# Elko County Local Road Safety Plan

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PREPARED FOR

Elko County with support from the Nevada Department of Transportation

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# Acronyms and Abbreviations

| | |
|---|---|
| AADT | Annual Average Daily Traffic |
| CMF | Crash Modification Factor |
| DAC | Disadvantaged Community |
| DOT | Department of Transportation |
| EMS | Emergency Medical Services |
| ETC | Equitable Transportation Community |
| FHWA | Federal Highway Administration |
| LRSP | Local Road Safety Plan |
| MVMT | million vehicle miles traveled |
| NDOT | Nevada Department of Transportation |
| NHTSA | National Highway Traffic Safety Administration |
| SHSP | Strategic Highway Safety Plan |
| SR | State Route |
| USDOT | U.S. Department of Transportation |
| VMT | Vehicle Miles Travelled |
| > | greater than |
| < | less than |
| % | percent |

# Executive Summary

## Project Overview

Elko County, Nevada, as a part of their goal to reduce fatal and serious injury crashes, have taken a proactive approach to identifying, analyzing, and prioritizing safety improvements throughout the county by developing a local road safety plan (LRSP). The plan, tailored to local issues identified through historical safety data and specific feedback from local stakeholders and the public, provides the framework for reducing fatal and serious injury crashes that occur on the Elko County transportation network. The LRSP supports the statewide goals and priorities established in the Nevada Strategic Highway Safety Plan while also following the best practices of the Federal Highway Administration's Safe System approach.

## Existing Conditions

Elko County is a predominantly rural region spanning over 17,000 square miles and has approximately 53,700 residents. Its transportation network consists of 1,000 centerline miles of county-maintained roads primarily concentrated on local routes. The county serves as a pivotal hub for gold mines and various natural resource operations, contributing to a significant transient population. Elko County faces challenges associated with long-distance travel, transportation demands linked to mining activities, a prevalence of rural roads, and numerous roadways dedicated to outdoor recreational pursuits.

## Leadership, Commitment, and Goal Setting and Planning Structure

The LRSP concept is designed to build on the foundation established by the Nevada Strategic Highway Safety Plan (SHSP). The county LRSP provides the basis for proactive implementation of safety countermeasures specific to Elko County. This allows the county to leverage the state SHSP to meet county-specific needs. The local stakeholders and champion are charged with the overseeing LRSP implementation and monitoring the implementation to ensure the objectives outlined in the LRSP's vision, mission, and goals are met. The LRSP mission, vision, and strategic goals follow.

**VISION**

*A transportation system free of fatal and serious injuries through a sustained decline in transportation-related deaths and injuries.*

**MISSION**

*To promote safer roads in Elko County and protect the lives of all road users through proactive education, awareness, and collaborative partnerships between all jurisdictions and stakeholders.*

**STRATEGIC GOALS**

*Maintain and optimize access to communities within Elko County.*

*Reduce the number of lane departure related fatal and serious injury crashes every year for the next 5 years.*

*Reduce the number of speed-related fatal and serious injury crashes every year for the next 5 years.*

*Implement proven, low-cost safety countermeasures systemically along Elko maintained roads.*

*Implement increased signage on Elko-maintained roads. Focus on newer facilities and those transitioning from asphalt to gravel.*

*Increase education for the public and state legislation by conducting at least two public safety events a year, focusing on topics such as motorcycle safety, seatbelt safety, road sign education, off-road education, and/or speed management.*

# Safety Analysis

An analysis spanning 5 years (2018 to 2022) of crash data reveals there were 3,489 crashes in Elko County. Among these, 50 were fatal crashes and 114 were serious injury crashes. Over this period, crash rates rose. The average fatal crash rate was 1.17 crashes per 100 million vehicle miles traveled (VMT) and the serious injury crash rate was 2.67 crashes per 100 million VMT over the 5-year span. The 50 fatal crashes resulted in 62 fatalities in Elko County, resulting in a 5-year average fatality rate of 23.12 fatalities per 100,000 people. This rate was higher than the state's 5-year average fatality rate for the same period of 10.17 fatalities per 100,000 people. The Elko County fatality rate has been decreasing since 2020.

Combining the crash data with roadway characteristics identified several emphasis areas for Elko County, all of which are listed within the Nevada SHSP. Lane departure crashes accounted for 45 percent (%) of the highest-occurring emphasis area crashes, followed by intersection crashes at 22%, speeding at 20%, occupant protection at 18%, and impaired driving at 19% of the total fatal and serious injury crashes in the county. A significant percentage (64%) of these crashes were non-collision or single-vehicle incidents.

Based on discussions and data analysis, Elko County has prioritized the following emphasis areas for the LRSP:

- Lane Departure
- Intersection
- Speeding
- Occupant Protection
- Impaired Driving

## Engagement and Collaboration

The development of this LRSP fostered engagement and collaboration between Elko County staff, stakeholders, and community members. Stakeholder involvement and collaboration were emphasized by holding facilitated technical workshops and integrating community engagement via an interactive public opinion survey hosted on the county's official website.

Two hybrid technical half-day workshops served as platforms for local stakeholders to share insights regarding county-specific issues and concerns, thereby fostering a sense of ownership and collaboration throughout the plan's developmental phase. Over 15 stakeholders attended each workshop; workshops were structured to encourage brainstorming, problem-solving, and interactive discussions encompassing diverse multidisciplinary perspectives. The first workshop focused on crash information and development of the draft vision, mission, and goals. The second workshop focused on the public opinion survey results; equity considerations; finalizing the crash data; and refining the vision, mission, and goals statements.

The community actively participated in developing the public opinion survey, which was designed to solicit community concerns and perspectives on the overall safety of the Elko County transportation network. The survey consisted of questions aimed at assessing the community's collective sense of safety, soliciting feedback on prevalent safety-related behavioral issues confronting Elko County and featuring a mapping module enabling respondents to pinpoint specific areas within the county where safety concerns were perceived to be heightened. From October 7 to December 9, 2023, 572 people participated in the survey and provided 958 comments.

Using the collective expertise and feedback garnered through these engagement activities, the LRSP has been written with an understanding of local safety challenges, priorities, and opportunities for intervention. This approach makes sure that the resulting safety strategies are not only evidence-based but also resonate with the needs and aspirations of the community.

## Equity Considerations

The equity analysis informs safety planning, project development, and implementation to maximize benefits to areas identified as disadvantaged communities (DACs). The analysis establishes a reference point for measuring benefits, informs decision makers about specific needs and challenges, and creates opportunities for targeted public engagement. Because all of Elko County's census tracts qualify as DACs, the focus was on the varying transportation needs and safety concerns that affect those populations rather than emphasizing specific geographic areas. Projects and locations within the DACs identified as needing safety improvements were given a higher priority.

## Strategy and Project Selections

The strategy for project selection involved two parts. The first part included creating a list of hot spot locations (using historical crash data) and systemic locations (using the risk factors present). The hot spot and systemic locations were identified and prioritized using a scoring system that considered the frequency of fatal and serious injury crashes, the emphasis areas covered, roadway ownership, equity, and public feedback. The list ranked 29 locations within Elko County with identified safety concerns.

The second part included identifying a set of projects and strategies (shaped by data, best available evidence, and noteworthy practices, as well as stakeholder input and equity considerations) to address the safety problems. These strategies and countermeasures focus on the Safe System Approach and effective interventions considering multidisciplinary activities. The list of projects, programs and strategies included those with improvements focused on infrastructure, behavioral, and/or operational safety.

## Progress and Transparency

Elko County will use the LRSP as a guiding framework for safety decisions and future projects. Recognized as a living document, the LRSP is adaptable and will reflect the evolving needs and priorities of Elko County and align seamlessly with the objectives of the Nevada SHSP.

Embracing a Safe System approach throughout LRSP implementation, Elko County and its stakeholders aim to significantly reduce traffic fatalities and serious injuries on the county's transportation network. In line with LRSP goals, comprehensive crash data should continue to be systematically collected, refined, and combined with traffic data and roadway characteristics annually for the next 5 years. This iterative process enables comparing outcomes with established baseline statistics. Annually, a brief memorandum will be compiled to outline the executed improvement projects, associated costs, and resultant crash data analysis. This practice ensures transparency and accountability while facilitating informed decision-making to further enhance road safety within Elko County.

# 1.0 Introduction

Elko County, in northeastern Nevada, distinguishes itself as a predominantly rural region with unique features within its transportation infrastructure. Spanning over 17,000 square miles, the county has approximately 53,700 residents, making it the second-largest county in Nevada and the fourth largest in the United States by land area. Its transportation network consists of roughly 1,000 centerline miles of county-maintained roads that are primarily concentrated on local routes. The study area is mapped in **Figure 1.**


**Figure 1. Elko County**
*(Source: Nevada Department of Transportation [NDOT])*

The county serves as a pivotal hub for gold mines and various natural resource operations, contributing to a significant transient population. Moreover, it boasts a thriving ranching community, housing some of the state's largest ranches. Elko County, however, faces challenges associated with longer-distance travel, transportation demands linked to mining activities, a prevalence of rural roads, and numerous roadways dedicated to outdoor recreational pursuits.

## 1.1 What is a Local Road Safety Plan?

As defined by the Federal Highway Administration (FHWA), a local road safety plan (LRSP) serves as a framework for identifying, analyzing, and prioritizing transportation safety improvements on local roads. Tailored to address local issues and needs, the development process and content of an LRSP are customized. Essentially, an LRSP is a strategic document that offers a roadmap to address key safety concerns and enhance the safety performance of the road network. It operates as a localized, data-driven safety plan, systematically pinpointing specific needs, analyzing traffic safety-related issues, and recommending future safety projects and countermeasures. Moreover, it fosters partnerships and collaboration among local agencies, leading to actionable results.

As one of FHWA's proven safety countermeasures, LRSPs have a proven track record of reducing fatal and serious injury crashes on local roads. Through selecting critical emphasis areas identified in the Nevada Strategic Highway Safety Plan (SHSP), this LRSP will inform and guide further safety evaluations of Elko County's transportation network.

Elko County has taken steps to enhance all modes of safety throughout the county, and with this LRSP, it is continuing to prioritize safety in its planning processes. This LRSP is a proactive risk management tool to demonstrate Elko County's project delivery approach. The LRSP is a living document that can be continually reviewed and revised to reflect evolving trends, community needs, and local priorities, once again emphasizing the importance the county places on transportation safety.

# 2.0 Vision, Mission, and Goal Statement

The stakeholders developed the Elko County LRSP vision, mission, and goal statements. Each of these statements reflect the Safe System approach being led by the U.S. Department of Transportation (USDOT). These principles reiterate that death and serious injuries are unacceptable and that a shared responsibility is necessary.

The vision statement is an idealized future description of Elko County's success; the mission statement describes how to achieve that vision and the goals supplement the vision and mission to help refine Elko County's focus and work efforts. The group reached consensus on the vision, mission, and goals for Elko County that follow.

### *Vision*

*A transportation system free of fatal and serious injuries through a sustained decline in transportation-related deaths and injuries.*

### *Mission*

*To promote safer roads in Elko County and protect the lives of all road users through proactive education, awareness, and collaborative partnerships between all jurisdictions and stakeholders.*

## *Goals*

*Maintain and optimize access to communities within Elko County.*

*Reduce the number of lane departure related fatal and serious injury crashes every year for the next 5 years.*

*Reduce the number of speed-related fatal and serious injury crashes every year for the next 5 years.*

*Implement proven, low-cost safety countermeasures systemically along Elko maintained roads.*

*Implement increased signage on Elko-maintained roads. Focus on newer facilities and those transitioning from asphalt to gravel.*

*Increase education for the public and state legislation by conducting at least two public safety events a year, focusing on topics such as motorcycle safety, seatbelt safety, road sign education, off-road education, and/or speed management.*

# 3.0 Local Road Safety Plan Process

## 3.1 Process Overview

The primary goal of Elko County and their safety partners is to provide safe, sustainable, and efficient mobility choices for all their road users. Developing an LRSP uses a data-driven, multidisciplinary, and collaborative process to reduce fatal and serious injury crashes. Guidance in creating LRSPs was provided by FHWA and supported by the Nevada Department of Transportation (NDOT). FHWA's roadmap for preparing an LRSP is shown in **Figure 2**.


**Figure 2. FHWA LRSP Roadmap**
*(Source: FHWA)*

FHWA underscores that even though local roads experience less traffic than state highways, they often experience a higher rate of fatal and serious injury crashes. Consequently, developing county LRSPs emerges as a highly effective strategy to enhance local road user safety while aligning with the objectives of a state's SHSP. The LRSP development process includes six steps, as shown in **Figure 3**.


**Figure 3. LRSP Development Process**

This LRSP presents the findings derived from the gathered data and information, including the vision, mission, and goals for the LRSP. It documents the county's leadership and commitment, research and data analysis, emphasis areas analysis, project identification and prioritization, and plan for implementation and evaluation by outlining the document research, public opinions, crash analysis, emphasis areas, equity analysis, countermeasures, and prioritized locations. Additionally, the LRSP recommendations align with the Safe System approach and the Six E's of traffic safety outlined in the Nevada SHSP: equity, engineering, education, enforcement, emergency medical services/emergency response/incident management, and everyone.

## 3.2 Stakeholder Identification

As part of LRSP development, local stakeholders were engaged throughout the process to ensure a local perspective was included. Stakeholders are not only a great resource for acquiring localized data, but are critical in the analysis, selection, development, implementation, and monitoring of safety strategies. Representatives from the following stakeholders convened to provide input on this LRSP:

- Elko County Road Department
- Elko County Commission
- Elko County Sheriff's Office
- Nevada Highway Patrol
- Nevada State Police
- Elko County Fire Protection District
- Elko County Emergency Management Agency
- NDOT Traffic Safety Office
- NDOT Operations Office
- NDOT District 3 Office
- NDOT Planning Office

## 3.3 Technical Workshop Overview

During LRSP development, two hybrid (in-person and virtual) technical workshops were held in Elko County with local stakeholders. The technical workshops provided a platform to engage local stakeholders, fostering ownership and collaboration to gain insight about issues and concerns specific to the county. Providing a multidisciplinary approach ensured that diverse perspectives were considered and integrated in the LRSP. Through brainstorming sessions, problem-solving, and group discussions, the workshops helped address safety challenges more effectively.

### 3.3.1 Technical Workshop #1

On October 10, 2023, Elko County hosted a project stakeholder technical workshop, where the LRSP stakeholder group was introduced and presented with an overview of Elko County and the LRSP process. The workshop included a summary of the safety document reviews and research findings, followed by a working session to revise the preliminary mission statement, vision statement, and LRSP goals. Additionally, stakeholders were provided with an overview of preliminary data analysis, identified hot spot locations, emphasis areas, and the projected course of action. Throughout the workshop, stakeholders were encouraged to contribute local insights and knowledge.

### 3.3.2 Technical Workshop #2

A second technical workshop was held in Elko County on February 28, 2024. During this workshop, the following items were presented and discussed in roundtable format:

1) A final update to the mission statement, vision statement, and goals list were agreed upon. The collaboration outcomes are presented in Section 2.
2) The results of the public opinion survey were shared with the stakeholders. The public's highest-ranked road safety issues and their opinions on locations of the least safe areas in Elko County were also shared and discussed, as well as a few more items.
3) The finalized crash data summary and analysis was shared with the team. Fatal and serious injury crashes by year, crash type, and crash rate, as well as other crash factors were discussed.
4) The preliminary results from the equity analysis were shared with the team. USDOT vulnerability indicators were shared, then the component scores of the disadvantaged community (DAC) census tracts in Elko County were shown.

5) The final top-five emphasis areas were discussed with the stakeholders; a comparison of the crash numbers for each area was presented. Top hot spot locations for each emphasis area were shared.

6) A high-level discussion of the LSRP implementation plan and schedule was shared.

