

## FOR ALL IRON COUNTY

May 2025

## IRON COUNTY SAFETY ACTION PLAN

**Final Report** 



## Iron County Safety Action Plan

#### **Final Report**

May 2025

Prepared for:



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## LIST OF ACRONYMNS

| AADT   | Annual Average Daily Traffic  |  |
|--------|---|--|
| AASHT0 | TO American Association of State Highway and Transportation Officia |  |
| ADA    | American with Disabilities Act                                      |  |
| BIL    | Bipartisan Infrastructure Law                                       |  |
| CCRI   | Crash Contributing Risk Indicator                                   |  |
| CMF    | Crash Modification Factor   |  |
| FCAOG  | Five County Association of Governments                              |  |
| FHWA   | Federal Highway Administration                                      |  |
| GFA    | Geographic Focus Area   |  |
| HSIP   | Highway Safety Improvement Program                                  |  |
| HSM    | Highway Safety Manual   |  |
| HPI    | Healthy Places Index  |  |
| ICRPO  | Iron County Regional Planning Organization                          |  |
| ITS    | Intelligent Transportation System                                   |  |
| NHTSA  | National Highway Traffic Safety Administration                      |  |
| PHB    | Pedestrian Hybrid Beacon  |  |
| PSC    | Proven Safety Countermeasure  |  |
| RP0    | Regional Planning Organization                                      |  |
| RRFB   | Rectangular Rapid Flashing Beacon                                   |  |
| RTAC   | Regional Transportation Advisory Committee                          |  |
| RTEC   | Rural Transportation Executive Council                              |  |
| SAP    | Safety Action Plan  |  |
| SHSP   | Strategic Highway Safety Plan                                       |  |
| SRTS   | Safe Routes to School   |  |
| SS4A   | Safe Streets and Roads for All                                      |  |
| SUU    | Southern Utah University  |  |
| SVI    | Social Vulnerability Index  |  |
| TWLTL  | Two-way Left-turn Lane  |  |
| UDOT   | Utah Department of Transportation                                   |  |
| USDOT  | United States Department of Transportation                          |  |
| usRAP  | United States Road Assessment Program                               |  |



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## **1. INTRODUCTION**



## **1. INTRODUCTION**

Between 2019 and 2023, there were 44 fatalities and 243 serious injuries on roadways in Iron County. The number of fatalities more than doubled between 2019 and 2023, from 4 fatalities in 2019 to 11 fatalities in 2023, as shown in **Figure 1**. The number of serious injuries has increased since 2019 with a high of 61 serious injuries occurring in 2021.

Recognizing these trends, a Safety Action Plan (SAP) for all Iron County was prepared to develop a holistic, well-defined strategy to reduce roadway fatalities and serious injuries. The SAP analyzes safety needs, identifies high-risk locations and factors contributing to crashes, and prioritizes strategies to address them.

The SAP was prepared with funding from the Safe Streets and Roads for All (SS4A) discretionary grant program<sup>1</sup>. The grant program was established by the Bipartisan Infrastructure Law (BIL) with \$5 billion in appropriated funds to fund plans, strategies, and infrastructure improvements to prevent roadway fatalities and serious injuries of all roadway users. The SS4A grant program is in effect from 2022 to 2026.

The Iron County SAP was completed on May 12, 2025, to meet eligibility criteria for the 2025 Notice of Funding Opportunity. The SAP is posted and publicly available at <u>https://ironcounty.net/engineering/safety-action-plan</u>.



Figure 1. Fatalities and Serious Injuries in Iron County, 2019 to 2023

1



## Safe Streets and Roads for All (SS4A) Grant Program

The purpose of the SS4A discretionary grant program is to fund regional and local initiatives to prevent roadway deaths and serious injuries of all roadway users including pedestrians, bicyclists, public transportation users, motorists, and others. The program supports the goal of zero roadway deaths using the United States Department of Transportation (USDOT) Safe System Approach.

The grant program provides funding for two types of grants: Planning and Demonstration Grants and Implementation Grants (see **Figure 2**). Iron County secured a Planning and Demonstration Grant to develop this SAP for all Iron County including municipalities and jurisdictions within the county.



Figure 2. SS4A Grant Funding Opportunities

The SAP meets eligibility requirements that will allow Iron County and local jurisdictions in the county to apply for supplemental Planning and Demonstration Grants or Implementation Grants from the SS4A grant program.

### **Action Plan Elements**

An eligible Action Plan within the SS4A grant program is determined by a Self-Certification Eligibility Worksheet. The Self-Certification Eligibility Worksheet (keep the link) details components of an Action Plan, summarized in **Table 1**. The Iron County SAP will satisfy requirements of an Action Plan.



Table 1. Action Plan Elements

#### ACTION PLAN ELEMENT

An eligible Action Plan must include the following two elements:

1. Safety Analysis of:

- Existing conditions and historical trends.
- Crashes by location, severity and contributing factor.
- Systemic and specific safety needs.

2. Identify a comprehensive set of projects.

In addition, the Action Plan must include at least three of the remaining five elements:

1. **Leadership's public commitment** to an eventual goal of zero fatalities and serious injuries, a date to reach zero, or setting targets to achieve significant declines in roadway fatalities and serious injuries.

2. Oversight by a committee charged with plan development, implementation, and monitoring.

- 3. **Engagement** with the public and relevant stakeholders to inform plan development.
- 4. **Opportunities to improve** plans, guidelines, and standards.

5. A process to measure and report progress over time.

### **SAP Approach**

To ensure the SAP satisfies all elements required of an eligible Action Plan, the following tasks in **Table 2** were completed in development of the plan.

#### Table 2. Iron County SAP Tasks

| SAFETY ACTION PLAN TASK                              | ACTION   |
|--|--|
| TASK 1: Leadership<br>Commitment and<br>Goal Setting | A Regional Safety Commitment Resolution was adopted by the Iron County Rural<br>Planning Organization (RPO). The Regional Safety Commitment Resolution is provided<br>to each jurisdiction for consideration for adoption.   |
| TASK 2: Planning Structure                           | A SAP Committee consisting of representatives from local jurisdictions, Iron County,<br>Utah Department of Transportation (UDOT), and other agencies was organized for the<br>SAP. The Committee oversaw the SAP development and deliverables.   |
| TASK 3: Safety Analysis                              | An analysis of crash history, existing data and trends, identification of risk factors, high-risk locations, and a high-injury network was completed.  |
| <b>TASK 4:</b> Engagement and Collaboration          | Community engagement and outreach was completed through stakeholder workshops, community events, a project website, online mapping and surveys, and advertisement. The project website provided the public and stakeholders the opportunity to identify locations of concern, review materials, and view upcoming events and deliverables. |
| TASK 5: Policy and<br>Process Changes                | Existing policies, programs, and plans were reviewed, and opportunities for change or development were identified.   |
| <b>TASK 6:</b> Strategy and Project Selections       | The SAP recommends and prioritizes countermeasures, strategies, and locations to help prevent fatal and serious injury crashes in the county.  |
| TASK 7: Progress and<br>Transparency                 | The SAP details how the county will track progress towards goals in the Regional Safety Commitment Resolution and the dashboard created for this task.   |
| TASK 8: Final Report and<br>Safety Resolution        | The final report summarizes the Safety Action Plan findings and recommendations. The final report was presented to the Iron County Commission for review and adoption.   |



## **SAP Study Area**

The Iron County SAP study area encompasses all of Iron County, including local jurisdictions, as illustrated in **Figure 3**. To organize the jurisdictions and unincorporated areas of Iron County into more detailed analysis areas, Iron County was divided into five Geographic Focus Areas (GFA). **Table 3** lists the GFAs and which jurisdictions or areas comprise each GFA.

Table 3. GFAs and Jurisdictions

| GEOGRAPHIC FOCUS AREA (GFA) | JURISDICTIONS/BOUNDARIES  |
|-----------------------------|---|
| Cedar City                  | Cedar City (excluding I-15)   |
| Enoch City                  | Enoch City (excluding I-15)   |
|                             | Parowan City<br>Paragonah Town  |
| East Iron County            | Kanarraville Town   |
|                             | Brian Head Town   |
|                             | The Paiute Indian Tribe of Utah   |
|                             | Unincorporated areas of Iron County, east of SR 130 and SR 56 (excluding Cedar City and Enoch City) |
| West Iron County            | Unincorporated areas of Iron County, west of SR 130 and SR 56 (excluding Cedar City and Enoch City) |
| Interstate-15 (I-15)        | From milepost 41 to milepost 101  |

The SS4A grant program defines an Underserved Community (would this be capitalized? Not sure) consistent with the definition of an Area of Persistent Poverty (APP). Areas of Persistent Poverty are defined in the Infrastructure Investment and Jobs Act using the following criteria:

- » Any county that has consistently had 20 percent or more of the population living in poverty during the 30-year period preceding November 15, 2021, as measured by the 1990 and 2000 decennial census and the most recent annual Small Area Income Poverty Estimates as estimated by the Bureau of the Census
- Any census tract with a poverty rate exceeding 20 percent, as measured by the 2014 – 2018 5-year data series available from the American Community Survey of the Bureau of the Census
- » Any territory or possession of the United States



Figure 3. Underserved Communities Tool

A review of the SS4A Underserved Communities Tool (linked: <u>https://www.transportation.gov/grants/ss4a/identifying-underserved-communities</u>) shows that 11 of the 12 census tracts, or 92% of Iron County's population, are defined as Underserved Communities as shown in **Figure 3**. The easternmost census tract of Iron County (Census Tract 1101) including portions of Brian Head Town, Paragonah Town, and Parowan City is not identified as an Underserved Community.





Figure 4. Iron County SAP Study Area and GFAs



Interstate 15 (I-15) is managed and maintained by the Utah Department of Transportation (UDOT). However, state governments are not eligible to apply for funding through the SS4A grant program. As such, the SAP defined I-15 as its own GFA and reviewed crash data for the I-15 corridor in Iron County but does not make recommendations for improvements to I-15.

For other state-owned and maintained routes outside of I-15, UDOT may partner with local jurisdictions or agencies to complete or implement improvements or strategies identified in the SAP. Therefore, those roadways are included in the SAP processes and analyses.

