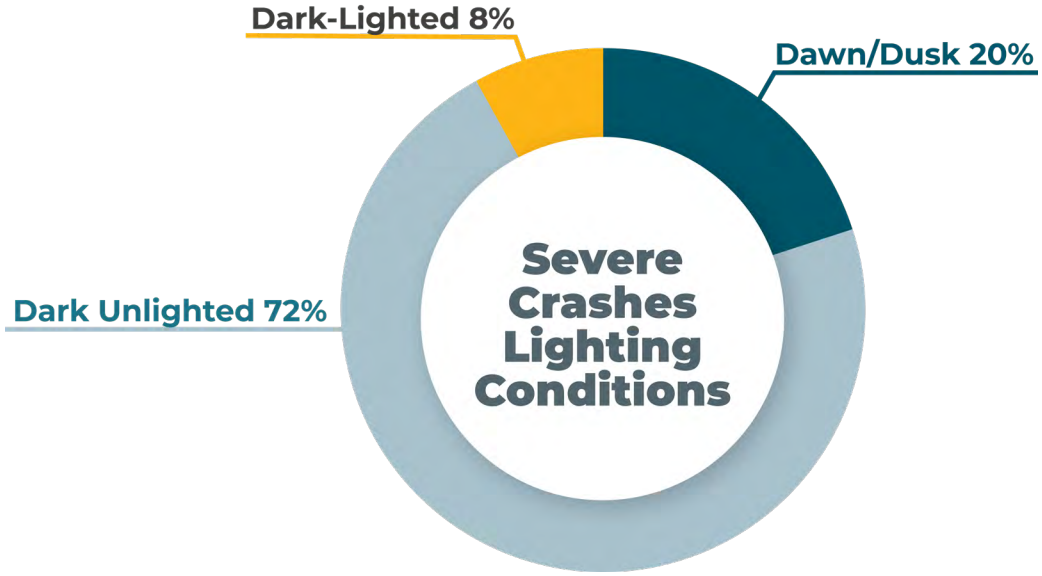
Adverse Conditions

Lighting

Lighting and weather conditions play a significant role in the frequency and severity of crashes. Among the various lighting conditions, dawn/dusk is the most frequently reported low-visibility condition, and accounts for 45% of total crashes (123 crashes) and 20% of severe crashes (26 crashes). While unlighted conditions pose a greater risk according to the data, much of the unincorporated county road system is generally not illuminated due to the rural nature of the unincorporated areas.

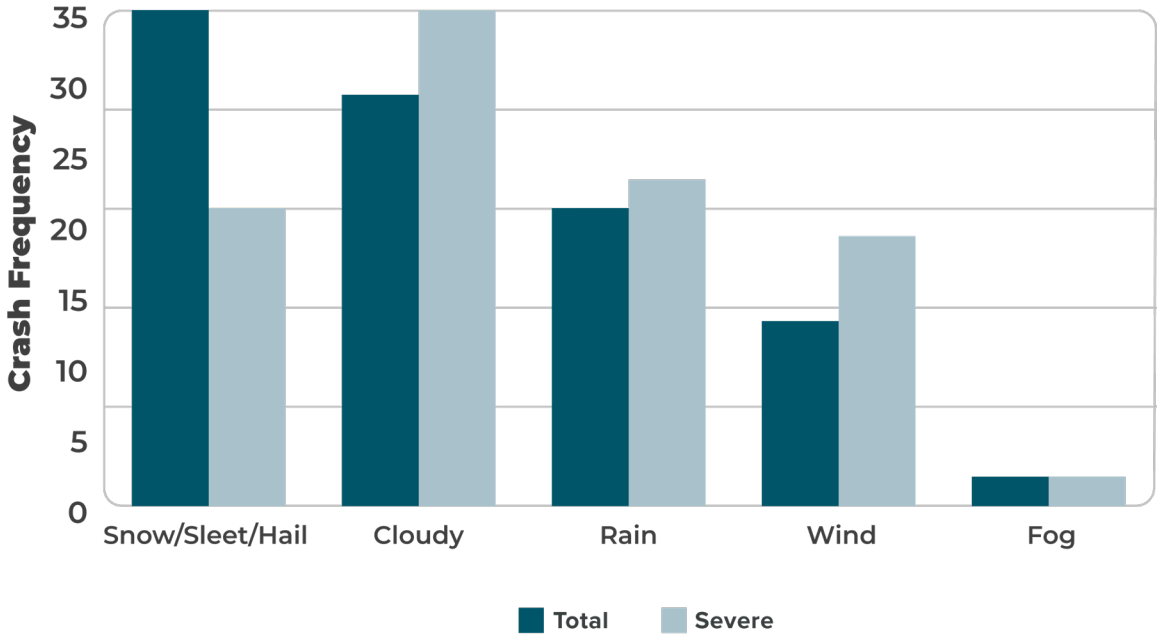
Dark Unlighted crashes make up 35% of total crashes (95 crashes) but 72% of severe crashes (95 crashes).





Weather

Snow, sleet, and hail are the most frequently reported adverse weather conditions contributing to crashes, accounting for 35% of total crashes (114 crashes) and 21% of severe crashes (13 crashes). However, cloudy weather is more dangerous when it comes to the severity of crashes. While cloudy conditions account for 29% of total crashes (94 crashes), they make up 35% of severe crashes (22 crashes).



Crash data from the study period reveal key patterns in crash severity and contributing factors that can inform road safety improvements. While certain crash types, such as Overturning/Rollover and Bicycle/Pedestrian crashes, are more likely to result in severe outcomes, factors like Careless Driving, Speeding, and Distracted Driving contribute to both total and severe crashes. The timing and location of crashes, particularly those occurring in non-intersection areas and during peak evening hours, further highlight areas with elevated crash patterns. Additionally, environmental conditions such as low visibility during dawn/dusk and at dark-unlighted locations and adverse weather including snow, sleet, hail, and cloudy conditions are strongly associated with severe crashes.

High Injury Network

The HIN highlights areas of Larimer County's unincorporated roadway system that are susceptible to higher rates of injury and fatal crashes. By mapping crash density and identifying patterns of severe accidents, the HIN provides a targeted approach to enhancing road safety, enabling the County to focus its limited resources where they can have the greatest impact.

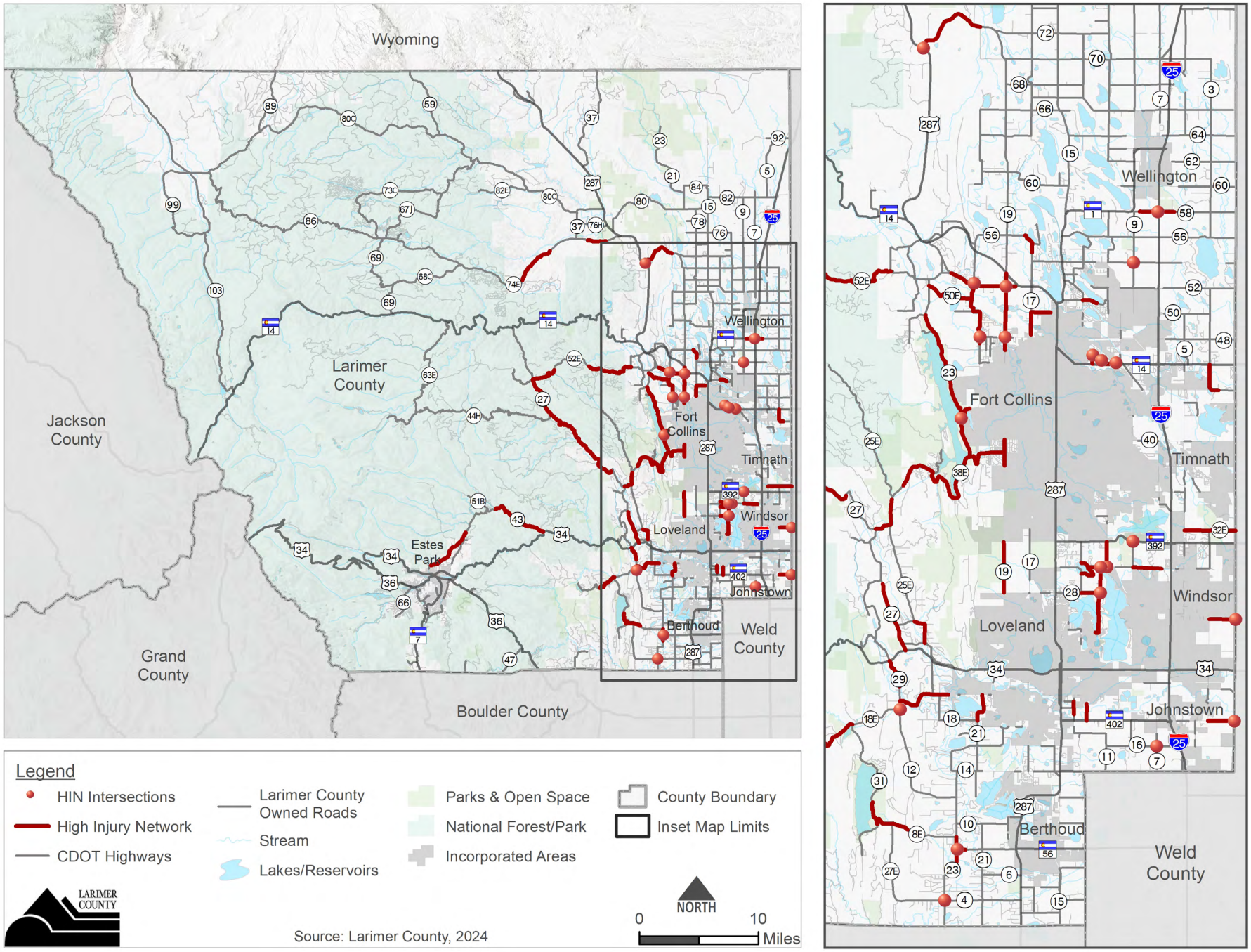
To develop the HIN, crash data was divided into two categories: **intersections** and **corridors**.