## 3.4 Document Research and Manual Review

This section provides a brief overview of pertinent documentation related to the transportation system within Elko County. To develop an effective and comprehensive LRSP, it is critical to review and analyze the documentation that underpins the safety measures, protocols, and regulations governing transportation. Reviewing transportation-safety-related policies, plans, research, and practices promotes a comprehensive understanding of the county's overall safety environment and identifies strengths, challenges, and opportunities for enhancing the security of transportation system users. Safety policies, processes, and practices from various agencies (state departments of transportation [DOTs], Metropolitan Planning Organizations, counties, and municipalities) and other resources were reviewed to inform this LRSP, including:

- Nevada SHSP
- Highway Safety Improvement Program
- FHWA LRSP
- FHWA Proven Safety Countermeasures
- FHWA Systemic Safety Analysis
- Transportation Safety for Tribes
- Various nationwide LRSPs

A summary of the document review and research is provided in **Appendix A**.

## 3.5 Public Opinion

This section provides a brief overview of the public opinion input that supported developing this LRSP. An important part of the LRSP process is to engage the community to accurately reflect the traffic safety issues and needs the community is experiencing.

Elko County, with the help of NDOT, launched a public opinion survey to solicit public feedback. This survey served as a platform to gather public preferences and insights into various issues and opportunities in Elko County. It was accessible from October 7 to December 9, 2023, and was made available on Elko County's website and in the *Elko Daily Free Press* (Elko Daily Free Press 2024). A total of 572 community members participated in the survey, contributing 958 comments.

The survey consisted of eight questions ranging from the participant's primary residence in Elko County to the participant's ranking of driver behavior issues in order of importance. It also included a map where participants could geolocate areas within Elko County where they felt there was a road safety issue. The survey comments and responses are provided in the outreach summary report in **Appendix B**.

Key results from the public opinion survey are as follows:

- Forty-one percent (%) of survey participants feel safe/very safe while traveling on Elko County roads; only 22% feel unsafe/very unsafe
- Driver behavior was ranked as the number one important road safety issue by survey participants. Of the driver behavior issues, distracted driving, speeding, and impaired driving were identified as the top three issues.
- The top three roadway safety issues identified by survey participants were improving roadway/intersection lighting, adding shoulders/increasing shoulder width, and creating safe spaces for pedestrians and bike riders.
- From survey participant comments, the most common issues noted were:
    - Need for an alternate route between the cities of Spring Creek and Elko
    - Concerns about intersections near Spring Creek High School
    - Poor road conditions/lack of maintenance (e.g., potholes)
    - Lack of lighting
    - Aggressive/unsafe driving behaviors

# 3.6 Analysis Techniques

## 3.6.1 Safe System Approach

The Elko County LRSP aligns with the Safe System approach endorsed by USDOT and NDOT. This approach prioritizes preventing crashes that result in fatalities or serious injuries by implementing multiple layers of protection to both deter crashes and mitigate harm to road users. The approach proactively identifies risk factors linked to serious crash types and implements safety countermeasures systematically, moving beyond reactive measures solely based on crash history. With its six guiding principles, the approach prioritizes eliminating crashes that result in death and serious injuries, as they are unacceptable. The approach acknowledges that humans make mistakes and are vulnerable; humans can make decisions that contribute to crashes and humans have physical limitations when these crashes occur. The approach emphasizes designing and operating the transportation system to accommodate certain types and levels of human mistakes, and incorporating designs to accommodate human vulnerabilities, thereby averting fatal and serious injury crashes. It emphasizes shared responsibility among all road users and stakeholders, highlighting the importance of collaborative engagement among stakeholders in developing and implementing the LRSP. By being proactive to safety rather than reactive, the Safe System approach relies on redundancy—if one part of the transportation system fails, another part helps keep road users safe.

The Elko County LRSP embraces the five objectives of the Safe System approach as the guidelines for defining emphasis areas and strategies. As shown in **Figure 4**, the five objectives of the Safe System approach are safer people, safer vehicles, safer speeds, safer roads, and post-crash care.

**Safer Vehicles** entail integrating advanced technologies, systems, and features aimed at preventing crashes or mitigating their impact on occupants and non-occupants. While seatbelts and airbags were instrumental in the past, recent advancements include lane departure warnings, forward collision warnings, and pedestrian automatic braking systems, which are becoming standard in newer vehicles. The increased availability of these technologies in the transportation system, however, introduces a need for comprehensive public education efforts to dispel negative perceptions surrounding automatic vehicle assists and ensure all road users are equipped with the knowledge to use the assists effectively.

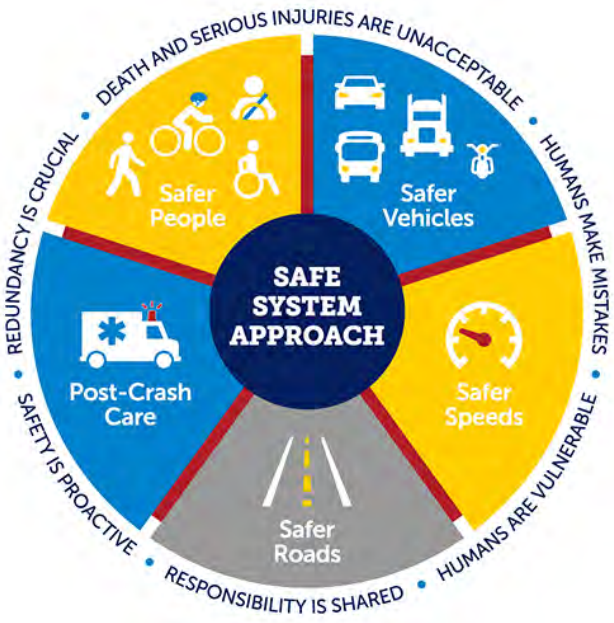



**Figure 4. Safe System Approach**
*(Source: FHWA)*

**Safer Speeds** are promoted across the transportation network as a fundamental aspect of road safety. As highlighted by the National Highway Traffic Safety Administration (NHTSA), speeding has consistently been involved in approximately one-third of all motor vehicle fatalities nationwide over the past two decades (NHTSA, 2022)[1]. This behavior not only jeopardizes the safety of the speeding driver but also poses a significant risk to all road users. In addressing this issue, LRSPs employ multiple approaches that encompass roadway design enhancements, educational initiatives, public outreach campaigns, and even enforcement measures. By targeting safer speeds through these strategies, LRSPs aim to mitigate the occurrence of speed-related crashes and enhance overall road safety.

**Safer Roads** entail the strategic implementation of safety measures within roadway design to mitigate human errors, promote safer driving behaviors, and effectively manage crash consequences, should they arise. Given that roadway design significantly influences driver behavior, they seek to leverage a blend of FHWA proven safety countermeasures to implement design features aimed at both preventing fatal and serious injury crashes while minimizing their impact.

**Post-Crash Care** is a pivotal determinant in the survivability of someone who is involved in a crash. It prioritizes improving the accessibility of emergency medical service (EMS) and the establishment of a secure environment for first responders to avert secondary crashes during response efforts. The efficient execution of locating, responding to, arriving, stabilizing, and transporting crash victims significantly

[1] NHTSA. 2022. "Speeding." Available at https://www.nhtsa.gov/risky-driving/speeding.

contributes to life-saving outcomes. However, such efforts pose challenges in rural settings like Elko County. To address this, the LRSP focuses on improving post-crash care through collecting and disseminating precise data, enhancing facility access and identification, and implementing traffic incident management measures tailored to rural areas.

**Safer People** addresses the safety of all road users, including those who walk, bike, drive, ride transit, and travel by other modes. This objective encourages responsible driving behaviors by considering factors such as age (young or older drivers), distraction (Distracted Driver), and impairment (Impaired Driver). By implementing countermeasures that encourage a change in driver behaviors, Elko County can increase the level of safety of the county's transportation system.

The Safe System approach puts safety at the forefront and changes how transportation investments and strategies are prioritized. This LRSP embraces this approach with the aim of significantly reducing fatal and serious injuries throughout the county's transportation infrastructure.

### 3.6.2 Systemic Safety Analysis

A systemic safety evaluation was conducted for the Elko County LRSP. Traditionally, network screening techniques identify sites for potential safety improvements based on locations with a history of severe crashes (hot spots). The systemic approach, however, considers implementing improvements based on high-risk roadway features correlated with specific severe crash types. This approach recognizes that relying solely on crash data may not be adequate, especially on low-volume local and rural roads with fewer crashes. A systemic evaluation uses the premise that fatal and serious injury crashes may be more likely to occur if certain risk factors are present at a location, even if the location does not have a history of crashes. As outlined in **Figure 5**, the LRSP systemic analysis process involved the following parts:

1) Data collection and preparation. This step involved collecting relevant crash data from the NDOT crash database and reducing the raw data so it could be used for analysis.
2) Identifying focus crash types. The crash data were reviewed to identify patterns and trends in crash types, with a focus on those that are recurring and have a high severity or risk of injury (e.g., lane departure crashes).
3) Identifying facility types. The roadway inventory database was used to identify the types of roadways or facilities where the focus crash types are occurring. This involved categorizing roadways based on characteristics such as urban or rural, median presence, speed limits, and annual average daily traffic (AADT).
4) Identifying risk factors. The contributing factors associated with the identified focus crash types were identified. This involved examining various elements such as roadway design, traffic control devices, signage, pavement conditions, visibility, lighting, driver behavior, and environmental factors. This effort also identified commonalities and trends among the crashes to pinpoint potential risk factors.
5) Prioritization. The identified focus crash types and risk factors were prioritized based on severity, frequency, public survey input opinions, proximity to DACs, and the potential for mitigation.

Factors posing the greatest risk to road users and having the potential for effective countermeasures were a focus.

6) Countermeasure selection. After the focus crash types and risk factors were identified and prioritized, appropriate FHWA proven and NDOT approved countermeasures were selected to address the focus crash types and risk factors. The safety countermeasures included roadway improvements, traffic control measures, education and outreach programs, and enforcement strategies.

7) Implementation and monitoring. The selected countermeasures are then implemented and periodically monitored over time for effectiveness. Elko County plans to continuously evaluate crash data and adjust strategies, as needed, to address emerging trends or new risk factors in the county.


**Figure 5. Systemic Safety Process**
*(Source: FHWA)*

# 4.0 Data Sources

As part of the LRSP, a comprehensive database was developed using crash data, roadway inventory data, and the traffic count database. This section describes the different databases used and how they were used in the analysis process.

## 4.1 Crash Data

The NDOT statewide crash database was used to obtain statewide crash data for the 5-year period of January 2018 through December 2022. Using data from the most recent 5 years of available data was crucial in identifying potential trends that were prevalent in the county. The crash database provided crash-level, vehicle-level, and person-level attributes and all crashes were geocoded using latitude and longitude coordinates for illustration on maps. The analysis of the raw crash data was the first step in understanding the specific issues in Elko County.

## 4.2 Roadway Data

The NDOT roadway systems division and NDOT's information technology staff created the roadway inventory database that was obtained via the NDOT Roadway Systems GeoHub. This database was used to build the base roadway network for the analysis. The database included various roadway characteristics for all public roads in Nevada. Attributes such a functional class, ownership, and median type were some of the categories provided.

## 4.3 Annual Average Daily Traffic Data

Vehicle count data was acquired via NDOT's Traffic Records Information Access (or TRINA) application and database. Vehicular count data was used as part of the analysis to process the impact of traffic and understand roadway network trends. The count data also helped supplement the roadway inventory data for the location of specific crashes on the transportation network. Within this database, geolocated historical AADT counts allowed the team to assess locations for risk, calculate crash rates, and review the locations with the highest crash rates.

## 4.4 Data Cleanup and Join

Evaluating raw crash data is a valuable initial step in revealing crash trends. However, when complemented with additional data sources, the data are transformed into a powerful tool capable of pinpointing trends and facilitating systemic analysis, identifying emphasis areas, and understanding county-specific issues more comprehensively. Through cleaning and integration, three data sources were combined to create a holistic database essential for in-depth analysis to support the framework of the Elko County LRSP (**Figure 6**).

The raw database file that included the geolocated crash, vehicle, and person attribute data was joined to each of their table data via a Crash ID. This new joined file represented all statewide crashes with the desired details about the crash incident; however, attribute information for the specific roadway in which the crash occurred was still lacking. To address this, each attribute from the original database had to be spatially matched and joined to each crash. Once this step was performed, the new output represented all statewide crashes with specific crash information such as: fatal or serious injury, person(s) involved, vehicle(s) involved, emphasis area, road attributes, and historical AADT data.

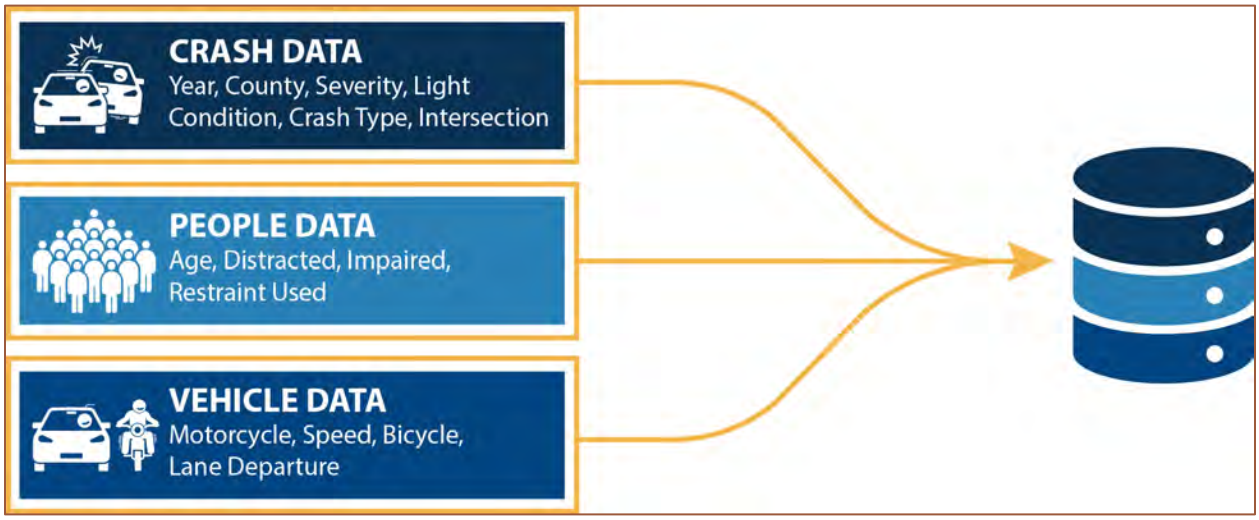



**Figure 6. Database Join Example**

# 5.0 Crash Trends and Analysis

## 5.1 Crash Overview

The Elko County LRSP development process included evaluating data over a 5-year period from 2018 to 2022. The data were limited to roadways within Elko County's jurisdiction. Crash data were provided by NDOT and were merged with other data including pavement condition, roadway geometrics, location, speed limit, and roadway surface. The crash data included 3,489 total crashes of all severity levels over the 5-year span. Because the LRSP places high importance on fatal and serious injury crashes, these two severity levels were extracted from the total number of crashes, resulting in 164 fatal and serious injury crashes. Law enforcement and emergency medical responders use an injury scale to classify the severity levels of crashes. The scale typically used is the KABCO scale. KABCO is an acronym formed from letters representing each severity level of crash: K for fatal crashes, A for serious injury crashes, B for non-incapacitating injury crashes, C for possible injury crashes, and O for non-injury crashes. For Elko County, of the 164 crashes, 50 were fatal (K) and 114 were serious injury (A). **Figure 7** and **Figure 8** show the locations of the fatal and serious injury crashes, respectively, throughout the county.