### **SAP Committee**

A SAP Committee was organized to oversee the development, implementation, and monitoring of the Action Plan. The Iron County SAP Committee was comprised of representatives from local jurisdictions, UDOT, and other agencies. The committee met monthly to review, discuss, and coordinate SAP elements and tasks. The Committee provided valuable information in identifying key stakeholders and insight that guided the safety analysis, preferred countermeasure and safety strategies selections, and safety priorities for the SAP. The Iron County SAP Committee members and the organizations represented are listed in **Table 4**.

| Table 4. Iron County SAP | Committee Members |
|--------------------------|-------------------|
|--------------------------|-------------------|

| MEMBER            | ORGANIZATION                                   |  |
|-------------------|--|--|
| Rich Wilson       | Iron County                                    |  |
| Reed Erickson     | Iron County                                    |  |
| Merilee Wilson    | Iron County                                    |  |
| Mike Bleak        | Iron County Commission                         |  |
| Russell Robertson | Federal Highway Administration (FHWA)          |  |
| Trevor Hart       | Federal Highway Administration (FHWA)          |  |
| Nate Wiberg       | Five County Association of Governments (FCAOG) |  |
| Cody Christensen  | Five County Association of Governments (FCAOG) |  |
| Rob Dotson        | Enoch City                                     |  |
| Kent Fugal        | Cedar City                                     |  |
| Dan Jessen        | Parowan City                                   |  |
| Todd Robinson     | Paragonah Town                                 |  |
| Tyler Allred      | Kanarraville Town                              |  |
| Heidi Loveland    | Kanarraville Town                              |  |
| Bret Howser       | Brian Head Town                                |  |
| Shane Parashonts  | Paiute Indian Tribe of Utah                    |  |
| Tracy Munson      | Utah Department of Transportation (UDOT)       |  |
| Chris Hall        | Utah Department of Transportation (UDOT)       |  |
| Cody Marchant     | Utah Department of Transportation (UDOT)       |  |
| Laurie Huntsman   | Utah Zero Fatalities                           |  |



## 2. REGIONAL SAFETY COMMITMENT RESOLUTION



## 2. REGIONAL SAFETY COMMITMENT RESOLUTION

The SAP builds consensus across Iron County on the importance of improving safety for all roadway users. To underscore a regional commitment to safety, the Iron County Rural Planning Organization (ICRPO) was designated as the agency to adopt a Regional Safety Commitment Resolution. The ICRPO represents Iron County and the municipalities and jurisdictions within it. The Regional Safety Commitment Resolution was presented to the ICRPO for review and was adopted on March 5, 2025. Agencies and communities within the ICRPO are encouraged to review and adopt the Regional Safety Commitment Resolution or jurisdiction.

## **Iron County RPO Information**

The ICRPO is a transportation planning organization that includes a regional policy group, an advisory committee, and a program manager. The ICRPO operates as part of the Five County Association of Governments (FCAOG) which serves southwestern Utah. The ICRPO is responsible for several key planning responsibilities within Iron County including: developing a transportation project priority list; establishing access management agreements; conducting modeling and build-out studies; facilitating public participation in the planning process; and a creating a Long-Range Transportation Plan (LRTP), among other duties.

Within the ICRPO, the Rural Transportation Advisory Committee (RTAC) and the Rural Transportation Executive Council (RTEC) convene bi-monthly, bringing together agency and municipal leaders from across the region. The Regional Safety Commitment Resolution was presented to the RTAC on February 4, 2025 for review and to the RTEC for adoption on March 5, 2025.

### **Regional Safety Commitment Resolution**

The Iron County SAP Regional Safety Commitment Resolution sets a goal to significantly reduce traffic fatalities and serious injuries among all road users in Iron County by 50% by 2040, with the ultimate aim to achieve zero traffic fatalities and serious injuries. A copy of the Regional Safety Commitment Resolution is provided on the following page.

### **Progress Monitoring**

Monitoring and tracking progress towards goals outlined in the Safety Commitment Resolution are essential for implementing the Safe System Approach. Details on monitoring including the use of the safety dashboard and performance measures are provided in **Section 9**.





## IRON COUNTY RURAL PLANNING ORGANIZATION

A resolution committing to a goal to significantly reduce traffic fatalities and serious injuries in Iron County among all road users by 2040 with a Zero Fatalities goal to achieve zero traffic fatalities and serious injuries

WHEREAS the Iron County Rural Planning Organization is the officially designated Rural Planning Organization for Iron County and all the local communities; and

WHEREAS between 2019 and 2023, in Iron County, 44 people died and another 243 people were seriously injured due to roadway crashes, where 30% of fatalities and serious injuries occurred on Interstate 15 (I-15); and

WHEREAS crashes that result in death or serious injury are preventable, and the Iron County Rural Planning Organization acknowledges that the only acceptable goal is to eliminate deaths and serious injuries to all roadway users; and

WHEREAS having safe, user-friendly streets is one of the goals of the adopted 2023-2050 Utah Strategic Highway Safety Plan; and

WHEREAS creating safe, user-friendly streets will encourage active transportation, improving population health, air quality, and overall public well-being; and

WHEREAS, while jurisdictions in Iron County cannot fully control all of the factors that contribute to collisions, such as distractions, impairment, and aggressive driving, jurisdictions can play a crucial role in promoting traffic safety; and

WHEREAS the Safety Action Plan for Iron County presents the Rural Planning Organization for Iron County's commitment and strategies to reduce deaths and serious injuries of all roadway users.

NOW, THEREFORE LET IT BE RESOLVED, by the Iron County Rural Planning Organization:

- 1. Iron County Rural Planning Organization supports proactively utilizing a "Safe System Approach" to improve safety for all roadway users, rather than relying on a reactive approach to address roadway fatalities or serious injuries, and
- 2. Iron County Rural Planning Organization declares that any roadway fatality or serious injury is unacceptable and supports reasonable measures to prevent roadway crashes, and
- 3. Iron County Rural Planning Organization establishes a goal of eliminating deaths and serious injuries and supports Utah Zero Fatalities strategies, and
- 4. Iron County Rural Planning Organization establishes a goal of reducing roadway fatalities and serious injuries by 50% by 2040, and
- 5. Iron County Rural Planning Organization will measure the progress towards these regional goals and will provide regional quantitative metrics that are reported annually.

Adopted on March 5, 2025

**TRANSPORTATION PLANNING OFFICE** Five County Association of Governments 1070 West 1600 S, BLDG. B, ST. GEORGE, UT 84771 PHONE 435-673-3548, FAX 435-673-3546

Mayor Mollie Halterman, Chair

## **3. SAFE SYSTEM APPROACH**





## **3. SAFE SYSTEM APPROACH**

## Safe System Approach

The Safe System Approach (Figure 5) was adopted by the USDOT as the guiding paradigm to address roadway safety.3

The Safe System Approach considers five objectives of a safe transportation system, summarized in 
**Table 5**. Achieving zero traffic fatalities and serious
 injuries requires strengthening each objective and building upon the foundational principles of the Safe System Approach as illustrated in Figure 5.



Figure 5. FHWA Safe System Approach

| Table 5. | Safe | System | Approach | Objectives |
|----------|------|--------|----------|------------|

|            | SAFER PEOPLE       | Encourage safe, responsible driving and behavior including those who walk, bike, drive, ride transit or travel by other modes and create conditions that prioritize their ability to reach their destination unharmed.  |
|------------|--------------------|---|
| $\bigcirc$ | SAFER<br>Vehicles  | Expand the availability of vehicle systems and features that help to prevent crashes and minimize the impact of crashes on both occupants and non-occupants.  |
|            | SAFER SPEEDS       | Humans are less likely to survive high-speed crashes. Promote safer speeds in all roadway environments through a combination of thoughtful, equitable, context-appropriate roadway design, appropriate speed-limit setting, targeted education, outreach campaigns, and enforcement.        |
|            | SAFER ROADS        | Design streets to mitigate human mistakes and account for injury tolerances,<br>encourage safer behaviors and facilitate safe travel by the most vulnerable users. An<br>example includes physically separating people traveling at different speeds.                                       |
|            | POST-CRASH<br>Care | People who are injured in crashes rely on emergency first responders to quickly locate<br>and stabilize their injuries and transport them to medical facilities. Post-crash care<br>also includes forensic analysis at the crash site, traffic incident management and<br>other activities. |

3



#### DEATH AND SERIOUS INJURIES ARE UNACCEPTABLE

A Safe System Approach prioritizes the elimination of crashes that result in death and serious injuries.

#### **HUMANS MAKE MISTAKES**

People will inevitably make mistakes and decisions that can lead or contribute to crashes, but the transportation system can be designed and operated to mitigate the outcomes of human mistakes and avoid death and serious injuries when a crash occurs.

#### HUMANS ARE VULNERABLE

Human bodies have physical limits for tolerating crash forces before death or serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and recognizes physical human vulnerabilities.

#### **RESPONSIBILITY IS SHARED**

All stakeholders—including government at all levels, industry, non-profit/advocacy, researchers, and the public—are vital to preventing fatalities and serious injuries on our roadways.

#### SAFETY IS PROACTIVE

Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.

#### **REDUNDANCY IS CRUCIAL**

Reducing risks requires that all parts of the transportation system be strengthened, so if one part fails, the other parts still protect people.

#### Figure 6. Safe System Approach Principles

Implementing the Safe System Approach requires moving away from traditional safety paradigms, as summarized in **Figure 7**.



#### Figure 7. Safe System Approach Paradigm



## Safe System Approach Strategies

The USDOT has advanced an initiative for a collection of Proven Safety Countermeasures (PSC)<sup>4</sup>. The PSCs are designed for all road users and various road types – rural and urban areas, arterial to local roadways, and intersections to roadway segments. The USDOT encourages agencies to prioritize and implement the PSCs to reduce roadway fatalities and serious injuries. More information on strategies and countermeasures is provided in **Section 7**.





## 4. ENGAGEMENT SUMMARY



## **4. ENGAGEMENT SUMMARY**

To develop a more complete and effective SAP, Iron County and the project team engaged stakeholders and communities to gather feedback and perspectives on transportation safety in Iron County.

A robust stakeholder engagement and community outreach plan was executed to ensure all users of the transportation system had the opportunity to inform and contribute to the SAP. The information and feedback gathered from engagement efforts was used throughout the SAP development to inform the safety analysis, recommended strategies, and potential project locations and improvements.