A total of 302 intersections with at least one crash and approximately 673 centerline miles of urban/rural and mountain corridors were evaluated. Crashes occurring at intersections accounted for 35 percent of all crashes (785 total) and 36 percent of severe crashes (293 total), while crashes occurring on corridors contributed to 65 percent of total crashes (1,444 total) and 64 percent of severe crashes (525 total).

To identify the most critical areas, the project team ranked intersections by the frequency of severe crashes or by a weighted crash severity index, with the top 15 ranking locations included in the HIN—resulting in 22 intersections with 4 or more severe crashes or an index value of 11 or more. Corridors were ranked by severe crash density (crashes per mile) or by a weighted crash severity index, with the top 50 percent of cumulative severe crashes selected, representing 127 urban/rural corridors over 41.8 miles as well as 33 mountain corridors over 21.3 miles. The project team used a refinement process that evaluated total crash frequency, continuity, recent projects, etc. to identify the final HIN, as shown on **Figure 8**.

The final HIN spans 21 intersections, 35 urban/rural corridors totaling about 58 centerline miles, and 14 mountain corridors totaling about 43.2 centerline miles. This network accounts for 53 percent of all crashes and 64 percent of severe crashes, despite representing only 15 percent of Larimer County's total roadway length.

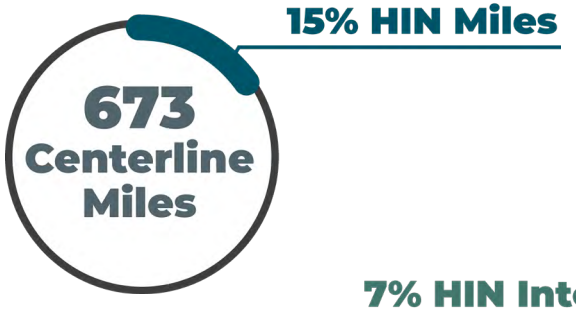
Figure 8. High Injury Network



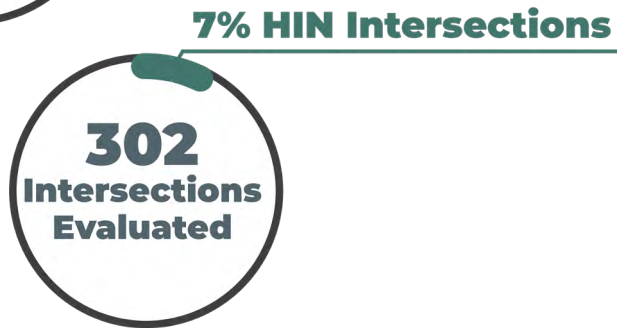
Snapshot

HIN as a portion of the network

HIN corridors make up about 101 0f 673 total centerline miles (15 percent)

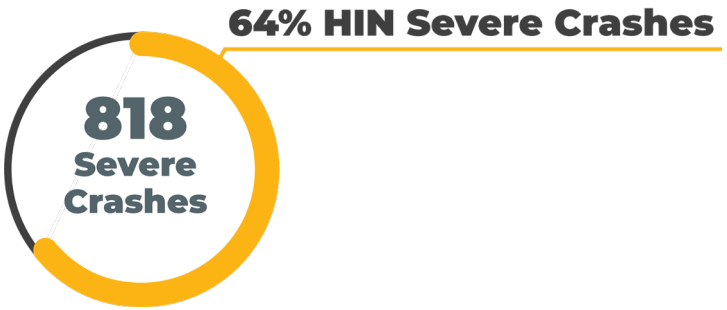


HIN intersections make up 21 of the 302 intersections evaluated (7 percent)

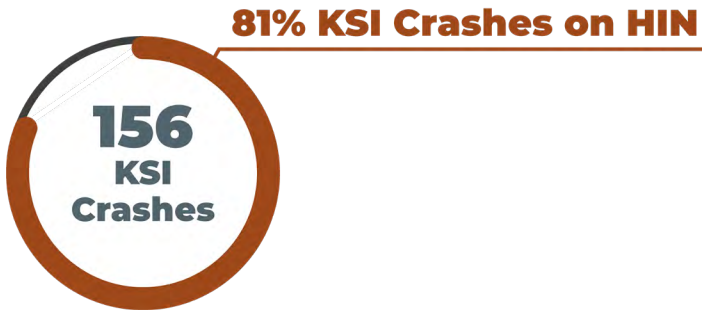


Severe and KSI Crashes on HIN

527 of 818 severe crashes occur on the HIN (64 percent)



126 of 156 KSI crashes occur on the HIN (81 percent)



Focus Areas

Focus Areas in the Safety Action Plan refer to specific categories of safety, including crash types that have been identified as priorities for targeted safety interventions and countermeasures. These areas identified through crash data analysis exhibit a disproportionately high representation in the overall crash frequency, resulting in higher risks of injury or fatality.

Identified Focus Areas include:

1. Intersections

Unsignalized intersections are noted as key areas of concern due to the frequency of crashes in the unincorporated county's suburban, rural, and mountainous areas. Crashes at these intersections often occur during roadway departure and can be influenced by limited sight distance from curves or hills, which may lead to misjudging gaps between vehicles, especially when traveling at higher speeds. Specific crash types of concern include:

Crash Type

- Broadside
- Rear End
- Fixed Object

Driver Action

- Failure to Yield
- Careless/Reckless Driving
- Follow Too Closely

2. Corridors

Crashes in corridors within the unincorporated county road system are more frequent, tend to result in more severe outcomes and often involve Roadway Departure Crashes on rural and mountainous corridors are often influenced by factors such as limited shoulder and clear zones, narrow and curved roads, and coupled with higher vehicle speeds. The following crash types and driver actions are of particular concern:

Crash Type

- Fixed Object
- Overturning/Rollover
- Rear End

Driver Action

- Careless/Reckless Driving
- Lane Violation
- Follow too Closely

Other driver behavior related issues such as speeding and distracted driving are part of a separate focus area.

3. Vulnerable Road Users

Vulnerable road user crashes are the most susceptible to severe crashes and require special focus in the Vision Zero paradigm. The vulnerable road user focus area centers on the safety of pedestrians and bicycles, with a particular focus on motorcycle crashes.

- Motorcycle Involvement
- Pedestrian
- Bicycle

4. Human Behavior

Human behavior is central to safety on the transportation network and is of concern based on public input and causal factors for crashes. The following are identified areas of special focus for behavior countermeasures in this Safety Action Plan:

Driver Action

- Careless and Reckless Driving
- Lane Violation
- Failure to Yield
- Speeding/Too Fast for Conditions

Driver Contributing Factors

- Distracted
- Aggressive Driving
- Impaired Driving

5. Safety Data

For credible safety analysis, good quality crash data are required. Key qualities of such data include completeness, accuracy, consistency, timeliness, geographic precision, and detailed crash characteristics. Additionally, these data are required for periodic evaluation of safety countermeasure effectiveness and for sharing with decision-makers and the public.

5.Systemic Safety Analysis

The Safety Action Plan builds on the systemic safety approach outlined in the National Cooperative Highway Research Program (NCHRP) Report 893: Systemic Pedestrian Safety Analysis, which offers a method for proactively identifying high-risk locations where pedestrian safety improvements are needed. By using a systemic approach, Larimer County can assess key risk factors and prioritize areas for intervention. This analysis plays a crucial role in shaping the Safety Action Plan by pinpointing highrisk locations and helping determine the most effective countermeasures to improve safety.

The systemic safety analysis includes the following elements:

- Identify target crash types, facility types, and risk factors
- Screen and prioritize candidate locations
- Select countermeasures
- Prioritize projects

Safety Risk Assessment

As part of the systemic safety analysis, the safety risk assessment provides a methodology to identify patterns and potential risk factors for crashes. This analysis provides insight into relationships between crashes and different environmental or roadway characteristics. A proactive safety approach will reveal a collection of meaningful location-based data correlated with a disproportionately higher number of crashes that are mapped as the High-Risk Network (HRN).

Crash Data

Crash data from Larimer County, covering fatal and injury crashes that occurred between 2019 and 2023, reveal characteristics that appear more frequently. These data help identify the most significant risk factors associated with fatal and injury crashes and highlight areas where there is a noticeable difference in crash frequency across various roadway conditions.

The following categories of crash data were analyzed:

- Crash type
- Road condition
- Lighting condition
- Time of day

Risk Factors

Risk factors refer to elements of the physical environment at the time of a crash that may have contributed to the crash or affected its severity. These risk factors are selected for analysis based on their relevance to the study area, including their prevalence, potential for high conflict between vehicles or road users, indication of traffic volume or speed, or other important reasons.

Identified risk factors include:

- Location type
- Functional classification
- Road characteristics
- Traffic volume
- Speed limit and operating speed
- Active transportation
- Land use
- Destination
- Low-income jobs
- Mobility barriers
- Communities of color

Results

Safety risk assessment results determine that the focus should be on injury and fatal crashes only, as these are the most concerning crashes, and mitigating those crashes will have the largest impact on safety. The mitigation for all crashes may also differ from the mitigation for injury crashes. For example, Rear End crashes represent 20 percent of all crashes, but only 3 percent of injury crashes and 0 percent of fatalities. If mitigations focus on Rear End crashes, the County will fail to address crashes resulting in injuries and fatalities and incidentally prioritize property damage over safety.

High-Risk Network

A HRN is a collection of critical roadway corridors and intersections with a greater risk of injury or fatal crashes occurring in the future based on the crash data evaluated and risk factors identified. The following risk factors were identified as having higher risk for injury or fatal crashes based on the systemic safety analysis and were used as inputs to create the HRN:

- Arterial (functional classification)
- Horizontal curvature
- Active transportation facilities (bike facilities, sidewalks, shared use paths, and trails)
- Signalized intersection
- ≥1,000-5,000 annual average daily traffic
- ≥50 low-income jobs

The HRN includes roadways identified by two or more high-risk factors as shown in **Figure 9**. **Figure 10** highlights areas where the HRN and HIN overlap. Although only 17% of roads are designated as part of the HRN, these roads are responsible for a disproportionate share of crashes, accounting for 43% of injury crashes and 54% of fatal crashes. **Table 1** provides a detailed summary of the number of high-risk factors on these roadways and the percentage of both injury and fatal crashes they contribute to.