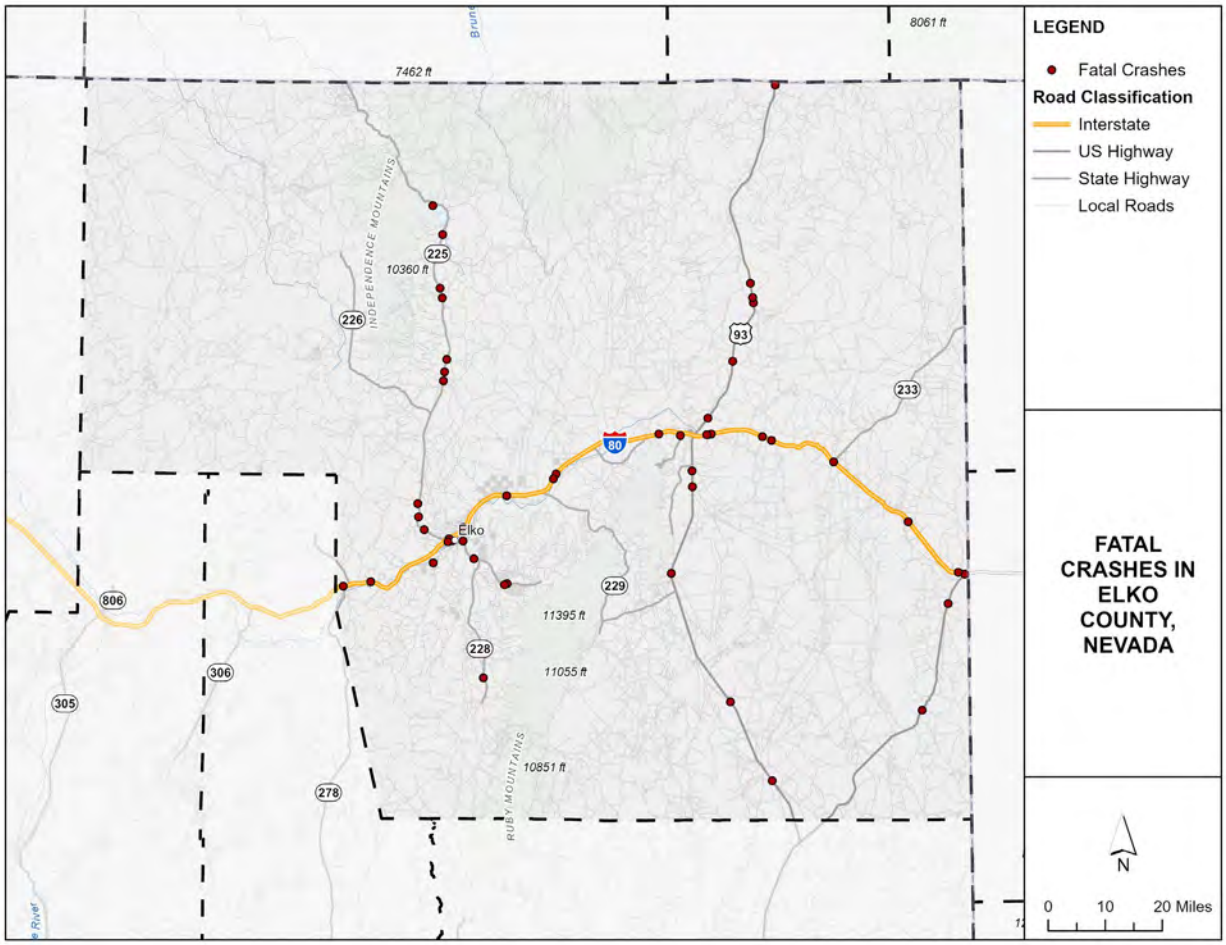



**Figure 7. Fatal Crashes in Elko County (2018–2022)**

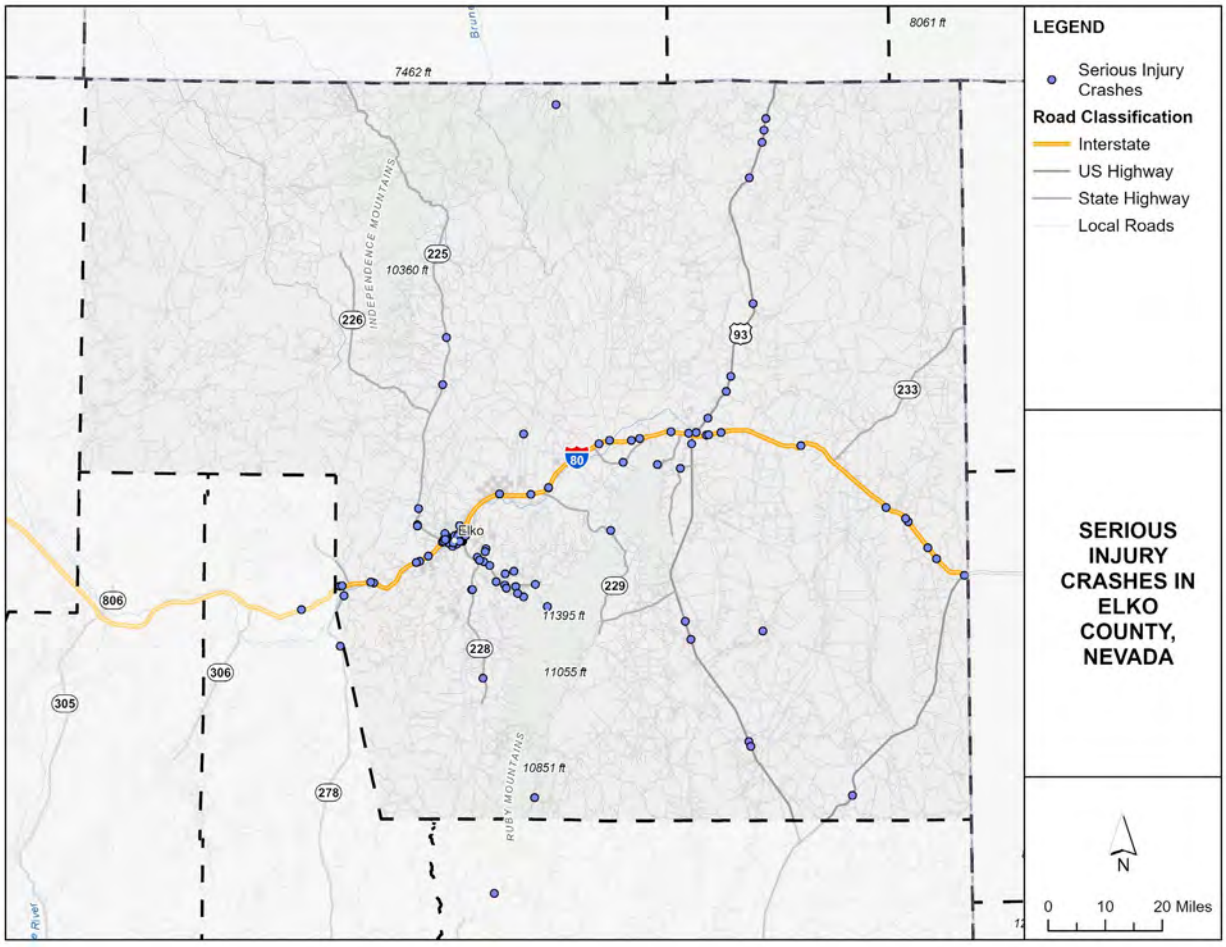


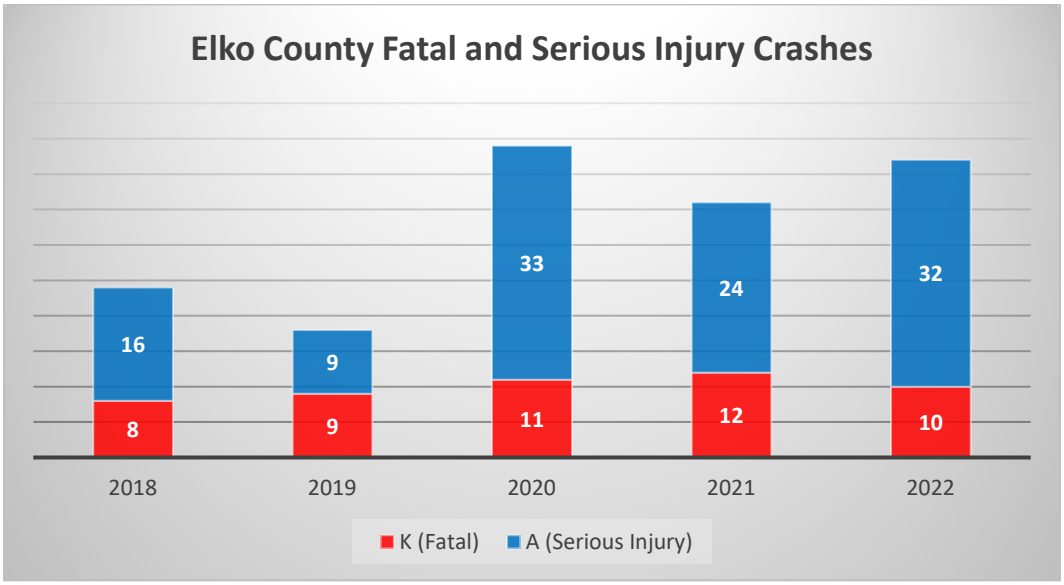

**Figure 8. Serious Injury Crashes in Elko County (2018–2022)**

## 5.2 Data Analysis

Data analysis was performed to identify trends, systemic risk factors, overrepresentation, and proportions in the types of crashes. The objective of this analysis was to examine the crash data to identify contributing factors, road safety priorities, and potential actions for the LRSP.

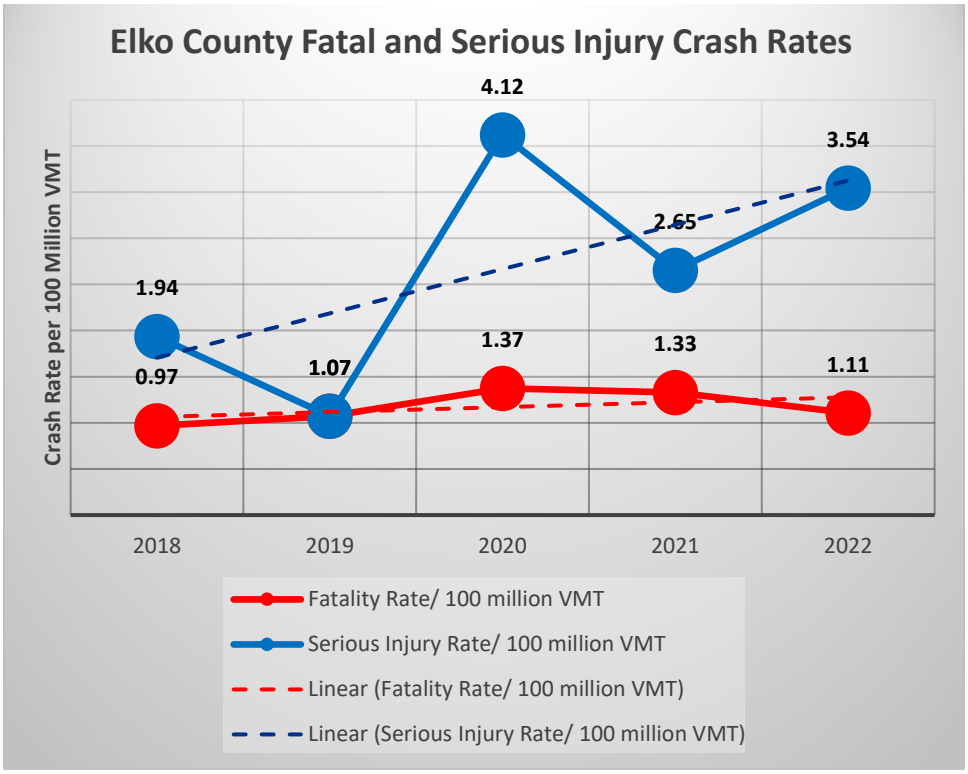
**Table 1** provides a breakdown by year of the fatal (K) and serious injury (A) crashes during the period analyzed. From the yearly comparison, there has been an increase in K and A crashes in the most recent 5 years of data available (2018 to 2022). This LRSP aims to reverse this trend.

**Table 1. Fatal and Serious Injury Crashes by Year (2018–2022)**



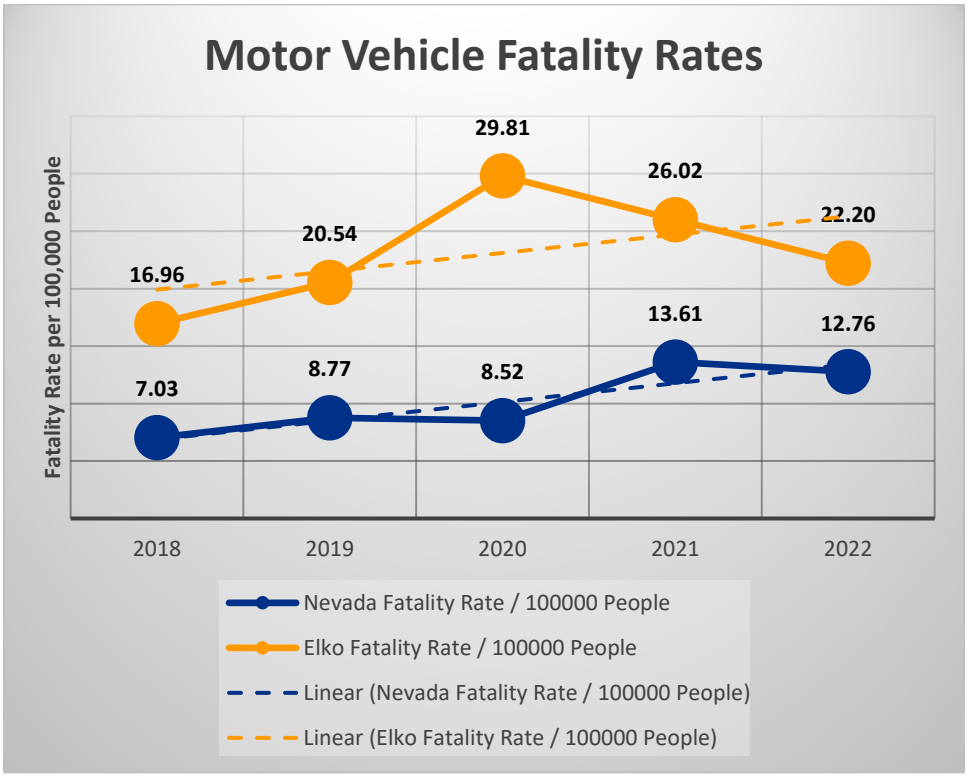

When analyzing safety data, it is imperative to look at the frequency of crash numbers and crash rates to best understand the safety performance of the transportation system. Motor vehicle fatality rates and crash rates both offer complementary perspectives to road safety. While fatality rates per 100,000 people provide an understanding of the overall risk of fatal accidents within a population, crash rates per million vehicle miles traveled (MVMT) considers the amount of travel/exposure on the roadways and provides insight into the risk factors associated with driving behaviors, road conditions, and infrastructure. **Table 2** summarizes the K and A crashes as a rate per MVMT on Elko County roads during the 5-year period and **Table 3** summarizes the motor vehicle fatality rate of Elko County as compared to the state of Nevada.

**Table 2. Fatal and Serious Injury Crash Rates by Year (2018–2022)**




Between 2018 and 2022, there was a rising trend in crash rates involving K and A crashes in Elko County. According to the 2022 NDOT Highway Performance Monitoring System data, Elko County constitutes 3.27% of the total annual VMT in Nevada, totaling 902,762,63 miles. This proportion is closely aligned with the percentage of fatal and serious injury crashes for the same year of 3.36%.