The engagement strategy of the SAP satisfies the engagement and collaboration element requirements of an Action Plan as noted in the FHWA Self-Certification Eligibility Worksheet to include:

#### DID THE ACTION PLAN DEVELOPMENT INCLUDE ALL THE FOLLOWING ACTIVITIES?

- » Engagement with the public and relevant stakeholders, including the private sector and community groups;
- » Incorporation of information received from the engagement and collaboration into the plan; and
- » Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

### **Stakeholder Engagement**

Iron County, the SAP Committee, and the project team engaged stakeholders to ensure those responsible for different aspects of the County's transportation network were included. To accompany transportation system users' feedback, stakeholders included planning, maintenance, funding staff, and other community members who share responsibility for creating communities where people enjoy living were engaged.

Key stakeholders included: City, Town, and agency staff, elected officials, advocacy group representatives, health departments, law enforcement and emergency responders, UDOT staff, school district representatives, business owners, and residents of Iron County.

The SAP collected information from stakeholders and the community through a variety of engagement activities, summarized in the following sub-sections.

#### SAFETY LAUNCH WEBINAR

The development of the SAP was initiated with a Safety Launch webinar on November 14<sup>th</sup>, 2024. More than 30 stakeholders representing varying groups such as municipalities, Iron County, UDOT, health departments, advocacy groups, school districts, residents, and other organizations attended the event.

The project team introduced attendees to the SAP project, outlined how to get involved and participate in the SAP, and shared the project website for viewing progress and collecting feedback. The Safety Launch webinar included an overview of desired project outcomes and described how local jurisdictions could support a regional safety commitment and prepare to submit SS4A grant applications to fund safety improvements or additional planning and demonstration activities in their community. A copy of the Safety Launch presentation and attendee list is included in **Appendix B**.

#### **GEOGRAPHIC FOCUS AREA WORKSHOPS**

The SAP included two rounds of planning workshops in each Geographic Focus Area (GFA) to solicit feedback from key stakeholders and community members. These workshops provided insight on transportation challenges faced by Iron County transportation system users.



#### GFA Workshop #1 – Safety Analysis

The first round of GFA Workshops, or GFA Workshop #1, took place in December 2024 (see **Figure 8** and **Figure 9**). A workshop was conducted in each GFA to provide an overview of the SS4A grant program, the SAP process, project schedule and tasks, and the safety analysis methodology and results. A portion of the workshop was dedicated to gathering stakeholder and community feedback regarding the safety analysis results, including if attendees felt the analysis reflected existing conditions, their experience, and insights or other information regarding the area's transportation safety.

At each GFA Workshop, segments and intersections identified in the safety analysis high-injury or high-risk networks were reviewed using maps to understand if the locations were consistent with stakeholder and community experiences. Stakeholder input from GFA Workshop #1 was considered during the process of selecting locations and strategies for potential safety improvement projects. GFA Workshop #1 locations, attendees, agencies represented, and materials can be found in **Appendix B**.

Discussions focused on the safety analysis findings areas of concern, as well as location specific safety concerns throughout the GFA were discussed and reviewed. Stakeholders provided valuable feedback including:

- » Noted areas of concern with vehicle speeding, particularly in residential neighborhoods (local streets) and school zone areas.
- » Noted areas with planned development and expected high growth.
- » Locations to prioritize safe school and pedestrian crossings.
- » Near-miss crash locations and high congestion areas that users may be avoiding.
- » General observations on user safety including vehicle speeding, crossings at unmarked locations, and dedicated active transportation space.



Figure 8. Cedar City GFA Workshop #1





Figure 9. West Iron County GFA Workshop #1

#### GFA Workshop #2 – Strategies and Projects

The second round of GFA workshops, or GFA Workshop #2 occurred in February 2025 (**Figure 10**, **Figure 11**, and **Figure 12**). The purpose of the second round of workshops was to solicit feedback concerning the identified safety improvement project locations and proposed countermeasures.

At each workshop, locations previously identified by the safety analysis and refined using feedback from GFA Workshop #1 were reviewed using maps and accompanied by project information sheets summarizing the identified safety concerns and proposed strategies and countermeasures for that location. Attendees were asked about the viability of each proposed safety improvement project and to note any additional locations or countermeasures that should be included. Stakeholder input from GFA Workshop #2 was used to refine the proposed strategies and project locations. GFA Workshop #2 locations, attendees, agencies represented, and materials are provided in **Appendix B**.

Note, a Workshop #2 was not held for the I-15 GFA as I-15 is a State-Governed roadway and UDOT, as a State Government agency, is not eligible for SS4A funding. Project strategies and countermeasures were not identified for I-15.



Attendee feedback included:

- » Where future growth is anticipated and validating that recommended projects could be applicable to multiple locations throughout the County.
- » Strategies to improve crossings, especially at highpedestrian or school-zone roadways.
- » Rural focused countermeasures, especially for two-lane higher speed roadways and minor roads that intersect those roadways, and those that connect at a skewed angle.
- » Prioritizing school zone safety improvements.
- Dedicating space to active transportation. Separated bicycle lanes, shared-use paths, etc.
- » Feedback on project sheet information, including information to show and how to display the data.
- » General consensus on identified strategies, countermeasures, and locations.



Figure 10. Enoch City GFA Workshop #2



Figure 11. Cedar City GFA Workshop #2



Figure 12. East Iron County GFA Workshop #2



## **Community Outreach**

Soliciting input from the public provides an understanding of individuals' unique experiences, which better informs the safety analysis results, countermeasure strategies, and proposed locations and projects.

#### **PROJECT WEBSITE**

Opportunities for the public to provide input on the SAP were focused on virtual engagement through a project website, interactive map, survey, and social media outreach. The project website<sup>5</sup> provided the public with project information, study area maps, an interactive map where they could leave location-specific feedback and suggestions, a survey, event details, and a set of frequently asked questions. **Figure 13** shows the project website homepage.

#### CEDAR CITY TRAFFIC SAFETY COMMUNITY MEETING

The project team attended the Cedar City Traffic Safety Community Meeting organized by the Utah Department of Public Safety - Highway Safety Office held at the Southern Utah University (SUU) Hunter Alumni Center on October 17, 2024. The meeting included representatives from Cedar City, Utah Highway Patrol, UDOT, Zero Fatalities, Southwest Utah Public Health Department, and Cedar City and SUU Police. The event was open to the public and attended by students, faculty, and residents of the community. The event shared information and collected feedback from participants on ways to improve transportation safety in Iron County. Members of the project team shared information about the SAP, directed visitors to the project website, and asked for participation in a survey (Figure 14). During the event, the project team collected survey responses and had one-on-one conversations with attendees and students.

5



Figure 13. Project Website Homepage



Figure 14. Cedar City Traffic Safety Community Meeting



#### **ONLINE INTERACTIVE MAP**

An online interactive map embedded into the project website was used to aggregate public comments and highlight potential locations for safety-focused improvements. The mapping tool allowed respondents to comment on four categories: bicycle safety, pedestrian safety, vehicle safety, or other feedback and place those comments on locations they navigated to using the map (see **Figure 15**).

There were 95 unique comments submitted on the interactive map during the comment period. Of the 95 comments, the total of each category was as follows. A list of the map comments is provided in **Appendix C.** 



Figure 15. Online Interactive Map

| Bicycle Safety: 16    | Vehicle Safety: 54 |
|-----------------------|--------------------|
| Pedestrian Safety: 22 | Other Feedback: 3  |

Common locations identified on the map include:

- » Old Highway 91 throughout the County
- » SR 130 in Cedar City (Main Street) and Enoch City
- » 600 South in Cedar City
- » Lund Highway
- » SR 143 in Brian Head Town
- » SR 130 and 3000 North Intersection

Common safety concerns or topics from the online interactive map comments include:

- » Pedestrian and bicyclist safety: a need for dedicated bike lanes, active transportation space, and separation from vehicle traffic, as well as risky intersections and crossings.
- » **Road conditions:** rough surface conditions, narrow roadways, and worn or faded pavement markings.
- » **Traffic congestion:** signal timing, risky intersections, and the need for turn lanes.
- » **Visibility:** sight obstructions including vegetation, signage, and the need for street lighting.
- » **Compliance:** users not obeying traffic laws, concerns with drivers speeding, and stop sign compliance.



#### **Online Interactive Map Update**

In February 2025 the interactive map was updated to reflect the identified locations of potential safety improvement projects for roadways and intersections (see **Figure 16**). These locations and project details were available for stakeholder and public comment to help inform the potential project locations and components. The map was updated in preparation for the second round of GFA workshops.

#### SURVEY

A survey provided stakeholders and residents the opportunity to give input on transportation safety in Iron County. Respondents were asked about their primary mode of travel, preferred safety improvements, and highest transportation safety concerns, among other questions. The survey was available online at the project website and print copies were distributed at engagement activities. A copy of the survey and a record of survey feedback is included in **Appendix B**.



Figure 16. Online Interactive Map Update

#### Survey Key Findings

The following findings and trends were noted based on survey responses:

- » Most respondents (99%) indicated they regularly use a personal vehicle as a form of transportation.
  - » 59% of respondents indicated they regularly walk as a form of transportation.
  - » 32% of respondents indicated they regularly bike as a form of transportation.
- » Respondents identified distracted driving (65%), people ignoring traffic laws (60%), and blocked views when turning (51%) as the most concerning safety issues.
- » Most respondents (94%) indicated they are an Iron County resident.
- » Of the respondents that answered the demographic questions, 51% identified as female and 44% identified as male.
- » The majority of respondents (83%) identified as white or Caucasian.
- » The most frequently requested roadway improvements include:
  - » Additional bike lanes

» Improved lighting

» Improved intersections

» Improved crosswalks

» School zone safety improvements



#### **ADVERTISING**

The SAP and project website were advertised to the community using the following methods:

- » Requests to local Facebook groups to post project information and gather feedback from group members.
- » Requests to local governments to share project information in their email updates, newsletters, or other communication methods.
- » Requests to advocacy and student groups to share information with their networks.
  - » An email was distributed to all Southern Utah University (SUU) students and faculty by an SUU administrator.
- » A newspaper advertisement was run in the *Iron County Today* in the December 15-21, 2024, edition, requesting participation and involvement in the SAP, survey, and project website.
- » Three in-person pop-up events in different communities to share project information and request participation in the SAP.
- » Flyers (see **Figure 17**) and table tents posted at locations around Iron County, including:
  - » Iron County Bus Garage
  - » SUU Student Center
  - » Cedar City Festival Hall
  - » Enoch City Senior Center and Library
  - » Cedar Band of Paiutes Health Clinic
  - » Cedar Band of Paiutes Administration Offices
  - » D&D Variety Store
- » Flyers and table tents were delivered to public buildings and services in each GFA, including:
  - » Iron County Sheriff's Office
  - » Cedar City Police
  - » Enoch City Police
  - » Newcastle Fire Station
  - » Parowan Police Station and Post Office
  - » City or Town offices for Cedar City, Kanarraville Town, Enoch City, Parowan City, Brian Head Town, and Paragonah Town

Advertisement materials are provided in Appendix B.