Table 1. Summary of High-Risk Factors Per Roadway Percentage

Number of Risk Factors	Percent of Roadways	Percent of Injury Crashes	Percent of Fatal Crashes
2+	17%	43%	54%
3+	6%	15%	12%
4	2%	3%	4%

Table 2 provides a detailed breakdown of the number of high-risk factors associated with roadways, as well as the percentage of roadways, injury crashes, and fatal crashes they contribute to.

Table 2. Number of High-Risk Factors

Measurement	Number of Risk Factors			
	1	2	3	4
Roadway Length (feet)	1,866,201	537,739	205,294	88,097
% of Roadway	39%	11%	4%	2%
# of Injury Crashes	105	140	59	15
% of Injury Crashes	21%	28%	12%	3%
# of Fatal Crashes	5	11	2	1
% of Fatal Crashes	19%	42%	8%	4%

Figure 9. High-Risk Network

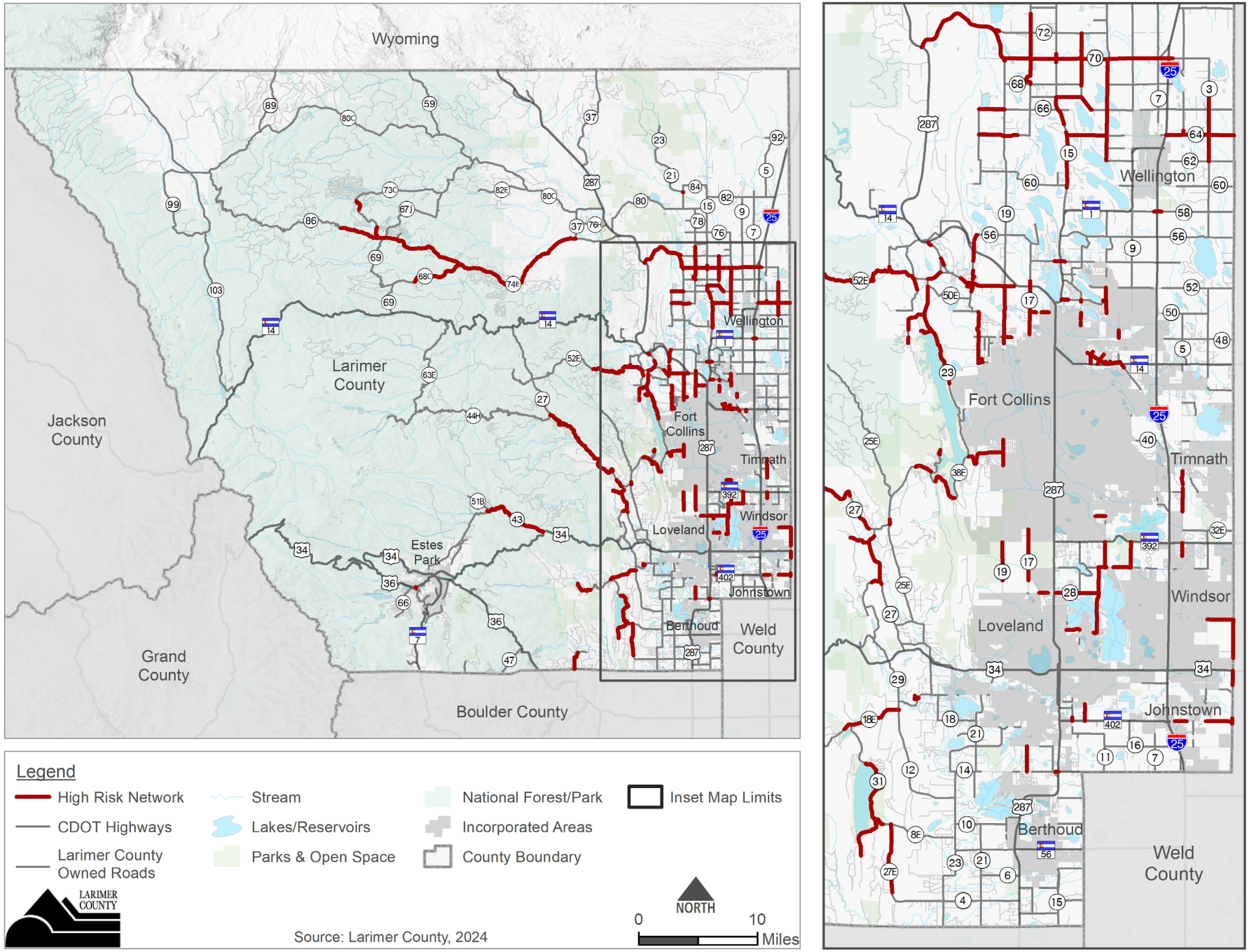
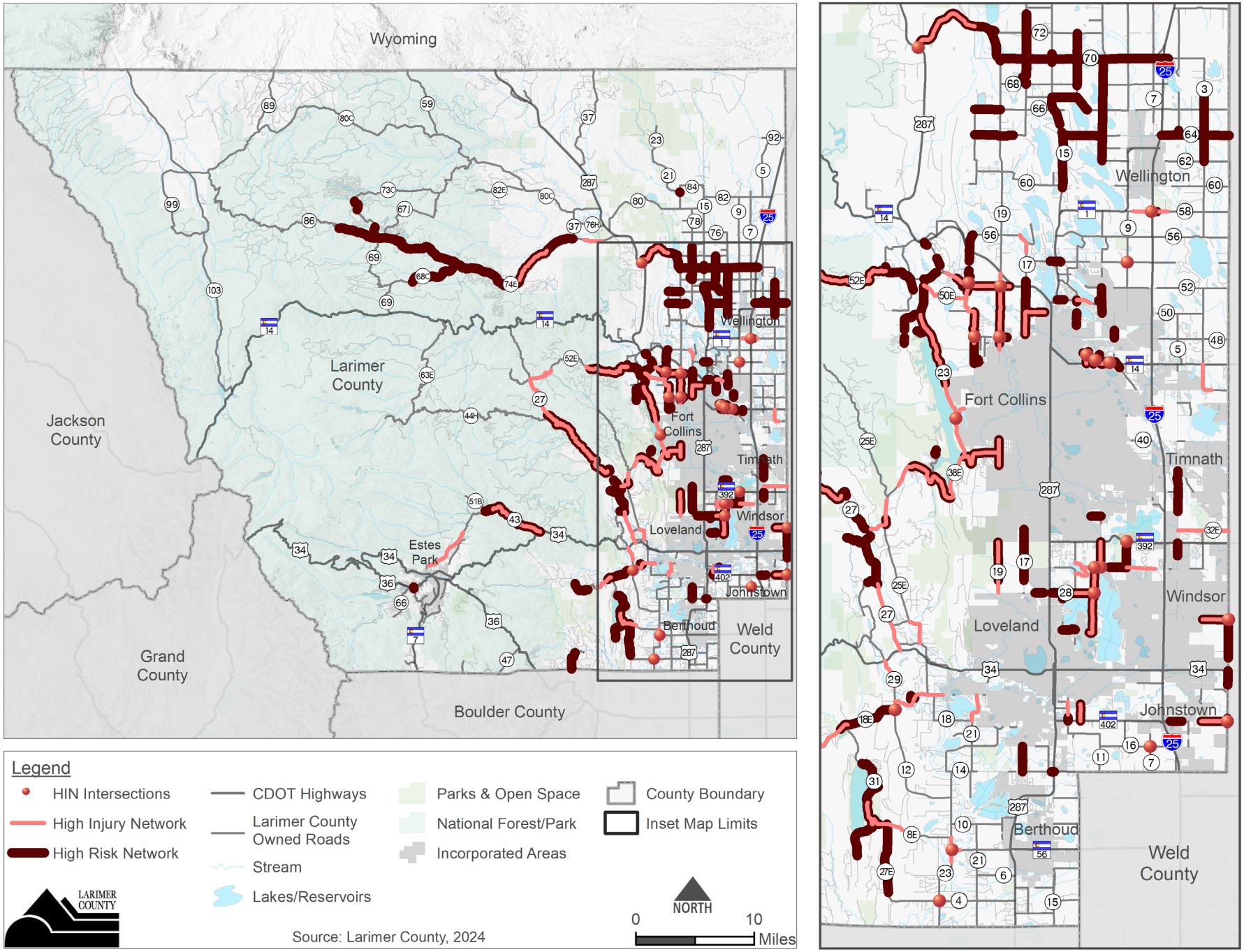


Figure 10. High Injury Network and High-Risk Network



6. Implementation Strategies and Project Prioritization

The Safety Action Plan captures the results of data analysis and public input to highlight the most common crash types and safety issues in Larimer County. The next phase is to combine this information with proven best practices and professional insight to develop strategies, actions, and countermeasures that will help achieve the County's safety goals. While some actions can be carried out in the short term, the Safety Action Plan requires long-term commitment and investment. This section outlines the implementation strategies, countermeasures, and prioritized projects that will drive the actions of the Safety Action Plan.

Implementation Strategies

The Safe System approach addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes. This Safety Action Plan adopted three of the five Safe System Approach objectives as the implementation strategies intended to accomplish the Vision Zero commitment.

Safer People

"Encourage safe, responsible driving and behavior by people who use our roads and create conditions that prioritize their ability to reach their destination unharmed."

Safer Roads

"Design roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users."

Safer Speeds

"Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, appropriate speed-limit setting, targeted education, outreach campaigns, and enforcement."

The implementation strategies align with the five core Focus Areas introduced in Chapter 4, Safety Trends and Data Analysis. Each implementation strategy highlights action items to address each Focus Area. The actions developed for the implementation strategies are based on input received from community members and partnering agency staff during the Safety Action Plan outreach phase.

The next part of this section lists actions associated with each implementation strategy that the County can follow to achieve Safe System and Vision Zero goals. In addition to describing each action, the tables list the time frame for each action and its associated Focus Area.

Safer People

This strategy promotes safe, responsible driving and behavior through outreach, education, and collaboration to enhance road safety for all users and foster a culture of shared responsibility.

The Safer People strategy focuses on promoting safe, responsible driving and behavior to ensure that all road users can reach their destination unharmed. It includes various measures to enhance safety for drivers, pedestrians, cyclists, and other vulnerable users. The strategy also emphasizes outreach efforts, educational campaigns, and collaboration among agencies to improve road safety. Its goal is to create a culture of shared responsibility, where all road participants work together to prioritize safety and reduce risks.