**Table 3. Motor Vehicle Fatality Rate by Year (2018–2022)**

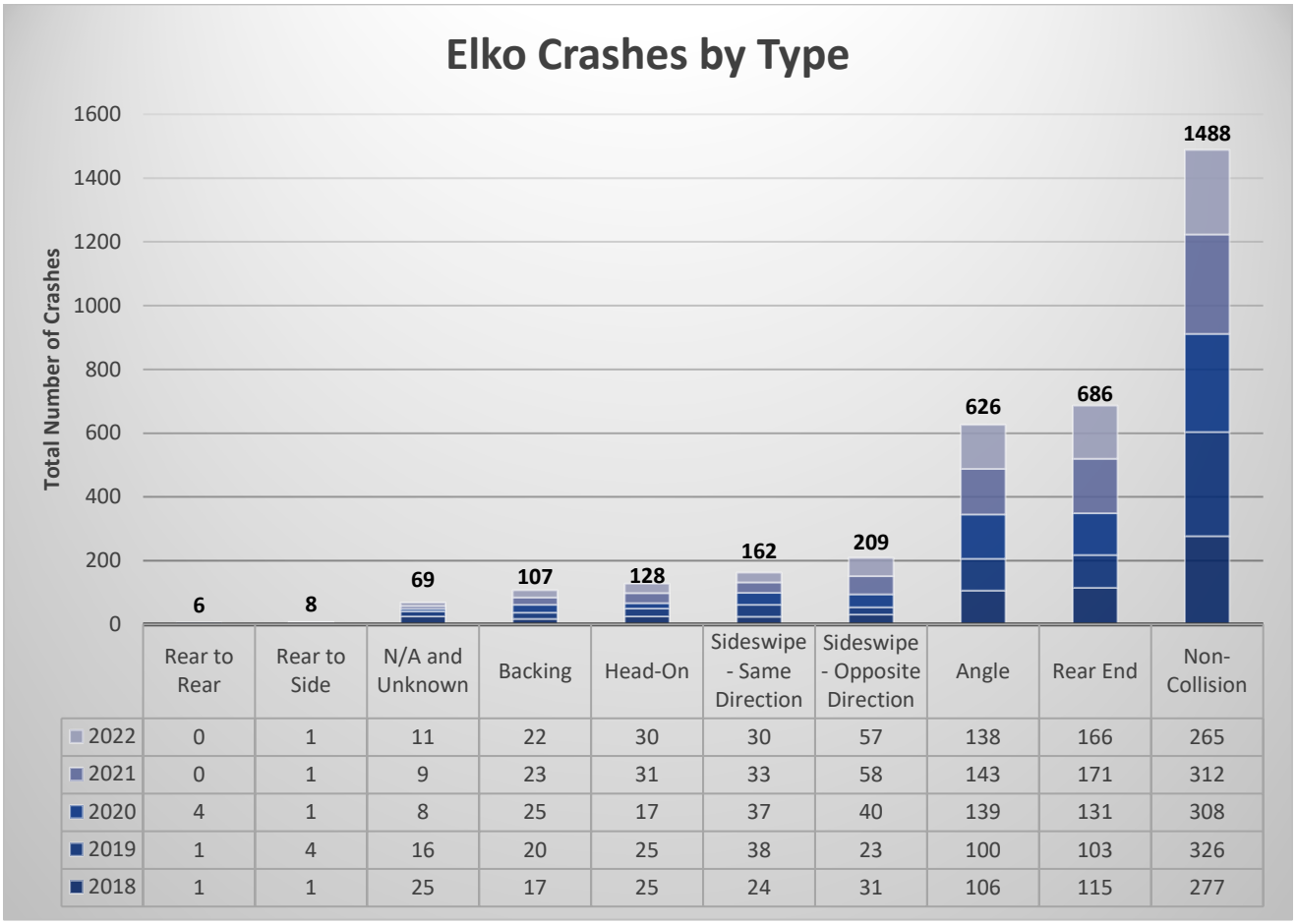



Between 2018 and 2022, there was also a rising trend in fatality rates in Elko County (these rates have been declining since 2020). The average 5-year fatality rate for Elko County was 23.12 fatalities per 100,000 people, which was higher than the average 5-year fatality rate for the state of Nevada of 10.17 fatalities per 100,000 people. This LRSP aims to reverse this trend.

## 5.3 Crash Types

As discussed in Section 5.1, 164 fatal (K) and serious injury (A) crashes occurred in Elko County during the 5-year analysis period. However, because of this low sample size of K and A crashes, some of the trends identified were not statistically significant. For example, while the predominant crash types represented by the K and A crashes were non-collision/single vehicle crashes (105), angle (22), and rear end (16), the most common crash types identified using the larger, finalized dataset were non-collision (1,488), rear end (686), and angle (626). According to the finalized crash data, the top five factors contributing to non-collision/single vehicle crashes were driving too fast for the conditions, “object avoidance”, “ran off road”, “failure to maintain lane”, and “mechanical defects”. A breakdown of the crash types by year in Elko County is provided in **Table 4.**

**Table 4. Crash Types by Year (2018–2022)**




| | Rear to Rear | Rear to Side | N/A and Unknown | Backing | Head-On | Sideswipe - Same Direction | Sideswipe - Opposite Direction | Angle | Rear End | Non-Collision |
|---|---|---|---|---|---|---|---|---|---|---|
| 2022 | 0 | 1 | 11 | 22 | 30 | 30 | 57 | 138 | 166 | 265 |
| 2021 | 0 | 1 | 9 | 23 | 31 | 33 | 58 | 143 | 171 | 312 |
| 2020 | 4 | 1 | 8 | 25 | 17 | 37 | 40 | 139 | 131 | 308 |
| 2019 | 1 | 4 | 16 | 20 | 25 | 38 | 23 | 100 | 103 | 326 |
| 2018 | 1 | 1 | 25 | 17 | 25 | 24 | 31 | 106 | 115 | 277 |

Crashes organized by time, day, month, weather, and road surface, were also reviewed to identify trends. However, there were no statistically significant results outside of normal conditions for each of these categories. The average number of crashes for each day ranged from 13% to 15%, while the average number of crashes per month ranged from 6% to 10%. Most crashes (50% to 55%), not just K and A crashes, occurred during clear conditions and 74% occurred on asphalt. The standout crash condition was lighting, with 51% of all K and A crashes occurring in dark, dawn, and dusk conditions.

## 5.4 Equity Analysis

A project that prioritizes equity from the beginning leads to equitable outcomes, and when carefully planned, those outcomes can lead to resilient strategies and investments that focus on those who are currently underserved. It is therefore important to bring those principles to the LRSP for Elko County. Conducting an equity analysis highlights where safety issues intersect with disadvantaged communities (DACs), as defined in the federally mandated Justice40 initiative (Executive Order 14008) under the Bipartisan Infrastructure Law. An equity analysis informs safety planning, project development, and implementation to maximize benefits to areas identified as DACs. The analysis establishes a reference point for measuring benefits, informs decision makers about specific needs and challenges, and creates opportunities for targeted public engagement.

As part of the safety analysis, crash analysis data for vehicle, pedestrian, bicycles, and other active transportation users were used to target areas of concerns and identify user's needs and issues, which are reflected in the Safety Action Plan. All but one of Elko County's census tracts qualify as DACs under the transportation insecurity component of Justice40, so the LRSP focuses on the varying transportation needs and safety concerns that affect those populations rather than focusing on specific geographic areas.


**Figure 9. Equity Analysis Objectives**

### 5.4.1 Background and Governance

In Nevada, the federal Justice40 initiative was addressed by the Nevada Equal Rights Commission in Executive Order 223. This executive order both recognizes past inequities in government policies, actions, and investments, and provides direction to government agencies within the state to ensure benefits of federal investments flow more equitably to DACs. This LRSP effort used USDOT created tools to identify and prioritize the projects that were included in the equity baseline developed for this study, as discussed further in Section 5.4.2.

### 5.4.2 Equitable Transportation Community Explorer Tool

USDOT created the Equitable Transportation Community (ETC) Explorer tool as a direct result of Justice40 to help identify and prioritize projects that can improve transportation conditions for DACs. The ETC Explorer tool is an interactive web application that spatially identifies these communities using predefined socioeconomic census statistics. For the LRSP analysis, elements of the transportation insecurity component were used to assess, analyze, and understand the burden levels in Elko County related to transportation cost, access, and safety.

### 5.4.3 Justice 40 Initiative Application

Under the federal Justice40 initiative, there is a clear objective to address inequities in past government policies and ensure future governmental actions do not negatively impact those most vulnerable to such policies. As part of this vision, Justice40 states that eligible agencies, including state DOTs, must work toward the goal that 40% of the benefits of certain federal investments flow to DACs. The application of Justice40 principles to the Elko County LRSP involved applying the principles engrained within the ETC Explorer tool, specifically those related to transportation insecurity, which consists of indicators related

to access, costs, and safety. **Figure 10** shows the top disadvantaged tracts within Elko County. **Table 5** breaks down the transportation insecurity metrics for each tract in Elko County from the ETC Explorer. Each highlighted census tract is shown in **Appendix C**.

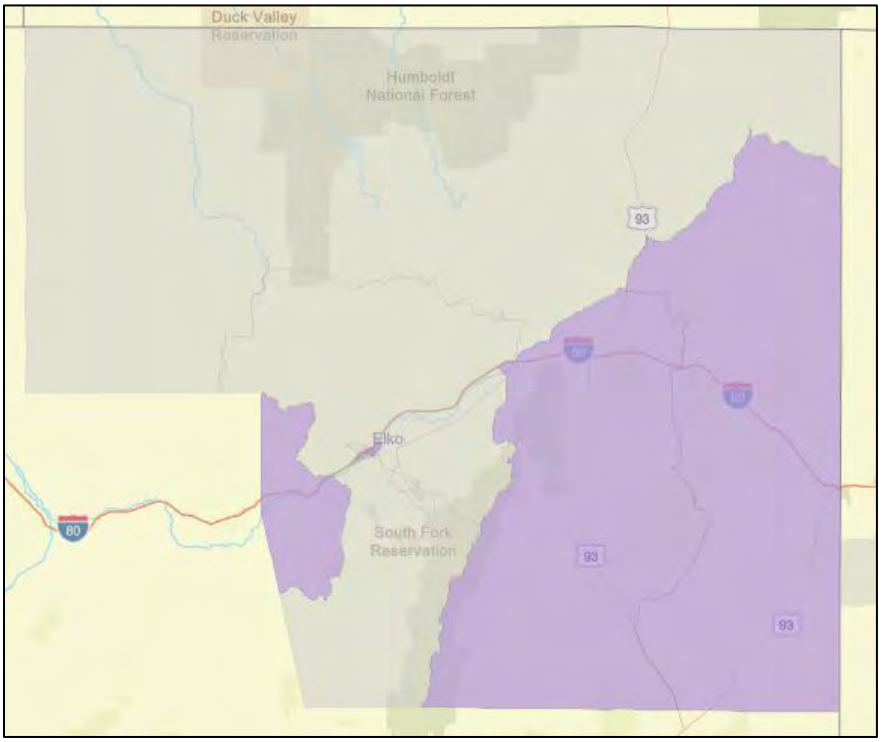



**Figure 10. Elko County Top Disadvantaged, Transportation-Insecurity Census Tracts**

**Table 5. Transportation Insecurity by Census Tract**

| Tract Number | Tract Identifier | Transportation Insecurity – Percentile Rank | | |
|---|---|---|---|---|
| | | Transportation Access | Transportation Cost Burden | Transportation Safety |
| 1 | 32007951700 | 99.9% | 90.0% | 99.9% |
| 2 | 32007950702 | 99.9% | 27.0% | 81.0% |
| 3 | 32007951600 | 96.8% | 54.7% | 76.1% |
| 4 | 32007951401 | 99.4% | 51.3% | 65.7% |
| 5 | 32007951202 | 99.6% | 61.9% | 58.9% |
| 6 | 32007951404 | 99.7% | 30.7% | 0.0% |
| 7 | 32007950200 | 92.7% | 79.6% | 99.6% |
| 8 | 32007951500 | 96.0% | 70.5% | 92.5% |
| 9 | 32007950900 | 54.6% | 67.5% | 46.5% |
| 10 | 32007950800 | 44.0% | 49.2% | 0.0% |
| 11 | 32007951300 | 61.1% | 86.0% | 54.5% |

**Table 5** reveals that all but one census tract in Elko County is experiencing transportation disadvantages based on the access, cost burden, or safety metrics that are beyond the 65% threshold established by Justice40. This indicates an opportunity to use the Elko County LSRP as a mechanism to understand the

specific barriers to access Elko County community members face, to reduce transportation costs, and more importantly, to identify strategies to improve safety for the whole county. This data can be used to develop strategies to reduce transportation disadvantages in Elko County. These strategies can include providing better public transportation, implementing traffic safety programs, and investing in infrastructure. Additionally, county governments can work together with local organizations to provide resources for people to access transportation.

## 5.5 Emphasis Areas Identification

Emphasis areas are key to shaping the direction of a roadway safety plan; they concentrate efforts on specific crash types that offer the greatest potential to mitigate K and A crashes through targeted safety countermeasures. These emphasis areas align closely with mitigating particular crash types, facilitating the selection of proven safety strategies and countermeasures that are tailored to roadway system user needs. By prioritizing safety emphasis areas based on crash data analysis, attention is directed toward crash types that account for the highest proportion of crashes, guiding the efficient allocation of resources and the implementation of effective safety measures.

The 2021 to 2025 Nevada SHSP defines 13 emphasis areas that offer the greatest potential for reducing fatal and serious injury crashes. **Table 6** presents the total K and A crashes associated with each emphasis area for Elko County. Each emphasis area was reviewed over the 5-year period, which is shown as a percentage of the total number of K and A crashes in the table. The table indicates that a single crash may be included in multiple emphasis areas (e.g., there may have been a lane departure crash associated with an impaired and speeding driver); therefore, the sum of the percentages involving fatalities and serious injuries for all emphasis areas may be greater than 100%.