Figure 17. SAP Project Information Flyer



#### **COMMUNITY POP-UP EVENTS**

Members of the project team participated in community "pop-up" events around Iron County between December 2024 and January 2025. The purpose of these events was to share project information and solicit feedback from individuals who may not participate online or at other project meetings.

## *D & D Variety Stakeholder Outreach - December 20, 2024*

The D & D Variety store is located on Highway 56 in Cedar City. The project team met with patrons of the store and encouraged them to complete surveys and provide feedback on their transportation habits and safety concerns (see **Figure 18**).

#### Parowan Birthday Party Luncheon – January 13, 2025

The Parowan Birthday Party Luncheon is held every year in Parowan City. Project team members shared project information, answered questions, shared a brief overview of the SAP to the assembled group, and distributed SAP fliers to participants (see **Figure 19**). Participants took posters to display throughout the City at commonly visited places, including the post office.



Figure 18. Pop-up Event at the D & D Variety Store



Figure 19. Pop-up Event at the Parowan Birthday Party Luncheon

#### SUU Men's Basketball Game – January 23, 2025

The SUU men's basketball game took place in the America First Event Center on January 23, 2025. Project team members distributed surveys and project fliers (see **Figure 20**). Many fans completed surveys while others scanned the QR code on the project poster to complete online.



Figure 20. Pop-up Event at an SUU Basketball Game



## **5. SAFETY ANALYSIS**



## **5. SAFETY ANALYSIS**

The SAP included an extensive safety analysis of the Iron County transportation network. The results of the safety analyses were used in developing a High-Risk Network identifying the highest safety priority roadway segments and intersections in Iron County.

The safety analysis conducted for the Iron County SAP satisfies the required SS4A Action Plan elements. Requirements for the safety analysis element of an Action Plan, as noted on the FHWA Self-Certification Eligibility Worksheet, include:

#### DOES THE ACTION PLAN INCLUDE ALL THE FOLLOWING?

- » Analysis of existing conditions and historical trends to baseline the level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region;
- » Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types;
- » Analysis of systemic and specific safety needs is also performed, as needed (e.g., high risk road features, specific safety needs of relevant road users; and,
- » A geospatial identification (geographic or locational data using maps) of higher risk locations.

### **Methodology Overview**

**Figure 21** provides an overview of the safety analyses performed for the SAP. Each safety analysis component uses different datasets or methodology to identify high-risk locations to create a High-Risk Network. The four safety analyses combined lead to a high-risk score and network, from which potential safety improvement project locations were identified. The High-Risk Network represents locations with the greatest potential for safety improvement.

The following two subsections (Crash Data Collection and Utah SHSP) provide an overview of information for Iron County and GFAs that contribute to the safety analysis.

The remaining subsections, starting with Historic Crash Analysis, detail the safety analysis components that directly contribute to the resulting High-Risk Network.



Figure 21. Safety Analysis Components


# **Crash Data Collection**

Crash data was obtained from UDOT's database for the most recent complete five-year period at the time of the analysis, 2019 to 2023. Crashes reported to UDOT within the Iron County SAP study area are included in this analysis. The project team recognizes that some crashes may have occurred that may not be reported. The analysis uses crash description terminology presented in the crash reports available in the UDOT database.

Two methods were applied to review the historic crash data, each informing the identification of safety strategies, locations, and potential countermeasures. Countermeasures refer to specific actions or infrastructure elements designed to improve transportation safety. The two methodologies for reviewing crash history include:

Historic Crash Review: Provides an overview of the most frequent crash types and common contributing factors.

**Utah Strategic Highway Safety Plan (SHSP) Emphasis Area Comparison:** Crashes in Iron County are grouped based on the Utah SHSP Emphasis Areas and are compared to statewide crash data.

Each of these analyses informs future phases of the SAP. Crash data was summarized for all of Iron County and for each individual GFA, which is provided in **Appendix A**.

## **HISTORIC CRASH OVERVIEW**

A total of 5,185 crashes occurred in Iron County from 2019 to 2023. **Figure 22** shows that the highest number of crashes (1,125) occurred in 2019. While crashes decreased in 2020 as compared to 2019, the number of crashes occurring each year has since increased.







**Table 6** summarizes crashes by severity and route type in Iron County. A review of the data shows:

- Approximately twice as many fatal crashes occurred on State Routes as compared to non-State Routes. »
- The total number of crashes that occurred on State Routes is more than double that of non-State Routes. Nearly » 20% of crashes in Iron County occurred on I-15.
- Approximately 5% of the crashes in Iron County were fatal or serious injury crashes. »

| ROUTE TYPE                       | STA   | TE ROUTE | ROUTE NON-STATE ROUTE |      |         | S OVERALL TOTAL |  |  |
|----------------------------------|-------|----------|-----------------------|------|---------|-----------------|--|--|
|                                  | Cł    | RASHES   | CRA                   | SHES | CRASHES |                 |  |  |
| UNAUTULVLNIT                     | #     | %        | #                     | %    | #       | %               |  |  |
| Fatal                            | 27    | 0.8%     | 12                    | 0.7% | 39      | 0.8%            |  |  |
| Suspected Serious Injury         | 109   | 3%       | 83                    | 5%   | 192     | 3.7%            |  |  |
| Suspected Minor Injury           | 428   | 12%      | 203                   | 13%  | 631     | 12.2%           |  |  |
| Possible injury                  | 517   | 14%      | 202                   | 13%  | 719     | 13.9%           |  |  |
| No Injury / Property Damage Only | 2,503 | 70%      | 1,101                 | 69%  | 3,604   | 69.5%           |  |  |
| Total                            | 3,584 | 100%     | 1,601                 | 100% | 5,185   | 100%            |  |  |

Table 6. Crashes by Severity, 2019-2023

## FATAL AND SERIOUS INJURY CRASH INFORMATION

The number of fatal and serious injury crashes by year is summarized in Figure 23. The highest number of fatal and serious injury crashes in the five-year analysis period occurred in 2021 with 11 fatal crashes and 40 serious injury crashes.



Figure 23. Number Of Fatal and Serious Injury Crashes by Year in Iron County, 2019-2023



## Manner of Collision

The manner of collision reported for a crash represents how two vehicles initially collided.<sup>6</sup> The three most frequent manners of collision that resulted in a fatal or serious injury crash are single vehicle crashes, sideswipe crashes, and angle crashes as shown in **Figure 24**.



## Crash Types

The ten most common crash types for Iron County are summarized in **Figure 25**. The three most common crash types are roadway departure crashes, highway crossover crashes, and "other" crashes. The crash type "other" may indicate a unique crash scenario not already identified as a crash type or a gap in data collection.

Crash type represents a query of multiple data fields, including the manner of collision. Each crash is assigned only one primary crash type; examples include left turns at intersections, rear-ends, crossover, and roadway departure crashes.



6 The recorded manner of collision may overlap with the recorded crash type, as manner of collision is a more detailed categorization as compared to crash type



## **Driver Contributing Factors**

Several factors may contribute to a single crash; however, the driver contributing factors shown in **Figure 26** only represent the first driver related contributing factor as recorded in the crash report. The first driver contributing factor recorded in the crash report indicates the primary cause of a crash. A review of the data shows that the three most frequent driver contributing factors are failing to keep in proper lanes, failing to yield proper right-of-way, and speeding. Note, the second most frequent driver contributing factor is "Other/Unknown," which may indicate a unique scenario or highlight a gap in data collection. The data shows that 19% of reported crashes from 2019 to 2023 were reported as "Other/Unknown" for the driver contributing factor.



#### **Vulnerable Road Users**

Vulnerable road users include pedestrians and bicyclists. The crash data shows 38 crashes involving pedestrians and 31 crashes involving bicyclists occurred from 2019 to 2023. **Figure 27** shows bicycle-related crashes have decreased since 2019 while pedestrian-related crashes increased after 2019, but in 2023, returned to a lower number. **Figure 28** provides an overview of the fatal and serious injury crashes involving vulnerable road users and shows that both fatal and serious injury crashes involving pedestrians have increased since 2019. The locations of these crashes showed a prevalence along major roads such as 200 North (SR 56), Main Street (SR 130), and Cross Hollow Road. There were no fatal crashes involving a bicyclist between 2019 and 2023.



Figure 27. Vulnerable User Crashes by Year, 2019-2023



Figure 28. Fatal and Serious Vulnerable User Crashes by Year, 2019-2023

SAFETY



# Utah State Strategic Highway Safety Plan

Utah's goal is to achieve zero traffic-related fatalities as documented in the Utah Strategic Highway Safety Plan (SHSP)<sup>7</sup>. An SHSP is a requirement of the Highway Safety Improvement Program (HSIP) (23 U.S.C. § 148) and is a statewide coordinated safety plan that provides a comprehensive framework for reducing fatalities and serious injuries on all public roads. The Utah SHSP identifies eleven different emphasis areas for safety to help reach the Zero Fatalities goal. The SAP recommendations build upon the identified emphasis areas in the Utah SHSP.

## UTAH SHSP EMPHASIS SAFETY AREAS

The 11 emphasis areas from the SHSP are grouped into three categories, shown in **Figure 29**.

To provide insight into emphasis areas in Iron County and each GFA, the number of fatalities and serious injuries corresponding to each emphasis area is compared to the total number occurring in Utah statewide.

A ranking is assigned to each emphasis area for all of Utah, Iron County, and each GFA, based on the frequency of fatalities and serious injuries for that emphasis area. A fatality or serious injury may be assigned to multiple emphasis areas. **Table 7** includes the total fatalities and serious injuries by emphasis area, and ranks the emphasis area by the number of traffic fatalities and serious injuries. The table compares rankings for all of Utah, Iron County, and each GFA. Detailed SHSP emphasis area comparisons are provided for each GFA in **Appendix A**.