Engagement and Communication

Larimer County has created a strong safety mindset for residents and will continue to actively engage the public while strengthening partnerships with agencies such as education, enforcement, and engineering to share responsibilities more effectively. As part of this effort, the County will implement messaging and public education campaigns focused on initiatives like the Safe System Approach and Vision Zero, especially during ongoing construction projects, as well as on programs that the community is already familiar with. Organizing safety events and workshops for residents and community groups will help raise awareness and encourage safety. These events also provide an opportunity for residents to give feedback on completed projects or treatments and suggest potential improvements for future efforts.

Data and Transparency

Data collection and analysis play a crucial role in helping local officials, stakeholders, and the public better understand safety issues within the unincorporated county road system. By providing transparent and accessible reporting, Larimer County ensures that everyone stays informed about progress, the returns on investment, and improvements in public health and safety. Currently, the County publishes an annual safety report, and to further enhance transparency and accountability, it can continue to report on key indicators and metrics, with a particular focus on tracking progress toward the goals outlined in the Safety Action Plan. These metrics can be monitored through an online Performance Dashboard, which will serve as a tool developed for this effort for measuring progress. In the future, this dashboard could be expanded into a dedicated webpage that provides annual updates on the implementation of the Safety Action Plan, reinforcing continued transparency for public benefit.

Table 3. Safer People Strategy Table

These actions will encourage safer behaviors on the County's transportation network by all road users.

Action	Examples	Focus Area	Timeline	Partner
Education and Enforcement				
Safe Routes to School (SRTS) program	Conduct SRTS studies for all schools identified in this SAP with a priority for those near the HIN and HRN (pedestrian). Address factors impacting safe walking and biking for students. Work with schools to pursue SRTS funding opportunities.	Vulnerable Road Users	<5 years	School Districts
Safe Start Traffic program	Continue the Safe Start Traffic program with schools during the first few weeks of school. Expand the program further into the school year.	Vulnerable Road Users	<5 years	School Districts
Enforcement	Continue monthly review of latest crash data and trends to determine where to focus the enforcement effort. Continue to pursue federal grants for traffic safety enforcement to use for law enforcement officer overtime, additional enforcement, and engagement.	Human Behavior	<5 years	Law Enforcement
Impaired driving	Develop and enforce impaired driving laws that focus on zero-tolerance law enforcement, including penalties for refusal of field sobriety/ breathalyzer tests.	Human Behavior	<5 years	Law Enforcement
Education	Implement a safe speed educational campaign with age-specific messages to improve distracted driving and increase awareness of speed limits, school zones, and overall signage. Seek to educate the general public about common traffic safety terminology during ongoing construction projects.	Human Behavior	<5 years	
Communication	Incorporate Safe System Approach and Vision Zero messaging in educational campaigns and promotional materials, particularly during ongoing construction projects.	Human Behavior	<5 years	
Engagement	Engage the community to gather feedback on past completed treatments and future potential improvements for future implementation.	Safety Data	<5 years	
Policy and Program				
Partnerships	Explore partnerships with departments that specialize in education, enforcement, engineering, etc. to share responsibility.	Safety Data	<5 years	
Tracking and Transparency				
Track KSI crashes for evaluation	Develop a statistically valid methodology to evaluate the efficacy of countermeasures through a before-after analysis and apply this methodology to evaluate countermeasures that the County puts into place. Refine future countermeasure applications based on this analysis.			

Safer Roads

This strategy aims to improve road safety and accessibility by improving some of the County's roadways, expanding multimodal options, and updating policies to reduce human error and ensure safe travel for all users, particularly vulnerable road users.

The Safer Roads strategy focuses on designing roadways to reduce the impact of human errors, promote safer behaviors, and ensure safe travel for all users, particularly the most vulnerable. It aims to improve street safety and accessibility for people of all ages and abilities. Key actions include enhancing road design through maintenance and low-cost treatments, accommodating all modes including motorcycles, bicycles and pedestrians, expanding multimodal transportation options, and updating policies with a Safe System Approach. The strategy emphasizes the importance of welldesigned infrastructure that supports diverse modes of travel and prioritizes safety across the entire transportation network.

Engineering and Design

To enhance safety for road users in unincorporated Larimer County, it is important to consider rural road safety improvements and incorporate Complete Streets design principles where applicable during the design, construction, and reconstruction of roads. These principles help guide projects that improve traffic safety through street design, infrastructure updates, and operational strategies. Investments in engineering and design support the County's ongoing efforts to improve safety, with specific projects addressing pedestrian, bicycle, motorcycle, and vehicle safety, particularly in rural and mountainous areas. Regularly incorporating safety improvements during maintenance ensures that safety remains a consistent focus over time. While solutions like retrofitting and rightsizing projects can quickly improve safety, mountainous roads present challenges due to their topography. Nonetheless, measures used in rural areas can offer valuable opportunities to enhance safety in these areas.

The design of a transportation system plays a significant role in shaping how road users perceive appropriate speeds, particularly on uninterrupted rural roads or narrow, curved mountainous roads. To support road safety, this plan recommends the consideration of geometric improvements and surface treatments. Flexible funding options can also be used to implement non-location-specific projects, allowing Larimer County to address safety needs as they arise. By considering both broader safety improvements and targeted infrastructure investments, as well as smaller, quick-build projects, the County can achieve safer roads.

Policy, Process, and Regulation

Larimer County has shown a strong commitment to improving transportation and mobility through careful planning and action. The county's Transportation Plan is being updated in parallel with the Safety Action Plan, both of which include clear strategic goals to guide future progress. A key objective of the Transportation Plan is to prioritize the development of a safe transportation network that meets the needs of both the local community and the traveling public. To achieve the goals set forth in the Transportation Plan and implement the engineering and design projects outlined in the Safety Action Plan, it is important to align policies, processes, and regulations. This will enable stakeholders and agencies to support community planning efforts and achieve safety goals. Additionally, Larimer County can explore local programs with a significant impact at lower costs, such as pilot projects, smaller federally funded initiatives, and adjustments to existing programs.

Table 4. Safer Roads Strategy Table

These actions and projects will improve safety through improved transportation design applications.

Action	Examples	Focus Area	Timeline	Partner
Engineering and Design				
Implement project list of design/ operations improvements	Apply safety countermeasures to locations identified in the HIN in Project Prioritization **Table 6**.	Intersections and Corridors	<5 years	
Access management	Evaluate opportunities to modify access points using techniques like increasing driveway spacing and restricting movements.	Corridors	5–10 years	
Roadway Rightsizing	Evaluate HIN and HRN urban/suburban corridors for roadway rightsizing.	Corridors	5–10 years	
Quick build demonstration projects	Reconfigure roadways to accommodate all road users through low-cost modifications, including installations such as striping and quick build applications for lane reconfiguration, reduced turning radii, hardened centerlines, high-visibility crosswalks, raised pedestrian crossings, improved signage at crossing locations, curve delineators, and application of rectangular rapid flashing beacons. Gather feedback from residents and stakeholders to evaluate potential permanent applications.	Intersections and Corridors	5–10 years	CDOT
Geometric improvements and roundabouts	Evaluate opportunities to convert all-way stop control intersections to mini- or compact roundabouts to increase intersection control compliance and provide traffic calming support to improve resident quality of life.	Intersections	5–10 years	
Signal improvements	Install retroreflective backplates at all signalized intersections. Evaluate and install pedestrian countdown timers at all signals, as necessary. Begin these improvements at HIN intersections and develop a program for countywide evaluation.	Intersections	<5 years	CDOT
Pedestrian safety improvements	Implement sidewalk and related improvements that are ADA compliant and improve crosswalk visibility and pedestrian lighting.	Vulnerable Road User	5–10 years	

Action	Examples	Focus Area	Timeline	Partner
Pedestrian-related signal improvements – LPI, pedestrian signal	Implement signal timing improvements for pedestrians through application of Pedestrian Phase or Leading Pedestrian Interval. Include the policy for this evaluation as part of Intersection Control Evaluation (ICE).	Vulnerable Road User	<5 years	CDOT
Roadway lighting	Assess and improve roadway lighting at intersections on the HIN.	Intersections and Corridors	5–10 years	
High friction surface treatment	Measure, monitor, and maintain pavement friction at areas with a higher need for friction, such as curves, bridges, intersections, and crosswalk approaches.	Intersections and Corridors	5–10 years	
Policy and Program				
Motorcycle safety program	Provide public information and education programs on severity of motorcycle crashes, where/why they are happening and risks of motorcycle riding and riding while impaired. Promote motorcycle safety. Educate operators of other vehicles to be more conscious of the presence of motorcycles. Retrofit standards for existing guardrails to improve safety of motorcycle barriers. Consider as a demonstration project at identified locations. Incorporate motorcycle safety considerations into routine roadway inspections. Increase awareness of the benefit of highvisibility clothing and technology. Provide a mechanism for road users to notify highway agencies of roadway conditions that present a potential problem for motorcyclists. Improve emergency response and trauma system services.	Human Behavior, Vulnerable Road User	5–10 years	
Road safety audit (RSA)	Include RSAs with all roadway improvement projects on the HIN and HRN. Develop a program to complete RSAs in the County annually where each RSA would be a formal safety evaluation of intersections and corridors for all road users. Perform before and after studies to quantify the safety benefits of completed safety interventions.	Intersections and Corridors	<5 years	NFRMPO, CDOT
Intersection Control Evaluation (ICE) policy	Develop an intersection evaluation process to determine appropriate intersection control through an ICE process that considers traffic operations, safety, and accommodation of all road users.	Intersections	<5 years	
Tracking and Transparency				
Track KSI crashes for evaluation	Continue to evaluate the efficacy of countermeasures through the established safety report process and refine future countermeasure applications based on this analysis.			

Safer Speeds

This strategy recognizes the vulnerability of the human body and aims to reduce excessive speeds and prevent traffic fatalities and serious injuries by implementing thoughtful design, speed limits, education, enforcement, and traffic calming measures.