**Table 6. Fatal and Serious Injury Emphasis Area Totals (2018–2022)**

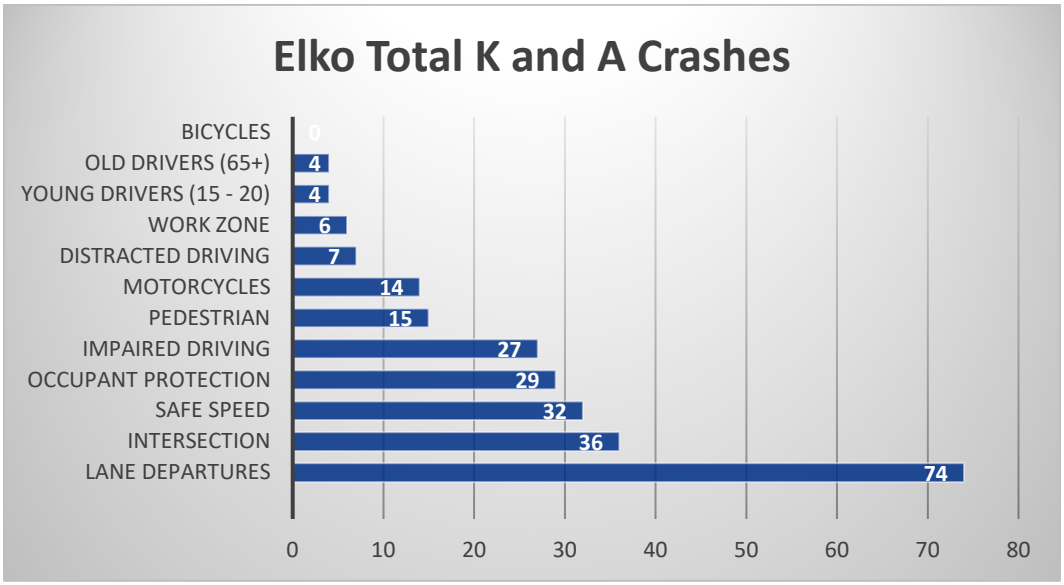


**Table 7. Elko County Overall Crash Summary (2018–2022)**

| Emphasis Area | Percentage of K and A Crashes | Number of K and A Crashes per Year | | | | | Totals |
|---|---|---|---|---|---|---|---|
| | | 2018 | 2019 | 2020 | 2021 | 2022 | |
| Crashes (KABCO) | - | 622 | 656 | 710 | 781 | 720 | 3489 |
| Crashes (K and A) | - | 24 | 18 | 44 | 36 | 42 | 164 |
| Fatal Crashes (K) | - | 8 | 9 | 11 | 12 | 10 | 50 |
| Serious Injury Crashes (A) | - | 16 | 9 | 33 | 24 | 32 | 114 |
| Impaired Driving | **16%** | 6 | 2 | 6 | 4 | 9 | 27 |
| Pedestrian | 9% | 2 | 3 | 6 | 2 | 2 | 15 |
| Intersection | **22%** | 7 | 0 | 11 | 6 | 12 | 36 |
| Bicycles | 0% | 0 | 0 | 0 | 0 | 0 | 0 |
| Motorcycles | 9% | 2 | 1 | 3 | 4 | 4 | 14 |
| Safe Speed | **20%** | 2 | 1 | 16 | 5 | 8 | 32 |
| Young Drivers (15–20) | 2% | 0 | 1 | 0 | 1 | 2 | 4 |
| Old Drivers (65+) | 2% | 0 | 1 | 1 | 1 | 1 | 4 |
| Distracted Driving | 4% | 0 | 0 | 2 | 2 | 3 | 7 |
| Occupant Protection | **18%** | 5 | 1 | 8 | 5 | 10 | 29 |
| Lane Departures | **45%** | 14 | 9 | 17 | 14 | 20 | 74 |
| Work Zone | 4% | 0 | 2 | 2 | 1 | 1 | 6 |

The leading emphasis areas associated with fatal and serious injury crashes include (in descending order of frequency) lane departures, intersections, speeding, occupant protection, and impaired driving. Lane departure crashes comprise the largest percentage of Elko County's K and A crashes (45%). These five high-priority emphasis areas were strategically selected for the LRSP based on the local safety concerns identified by stakeholders. This strategic approach aims to optimize limited resources, including finances, expertise, and time.

The emphasis areas were also compared to statewide percentages. **Table 8** presents the comparison of Elko County's K and A crashes and K+A percentages to those of the state. Among the emphasis areas, the county's percentages were higher than the statewide percentages for four of the five key Elko County LRSP emphasis areas (lane departures, speeding, occupant protection, and impaired driving).

**Table 8. Elko County Statewide Emphasis Area Comparison (2018–2022)**

| Emphasis Area | Elko County | | | Nevada | | |
|---|---|---|---|---|---|---|
| | Percent of KA Crashes | Number of KA Crashes (164) | Percent of All Crashes | Number of All Crashes (3489) | Percent of KA Crashes | Number of KA Crashes (5334) |
| Impaired Driving | **16%** | **27** | 4% | 139 | 15% | 815 |
| Pedestrians | 9% | 15 | 1% | 42 | 20% | 1072 |
| Intersections | 22% | 36 | 31% | 1072 | 32% | 1686 |

| Emphasis Area | Elko County | | | Nevada | | |
|---|---|---|---|---|---|---|
| | Percent of KA Crashes | Number of KA Crashes (164) | Percent of All Crashes | Number of All Crashes (3489) | Percent of KA Crashes | Number of KA Crashes (5334) |
| Bicycles | 0% | 0 | 0% | 4 | 3% | 161 |
| Motorcycles | 9% | 14 | 1% | 38 | 15% | 780 |
| Safe Speeds | **20%** | **32** | 10% | 357 | 11% | 602 |
| Young Drivers (15–20) | 2% | 4 | 4% | 154 | 6% | 304 |
| Older Drivers (65+) | 4% | 4 | 4% | 140 | 9% | 461 |
| Distracted Driving | 7% | 7 | 5% | 160 | 1% | 73 |
| Occupant Protection | **18%** | **29** | 3% | 112 | 12% | 629 |
| Lane Departures | **45%** | **74** | 28% | 986 | 25% | 1318 |

### 5.5.1 Pedestrian-, Bicycle-, Motorcycle-, and Bus-Related Crashes

In addition to the top five emphasis areas identified, further analysis was conducted for pedestrian-, bicycle-, motorcycle-, and bus-related crashes. FHWA uses a focused approach to safety by providing additional resources to eligible high-priority states to address the nation's most critical safety challenges. Pedestrian safety is one of the focus areas that FHWA identified for Nevada. Because of this, Nevada has priority access to receiving federal assistance, which will lead to efforts that may reduce this specific crash type.

Elko County experienced 42 pedestrian-related crashes from 2018 to 2022; 15 of those were fatal or serious injury crashes. Contributing crash factors that were occurred more frequently in these crashes were the presence of an intersection and lighting, which are typical pedestrian-related crash risk factors. Of the 42 pedestrian-related crashes, 25 (60%) occurred at intersection locations and 24 (57%) occurred in low-illuminance (e.g., dark, dawn, dusk) conditions.

For the bicycle-related crashes, there was not enough crash data to perform a thorough analysis; only four bicycle-related crashes occurred over the 5-year span. All four crashes occurred at an intersection under clear daylight conditions and none of them resulted in a fatality or serious injury.

Elko County experienced 38 motorcycle-related crashes between 2018 and 2022. Motorcycle crashes tend to result in fatal and serious injuries because of the minimal protection afforded to motorcycle riders. Of the 38 crashes, 14 (37%) led to a fatal or serious injury. NHTSA has identified several common risk factors associated with motorcycle crashes that include impairment, lack of helmet use, speeding, and driver inexperience. Among the observed crashes, alcohol was a contributing factor in five (13%), only nine (24%) involved riders wearing "DOT-compliant" helmets, and eight (21%) were attributed to speeding. Driver experience data were not available because it is not recorded in crash reports. Notably, most of these crashes (29 of 38, or 76%), were of the non-collision/single vehicle type and many occurred in clear daylight conditions.

For bus-related crashes, there was not enough data to perform a thorough analysis; only four bus-related crashes occurred over the 5-year span.

Additional crashes involving vulnerable road users (work zone and micromobility crash types) were looked at but because of the low frequency of crashes, and lack of data, crash trends were not able to be derived and therefore were not included in this LRSP.

A summary of pedestrian-, bicycle-, motorcycle-, and bus-related crashes is provided in **Table 9.**

**Table 9. Elko County Crash Totals (2018–2022)**

| | Total | K+A Crashes | K Crashes | A Crashes |
|---|---|---|---|---|
| Pedestrian-Related | 42 | 15 | 4 | 11 |
| Bicycle-Related | 4 | 0 | 0 | 0 |
| Motorcycle-Related | 38 | 14 | 4 | 10 |
| Bus-Related | 4 | 0 | 0 | 0 |

## 5.6 Systemic Analysis

A systemic analysis was conducted to determine any correlations between roadway features and crash occurrences. Crash data were examined for each roadway characteristic to assess whether the characteristic led to an unusually high frequency of crashes. The systemic evaluation operates on the assumption that K and A crashes may be heightened by specific risk factors present at a location, irrespective of the crash history at the location.

As outlined in Section 3.5, after data collection, the first step in the systemic analysis is to identify the focus crash types. Section 5.3 identified that the top target crash types were angle, rear end, and non-collision/single vehicle crashes, and Section 5.5 identified the top crash emphasis areas as lane departures, intersections, and speeding. The three crash types and three emphasis areas represent the greatest proportion and types of fatal and serious injury crashes in Elko County. With angle and rear-end crashes typically associated with the intersection and speeding emphasis areas, and non-collision/single vehicle crashes typically associated with lane departures and speeding, crash patterns for Elko County begin to emerge.

The second step in the systemic analysis is to identify focus facility types. Using crash tree diagrams, the target crash types are categorized according to similar roadway characteristics. The crash tree diagrams for the top target emphasis areas are shown in **Figure 11** (lane departures) and **Figure 12** (intersections). Crash tree diagrams help identify factors for the systemic application of safety countermeasures.

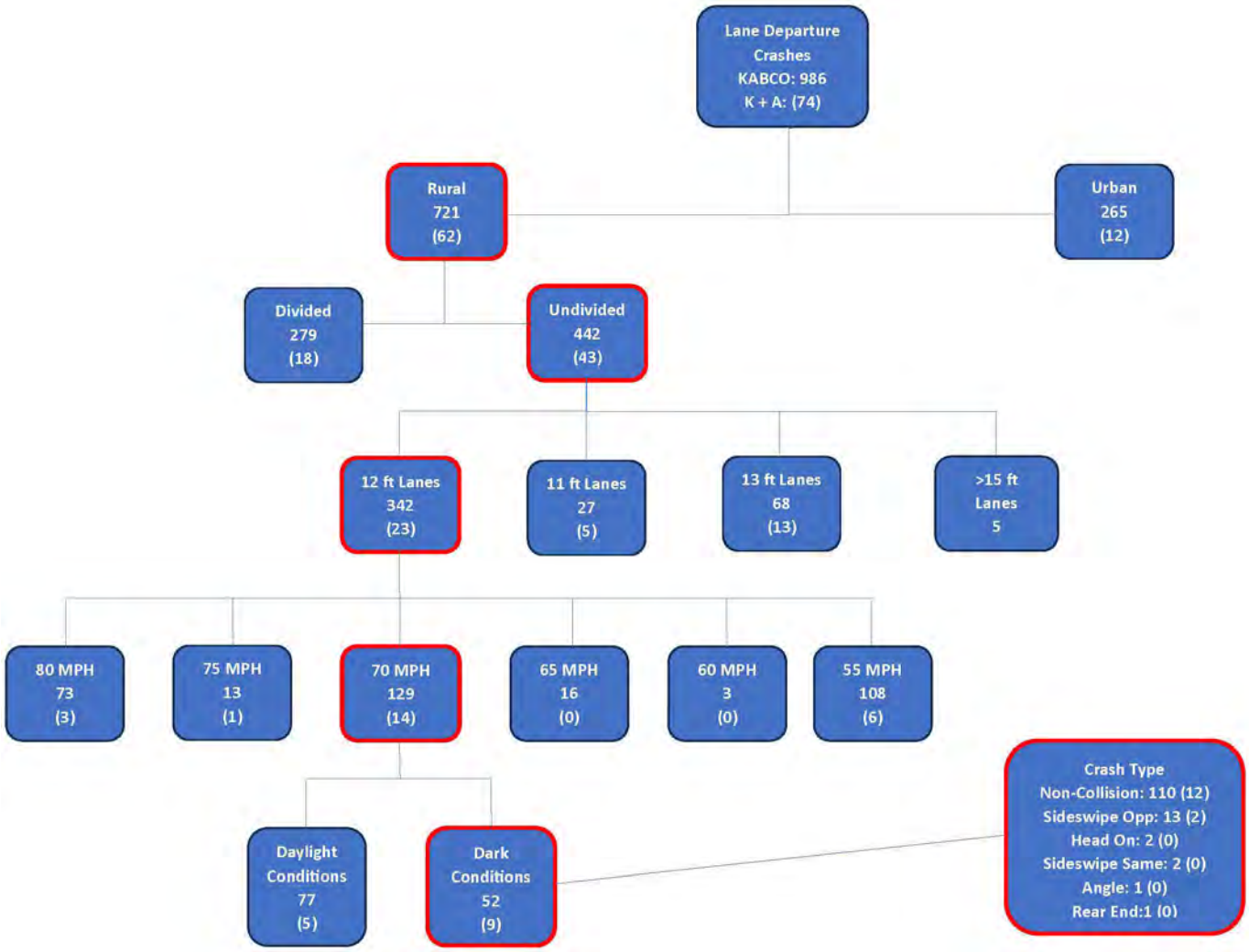



**Figure 11. Lane Departure Crash Tree Diagram**

The first crash tree analysis focused on lane departure crashes, as they constituted 45% of the total fatal and serious injury crashes in Elko County. The analysis revealed that most of these fatal and serious injury crashes occurred on rural, undivided roadways with a posted speed limit of 70 miles per hour, often in low-illuminance conditions. This suggests a potential need for improved lane identification and visibility, enhanced signage, or the implementation of traffic calming measures (e.g., Speed Feedback signs, chicanes, and speed humps). Among these crashes, the predominant crash type was non-collision/single vehicle incidents (12 of the K and A lane departure crashes).

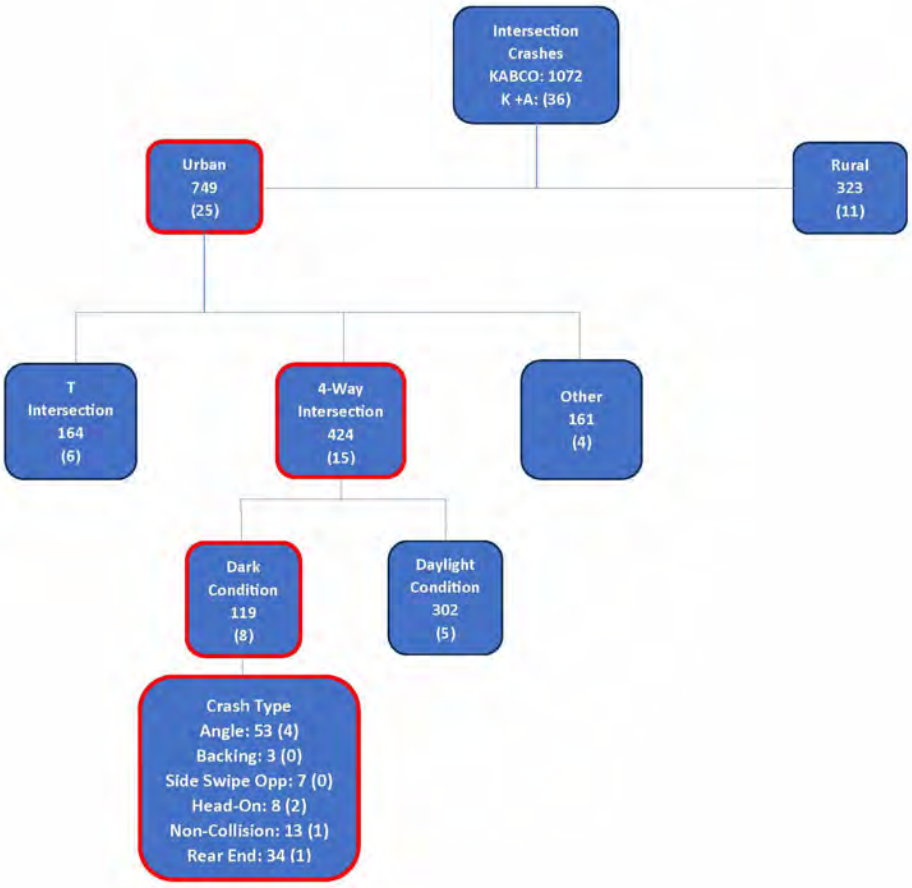



**Figure 12. Intersection Crash Tree Diagram**

As shown in **Figure 12,** there were 36 fatal and serious injury intersection crashes in Elko County (the second-highest proportion of K and A crashes). From the analysis, most intersection crashes occurred at urban, four-way intersections during low-illuminance conditions. Among these crashes, the predominant crash type was angle with a total of 53 (45%) occurring. Of the 53 angle crashes, four were of serious injury crash severity. In addition, non-collision/single vehicle crashes represent 13 of the total crashes, with one serious injury crash, and 8 total Head-On crashes with two of them resulting in serious injury crashes.