This analysis helps to determine priority emphasis areas for Iron County and each individual GFA, based on whether the ranked frequency of fatalities and serious injuries within the GFA differ from the statewide or County total rankings.

The following five emphasis areas resulted in the highest frequency of fatalities and serious injuries in Iron County. It should be noted the same five emphasis areas are identified for statewide crashes, but in a different order. Some individual GFAs have different emphasis areas identified.

- 1. Roadway departure
- 2. No safety restraints
- 3. Speed-related
- 4. Intersection
- 5. Teen driver





Figure 29. Utah SHSP Emphasis Areas



#### Table 7. Utah SHSP Emphasis Safety Area Rank Comparison

|          |                                | STATEWIDE                             |      | IRON COUNTY                           |      | CEDAR CITY<br>GFA | ENOCH CITY<br>GFA | EAST IRON<br>COUNTY GFA | WEST IRON<br>COUNTY GFA | I-15 GFA |
|----------|--------------------------------|---------------------------------------|------|---------------------------------------|------|-------------------|-------------------|-------------------------|-------------------------|----------|
| CATEGORY | UTAH SHSP EMPHASIS SAFETY AREA | FATALITIES<br>AND SERIOUS<br>INJURIES | RANK | FATALITIES<br>AND SERIOUS<br>INJURIES | RANK | RANK              | RANK              | RANK                    | RANK                    | RANK     |
|          |                                | 9,470                                 | #    | 287                                   | #    | #                 | #                 | #                       | #                       | #        |
|          | Teen Driver                    | 1,695                                 | 4    | 54                                    | 5    | 3                 | 5                 | 6                       | 3                       | 6        |
|          | Older Driver                   | 1,565                                 | 7    | 49                                    | 6    | 2                 | 3                 | 5                       | 9                       | 4        |
| AL       | Speed-Related                  | 2,268                                 | 3    | 78                                    | 3    | 7                 | 9                 | 2                       | 2                       | 3        |
| HAVIOR   | Aggressive Driving             | 615                                   | 11   | 19                                    | 10   | 9                 | 8                 | 9                       | 9                       | 9        |
| BE       | Distracted Driving             | 732                                   | 10   | 28                                    | 8    | 10                | 6                 | 10                      | 10                      | 5        |
|          | Impaired Driving               | 1,100                                 | 8    | 27                                    | 9    | 11                | 7                 | 5                       | 6                       | 7        |
|          | No Safety Restraints           | 1,627                                 | 5    | 85                                    | 2    | 8                 | 1                 | 4                       | 4                       | 2        |
| TYPES    | Intersection                   | 3,683                                 | 1    | 67                                    | 4    | 1                 | 2                 | 8                       | 5                       | 11       |
| CRASH    | Roadway Departure              | 3,372                                 | 2    | 132                                   | 1    | 4                 | 4                 | 1                       | 1                       | 1        |
| SERS     | Motorcycle                     | 1,571                                 | 6    | 40                                    | 7    | 5                 | 10                | 3                       | 7                       | 8        |
| ERABLE U | Pedestrian                     | 1,000                                 | 9    | 15                                    | 11   | 6                 | 11                | 11                      | 11                      | 10       |
| VULNE    | Bicycle*                       | 303                                   | 12   | 3                                     | 12   | 12                | 12                | 12                      | 12                      | 12       |

\*Bicyclists are not one of the eleven Utah SHSP emphasis areas but was included as part of the SAP safety analysis.



# **Historic Crash Analysis**

Understanding the types and locations of crashes is an important aspect of analyzing the safety conditions of a roadway network. The first component of the SAP safety analysis is to identify locations with an elevated risk of crashes (see **Figure 30**). The initial step of this analysis is to spatially reference crashes that occurred within the study area. The following networks were created using historic crash data in Iron County to contribute to the High-Risk Network:

- » High-Crash Network: Represents roadways and intersections that experience high crash rates and where most crashes occur.
- » **High-Injury Network**: Represents roadways and intersections where fatal, serious, and minor injury crashes often occur.



## **HIGH-CRASH NETWORK**

Figure 30. Safety Analysis Components

Concentrations of crashes were identified by spatially referencing crashes to individual intersections and roadways, and calculating a crash rate (crashes of all severities per mile) for each roadway segment. For each intersection, a rate of crashes per entering vehicles was calculated. Entering vehicle data was obtained from UDOT.

The resulting High-Crash Network represents locations where crashes of all severities are occurring at a higher rate in comparison to other locations. The High-Crash Network displays locations where 50% of all crashes in Iron County have occurred on the transportation network.

## **HIGH-INJURY NETWORK**

The High-Injury Network was developed by spatially referencing fatal, serious, and minor injury crashes to the roadway network. An "injury rate" of fatal, serious injury, and minor injury crashes per mile was calculated for each roadway segment. A similar injury rate was calculated for intersections as injury crashes per million entering vehicles.

The resulting High-Injury Network represents roadways and intersections where 50% of fatal, serious, and minor injury crashes occurred in Iron County. Adjacent roadway segments were combined to illustrate more complete corridors or locations with safety issues.

# **Network Screening**

The Highway Safety Manual (HSM), Volume 1 Part B, Roadway Safety Management Process outlines the process for agencies to monitor and reduce crash frequency and severity on existing roadway networks. The basic structure of the Roadway Safety Management Process is illustrated in **Figure 31** and starts with a network screening.



Figure 31. Roadway Safety Management Process



Network screening identifies and ranks locations from most likely to least likely to realize a reduction in crash frequency with the implementation of a particular countermeasure or set of countermeasures. Locations identified as most likely to benefit from a reduction in crash frequency are then evaluated in more detail to identify crash patterns, contributing factors, and appropriate countermeasures. The network screening analysis applied in the SAP is based on the HSM Volume 1, Part B, Chapter 4.

The network screening steps included the following:

- Establish sub-populations of roadway segments and intersections with similar characteristics. Roadway segments are grouped by their roadway functional classification. Roadway functional classifications include interstate or freeway ramps, major arterials, secondary arterials, collector arterials, and local streets. Intersections are grouped by their control type, either signalized or unsignalized.
- 2. Calculate individual crash rates for each sub-population.
- 3. Identify locations with higher crash rates than expected by comparing to the sub-population level crash rates. This is known as the critical crash rate analysis.

## **CRITICAL CRASH RATE**

The critical crash rate (CCR) analysis compared the observed crash rate to the expected crash rate at a particular location, based on the facility type and traffic volume using a calculated average crash rate for the specific type of intersection or roadway segment being analyzed. Additional details concerning the critical crash rate calculations are provided in **Appendix A**. A critical crash rate differential was determined for each intersection and roadway segment by calculating the difference of the location-specific critical crash rate and the expected critical crash rate. A positive critical crash rate differential indicates a location with higher-than-expected crashes or a location with a greater potential for safety improvement, these locations completed the Network Screening component of the safety analysis (See **Figure 30**). The roadways and intersections identified through the CCR process represented those with the highest potential for safety improvement and were considered as potential project locations.

# **Conflict Areas**

Conflict Areas analysis used data provided by Replica, obtained for Iron County, to proactively address areas of potential safety risks. Replica provides a digital application called Safe Streets Planner that combines detailed multimodal data with driving event data to identify and prioritize high conflict or risky corridors.

Replica's collected cellular data includes indicators of certain risky behaviors including speeding, distracted driving, and hard-braking. The number of instances or "events" of risky behaviors is used to calculate a risk score for each roadway. Risky events captured in the data include speeding, phone handling, sudden braking, sudden acceleration, and suspected collisions (or near-miss collisions). Risk scores are calculated to represent the proportion of risky events to the number of total vehicle trips on a roadway. Roadways with higher risk scores represent roadways with the most safety conflicts.

The following metrics were isolated in Replica to identify high-risk roadways in Iron County from the data provided:

- » Speeding Events
- » Non-Speeding Events: suspected collisions (or near-miss type locations), phone handling (distracted driving), and sudden braking
- » Active Transportation (pedestrians and bicyclist) high-risk corridors

The maximum risk score is 100 points. Roadways with a risk score of 80 or more in any of the Replica metrics analyzed were included in the Conflict Area Network for Iron County (see **Figure 30**).



## **Roadway Characteristic Risk Analysis**

A roadway characteristic risk analysis was completed to identify characteristics that may contribute to fatal and serious injury crashes occurring on roadways within the SAP study area, using the following two sub-analyses:

- » Crash Profile Risk Assessment
- » usRAP Risk Factors Analysis

## **CRASH PROFILE RISK ASSESSMENT**

The Crash Profile Risk Assessment reviewed fatal and serious injury crashes in the SAP study area to identify attributes that correspond to a higher frequency of fatal and serious injury crashes. A point value was assigned to each characteristic or attribute based on the frequency. A risk factor score was calculated for each state and federal aid roadway. Note, the dataset used in this analysis is only available for state or federal aid routes.

The Crash Profile Risk factor scoring framework is detailed in **Appendix A**. The roadway characteristic data used in this assessment was extracted from UDOT's United States Road Assessment Program (usRAP) dataset. UDOT collects and maintains usRAP data for state and federal aid routes for the entire state. Local roads were not included in this analysis because sufficient data regarding their attributes was not available. This analysis identifies higher risk roadway segments.

## **USRAP RISK FACTORS ANALYSIS**

The usRAP data is a proactive tool for analyzing the safety of a roadway. Within the tool, the road network data is coded into segments and roadway attributes for each segment, and then assessed and scored by a technician. Software, known as ViDA, outputs a star rating for each roadway segment on a 1 to 5 scale.

Star ratings consider road infrastructure attributes known to impact the likelihood of a crash and its severity. The roadway's star rating is based on the presence or absence of these roadway design and traffic control features (shoulder widths, striping, rumble strips, medians, etc.). Stars are awarded depending on the level of safety that is "built-in" to the roadway. Separate star ratings are assigned for vehicle occupants, bicyclists, and pedestrians.

Five-star roadways have the most safety-related design and traffic control features. One-star roadways have the fewest safety related design and traffic operational features. The candidates for safety improvements usually fall in the two star and below range. Roadways with a star rating of 1 - 2 contributed to the High-Risk Network. A combination of the Crash Profile Risk Assessment and usRAP Risk Factor Analysis contributed to creating the Risk Characteristic component of the safety analysis, see **Figure 30**.