The Safer Speeds strategy focuses on promoting safer speeds across all contexts through thoughtful design such as self-enforcing streets, appropriate speed limits, education, outreach campaigns, and enforcement. The application of context sensitive speed limits and reinforcing the need for drivers to operate vehicles at appropriate speeds is key to preventing traffic fatalities and serious injuries. Self-enforcing streets is a concept that designing roadways such that the operating speeds and posted speed limits are in harmony with the roadway's geometric design speed. Implementing this self-enforcing roadway design approach is most applicable in the suburban and urban areas of the county, and it encourages drivers to operate at speeds in compliance with the posted speed limit. Such self-enforcing roadways are one of the most effective ways for speed compliance contributing to less severe crash outcomes. Other actions include appropriate speed limit setting, traffic calming measures, data-driven enforcement, and speed management strategies.

Speed Management and Enforcement

Managing speed through design elements is an important component for improving road safety, especially for vulnerable road users. Reducing speeds or setting appropriate speed limits in areas such as rural-to-suburban/urban transition zones, school zones, residential areas, and local roads can be achieved using traffic calming measures. In unincorporated Larimer County, rural and mountainous areas may benefit from speed management strategies like roundabouts, gateway treatments, and lane narrowing. Along with these design improvements, a Speed Management Plan can help identify key corridors for speed control and provide a clear framework for setting appropriate speed limits. Speed enforcement is also an important component and may include measures such as speed camera enforcement or the use of temporary speed warning and feedback signs.

Table 5. Safer Speeds Strategy Table

These actions will promote safer speeds on the County's transportation network through a multipronged approach.

Action	Examples	Focus Area	Timeline	Partner
Engineering and Design				
Appropriate speed limits for all road users	Continue to consider a range of factors such as land use context, vulnerable user activity, crash history, crossing conflicts, roadway geometry, roadside conditions, roadway functional classification, traffic volume, and observed speeds.	Corridors	Ongoing	
Appropriate roadway design for speeds	Implement rightsizing projects to reduce traffic speeds and to improve safety and comfort of all users.	Intersections and Corridors	<5 years	
Dynamic speed feedback sign deployment	Deploy temporary speed feedback signs, prioritizing locations with identified speeding issues, at high-crash areas, or near locations with vulnerable road users. Identify priority locations based on GPS or other sources of speed data.	Corridors	<5 years	
Policy and Program				
Speed management plan for setting speed limits	Continue speed management efforts to evaluate speed limits and to establish appropriate speed limits for all road contexts.	Corridors	<5 years	Law Enforcement
Traffic calming program	Develop a traffic calming program to inform the installation of traffic calming infrastructure based on location-specific context. Base application on speed data and crash history.	Intersections and Corridors	<5 years	
Tracking and Transparency				
Track speed, traffic volumes, public input as metrics for evaluation	Collect speed data along with the County's traffic count collection program.			

Project Prioritization

The project locations and countermeasures for the Safety Action Plan were carefully selected through a prioritization process designed to address the areas with the greatest need first. This process evaluates potential locations by first assessing crash severity and risk, then locations are ranked using a weighting system that takes into account factors such as travel choice, equity, and community input, ensuring that the plan not only maximizes safety but also serves the needs of all residents.

Evaluation Criteria

Projects were assessed and ranked using four criteria outlined below. Each criterion's percentage indicates its contribution to the overall project score.

Safety (60 percent)

- Is the project located on the High Injury Network (HIN)?
- Is the project located on the High-Risk Network (HRN)?
- What is the Weighted Crash Severity Index (WCSI) relative to other projects?

Travel Choice (19 percent)

- Would the project enhance sustainable travel options like bicycling and walking?
- Is the project located in an area with high pedestrian demand?
- Would the project improve the comfort in a high stress area for bicyclists and pedestrians?
- Is the project located in an area with a high volume of short trips that have the potential to be converted to bicycling or walking trips?

Equity (11 percent)

- Is the project located in an area of the county with:
  - Economic Barriers
  - Mobility Barriers
  - Communities of Color
  - SS4A Underserved Communities
  - Climate & Economic Justice Screening Tool
  - USDOT Equitable Transportation Explorer

Community Input (10 percent)

- How many public comments were received supporting the project relative to other projects?

Safety-focused projects are seamlessly integrated into "Larimer on the Move" initiative alongside the broader roadway, paving, intersection, and bridge projects. Other projects within the "Larimer on the Move" portfolio are prioritized based on their potential to achieve the County's transportation goals. Many of these projects also incorporate safety elements, with the safety criterion described previously serving as one of the key goal-based metrics used to evaluate and rank them.

Table 6 lists ranked projects and **Figure 11 and Figure 12** identifies their locations.

Table 6. Safety Action Plan Projects

Short-Term Projects

ID	Route	Location	Description	Patterns	Type
180	LCR 54G	Rist Canyon Rd to US 287	Signing and striping improvements were completed in 2024. Also consider wider edge lines	Off Road – Right, Embankment/ Ditch, Fixed Object, Driver Inexperience, Driver Preoccupied	Segment
182	LCR 21C/ LCR 21	Orchard Dr to n.o. High St	Consider multimodal improvements for bike, pedestrian, and equestrian safety, and implementation of wider edge lines	Off Road – Right, Fixed Object, Driver Inexperience	Segment
193	LCR 38E	Centennial Dr to Taft Hill Rd	Consider intersection access delineation and bike safety improvements		Segment
194	LCR 19	Horsetooth Rd to Fromme Praire Wy	Explore speed management treatments including medians and signage	Rear End, Driver Preoccupied	Segment
236	N Overland Trl	N Overland Trl & W Vine Dr	Perform an intersection control evaluation and consider improvements to visibility through enhanced signage, delineation, and clear sight triangles. Explore adding bike lane striping through the intersection.	Broadside	Intersection
237	E Lincoln Ave	E Lincoln Ave & S Link Ln	Consider evaluating the intersection control, including the addition of flashing yellow arrow (FYA) signal heads, reviewing clearance intervals, and optimizing signal phasing. Consider improving the intersection design by adding channelizing islands and providing a positive offset for left turns, restriping the intersection for better stop bar placement, and adding pedestrian crosswalk striping with a reduced crossing distance from the channelizing islands. Consider installing a flashing beacon with advance signal warnings on northbound Link Ln,	Broadside	Intersection
238	E Lincoln Ave	E Lincoln Ave & Air Park Dr	Perform intersection control evaluation and consider implementing a roundabout at this location and improving visibility with enhanced signing, delineation, and clear sight triangles	Broadside	Intersection

Mid-Term Projects

ID	Route	Location	Description	Patterns	Type
177	LCR 72	US 287 to LCR 21	Explore speed management treatments including longitudinal rumble strips and wider edge lines. Slope flattening effort was completed in 2021.	Off Road – Right, Overturning/Rollover	Segment
183	LCR 19	US 287 to Laporte Ave	Consider trail crossing improvements with additional warning signs and temporary speed feedback signs	Rear End, Sideswipe, Driver Preoccupied	Segment
184	LCR 50E	Lemay Ave to Warren Dr	Consider roadside design improvements and speed management treatments		Segment
185	LCR 50	Shields St to e.o. Maplewood Rd	Consider roadside design improvements and school zone safety measures		Segment
190	LCR 23/LCR 42C	Lodgepole Dr to w.o. Overland Trl	Explore motorcycle and pedestrian safety enhancements and traffic calming features for speed management	Off Road – Left, Overturning/ Rollover, Traffic Sign, Driver Inexperience, Unfamiliar with Area	Segment
192	LCR 38E	e.o. LCR 25E to Centennial Dr	Explore trail and pedestrian crossing improvements and traffic calming features for speed management	Rear End, Driver Preoccupied	Segment
195	LCR 19	Spring Mesa Rd to 57th St	Consider enhanced signage and pavement markings, including wider edge lines	Dark-Unlighted	Segment
207	LCR 11H	s.o. 4th St to CO-402	Consider enhanced signage and pavement markings, including wider edge lines	Off Road – Right, Fixed Object	Segment
223	LCR 29	US 34 to s.o. Big Valley Dr	Consider roadside design improvements, safety edge treatments, and clear zone assessment	Off Road – Right, Embankment/Ditch, Fixed Object, Driver Preoccupied	Segment
225	LCR 31	s.o. Sky View Campground to LCR 18E	Explore speed management treatments including centerline rumble strips and traffic calming measures	Off Road – Right, Overturning/Rollover, Driver Inexperience	Segment
226	N Taft Hill Rd	N Taft Hill Rd & W Vine Dr	Review roundabout geometry including entry angle and approach geometry for appropriate speeds and consider restriping to make pavement marking improvements, and improve pedestrian visibility by providing pedestrian oriented lighting at pedestrian crossings	Fixed Object	Intersection
227	LCR 30	LCR 30 & S Timberline Rd	Review central island design for truck aprons, review signing and placement of signs and improve pavement markings to ensure retro reflectivity, consider improving advance signing to reduce approach speed	Fixed Object	Intersection

ID	Route	Location	Description	Patterns	Type
230	LCR 30	LCR 30 & LCR 11C	Review island and splitter design for speed reduction, consider improving pedestrian visibility with enhanced lighting at pedestrian crossings		Intersection
232	LCR 29	LCR 29 & Pole Hill Rd	Consider providing advance warning signs and improving visibility through enhanced signing, delineation, and relocating the stop bar		Intersection
235	N Taft Hill Rd	N Taft Hill Rd & LCR 54G	Consider improving delineation through channelizing islands and enhanced striping, provide signal head backplates with retroreflective borders	Inexperience	Intersection
240	LCR 54G	LCR 54G & N Overland Trl	Consider the following improvements: providing advance warning signs for the westbound signal, installing mast arm signals with flashing yellow arrow (FYA) signal heads, improving the lateral offset of signal poles, and reviewing clearance intervals and signal phasing. Additionally, enhancing the intersection design by adding a positive offset for left turns, using backplates with retroreflective borders, and improving intersection lighting could be beneficial. In the long term, installing a roundabout may also be worth exploring		Intersection
246	Carpenter Rd	Carpenter Rd & LCR 9	Consider restriping in the short-term to improve stop bar location on LCR 9 to increase visibility and providing advance intersection warning sign on LCR 9. Consider intersection control evaluation in long-term		Intersection