The systemic approach then shifts its focus from specific locations to risk factors. Analyzing the common characteristics of crash locations helps refine the selection of facility types. Identifying specific risks enables proactive measures to address issues wherever they arise. Initially, potential risk factors must be determined based on various considerations and engineering judgment. In Elko County, the identified potential risk factors include traffic volume, roadway width, posted speed limits, the presence of lighting, divided/undivided roadway, roadway classification, and rural/urban land types, all of which align with the FHWA potential risk factors list. The potential risk factors for each emphasis area are shown in **Table 10**.

**Table 10. Potential Risk Factors for Focus Emphasis Areas**

| Emphasis Area | Potential Risk Factors |
|---|---|
| Lane Departures | Traffic Volume |
| | Lighting |
| | Posted Speed Limit |
| | Adjacent Land Type |
| | Lane Width |
| | Median Presence |
| | Divided or Undivided |
| | Shoulder Width/Material |
| Intersections | Traffic Volume |
| | Traffic Control Device |
| | Lighting |
| | Turn Lane Presence |
| | Speed Limit |
| | Presence of Backplates |
| | Divided or Undivided |
| Speeding | Traffic Volume |
| | Posted Speed Limit |
| | Adjacent Land Type |
| | Lane Width |
| | Median Presence |
| Impaired Drivers | Time of Day |
| | Sex of Driver |
| | Age of Driver |
| | Adjacent Land Type |
| | Proximity to Alcohol Sales |
| Occupant Protection | Sex of Driver |
| | Age of Driver |
| | Distraction |

Once the potential risk factors were identified, they were evaluated to determine whether their characteristics exhibit a relationship to future crash potential. When the crash type, facility type, and roadway factors were established, the screening and prioritization steps were conducted.

Prioritization of the identified focus crash types and risk factors was based on severity, frequency, public survey input, proximity to DACs, and potential for mitigation. Focus was placed on those crash types and risk factors that pose the greatest risk to road users and have the potential for effective countermeasures.

After the focus crash types and risk factors were identified and prioritized, appropriate FHWA proven and NDOT approved countermeasures were selected to address them. These included roadway improvements, traffic control measures, education and outreach programs, and enforcement strategies. When considering potential systemic countermeasures, it is essential to examine Crash Modification Factors (CMFs) for the proposed changes. The CMF Method, found in Part D of NDOT's Highway Safety Manual, quantifies the effectiveness of specific conditions compared to others. CMFs represent the relative change in crash frequency resulting from altering a particular condition. Put simply, CMFs serve as multiplicative factors that are used to estimate the expected number of crashes following the implementation of a countermeasure at a specific location. Countermeasures associated with CMFs less than (<) one are anticipated to reduce crashes when implemented; countermeasures associated those with CMFs greater than (>) one are expected to increase crashes.

# 6.0 Emphasis Areas Analysis

Each emphasis area is accompanied by specific safety strategies, the implementation of which has the potential to contribute significantly to the overarching goal of reducing fatalities to zero. By directing efforts toward these key areas, Elko County aims to make a substantial impact on reducing the occurrence of fatal and serious injury crashes. The Elko County LRSP crash analysis identified five priority emphasis areas: lane departures, intersections, speeding, impaired drivers, and occupant protection. Targeting these five emphasis areas offer the greatest opportunity to achieve significant reductions in traffic-related fatal and serious injury crashes.

## 6.1 Lane Departure

Lane departure crashes are those that occur after a vehicle crosses an edge line, road edge, or a centerline, or otherwise leaves the designated travel lane. These crashes include non-collision/single vehicle, head-on, fixed-object, overturned, rollover, sideswipe opposite direction, and sideswipe same direction crashes. Of the total lane departure crashes that occurred in Elko County, 74 (7.5%) resulted in a fatality and/or serious injury.

A review of the crash data indicates non-collision/single vehicle crashes with contributing factors of dark conditions, rural areas, and high posted speed limits make up most of these crashes, accounting for 17 of the 74 (23%) fatal and serious injury lane departure crashes. **Figure 13** shows the locations of the fatal and serious injury lane departure crashes in Elko County.

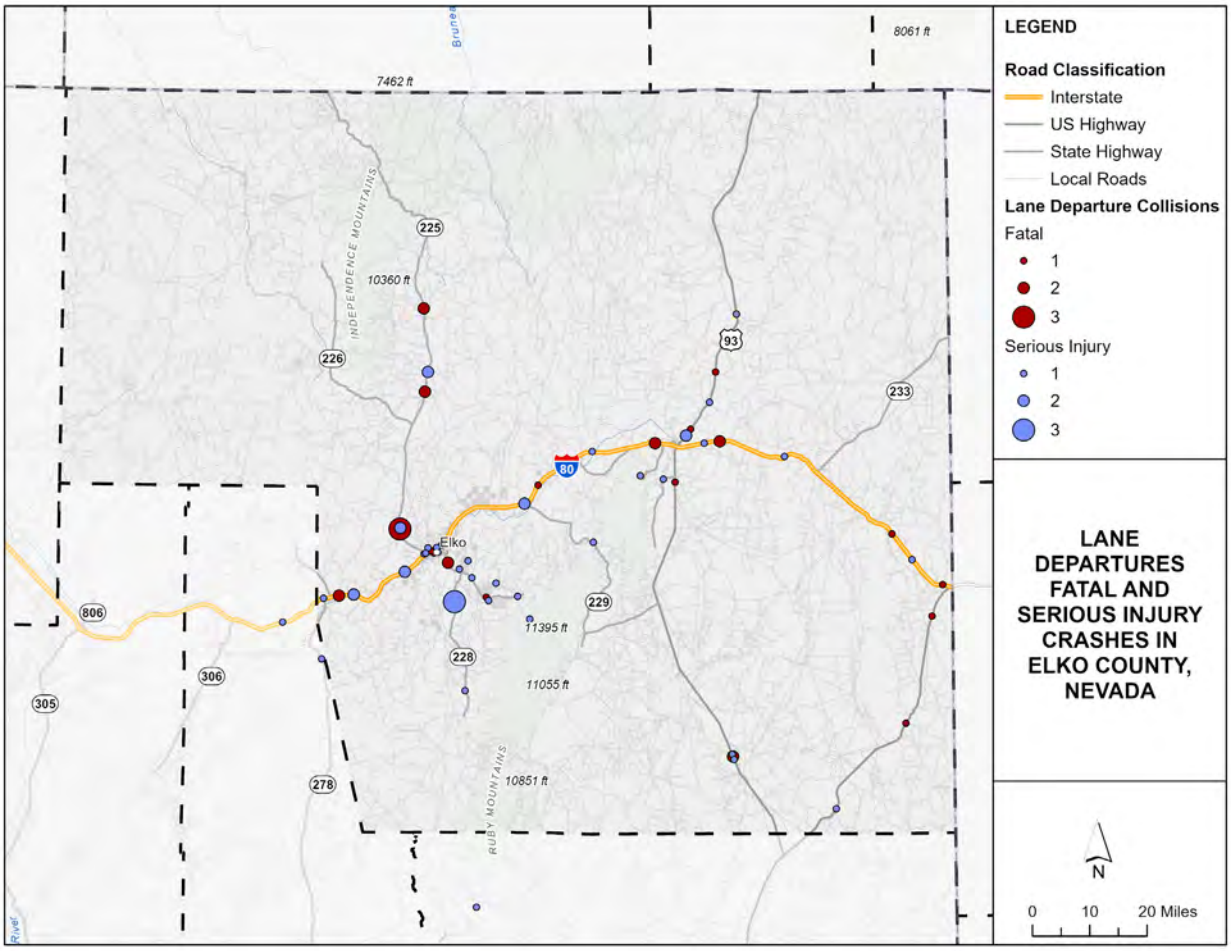



**Figure 13. K and A Lane Departure Crashes (2018–2022)**

Nevada's CMF List, FHWA's CMF Clearinghouse, and FHWA's Proven Countermeasures List include several low-cost safety measures designed to mitigate lane departure crashes. These measures include enhanced lane delineation, installation of median barriers, increased Retroreflectivity of pavement markings, wider pavement markings, enhanced pavement friction, implementation of SafetyEdge treatments, and improved signage. **Figure 14** shows some of FHWA's proven safety countermeasures.

With the LRSP goal of reducing the number of lane departure crashes over the next 5 years, all five Safe System objectives can be engaged through roadway design countermeasures (Safer Roads), education (Safer People), reducing speeds (Safer Speed), improving the understanding of new vehicle safety features (Safer Vehicles), and providing emergency medical responders better information to solicit better response times (Post-Crash Care). The engineering-focused countermeasures can effectively reduce the frequency of lane departure crashes.


**Figure 14. FHWA Lane Departure Proven Safety Countermeasures**
*(Source: FHWA)*

A hot spot analysis was conducted to supplement the systemic analysis for this emphasis area. The following locations were identified as experiencing a high number of fatal and serious injury crashes related to lane departures over the 5-year analysis period:

- Lamoille Highway (State Route [SR] 277) from Pinion Road to Corral Lane
- Mountain City Highway (SR 225) from Adobe Heights Drive to EL 35
- Great Basin Highway (US 93) from EL 78 to Wildlife Bridge near EL 85
- Great Basin Highway (US 93) from EL 8 to EL 16

## 6.2 Intersection

Intersections create natural points of conflict because of the various types of maneuvers (turning and crossing) and the various types of users (e.g., vehicles, pedestrians, bicycles). Because of these factors, greater demand is placed on road users when making decisions. An analysis of Elko County intersections determined there were 36 fatal and serious injury crashes that occurred at Elko County intersections from 2018 to 2022. A review of the crash data indicates angle and non-collision/single vehicle crashes make up most of these crashes, with two major contributing factors being dark conditions and urban areas. **Figure 15** shows the locations of the fatal and serious injury intersection crashes in Elko County.

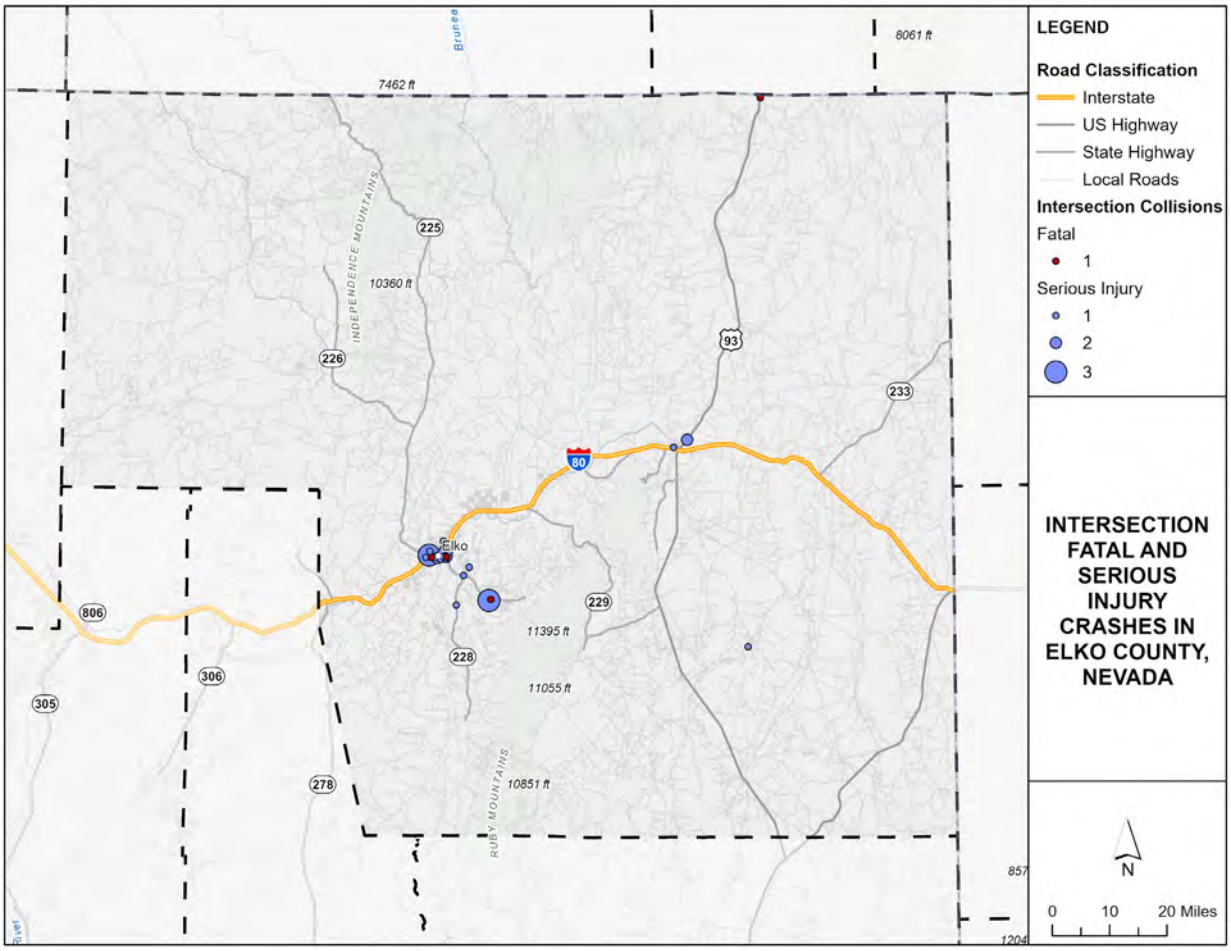



**Figure 15. K and A Intersection Crashes (2018–2022)**

Similar to lane departures, Nevada's CMF List, FHWA's CMF Clearinghouse, and FHWA's Proven Countermeasures List include several low-cost safety measures designed to mitigate intersection crashes. These measures include installation of retroreflective backplates on overhead signal heads, installation of dedicated turn lanes, calculated appropriate yellow change intervals in the signal timings, adjusted signal phasing, and improved signage and pavement markings approaching intersections and at intersections. **Figure 16** shows some of FHWA's proven safety countermeasures. These design enhancements, when partnered with enforcement and education strategies, can effectively reduce the frequency of intersection crashes. Moreover, aligning with the Safe System approach, all five objectives can be tailored to address intersection crashes, thereby reducing fatal and serious injuries countywide.


**Figure 16. FHWA Intersection Proven Safety Countermeasures**
*(Source: FHWA)*

A hot spot analysis was conducted to supplement the systemic analysis for this emphasis area. The following locations were identified as experiencing a high number of fatal and serious injury crashes over the 5-year analysis period:

- Intersection of Lamoille Highway (SR 277) at Spring Valley Parkway (SR 228)
- Intersection of Lamoille Highway (SR 277) at Metzler Road
- Intersection of Lamoille Highway (SR 277) at Willwood Way/Colt Drive
- Intersection of Lamoille Highway (SR 277) at Pinion Road
- Intersection of Mountain City Highway (SR 225) at Sagecrest Drive/Spruce Road
- Intersection of Mountain City Highway (SR 225) at Terminal Way/Cimarron Way
- Intersection of Idaho Street at 12th Street

## 6.3 Speeding

As speeds increase so does the frequency and severity of crashes. Higher speeds typically demand increased stopping distances and increased reaction times, and generally limit a driver's ability to safely navigate the road. The Elko County analysis determined 32 fatal and serious injury crashes were speed related, with non-collision/single vehicle crashes making up most of these crashes (81%). Major contributing factors were dark conditions, rural areas, and along local roads. **Figure 17** shows the locations of the fatal and serious injury speed-related crashes in Elko County.