# **High-Risk Network**

The four safety analysis methodologies identified roadway segments or intersections that may benefit from safety improvements to reduce fatalities and serious injuries.

To provide focused information for decisions regarding prioritization of safety improvements, an overlay of each analysis methodology was completed to develop the High-Risk Network for Iron County. Locations displayed on the High-Risk Network are those identified with the highest safety risk. Note that the High-Risk Network includes intersections identified in the high crash network, high-injury network and the critical crash rate analysis. See **Table 8** for a breakdown of contributing analyses to the High-Risk Network. The High-Risk Network is illustrated in **Figure 32**.



Table 8. Safety Analysis Components of the High-Risk Network







Figure 32. High-Risk Network in Iron County



# 6. STRATEGIES AND SOLUTIONS



# **6. STRATEGIES AND SOLUTIONS**

A key outcome of the SAP is a set of safety strategies and countermeasures that can be implemented to reduce the frequency of transportation related fatalities and serious injuries in Iron County at specific or potential project locations.

# **Safety Strategies**

National and state level safety strategies were used to assist the SAP Committee and project team in identifying effective strategies and countermeasures for Iron County. Transportation safety countermeasures were identified from the following sources:

- » FHWA Proven Safety Countermeasures
- » National Highway Traffic Safety Administration (NHTSA) Countermeasures That Work
- » FHWA <u>Pedestrian Safety Guide and Countermeasure Selection System</u> (PEDSAFE) and <u>Bicycle Safety Guide and</u> <u>Countermeasure Selection System</u> (BIKESAFE)
- » Crash Modification Factor (CMF) Clearinghouse
- » UDOT's Countermeasure Fact Sheets
- » Other published Safety Action Plans

## FHWA PROVEN SAFETY COUNTERMEASURES

FHWA has identified 26 proven safety countermeasures (PSCs) to reduce fatal and serious injury crashes. Additionally, FHWA has highlighted PSCs specifically applicable to Rural Communities or more rural applications (**Figure 33**).

Countermeasures are categorized into speed management, pedestrian/ bicyclist, roadway departure, intersections, and crosscutting categories. The countermeasures by category are shown in **Figure 34**.

These PSCs can support Iron County and its communities to prevent and reduce the frequency of fatal and serious injury crashes.



Figure 33. FHWA Proven Safety Countermeasures in Rural Communities







#### SPEED MANAGEMENT

- Appropriate Speed Limits for All Road Users
- Variable Speed Limits

#### INTERSECTIONS

- Backplates with Retroreflective Borders
- Corridor Access Management
- Yellow Change Intervals
- Dedicated Left- and Right-Turn Lanes at Intersections
- Reduced Left-Turn Conflict Intersections
- Roundabouts
- Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

#### **ROADWAY DEPARTURES**

- Enhanced Delineation for Horizontal Curves
- Longitudinal Rumble Strips and Stripes on Two-Lane Roads
- Median Barriers
- Roadside Design Improvements at Curves
- Safety Edge
- Wider Edge Lines

#### **PEDESTRIANS/BICYCLISTS**

- Bicycle Lanes
- Crosswalk Visibility Enhancements
- Leading Pedestrian Interval
- Medians and Pedestrian Refuge Islands in Urban and Suburban Areas
- Pedestrian Hybrid Beacon
- Rectangular Rapid Flashing Beacons (RRFB)
- Road Diets (Roadway Configuration)
- Walkways

#### CROSSCUTTING

- Local Road Safety Plans
- Pavement Friction Management
- Road Safety Audit

Figure 34. FHWA Proven Safety Countermeasures



## **ADDITIONAL SAFETY STRATEGIES**

In addition to the FHWA PSCs, countermeasures identified from other sources contributed to safety strategies and improvements recommended in the SAP.

#### **NHTSA's Countermeasures that Work**

NHTSA's Countermeasures That Work is a comprehensive guide published by the National Highway Traffic Safety Administration (NHTSA) that evaluates the effectiveness of behavioral safety countermeasures. In the context of the SAP, this resource helps agencies identify evidence-based strategies to address driver behavior, including impaired driving, speeding, and seat belt use.

#### FHWA PEDSAFE and BIKESAFE

FHWA's PEDSAFE and BIKESAFE systems are guides intended to provide users with the latest strategies for improving the safety and mobility of those who walk and bike. The guides provide a combination of countermeasures, implementation components, and cases studies. In the context of the SAP, this resource can help agencies identify, select, and implement countermeasures appropriate specifically for pedestrians and bicyclists.

#### CMF Clearinghouse Website

The CMF Clearinghouse Website provides a regularly updated online repository of Crash Modification Factors (CMF) for numerous researched countermeasures. The CMF Clearinghouse summaries published information on each countermeasure including how it was developed, the statical properties of crash reduction, and a grading scale based on factors like data sources and study sample sizes. CMF are factors used to calculate the expected number of crashes after the implementation of a given countermeasure. Smaller CMFs indicate a greater reduction in crashes. For example, a countermeasure that reduces crashes by 80% will have a CMF of 0.20 (20%). In the context of the SAP, this resource helps agencies research and identify a variety of countermeasures applicable to improving transportation safety.

#### **UDOT's Countermeasure Fact Sheets**

The UDOT Countermeasure Fact Sheets provides information on safety countermeasures specific applications in Utah. It includes information on countermeasure effectiveness, implementation guidelines, and associated crash reduction factors. In the context of the SAP, the fact sheet may help agencies identify and implement targeted safety improvements by offering data-driven insights on countermeasures that reduce fatal and serious injury crashes in Utah.

## **Countermeasure Toolbox**

A Safety Countermeasure Toolbox was compiled to assist agencies in selecting appropriate safety countermeasures for their community. The toolbox is organized by roadway segment and intersection related countermeasures. The countermeasures are also grouped by the needs they are intended to address. Needs include vulnerable road users, speeding, intersection safety, etc. Note, some countermeasures are applicable to broad areas and users while others are targeted to address specific needs. Multiple countermeasures may need to be implemented together to address needs. The countermeasure toolbox is provided in **Appendix D**.

The following pages provide a brief description of countermeasures that were considered and used throughout the SAP process. The countermeasures are sorted first by application location: roadway segments or intersections. Then countermeasures are grouped by type of improvement or need being addressed such as countermeasures directed to roadway curve improvements, crossing type improvements, roadside design improvements, or other applications.



## **ROADWAY SEGMENT COUNTERMEASURES**

**Install 6-in. Edge Line (Both Sides of Roadway)** - Increases visibility, especially at night and in poor weather. 6 inch edge lines provide clearer guidance, helping drivers maintain their lane position. Improved lane adherence reduces the risk of roadway departure crashes.



#### Install 4-in. Centerline and Edge Line Striping (Paint) -

Improves Lane visibility and delineation. These markings help drivers maintain proper lane positioning, especially in low-light conditions. Better lane guidance reduces the potential for headon and run-off-road crashes.

**Install 4-in. Retroreflective Centerline and Edge Lines -**Improves nighttime visibility and lane delineation. The enhanced reflectivity provides better guidance, reducing driver confusion and lane departures. Clearer lane markings help prevent crashes,

especially in low-light conditions.



**Install Edge Line Rumble Strips -** Create audible and vibratory warnings when vehicles drift toward the shoulder. These strips alert distracted or drowsy drivers, preventing lane departures. Keeping vehicles in their lanes reduces the risk of run-off-road crashes.

**Install Centerline Rumble Strips -** Provide tactile and auditory alerts to drivers who cross into opposing lanes. They help prevent head-on and opposite-direction sideswipe collisions by encouraging lane compliance



**Install Transverse Rumble Strips Prior to Curve -** Provides tactile and auditory warnings to approaching drivers. These strips alert drivers to reduce speed and prepare for a curve. Slowing vehicles before curves decreases the likelihood of curve-related crashes.



## Extend Unpaved Shoulder 2 ft (Both Sides of Roadway)

- Provides additional recovery space for vehicles that leave the roadway. This extra space allows drivers to regain control, reducing the likelihood of run-off-road crashes.

**Install 4 ft Paved Shoulder (Both Sides of Roadway)** - Provides additional recovery space for vehicles, reducing the risk of runoff-road crashes. Paved shoulders can also enhance safety by accommodating multiple road users including pedestrians and bicyclists.



**Install Medians (Back-to-Back Curb)** – Provides a physical barrier that separates opposing traffic, reducing head-on and left-turn crashes. These medians limit dangerous crossing movements.



**Install Medians and Pedestrian Refuge Islands -** Provide safe stopping points for pedestrians crossing multi-lane roads. They allow pedestrians to cross one direction of traffic at a time, reducing exposure to traffic. This enhances pedestrian safety and reduces conflict points with turning vehicles.



**Lane Narrowing -** Reduces the width of vehicle travel lanes, often through restriping or adding buffers for bicyclists or pedestrians. Narrower lanes naturally encourage slower driving speeds and increase driver focus.

**Widen Roadway and Install Two-Way Left-Turn Lane** - Reduces conflicts by providing a dedicated space for turning vehicles. This minimizes rear-end and sideswipe crashes by keeping turning vehicles out of travel lanes. Safer left-turn movements reduce the risk of crashes.



Install or Upgrade Curve Signage to Enhanced

**Delineations -** Uses bright, retroreflective materials and larger signs to increase curve visibility. These signs alert drivers to approaching curves, encouraging appropriate speed adjustments.

#### **Install Speed Activated Flashers on Chevron Signs**

- Illuminate chevron signs when vehicles approach at excessive speeds, providing an immediate visual warning. These flashers alert drivers to reduce speed before entering dangerous curves.

#### Install In-Lane Curve Warning Pavement Markings -

Provide visual cues directly on the pavement, alerting drivers to upcoming curves. This enhances curve awareness and encourages speed reduction. Increased driver attention reduces the risk of curve-related crashes.

#### Install High Friction Surface Treatment (HFST) on Curve

- Increases pavement friction at critical curve locations, improving vehicle traction and reducing skidding. HFST helps vehicles maintain control on curves, especially in wet or slippery conditions.



**Install 6 ft Sidewalk (Both Sides of Roadway)** - Provide a designated space for pedestrians, separated from vehicle traffic. Installing sidewalks on both sides of a roadway increases pedestrian safety by reducing the likelihood of pedestrian-vehicle interactions.