Long-Term Projects

ID	Route	Location	Description	Patterns	Type
178	LCR 58	e.o. Giddings Rd to e.o. Legacy Ln	Consider enhanced signage and paving markings, including wider edge lines		Segment
179	LCR 56	e.o. Jackson Ditch to n.o. Mesa Dr	Consider roadside design improvements including safety edge treatments, wider edge lines, and performing a clear zone assessment	Off Road – Right	Segment
181	LCR 50E	LCR 23 to Overland Trl	Consider roadside vegetation management, wider edge lines, and bike safety enhancements	Off Road – Right, Fixed Object	Segment
186	LCR 17	Wilcox Ln to n.o. Vine Dr	Consider enhanced signage and pavement markings, including wider edge lines		Segment
187	LCR 46E	12th St to Timberline Rd	Consider roadside design improvements including speed management treatments and performing a clear zone assessment. Explore design options for 2-lane section with two-way left turn lane	Rear End	Segment

ID	Route	Location	Description	Patterns	Type
188	LCR 11F	Lincoln Ave to Mulberry St	Consider implementing a roundabout and providing enhanced signage and pavement markings	Broadside	Segment
189	LCR 3/LCR 44	CO-14 to Kimmer Ln	Consider roadside design improvements including safety edge treatments		Segment
191	LCR 23	Dixon Canyon Rd to LCR 38E	Consider roadside design improvements including pedestrian safety enhancements	Fixed Object	Segment
196	LCR 13/LCR 30	Lemay Ave to LCR 13	Consider roadside design improvements including safety edge treatments and performing a clear zone assessment	Fixed Object	Segment
197	LCR 30	Lemay Ave to Timerberline Rd	Consider roadside design improvements including safety edge treatments bike lane improvements		Segment
198	LCR 11	CO-392 to LCR 30	Explore speed management treatments including enhanced striping and longitudinal rumble strips	Rear End, Driver Preoccupied	Segment
199	LCR 11C	LCR 30 to e.o. Pikes Peak Dr	Consider roadside design improvements including safety edge treatments and performing a clear zone assessment		Segment
200	LCR 28	LCR 13 to LCR 11C	Consider roadside design improvements including safety edge treatments and performing a clear zone assessment		Segment
201	LCR 32E	LCR 5 to County Line Rd	Consider roadside design improvements including longitudinal rumble strips and safety edge treatments	Off Road – Right, Fixed Object	Segment
202	LCR 30	LCR 9 to w.o. Byrd Dr	Consider roadside design improvements including bike lane improvements		Segment
204	LCR 20	LCR 29 to e.o. Bitterbush Wy	Consider enhanced signage and pavement markings, including wider edge lines	Fixed Object, Dark-Unlighted	Segment
205	LCR 21	LCR 20 to 14th St	Consider roadside design improvements including safety edge treatments and performing a clear zone assessment		Segment
206	LCR 13C	4th St to n.o. CO-402	Consider enhanced signage and pavement markings, including wider edge lines	Off Road – Right	Segment
209	LCR 8E	LCR 31 to e.o. Sedona Hills Dr	Consider longitudinal and centerline rumble strips, wider edge lines, and clear zone improvements	Off Road – Right, Overturning/Rollover, Driver Inexperience	Segment
210	LCR 23/LCR 8	LCR 8E to w.o. Sunbird Ln	Explore roadway treatments for dark-unlighted conditions and consider wider edge lines and enhanced curve delineation	Dark-Unlighted	Segment
211	LCR 23	LCR 23/LCR 8 to no.o. LCR 6	Consider enhanced signage and pavement markings		Segment
212	LCR 74E	e.o. Deer Meadow Wy to w.o. LCR 37	Consider roadside design improvements including longitudinal rumble strips and wider edge lines	Off Road – Right, Fence, Fixed Object	Segment

ID	Route	Location	Description	Patterns	Type
213	LCR 74E	e.o. LCR 37 to w.o. Roberts Ranch Rd	Consider roadside design improvements including longitudinal rumble strips and wider edge lines	Off Road – Right, Embankment/Ditch, Fixed Object	Segment
214	LCR 52E	Stove Prairie Rd to e.o. Spring Valley Rd	Consider roadside design improvements including safety edge treatments, and performing a clear zone assessment	Off Road – Left, Fixed Object, Driver Inexperience	Segment
215	LCR 52E	e.o. Rist Creek Rd to LCR 27E	Consider roadside design improvements including and curve delineation	Off Road – Right, Large Boulders/Rocks, Fixed Object, Driver Inexperience	Segment
216	LCR 27	Rist Canyon Rd to w.o. Patience Wy	Consider roadside design improvements including longitudinal rumble strips, wider edge lines and advanced curve warning signs	Off Road – Right, Overturning/Rollover	Segment
217	LCR 27	w.o. Patience Wy to w.o. Paintbrush Wy	Consider enhanced signage and pavement markings, including wider edge lines		Segment
218	LCR 38E	Buckhorn Rd to s.o. LCR 25E	Consider enhanced signage and pavement markings, including wider edge lines	Fixed Object	Segment
219	LCR 43	e.o. MacGregor Ave to n.o. McGraw Ranch Rd	Consider enhanced signage and pavement markings, including wider edge lines	Off Road – Right	Segment
220	LCR 43	Streamside Dr to US 34	Consider enhanced signage and pavement markings, including wider edge lines	Off Road – Right, Fixed Object	Segment
221	LCR 27	Woods Rose Ln to US 34	Explore roadway treatments for dark-unlighted conditions and consider enhanced curve delineation	Off Road – Right, Fixed Object, Dark-Unlighted	Segment
222	LCR 24H	Glade Rd to LCR 24	Consider enhanced signage and pavement markings, including wider edge lines and advanced curve warning signs		Segment
224	LCR 18E	w.o. Chimney Hollow Rd to LCR 31	Consider enhanced signage and curve delineation, including wider edge lines		Segment
228	Dixon Canyon Rd	Dixon Canyon Rd & Centennial Dr	Explore treatments that improve visibility such as enhanced signing, delineation, and clear sight triangles, and providing advance warning signs for upcoming intersection		Intersection
229	LCR 11C	LCR 11C & E 57th St	Review roundabout design (ICD ~ 130') for design vehicle, consider updating signage and pavement markings for visibility		Intersection

ID	Route	Location	Description	Patterns	Type
233	LCR 23	LCR 23 & LCR 8	Consider relocating the stop bar for improved line of sight, improving visibility with enhanced signing, delineation, and striping, and providing two-direction signage for T-intersection		Intersection
239	N Giddings Rd	N Giddings Rd & E Doublas Rd	Explore treatments that improve visibility such as enhanced signage and delineation and advance warning signs for the intersection. Consider assessing the posted speed limits on both approach roads, evaluating the usage of heavy equipment vehicles at the intersection, and providing appropriate warning signs	Broadside	Intersection
241	LCR 16	LCR 16 & LCR 7	Consider treatments that improve visibility such as an advance warning sign and flashing beacon on the stop sign to address issues caused by sun glare, along with enhanced delineation and clear sight triangles. Consider providing transverse rumble strips approaching stop signs	Broadside	Intersection
243	LCR 23E	LCR 23E & LCR 4	Consider restriping the intersection for better stop bar placement and lane delineation, improving the eastbound stop sign post height for better visibility, and enhancing visibility through improved delineation and clear sight triangles.	Broadside	Intersection

Projects in Other Jurisdictions

ID	Route	Location	Description	Patterns	Type
Short-Term Projects					
208	LCR 18	High Plains Blvd to County Line Rd	Consider roadside design improvements, including safety edge treatments and performing clear zone assessments (future expected roundabout construction, Weld County responsibility)		Segment
234	S Timberline Rd	S Timberline Rd & E Lincoln Ave	Perform an intersection control evaluation for the two-way stop and consider the implementation of a roundabout in the long term. Consider access management options for Lincoln Avenue onto Timberline Road, adding pedestrian crosswalk striping, and providing directional curb ramps. Consider improvements to visibility through enhanced signage, delineation, and clear sight triangles (future expected project to limit turning movements at intersection by implementing Michigan left, City of Fort Collins responsibility)	Broadside	Intersection
244	LCR 18	LCR 18 & County Line Rd	Explore improvements to the left turn geometry to provide a positive offset, consider restriping to establish stop bars, and enhancing visibility through improved signage, delineation, and clear sight triangles, and providing advance warning signs (future expected roundabout construction, Weld County responsibility)	Broadside, Unfamiliar with Area	Intersection

ID	Route	Location	Description	Patterns	Type
Mid-Term Projects					
231	US 287	US 287 & LCR 72	Consider restriping and repaving intersection area for positive guidance and improving advance signing on LCR 72 . (future expected project, CDOT responsibility)		Intersection
242	LCR 58	LCR 58 & I-25 FR	Consider conducting an intersection control evaluation to assess the placement of the stop sign, as the current stop sign is located on a 55 mph road, and the east-west approach visibility is inadequate. Consider reassessing the posted speed limit on the frontage road, improve visibility with enhanced signage, delineation, and clear sight triangles (CDOT responsibility)	Broadside	Intersection
245	Crossroads Blvd	Crossroads Blvd & County Line Rd	Consider improving the left turn geometry to provide a positive offset, reviewing clearance intervals and signal timing, and applying a high friction surface treatment at the intersection, restriping to enhance the stop bar location, and adding bike lane striping through the intersection (Town of Windsor responsibility)		Intersection
Long-Term Projects					
203	LCR 26	LCR 3 to County Line Rd	Consider roadside design improvements including enhanced striping, longitudinal rumble strips, and speed management treatments (Town of Windsor responsibility)	Rear End, Driver Preoccupied	Segment