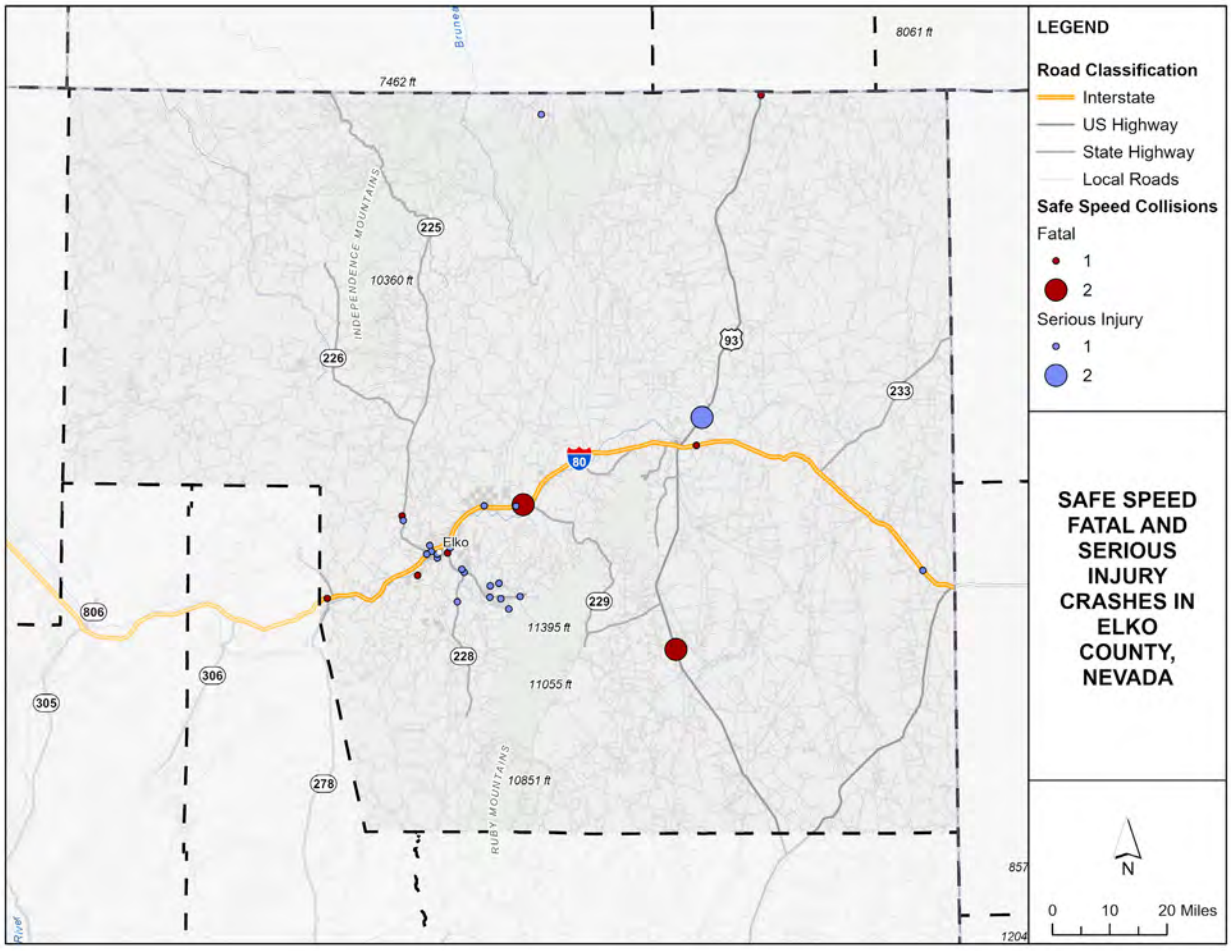



**Figure 17. K and A Speed-Related Crashes (2018–2022)**

Nevada's approved CMF List, FHWA's CMF Clearinghouse, and FHWA's Proven Countermeasures List include several low-cost safety measures designed to mitigate speed-related crashes. These measures include variable speed limits, speed safety cameras, appropriate speed limits, and various traffic calming measures. **Figure 18** shows some of FHWA's proven safety countermeasures. These design enhancements, when partnered with enforcement and education strategies, can effectively reduce the frequency of speed-related crashes. Speed-related crashes are directly related to the Safe System element of Safer Speeds; however, to effectively reduce speed-related crashes, safer speeds, roadway design (Safer Roads) and driver behavior (Safer People) all have to be addressed together to reduce fatal and serious injuries. A consideration is that use of speed safety cameras (an FHWA proven countermeasure using automated enforcement) is not currently legal in Nevada.


**Figure 18. FHWA Speed-Related Proven Safety Countermeasures**
*(Source: FHWA)*

A hot spot analysis was conducted to supplement the systemic analysis for this emphasis area. The following locations were identified as experiencing a higher number of fatal and serious injury crashes over the 5-year analysis period:

- Lamoille Highway (SR 277) from Pinion Road to Corral Lane
- Great Basin Highway (US 93) from EL 78 to Wildlife Bridge near EL 85
- Lamoille Highway (SR 277) from Lipparelli Lane to NF 660
- Sagecrest Drive (SR 225) from EL 36.50 to EL 38.50
- Spring Creek/Lamoille areas

## 6.4 Occupant Protection

Occupant protection is a major factor in ensuring the safety of all road users; fatal and serious injury crashes are often contingent upon the proper use of safety restraints within vehicles. Seat belts, child safety seats, and other occupant protection measures are critical safeguards against the devastating effects of a crash. The Elko County analysis determined 29 fatal and serious injury crashes involved an unrestrained occupant during the analysis period.

A review of the crash data indicates non-collision/single vehicle crashes make up most of these crashes (83%), with major contributing factors being dark conditions and rural areas. **Figure 19** maps the location of the fatal and serious injury speed-related crashes in Elko County.

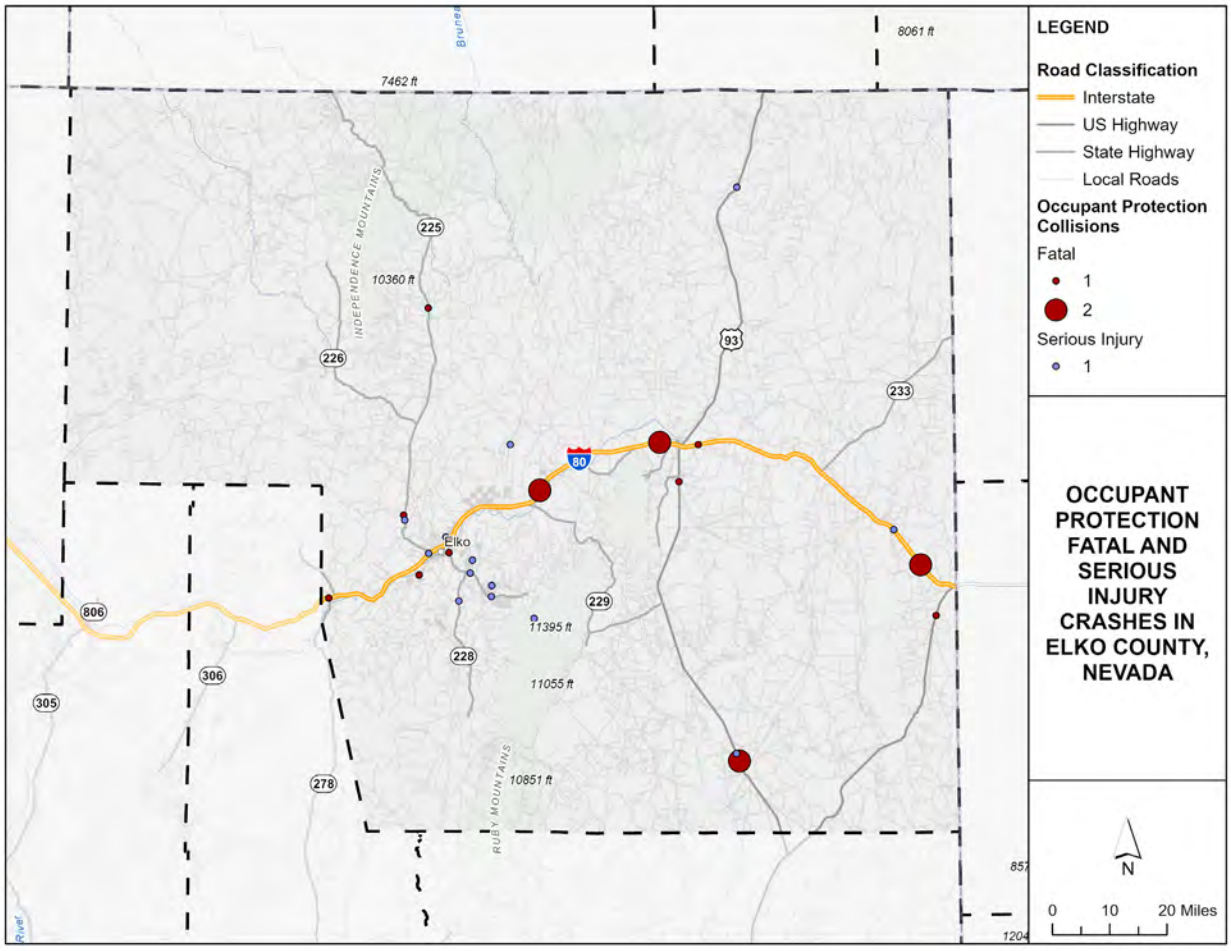



**Figure 19. K and A Occupant Protection Crashes (2018–2022)**

A hot spot analysis was conducted to supplement the systemic analysis for this emphasis area. Rather than targeting specific hot spot locations, communities were identified that experienced a higher number of fatal and serious injury crashes over the 5-year analysis period, as follows:

- City of Elko
- Lamoille Highway (SR 277)
- Mountain City Highway (SR 225)

## 6.5 Impaired Driving

Impaired driving poses a significant threat to road safety within Elko County. Whether caused by alcohol, drugs, or other substances, impaired driving diminishes a drivers ability to safely operate a vehicle, jeopardizing the lives of not only themselves but of passengers, pedestrians, and other road users. The Elko County analysis determined 27 fatal and serious injury crashes were speed related during the analysis period.

A review of the crash data indicates non-collision/single vehicle crashes make up most of these crashes, with major contributing factors being dark conditions and rural areas. **Figure 20** shows the locations of the fatal and serious injury crashes associated with impaired driving in Elko County.

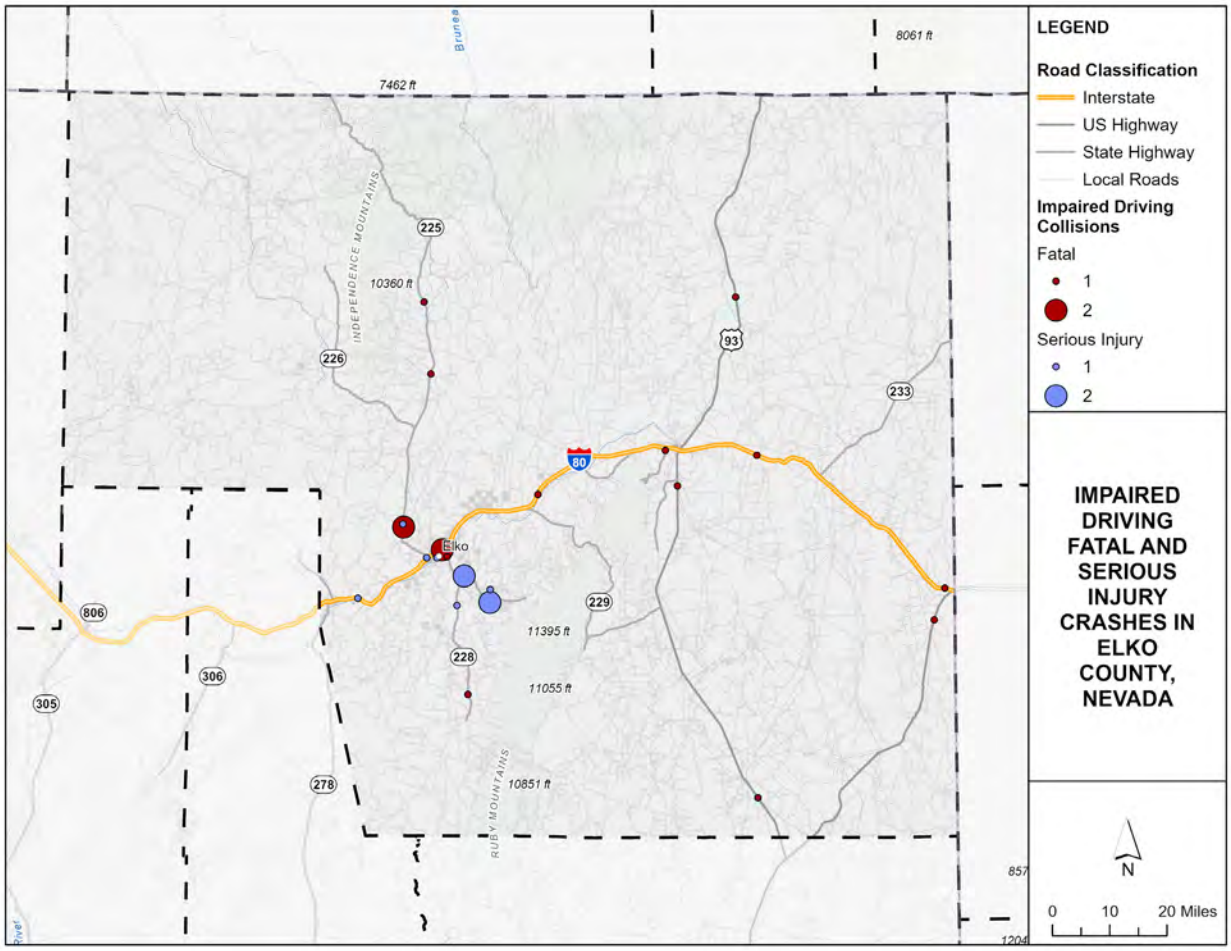



**Figure 20. K and A Impaired Driving Crashes (2018–2022)**

There are typically not many roadway design countermeasures to address impaired driving crashes; however, because of most of these crashes in Elko County involve speeding and result in lane departures, stakeholders expressed a preference for design countermeasures to address these two emphasis areas. These design enhancements, when partnered with high visibility enforcement and public/youth education strategies, can effectively reduce the frequency of impaired-driving-related crashes.

A hot spot analysis was conducted to supplement the systemic analysis for this emphasis area. Rather than targeting specific hot spot locations, larger areas with increased numbers of fatal and serious injury crashes related to impaired driving over the 5-year analysis period were identified, as follows:

1) Area near West Wendover
2) Area near City of Elko
3) Area near Spring Creek/Lamoille

# 7.0 Project Identification and Prioritization

In the project identification and prioritization process, systemic and hot spot locations were ranked using a combined approach. Establishing criteria for prioritizing safety projects is essential to ensure resources are allocated effectively. Prioritization criteria consider factors such as crash severity and frequency, the potential for improvement, cost-effectiveness, community impact, equity, and alignment with local priorities and goals. For this LRSP, greater emphasis is placed on the frequency of fatal and serious injury crashes and the emphasis areas covered in this LRSP, roadway ownership, equity, and public feedback. The following emphasis areas were prioritized based on the high numbers of fatal and serious injury crashes experienced: lane departures, intersections that occurred along county-maintained roads.

For equity assessment and gathering public feedback, a systematic scoring methodology was employed for prioritization. Equity scores ranging from 0 to 5 were assigned to each location based on its census tract designation. The highest score (5) was assigned to locations within the most disadvantaged tracts, and the lowest score (0) was assigned to locations within singular, non-disadvantaged tracts.

Regarding public opinion, locations were assigned scores ranging from 0 to 5 based on their mention in the public opinion survey responses. A score of 5 was assigned to locations mentioned multiple times in the survey or featured prominently in the detailed comments summary section. Locations not mentioned in the survey were assigned a score of 0.