#### Install A Separated 12 ft. Shared-Use Path -

Accommodates pedestrians, bicyclists, and other nonmotorized users, separated from the roadway. The separation significantly reduces conflicts between vulnerable users and vehicles.



**Install Highway Lighting -** Improves nighttime visibility for drivers, pedestrians, and bicyclists. Properly lit roadways enhance driver reaction times and reduce the likelihood of crashes in low-visibility conditions. Enhanced lighting reduces nighttime crash severity and frequency.



**Driver Feedback Speed Limit Signs -** Display vehicle speeds to approaching drivers, encouraging them to slow down when exceeding the posted speed limit. These signs use radar to detect speeds and provide real-time feedback, raising driver awareness.

#### Driver Feedback Speed Limit Signs on Rural Curves - Alert

drivers to their speed as they approach potentially hazardous curves, encouraging speed reduction. These signs are strategically placed before curves to give drivers time to adjust their speed.

**Install Guardrail** - Provides a protective barrier that prevents vehicles from leaving the roadway, especially on curves or embankments. They redirect errant vehicles and minimize the severity of crashes. Properly placed guardrails reduce the potential for fatal off-road crashes.



**Install Post-Mounted Delineators -** Increases edge of travel way visibility and guides drivers through curves, intersections, and other road features. Provides visual cues, especially in lowlight conditions, enhancing driver awareness. Improved guidance reduces run-off-road and curve-related crashes.

**Install Concrete Barrier -** Provides a rigid, protective barrier that prevents vehicle crossovers and errant vehicle departures. They are effective at containing high-speed vehicles and reducing crash severity. Barriers prevent head-on collisions and protect vulnerable roadside areas.





**Install Bicycle Lanes -** Designate space exclusively for bicyclists, typically with pavement markings and signage. They provide a safer, dedicated area for bicyclists, separating them from motor vehicle traffic and reducing conflicts between bicyclists and vehicles.



**Install Buffered Bicycle Lanes (Curb Separated)** - Adds a physical separation between bicyclists and vehicles using curbs or raised elements. This increased separation protects bicyclists from encroaching vehicles and further reduces conflicts with traffic.

**Convert Traditional/Buffered Bike Lanes to Separated Lane with Flexible Delineator Posts -** Provides a physical buffer between bicyclists and vehicles. Delineator posts increase driver awareness and prevent vehicle encroachment into bicycle lanes.



**Install Paved Bus Pullout** - Provide a designated area for buses to stop outside the travel lane. This prevents buses from blocking traffic and reduces the likelihood of rear-end collisions. Pullouts enhance safety for both passengers and passing vehicles.

**Conduct A Road Safety Audit (RSA)** - A formal evaluation by a multidisciplinary team to identify safety concerns and recommend improvements. RSAs assess potential hazards and suggest mitigation measures. Addressing identified issues helps prevent crashes.





## INTERSECTION COUNTERMEASURES



**Install High-Visibility Crosswalk (Including Lighting)** - Uses bold markings (e.g., continental or ladder styles) with enhanced lighting to improve pedestrian visibility. The increased visibility helps drivers detect crossing pedestrians earlier, especially at night.

**Install Extended Time Pushbutton** - Allows pedestrians who need extra time to cross to extend the signal phase. These pushbuttons accommodate slower-moving pedestrians, ensuring they can safely clear the intersection.

**Install Raised Crosswalk and Signage -** Elevates pedestrian crossings, decreasing speeds and increasing pedestrian visibility. Accompanying signage alerts drivers to yield to crossing pedestrians. Slower speeds and increased driver awareness reduce pedestrian crash frequency and severity.

**Install High Visibility Crosswalk Markings and Signage -**Uses bold pavement markings and signage to alert drivers to pedestrian crossings. The increased visual cues improve driver awareness and compliance. Enhanced crosswalks reduce pedestrian crashes by improving visibility.



**Install High-Visibility Crosswalk (Including RRFB)** - Uses bold pavement markings, signage, and bright, flashing lights to alert drivers to pedestrian crossings. The flashing beacons activate when pedestrians approach, significantly increasing driver awareness.

**Install Rectangular Rapid Flashing Beacons (RRFB) -** Uses bright, flashing lights to warn drivers of pedestrians crossing the roadway. Activated by pedestrians, RRFBs draw driver attention and prompt yielding behavior.



**Install Pedestrian Hybrid Beacons (PHB) or HAWK -** Uses flashing and solid lights to control vehicle movements and allow pedestrians to cross safely. These signals create clear gaps in traffic for safe crossings. PHBs greatly reduce pedestrian crashes at midblock locations.



**Install Pedestrian Refuge Island** - Provides a safe space in the center of the roadway for pedestrians crossing multiple lanes. They allow pedestrians to cross one direction of traffic at a time, reducing exposure to traffic. Refuge islands can decrease the number of pedestrian related crashes

**Install Left Turn Lanes -** Provides space for slower, turning vehicles, removing them from the through traffic flow. This separation reduces rear-end and angle crashes by minimizing conflicts between turning and through vehicles.

#### Create Positive Offset of Existing Left-Turn Lanes (Pavement Markings and Curb Work, No Widening) -

Realigns opposing left-turn lanes to improve driver visibility of oncoming traffic. This change reduces sightline obstructions and minimizes risky turning maneuvers.

**Install Right Turn Lanes -** Provides space for turning vehicles to exit the through traffic flow, reducing rear-end crashes. Separating right-turning vehicles improves intersection efficiency and reduces conflicts. Safer turning movements lead to fewer intersection involved crashes.

**Realign Intersection Approach to Reduce or Eliminate Skew** - Improves sightlines and reduces complex turning movements. Better alignment simplifies driver decision-making, reduces turning conflicts, and reduces. the risk of severe intersection crashes.



**Implement Leading Pedestrian Interval (LPI) Signal Timing -**Gives pedestrians a 3-7 second head start to enter the crosswalk before vehicles receive a green light. This early entry makes pedestrians more visible and reduces conflicts with turning vehicles.

**Change Left-Turn Timing from Permissive Only to Flashing Yellow Arrow -** Provides drivers more clarity by indicating when left turns are allowed but not protected. This reduces driver confusion and improves gap selection.



**Change Left-Turn Timing from Permissive to Protected -**Provides left-turning vehicles a dedicated green arrow and removes the need for drivers to judge gaps in opposing traffic, reducing conflicts.

**Change 5-Section Doghouse to Flashing Yellow Arrow** - Simplifies driver decision-making for left turns by clearly indicating when drivers must yield to oncoming traffic.

Install a Rural Intersection Control Warning System (RWIS)

- Uses dynamic flashing beacons and signage to alert drivers of approaching traffic at rural intersections. These systems provide real-time warnings, improving driver awareness and reducing risky maneuvers.

 Install Transverse Rumble Strips on Minor Approach
 Provides placed auditory and tactile warnings to drivers approaching intersections. These strips alert inattentive drivers, reducing the risk of failure-to-yield crashes.



**Clear and Grub** - Removes vegetation and obstacles that obstruct sightlines at intersections. Improved sight distance allows drivers to detect and react to potential hazards more quickly. Better visibility reduces the likelihood of intersection crashes.



**Install Pedestrian Refuge Island** - Provides a safe space in the center of the roadway for pedestrians crossing multiple lanes. They allow pedestrians to cross one direction of traffic at a time, reducing exposure to traffic. Refuge islands can decrease the number of pedestrian related crashes.



**Perform an Intersection Control Evaluation (ICE) and Implement -** Assesses the best control type (signals, roundabouts, or stop signs) to improve safety and operations. Implementing the optimal control can reduce crash potential and improve traffic flow.



**Convert Existing Intersection to Modern Roundabout** (Single Lane) - Replaces traditional intersections with a circular layout where traffic flows counterclockwise. Roundabouts reduce conflict points, slow vehicle speeds, and minimize crash severity.





**Right-In-Right-Out Access Treatment -** Restricts left-turn movements at driveways or intersections, reducing conflict points. Vehicles enter and exit only via right turns, preventing risky crossing maneuvers. Limiting left-turns reduces the frequency of angle crashes.

**Stop-Control Intersection Signage -** Improves visibility and awareness at stop-controlled intersections. Larger, retroreflective signs or supplemental signs alert drivers earlier, reducing the likelihood of failure-to-yield crashes.

**Install Second Stop Sign and Stop Ahead Sign -** Reinforces the need for drivers to stop. This redundancy improves driver compliance and reduces the likelihood of failure-to-yield crashes.

**Install Beacon on Stop Sign -** Uses flashing lights to draw driver attention to the intersection. The increased visibility improves driver compliance to stop signs. Better compliance reduces intersection crashes, particularly at night or in low-visibility conditions.

**Upgrade Signs and Pavement Markings (Paved Approach) –** Enhances driver guidance and intersection visibility by providing, more visible signage and markings to reduce driver confusion.



**Install Bulbouts** - Bulbouts, or curb extensions, extend the sidewalk into the roadway, reducing crossing distance and slowing the speed of turning vehicles. Bulbouts improve pedestrian visibility and safety.





# **Opinion of Probable Cost Estimates**

Opinion of probable costs were prepared for each countermeasure type to be used as planning level estimates. Additionally, other project cost components including mobilization, traffic control, contingency for unknown items, preconstruction engineering/design, and construction engineering/management were estimated. All cost estimates were developed using the latest available 2024 or 2025 dollar estimates from recently completed UDOT projects and the UDOT Concept Cost Estimate Form<sup>8</sup>, which provides percentage assumptions for other project components based on locations and project complexities.

The estimated project total does not include any adjustment for future inflation and must be reevaluated before project scoping, design, or implementation. Inflation rates per year are provided in the UDOT Concept Cost Estimate Form and may be used as an estimate for local jurisdictions. For example, an inflation factor of 1.23 would be applied to project costs prepared in 2025 but planned to be constructed in 2030 (a project in 5-years). The following inflation factors in **Table 9** may be used to estimate project costs for future years using the inflation rates provided in the UDOT Concept Cost Estimate Form.

| YEAR | CUMULATIVE INFLATION FACTOR FOR FUTURE<br>YEARS (TO BE APPLIED TO 2025 COST<br>ESTIMATE) |
|------|--|
| 2030 | 1.23   |
| 2035 | 1.46   |
| 2040 | 1.75   |
| 2045 | 2.08   |
| 2050 | 2.49   |

Table 9. Future Year Cumulative Inflation Factors

For the countermeasures identified and used in the Iron County SAP, the assumptions used in developing opinion of probable costs are provided in **Appendix D**.