Figure 11. Safety Action Plan Projects – Short-Term and Mid-Term

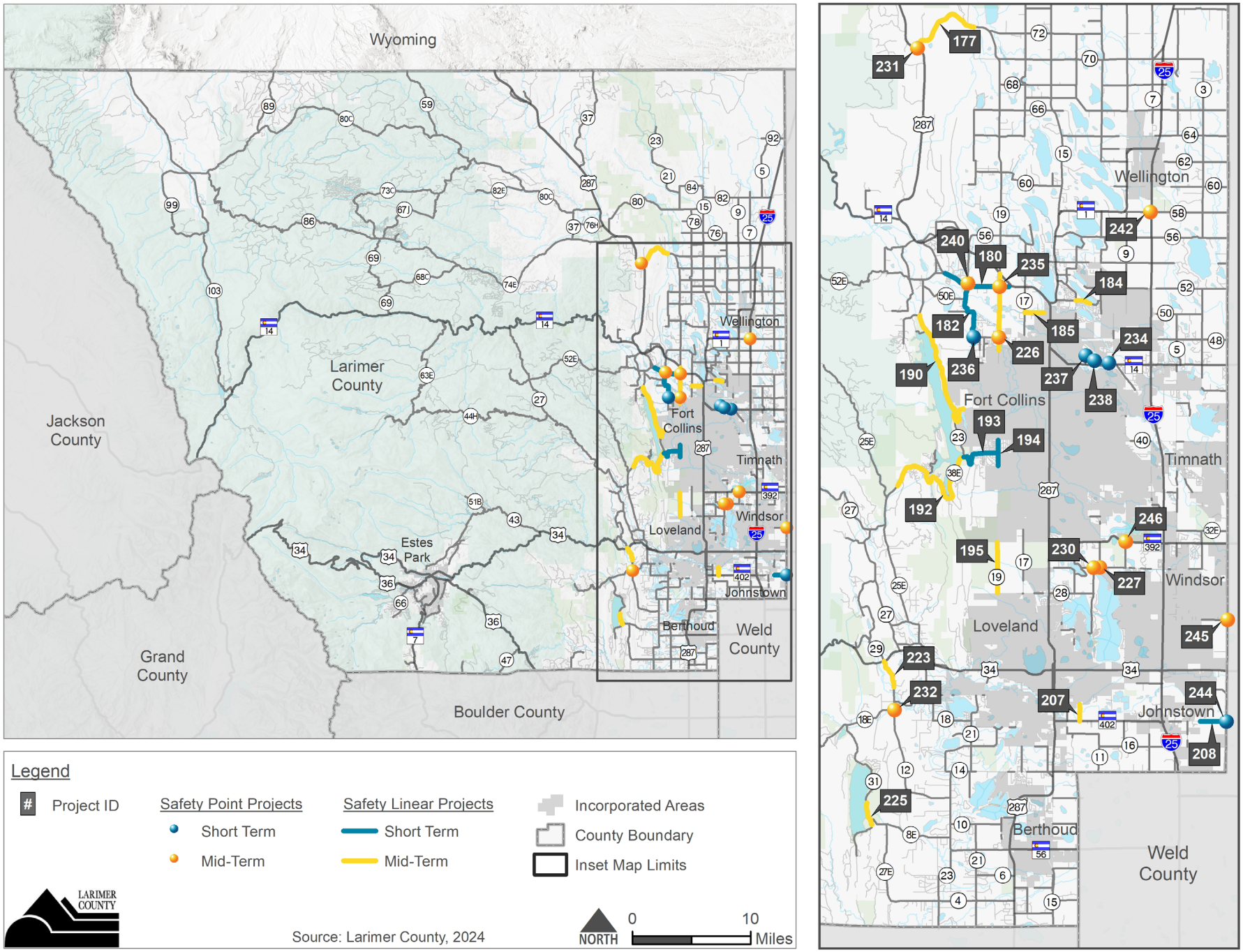
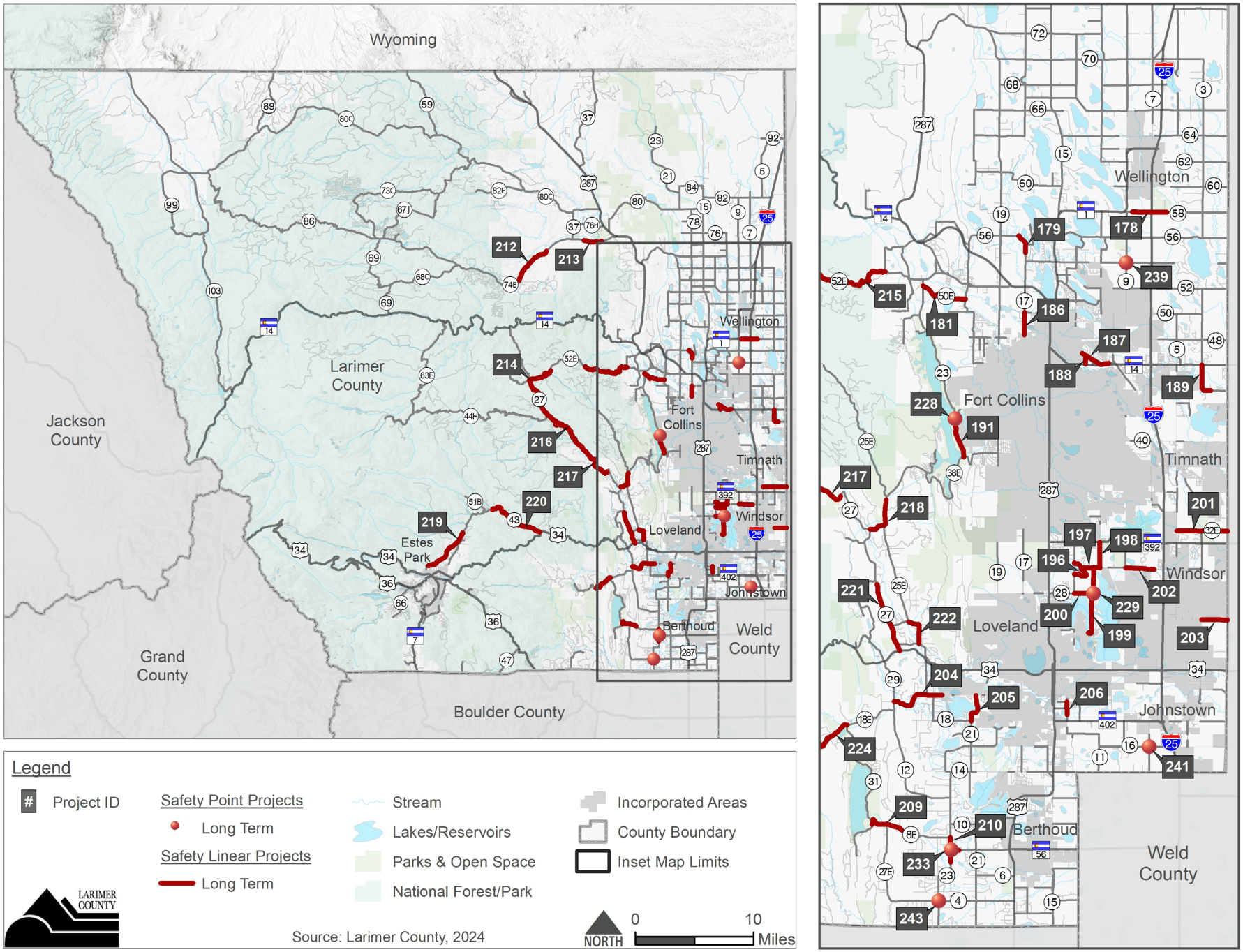


Figure 12. Safety Action Plan Projects – Long-Term



Countermeasures Toolbox

Countermeasures refer to actions or strategies designed to mitigate or neutralize the impact of specific risks or hazardous situations, either across a transportation network or at specific locations. These measures can be broadly categorized into two types systemic and location-specific.

Systemic countermeasures are applied across the entire transportation network to reduce overall risk. Examples include equipment and roadway improvements such as rectangular rapid flashing beacons, pedestrian hybrid beacons, enhanced lighting, curb bulbouts, and high-visibility crosswalks.

Location-specific countermeasures focus on addressing hazards and crash risks at particular sites, typically where severe crashes have occurred.

The Countermeasures Toolbox is grounded in the Safe System Approach, which acknowledges the complexity of the transportation system and the human factor in safety. Aligned with key focus areas, the toolbox offers a comprehensive, proactive approach to improving safety. The Countermeasures Toolbox includes proven safety measures, context sensitive design solutions, and multimodal roadway and community typologies to address specific focus areas, while also offering guidance on cost magnitude for ongoing use by the County.

Table 7. Countermeasures Toolbox

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
Appropriate Speed Limit	Speed	When setting a speed limit, agencies should consider a range of factors beyond 85th percentile speeds.	Arterials, Collectors and Local roads	Systemic application across the roadway network	$$	FHWA
Variable Speed Limit (VSL)	Speed	This strategy improves safety performance and traffic flow by reducing speed variance and may also improve driver expectation.	Urban and rural freeways and high-speed arterials with posted speed limits greater than 40 MPH.	CDOT highways	$$	FHWA
Speed Camera Enforcement	Speed	Speed management through the use of automated enforcement.	Locations where speeding is common; entrance/exit of urban areas	Speed Differential Map	$$	
Temporary Dynamic Speed Warning/ Feedback Signs	Speed	Temporary speed feedback provided to road users if they are travelling at speeds higher than the posted speed limit.	Locations where speeding is common; entrance/exit of urban areas	Speed Differential Map	$	
Vertical Speed Control Devices: Speed Cushions, Tables	Speed	Design elements to discourage high speeds through vertical elements in the roadway.	Local or collector neighborhood roads with a posted speed limit of 30 MPH or less, speeding is a concern	Speed Differential Map	$$	NACTO
Medians with Horizontal Deflection	Speed	Design elements to discourage high speeds through horizontal elements in the roadway requiring road users to navigate design elements in the roadway.	Roadways where design speed ≤ 45 MPH; roadways with wide lanes (> 11 ft)	Urban - Rural transition map; 85th percentile speeds map	$$	MDOT