**Table 11** shows a potential combined list of systemic and hot spot locations within Elko County. Each location was evaluated and ranked based on the criteria discussed above. Further analysis of each location should be completed to assess site-specific needs. Some of the suggested safety locations are on state-maintained roads, so Elko County is encouraged to coordinate with NDOT to identify a path forward.

**Table 11. Systemic and Hot Spot Locations**

| Rank | Location | Total Crashes (K+A) | Emphasis Area(s) | Urban/ Rural | Length | Roadway Classification | Roadway Ownership | Equity Score | Public Opinion Score | Emphasis Score | Owner Score | Crash Score | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Jiggs Highway (SR 228) at South Fork Road | 8 (3) | LD, INT, SP | Rural | - | Major Collector/Minor Collector | NDOT/ County | 3 | 3 | 12 | 3 | 3 | 24 |
| 2 | Lamoille Highway (SR 277) from Pinion Road to Corral Lane | 105 (6) | LD, SP | Rural | 4.9 | Minor Arterial/Minor Collector | NDOT | 1 | 5 | 8 | 1 | 5 | 20 |
| 3 | Last Chance Road from Lamoille Highway (SR 227) to Fort Worth Street | 11 (1) | INT, SP | Urban | 1.6 | Minor Collector/Local | County | 2 | 5 | 7 | 5 | 1 | 20 |
| 4 | Great Basin Highway (US 93) from EL 78 to Wildlife Bridge near EL 85 | 16 (1) | LD, SP | Rural | 7.0 | Principal Arterial: Other | NDOT | 4 | 5 | 8 | 1 | 1 | 19 |
| 5 | Lamoille Highway (SR 277) at Metzler Road | 8 (2) | INT | Urban | - | Local/Minor Arterial | NDOT/City | 3 | 5 | 4 | 3 | 3 | 18 |
| 6 | Lamoille Highway (SR 277) at Pinion Road | 11 (3) | INT | Urban | - | Minor Arterial/Minor Collector | NDOT/City | 3 | 5 | 4 | 3 | 3 | 18 |
| 7 | Lamoille Highway (SR 277) at Spring Valley Parkway (SR 228) | 26 (2) | INT | Rural | - | Minor Collector | NDOT/ County | 2 | 5 | 4 | 3 | 3 | 17 |
| 8 | Palace Parkway from Lamoille Highway (SR 227) to Parkridge Parkway | 11 (1) | LD, ID | Urban | 1.00 | Major Collector | County | 1 | 5 | 5 | 5 | 1 | 17 |
| 9 | Great Basin Highway (US 93) from EL 8 to EL 16 | 10 (3) | LD | Rural | 7.5 | Principal Arterial: Other | NDOT | 4 | 3 | 5 | 1 | 3 | 16 |
| 10 | Lamoille Highway (SR 277) at Willwood Way/Colt Drive | 4 (1) | INT | Urban | - | Minor Arterial/Minor Collector | NDOT/City | 3 | 5 | 4 | 3 | 1 | 16 |
| 11 | Lamoille Highway (SR 227) at Boyd Kennedy Road | 25 (0) | INT, SP | Rural | - | Minor Arterial/Local | NDOT/ County | 1 | 5 | 7 | 3 | 0 | 16 |
| 12 | Mountain City Highway (SR 225) at Sagecrest Drive/Spruce Road | 40 (1) | INT | Rural | - | Local/Minor Arterial | NDOT/ Other | 2 | 5 | 4 | 3 | 1 | 15 |

| Rank | Location | Total Crashes (K+A) | Emphasis Area(s) | Urban/ Rural | Length | Roadway Classification | Roadway Ownership | Equity Score | Public Opinion Score | Emphasis Score | Owner Score | Crash Score | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | Idaho Street at 12th Street | 39 (1) | INT | Urban | - | Principal Arterial: Other/Minor Collector | City | 0 | 5 | 4 | 4 | 1 | 14 |
| 14 | Lamoille Highway (SR 227) at Spring Creek Parkway | 18 (1) | INT | Rural | - | Major Collector/Minor Arterial | NDOT/ County | 1 | 5 | 4 | 3 | 1 | 14 |
| 15 | Lupine Street at Modoc Ave | 7 (1) | INT | Urban | - | Local | County | 2 | 0 | 4 | 5 | 1 | 12 |
| 16 | Spring Valley Parkway Loop | 19 (2) | SP | Rural | 5.7 | Minor Collector | County | 1 | 0 | 3 | 5 | 3 | 12 |
| 17 | Mountain City Highway (SR 225) from Adobe Heights Drive to EL 35 | 11 (2) | LD | Rural | 2.1 | Minor Arterial | Nevada State Parks | 1 | 0 | 5 | 2 | 3 | 11 |
| 18 | City of Elko | 38 (5) | ID | Urban | - | - | - | 4 | 1 | 1 | 0 | 5 | 11 |
| 19 | Lamoille Highway (SR 227) at Corral Lane | 7 (1) | INT | Rural | - | Minor Arterial/Local | NDOT/ County | 1 | 2 | 4 | 3 | 1 | 11 |
| 20 | Spring Creek/Lamoille Areas | 48 (8) | SP | Rural | - | - | - | 1 | 1 | 3 | 0 | 5 | 10 |
| 21 | Mountain City Highway (SR 225) at Terminal Way/Cimarron Way | 10 (1) | INT | Urban | - | Principal Arterial: Other/Local | NDOT/City | 1 | 0 | 4 | 3 | 1 | 9 |
| 22 | City of Elko | 5 (2) | OP | Urban | - | - | - | 3 | 1 | 2 | 0 | 3 | 9 |
| 23 | Lamoille Highway (SR 277) | N/A | OP | Rural | 4.9 | Minor Arterial/Minor Collector | NDOT | 1 | 5 | 2 | 1 | 0 | 9 |
| 24 | Lamoille Highway (SR 277) from Lipparelli Lane to NF 660 | 37 (2) | SP | Rural | 5.5 | Minor Arterial | NDOT | 1 | 0 | 3 | 1 | 3 | 8 |
| 25 | Sagrcrest Drive (SR 225) from EL 36.50 to EL 38.50 | 9 (2) | SP | Rural | 2.3 | Minor Arterial | NDOT | 1 | 0 | 3 | 1 | 3 | 8 |
| 26 | Spring Creek/Lamoille Areas | 39 (7) | ID | Rural | - | - | - | 1 | 1 | 1 | 0 | 5 | 8 |
| 27 | Bronco Drive near Buckskin Lane | 1 (1) | LD | Rural | 0.2 | Local | County | 1 | 0 | 1 | 5 | 1 | 8 |
| 28 | West Wendover | 8 (1) | ID | Urban | - | - | - | 4 | 0 | 1 | 0 | 1 | 6 |
| 29 | Mountain City Highway (SR 225) | N/A | OP | Rural | 2.1 | Minor Arterial | Nevada State Parks | 1 | 0 | 2 | 2 | 0 | 5 |

*(Note: Emphasis Area Abbreviations: LD = Lane Departure, INT = Intersection, SP = Speeding, ID = Impaired Driving, OP = Occupant Protection)*

# 8.0 Implementation and Evaluation

This section provides recommendations for implementing Elko County's LRSP and evaluating the county's progress in reaching the vision, mission, and goals established by the stakeholders. As such, the following outlines recommendations regarding project implementation and ways to evaluate progress.

## 8.1 Implementation

An implementation plan typically outlines possible ways to strategically plan improvement projects to meet the goals established in an efficient and fiscally responsible manner. The improvement project alternatives identified and prioritized in Section 7 are intended to focus efforts and resources on emphasis areas and systemic/hot spot crash locations. Improvements to address fatal and serious injury crashes can be categorized into low (<$100,000), medium, and high-cost (>$1,000,000) projects/strategies, and short- (<1 year) and longer-term (>3 years) projects/strategies.

Each component of the Safe System framework—Safe Roads, Safe Speeds, Safe Road Users, Safe Vehicles, and Post-Crash Care—serves as a foundational pillar guiding implementation efforts. The emphasis areas, strategies, and implementation/evaluation recommendations outlined in the LRSP are aligned with these Safe System elements. With strong leadership and partnership support, implementing these measures is envisioned to realize the safety goals set forth in the Elko County LRSP. Each potential strategy and countermeasure in **Table 12** addresses one of the five priority emphasis areas identified in the Elko County LRSP using the Safe System approach. The strategies identified in **Table 12** can be applied to the locations listed in Section 7 and can be implemented independently to address the emphasis areas and goals identified.

**Table 12. Potential Safety Strategies for Focus Emphasis Areas**

| Emphasis Area | Goal | Strategy/Action | CMF | Safe System Element | Cost | Timeframe |
|---|---|---|---|---|---|---|
| All | Improve road user behavior | Host safety-related events | - | Safer People | Medium | Long |
| All | Use EMS data to improve safety analysis across the county | Improve data collection and analysis capabilities related to EMS and trauma tracking/reporting | - | Post-Crash Care | Medium | Long |
| All | Maintain and optimize access to Elko communities | Maintain and increase alternative transportation options to Elko communities | - | Safer Vehicles | Medium | Long |
| All | Increase public awareness | Promote existing safety campaigns throughout the county via multiple social media sources | - | Safer People | Low | Long |
| All | Increase public awareness | Support licensing and training for motorcycle riding skills | - | Safer People | Low | Long |
| All | Increase knowledge of all-terrain/utility task vehicles for targeted safety improvements | Monitor and investigate all-terrain vehicle/utility terrain vehicle activity on county roads to identify potential issues | - | Safer Roads | Low | Long |

| Emphasis Area | Goal | Strategy/Action | CMF | Safe System Element | Cost | Timeframe |
|---|---|---|---|---|---|---|
| Impaired Driver | Increase public awareness | Support impairment education in focus areas | - | Safer People | Low | Long |
| Impaired Driver | Increase public awareness | Promote outreach and education addressing youth alcohol and drug use | - | Safer People | Low | Long |
| Impaired Driver | Reduce the number of drunk drivers | Conduct high visibility dui checkpoints at targeted locations based on crash data | - | Safer People | Medium | Short |
| Intersection | Reduce angle crashes at intersections | Implement flashing yellow arrow left-turn phase | 0.85 | Safer Roads | Low | Short |
| Intersection | Reduce angle crashes at intersections | Install left-turn lane when warranted | 0.64 | Safer Roads | Low | Short |
| Intersection | Reduce angle crashes at intersections | Install right-turn lane when warranted | 0.78 | Safer Roads | Low | Short |
| Intersection | Reduce angle crashes at intersections | Install intersection conflict warning system (ICWS) | 0.69 | Safer Roads | Low | Short |
| Intersection | Increase visual conspicuity at intersections | Install intersection lighting | 0.90 | Safer Roads | Medium | Short |
| Intersection | Increase visual conspicuity at intersections | Increase Retroreflectivity of stop signs | 0.91 | Safer Roads | Low | Short |
| Intersection | Increase visual conspicuity at intersections | Add yellow reflective backplates | 0.85 | Safer Roads | Low | Short |
| Intersection | Increase visual conspicuity at intersections | Implement systemic signing and visibility improvements at signalized intersections | 0.96 | Safer Roads | Low | Medium |
| Lane Departure | Increase visual conspicuity | Install wider edge lines | 0.79 | Safer Roads | Low | Short |
| Lane Departure | Warn drivers of lane departures | Install longitudinal rumble strips on two-lane roads | 0.90 | Safer Roads | Medium | Short |
| Lane Departure | Allow for vehicle recovery after a lane departure | Install SafetyEdge treatment on local roads | 0.94 | Safer Roads | Low | Short |
| Lane Departure | Reduce lane departure crashes | Install center line and edge line pavement markings in curves to provide enhanced visibility of the travel lane | 0.63 | Safer Roads | Low | Short |
| Lane Departure | Reduce lane departure crashes | Install shoulder rumble strips and widen shoulder | 0.55 | Safer Roads | Low | Short |
| Lane Departure | Increase visual conspicuity | Install advanced curve warning signs and chevrons through curves | 0.61 | Safer Roads | Low | Short |
| Lane Departure | Increase public awareness | Conduct education events to highlight new vehicle warning systems | - | Safer Vehicles | Low | Medium |
| Lane Departure | Increase public awareness | Support training for off-road education to public | - | Safer People | Low | Long |

| Emphasis Area | Goal | Strategy/Action | CMF | Safe System Element | Cost | Timeframe |
|---|---|---|---|---|---|---|
| Occupant Protection | Increase public awareness | Support training for seatbelt safety | - | Safer Vehicles | Low | Long |
| Occupant Protection | Increase seatbelt use | Participate in national click it or ticket enforcement campaign | - | Safer People | Medium | Long |
| Speeding | Reduce the average speed in overrepresented areas | Install traffic calming strategies in the appropriate street and road sections | Varies | Safer Roads | Medium | Medium |
| Speeding | Increase compliance with safe speeds | Set speed limits based on use of appropriate engineering practices | - | Safer Roads | Medium | Medium |
| Speeding | Increase compliance with safe speeds | Install speed feedback signs to notify drivers | 0.95 | Safer Speeds | Low | Short |
| Speeding | Improve driver behavior and reduce speeds | Conduct high visibility speed enforcement in overrepresented areas | - | Safer Speeds | Medium | Medium |
| Speeding | Increase compliance with safe speeds | Conduct educational campaigns to reinforce safer speeds | - | Safer Speeds | Low | Long |
| Speeding | Identify additional locations where speeding is an issue | Incorporate traffic citation data to determine additional locations with potential for safety improvements | - | Safer Speeds | Low | Long |
| Speeding | Better identify safety concerns across the transportation network | Improve collection of speed and volume data | - | Safer People | Low | Long |

## 8.2 Evaluation and Updates

The Elko County LRSP serves as a guidance document that is intended for regular updates every 2 to 5 years in collaboration with safety champions and stakeholders. Elko County should implement the identified projects and annually evaluate performance for each of the top emphasis areas. The ultimate measure of LRSP success is in reducing fatal and serious injury crashes throughout Elko County. Failure to observe a decrease in crash numbers over time would trigger a reevaluation of emphasis areas and countermeasures. If fatal and serious injury crash numbers increase, stakeholders should meet to review the data, investigate the crash causations, and identify potential adjustments to the countermeasures.

Consistent with the goals of the LRSP, crash data should be collected, cleaned up, and rejoined with AADT and roadway characteristics data on an annual basis for 5 years to compare results with the baseline statistics established in this LRSP. Each year, a brief memorandum should be prepared to identify the improvement projects implemented, the costs associated with implementation, and the resultant crash data analysis. This memorandum could also identify whether the NDOT CMFs resulted in the expected decrease in crash numbers within Elko County, and whether a new emphasis area has emerged.

# 9.0 Conclusion

The Elko County LRSP builds upon previous and ongoing initiatives, promoting collaboration with the intent to maximize the use of limited funds and resources. The effectiveness of the Elko County LRSP depends on coordinated implementation and ongoing collaboration. Developed with input from stakeholders, the identified priority emphasis areas and recommended strategies to mitigate fatalities and serious injuries on the county's transportation system align with those outlined in the Nevada SHSP for the statewide system. While the LRSP emphasizes systemic and site-specific infrastructure improvements, it also outlines tailored education and enforcement programs for implementation within Elko County. These programs are designed to complement infrastructure strategies and reduce fatal and serious injury crashes when implemented in tandem. Finalizing this Elko County LRSP marks a crucial step toward enhancing safety across the county's transportation network. However, having an LRSP does not directly accomplish the objective of reducing crashes. The initial implementation phase of this LRSP entails using recommendations from the priority emphasis areas analysis to identify further project opportunities and additional locations exhibiting similar attributes throughout the county's transportation system.

The Elko County LRSP was purposely aligned with the Nevada SHSP. By aligning LRSP priorities and strategies with the state priorities outlined in the SHSP, the eligibility for federal and state funding is significantly enhanced—accessing funds such as those from the Highway Safety Improvement Program becomes feasible.