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
Slow Turn Wedges	Speed	Design elements to discourage high speeds through horizontal elements in the roadway requiring road users to navigate design elements in the roadway.	Corners of intersections where minor roads intersect major roads; intersections with high volumes of pedestrians where speeds of turning vehicles are a concern	Collect pedestrian volumes, turning volumes at select intersections in transition or fringe areas	$	City of Orlando NACTO
Hardened Centerlines	Speed	Design elements to discourage high speeds through horizontal elements in the roadway requiring road users to navigate design elements in the roadway.	Pair with slow turn wedges	Collect pedestrian volumes, turning volumes at select intersections in transition or fringe areas	$	City of Orlando
Raised Crosswalks	Speed	Design elements to discourage high speeds through horizontal elements in the roadway requiring road users to navigate design elements in the roadway.	Local or collector neighborhood roads with a posted speed limit of 30 MPH or less, speeding is a concern	Collect pedestrian volumes, turning volumes at select intersections in transition or fringe areas	$$	FHWA
Curb Extensions	Speed	Design elements to discourage high speeds through horizontal elements in the roadway requiring road users to navigate design elements in the roadway.	Where there is an on-street parking lane; gateways to minor roads	Collect pedestrian volumes, turning volumes at select intersections in transition or fringe areas	$$	NACTO
Bicycle Facilities	Vulnerable Road Users	Providing bicycle facilities can mitigate or prevent interactions, conflicts, and crashes between bicyclists and motor vehicles	New roadways or on existing roads by reallocating space in the right-of-way	Locations identified in the Transportation Plan and Prioritized project list	$$	FHWA
Crosswalk Visibility	Vulnerable Road Users	Visibility enhancements help make crosswalk users more visible to drivers. Enhancements include high-visibility crosswalks, lighting, and signing and pavement markings.	Areas with high number of crossings, fewer safe crossing opportunities for pedestrians and bicycles, and higher speeds	Locations identified in the Transportation Plan and Prioritized project list	$	FHWA

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
Leading Pedestrian Interval (LPI)	Vulnerable Road Users	Pedestrians enter the crosswalk at an intersection 3-7 seconds before vehicles and can better establish their presence in the crosswalk before vehicles have priority to turn right or left.	Signalized intersections with pedestrian activity	Apply at signalized intersections with pedestrian facilities	$	FHWA
Medians and Pedestrian Refuge	Vulnerable Road Users	Installing a median or pedestrian refuge island can help improve safety by allowing pedestrians to cross one direction of traffic at a time.	Curbed sections of urban and suburban multilane roadways, in areas with a significant mix of pedestrian and vehicle traffic, traffic volumes over 9,000 vehicles per day, and travel speeds 35 MPH or greater	Mid-block crossings, multilane intersections, near transit stops	$$	FHWA
Pedestrian Hybrid Beacon (PHB)	Vulnerable Road Users	PHBs help pedestrians safely cross higher-speed roadways at mid-block crossings and uncontrolled intersections.	Pedestrian crossings at mid-block locations and at uncontrolled intersections	Mid-block crossings, unsignalized intersections	$$$	FHWA
Rectangular Rapid Flashing Beacon (RRFB)	Vulnerable Road Users	Enhance pedestrian conspicuity and increase driver awareness at uncontrolled, marked crosswalks with an RRFB.	Crossings at locations with speed limits less than 40 MPH or 45 MPH per site conditions	Trail crossings	$$	FHWA
Roadway Reconfiguration	Vulnerable Road Users	Converting an existing four-lane undivided roadway to a three-lane roadway can improve safety, calm traffic, provide better mobility and access for all road users, and enhance overall quality of life.	Implemented on four-lane roadway with a current and future average daily traffic of 25,000 or less.	Locations identified for potential future application	$$$	FHWA
Walkways	Vulnerable Road Users	Well-designed pedestrian walkways, shared use paths, and sidewalks improve the safety and mobility of pedestrians.	Integrate walkways more fully into the transportation system, especially in areas with higher disadvantaged populations	Locations identified in the Transportation Plan and Prioritized project list	$$$	FHWA

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
*Enhanced Delineation	Corridors	Enhanced delineation at horizontal curves includes a variety of potential strategies that can be implemented in advance of or within curves, in combination, or individually.	Locations with sharp curves, intersection in the curve, and presence of a visual trap	Locations identified in the Prioritized project list	$	FHWA
Rumble Strips	Corridors	Milled elements on the pavement intended to alert drivers through vibration and sound that their vehicle has left the travel lane. They can be installed on the shoulder, edge line, or at or near the center line of an undivided roadway.	Rural roadways, starting with locations with a high number of roadway departure crashes	Locations identified in the Prioritized project list	$	FHWA
Median Barriers	Corridors	Barriers that separate opposing traffic on a divided highway, designed to redirect or absorb energy of vehicles striking either side of the barrier.	At locations with a high head-on crash history, on divided highways	Head-on hot spot locations	$$$	FHWA
Roadside Design Improvements	Corridors	These treatments (clear zone, curve widening, slope flattening, widening shoulders, and providing roadside barriers) can reduce roadway departure fatalities and serious injuries by giving vehicles the opportunity to recover safely and by reducing crash severity.	Recommended at horizontal curves and where data indicate a higher risk for roadway departure	Locations identified in the Prioritized project list	$$$	FHWA
Safety Edge	Corridors	This safety practice eliminates the potential for vertical drop-off at the pavement edge.	High speed roadways	High speed roadways	$	FHWA
Wider Edge Lines	Corridors	Wider edge lines increase drivers' perception of the edge of the travel lane and can provide a safety benefit to all facility types.	Locations with high potential for roadway departure crashes	Systematic deployment starting with locations identified in the Prioritized project list	$	FHWA
Intersection Control Evaluation (ICE)	Intersections	Intersection Control Evaluations consider context-sensitive control strategies at new or existing intersections.	Locations with high crash history or high volumes on HRN	Locations identified in the Prioritized project list	$	

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
Splitter Islands	Intersections	Install splitter islands on minor approaches	Unsignalized intersections	Location TBD based on analysis	$$$	
Sight Distance	Intersections	Improve intersection sight distance and sight triangles	Minor road approaches of unsignalized intersections where intersection visibility is poor	Location TBD based on analysis	$$$	FHWA
Backplates with Retroreflective Borders	Intersections	Backplates added to a traffic signal head improve the visibility of the illuminated face of the signal by introducing a controlled-contrast background.	Signalized intersections	Signalized intersections	$	FHWA
Access Management	Corridors and Intersections	Access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.	Urban/Suburban corridors with high density of accesses (intersections, driveways and business accesses)	Location TBD based on analysis	$$$	FHWA
Dedicated Turn Lanes at Intersections	Intersections	Left turn or right turn lanes provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections.	At major road approaches of both three- and four-leg intersections with stop control on the minor road, where significant turning volumes exist, or where there is a history of turn-related crashes	Locations identified in the TMP and Prioritized project list.	$$$	FHWA

Counter-measure	Focus Area	Description and Purpose	Context	Possible Locations	Relative Magnitude of Cost:	For more information
Reduced Left-Turn Conflict Intersections	Intersections	Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur. These intersections simplify decision-making for drivers and minimize the potential for higher severity crash types	Locations ranging from isolated rural, high-speed locations to urban and sub-urban high-volume, multimodal corridors. At intersections with heavy through traffic and moderate left-turn volumes	Location TBD based on analysis	$$$	FHWA
****Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections**	Intersections	This systemic approach to intersection safety involves deploying a package of multiple low-cost countermeasures, including enhanced signing and pavement markings, at a large number of stopcontrolled intersections within a jurisdiction.	Stop-controlled intersections across the county	Unsignalized rural intersections	$	FHWA
Yellow Change Intervals	Intersections	Improve signalized intersection safety and reduce red-light running by reviewing and updating traffic signal timing policies and procedures concerning the yellow change interval.	Signalized intersections	Systematically at all signalized intersections starting with those identified in the Prioritized project list	$	FHWA
Pavement Friction Management	Corridors and Intersections	Measuring, monitoring, and maintaining pavement friction, especially at locations where vehicles are frequently turning, slowing, and stopping, can prevent many roadway departures, intersection, and pedestrian-related crashes.	Horizontal curves, ramps, higher approach speed intersections and locations with rear end, failure to yield, wet weather or red-light-running crashes	Location TBD based on analysis	$$	FHWA
Road Safety Audit	Corridors, Intersections, Vulnerable Road Users	Formal safety evaluation performed by a multidisciplinary team that considers all road users and accounts for human factors.	Corridors on the HIN and HIN.	Locations identified in the Prioritized project list	$$	FHWA

7.Progress and Transparency Methods

This section provides the framework for tracking progress and evaluating trends as Larimer County works toward a safer transportation system. Knowing what to measure is key to identifying a baseline and tracking improvements. Transparency is how the County will share information and updates with the public.

In developing performance measures and selecting specific metrics, the questions to ask include what the goals and what reporting or decision-making tools are we're trying to develop. To use these tools and track actions well, data-informed analysis and measurable metrics are needed.

For each Implementation Strategy identified in the Safety Action Plan, the following will be used as metrics to track progress:

- Number of roadway fatalities
- Number of roadway serious injuries
- Roadway fatalities per vehicle miles traveled
- Roadway serious injuries per vehicle miles traveled

These metrics will be evaluated and summarized in the Larimer County SS4A Dashboard, with public-facing information about the ongoing progress toward the goals outlined in the Safety Action Plan. These metrics as a measure of progress towards safety can be tracked in an online Performance Dashboard developed as part of this Safety Action Plan. Building on this dashboard, a similar webpage could be created in the future to provide annual updates on the implementation of the Safety Action Plan to ensure continued transparency and engagement. The dashboard will provide the following:

- Safety trends focused on the metrics mentioned above
- Tracking of Safety Action Plan projects completed
- Annual safety summary report

Dashboard

Larimer County will track the safety benefits of implemented projects identified in this Safety Action Plan through the aforementioned metrics and will ensure transparency to stakeholders and the public. To that end, Larimer County's webpage will be a repository for this Plan, future updates to the Safety Action Plan, and future annual reports that will summarize safety improvements and progress made toward the adopted Vision Zero goals. The website will also provide the County's SS4A Dashboard that will help visualize trends and provide crash data insights. The Dashboard's control panel provides the ability to search and filter by dates, crash severity, and crash types. The crash data in this plan represents years 2019 to 2023 but will be updated periodically as new crash data becomes available.

The following screenshots depict the SS4A Dashboard with the control panel set to Safety Outcome Trend and the filter set to display all crash types, all levels of crash severity, and latest five years of available crash data.