# **Safety Improvement Projects and Case Studies**

Location-specific safety improvements were developed for multiple locations throughout the County in coordination with the SAP Committee. The improvements and locations were identified from the safety analysis findings, the High-Risk Network, and engagement feedback received in the SAP process.

Additionally, case study information sheets for common scenarios or typical locations throughout the County were developed as a resource to show an example of safety strategies and countermeasures that may be applied in similar locations.

## **PROJECT INFORMATION SHEETS**

Project Information Sheets were prepared to provide examples and relative costs of safety-focused projects that could be implemented at locations throughout Iron County. A wide range of potential project locations and types of countermeasures were identified throughout Iron County. A minimum of five locations were identified from each GFA. In total, 29 Project Information Sheets were developed from the resulting High-Risk Network locations and locations identified through received feedback.

Project Information Sheets were not prepared for each location identified on the High-Risk Network. The locations where



Project Information Sheets were prepared represent priority areas and project types based on SAP Committee review and comments. Project Information Sheets were developed for each location listed in **Table 10**. *Note, the projects are not numbered or listed in order of priority* – project numbers were assigned for convenience in displaying information and correlate to the Project Information Sheets provided in **Appendix E**.

#### Table 10. Proposed Project Location Information

| PROJECT<br>NUMBER | PROJECT LOCATION  | JURISDICTION(S)         | GFA(S)  |
|-------------------|---|-------------------------|---|
| 1                 | Main Street (SR 130) from 3000 North to South I-15 Interchange              | Cedar City, UDOT        | Cedar City GFA                                |
| 2                 | SR 289/SUU Loop   | Cedar City, UDOT        | Cedar City GFA                                |
| 3                 | 600 South, 800 South, 860 West School Area                                  | Cedar City              | Cedar City GFA                                |
| 4                 | Cross Hollow Road from SR 56 to Royal Hunte Drive/Providence<br>Court Drive | Cedar City              | Cedar City GFA                                |
| 5                 | Westview Drive from SR 56 to 2700 South                                     | Cedar City, Iron County | Cedar City GFA, East<br>Iron County GFA       |
| 6                 | SR 56 from Iron Springs Road to Airport Road                                | Cedar City, UDOT        | Cedar City GFA                                |
| 7                 | SR 56 and Airport Road Intersection   | Cedar City, UDOT        | Cedar City GFA                                |
| 8                 | SR 56 from Airport Road to Main Street (SR 130)                             | Cedar City, UDOT        | Cedar City GFA                                |
| 9                 | Midvalley Road from Lund Highway to Old Highway 91                          | Enoch City, Iron County | Enoch City GFA, West<br>Iron County GFA       |
| 10                | SR 130 from 3000 North to Midvalley Road                                    | Enoch City, UDOT        | Enoch City GFA                                |
| 11                | SR 130 from Midvalley Road to 6400 North                                    | Enoch City, UDOT        | Enoch City GFA                                |
| 12                | 4200 North from SR 130 to Half Mile Road                                    | Enoch City              | Enoch City GFA                                |
| 13                | 3600 North from Bulldog Road to SR 130                                      | Enoch City              | Enoch City GFA                                |
| 14                | Old Highway 91 from SR 130 to Midvalley Road                                | Enoch City              | Enoch City GFA                                |
| 15                | Comstock and Pinto intersections with SR 56                                 | Iron County, UDOT       | East Iron County GFA,<br>West Iron County GFA |
| 16                | SR 56 Rural Local Intersections (7700 West)                                 | Iron County, UDOT       | East Iron County GFA                          |
| 17                | SR 56 from Comstock Road to Iron Springs Road                               | Iron County, UDOT       | East Iron County GFA,<br>West Iron County GFA |
| 18                | 200 South (SR 143) from I-15 to SR 143                                      | Parowan City, UDOT      | East Iron County GFA                          |



| PROJECT<br>NUMBER | PROJECT LOCATION   | JURISDICTION(S)                       | GFA(S)  |
|-------------------|--|---------------------------------------|---|
| 19                | Main Street (SR 274) from I-15 to 300 South                              | Parowan City, UDOT                    | East Iron County GFA                          |
| 20                | SR 143 from Dry Lakes Road to Vasels Road                                | Brian Head Town, Iron<br>County, UDOT | East Iron County GFA                          |
| 21                | Brian Head, SR 143 Intersections (Snowshoe Village Road and Vasels Road) | Brian Head Town, UDOT                 | East Iron County GFA                          |
| 22                | SR 20 from Burnt Peak Road to Bear Valley Road                           | Iron County, UDOT                     | East Iron County GFA                          |
| 23                | SR 56 from 2400 West to Main Street (New Castle)                         | Iron County, UDOT                     | West Iron County GFA                          |
| 24                | SR 56 & SR 18 (Beryl Junction)   | Iron County, UDOT                     | West Iron County GFA                          |
| 25                | Bench Road from SR 56 to Newcastle Hills                                 | Iron County                           | West Iron County GFA                          |
| 26                | SR 56 from Main Street (New Castle) to Comstock Road                     | Iron County, UDOT                     | West Iron County GFA,<br>East Iron County GFA |
| 27                | Iron Springs Road from SR 56 to Comstock Road                            | Iron County, Cedar City               | West Iron County GFA                          |
| 28                | Lund Highway from SR 56 to Midvalley Road                                | Iron County, Cedar City               | West Iron County GFA                          |
| 29                | Lund Highway from Midvalley Road to 7000 North                           | Iron County, Cedar City               | West Iron County GFA                          |

The Project Information Sheets detail the following for each location:

» Project location characteristics

» Photos of existing conditions

» Crash history

- » A summary map showing locations and types of recommended improvements.
- » Recommended safety countermeasures
   » Opinions of probable costs for each improvement
- It should be noted that the opinions of probable cost for each improvement were estimated using the latest available 2024 or 2025 dollar estimates from recently completed UDOT projects and the cost database. The estimated project total includes factors beyond individual countermeasure material costs, including mobilization, traffic control, a contingency for unknown items, preconstruction engineering/design, and construction engineering/management. The estimated project total does not include right-of-way costs or adjustments for future inflation and must be reevaluated before project scoping, design, or implementation.

The Project Information Sheets are organized by GFA in **Appendix E**. An example Project Information Sheet and an explanation of information included is provided in **Figure 35** through **Figure 39**.





Figure 35. Example Project Information Sheet, Page 1





## LOCATION INFORMATION

Behavioral

**Crash Types** 

**Vulnerable Users** 

Percentage

of crashes in each Utah SHSP

Emphasis Area for

this project location

0-(1

( ? )

14-2 YEAR

70 AN

18

,Å

**A** 

Use of Safety Restrains

Speed Management

Teen Driving Safety

**Roadway Departure Crashes** 

Senior Safety

Intersection Safety

Motorcycle Safety

Pedestrian Safety

Bicycle Safety

2%

5%

34%

21%

6%

64%

2%

1%

1%

#### **Key Intersection Crash History**

**PROJECT NUMBER: 1** 

| Olevelifie e !     |   |                     | Crashes | Serious Injury<br>Crashes | Angle   | Left Turn | Rear<br>End | Head<br>On | Sideswipe | Roadway<br>Departure | Pedestrian              | Bike |
|--------------------|---|---------------------|---------|---------------------------|---|-----------|-------------|------------|-----------|----------------------|-------------------------|------|
| 01                 |   | Old Highway 91      | 24      |                           | 8   | 10        | 12          |            | 2         | 1                    |                         |      |
|                    |   | Fir Street          | 29      |                           | 14  | 12        | 5           | 2          | 7         | 1                    |                         |      |
| Significant        | Н | 300 West            | 19      |                           | 10  | 2         | 5           |            | 1         | 3                    |                         | 1    |
| Intersection       | n | 600 South           | 35      | 1                         | 17  | 10        | 13          |            | 3         |                      |                         |      |
| CI dSII<br>bietory |   | 200 South           | 29      | 1                         | 20  | 12        | 9           |            |           |                      |                         |      |
| THEOLY             |   | Center Street       | 36      | 1                         | 14  | 5         | 13          | 1          | 2         | 2                    | 2                       |      |
|                    |   | 200 North (SR 56)   | 105     |                           | 57  | 48        | 23          | 2          | 13        | 4                    | 2                       | 2    |
|                    |   | Coal Creek Road     | 19      |                           | 8   | 7         | 9           |            |           | 1                    |                         |      |
|                    |   | 1045 North          | 36      | 1                         | 14  | 8         | 15          |            | 3         |                      |                         | 1    |
|                    |   | 1925 North          | 41      | 2                         | 19  | 16        | 12          | 1          | 3         | 1                    | 1                       |      |
|                    |   | 3000 North          | 52      |                           | 28  | 29        | 14          | 6          | 1         |                      |                         | 1    |
|                    |   | Utah Emphasis Areas |         | 0%                        | <ul> <li>Other Applicable Locations/Scenarios:</li> <li>Principal arterial, four lane roadways with a center two-way left-turn limit and speed limits between 30 and 45 mph with numerous driveway access locations and intersections may benefit from similar safety countermeasures. Locations may include SR 56 (200 North) in Cedar City and SR 130 in Enoch City.</li> </ul> |           |             |            |           |                      | :<br>er<br>30<br>ations |      |
|                    |   | Distracted Driving  |         | 9%                        |   |           |             |            |           |                      |                         |      |

Roadway characteristics where these types of countermeasures may be applicable, including locations in Iron County

#### **Comments, Feedback, Ongoing Projects:**

- Pedestrian and bicycle conflicts with vehicles •
- Vehicle speeding ٠
- Lack of protected crossings •
- High (and increasing) Vehicle traffic volumes •
- Access management and control

Other comments or feedback from engagement activities specific to this project location

Page 2 of 5

#### Figure 36. Example Project Information Sheet, Page 2





## **EXISTING CONDITIONS**

Photos of existing conditions at the

project location

#### **PROJECT NUMBER: 1**



 ROW may need to be acquired to accommodate bicycle lanes and/or turn lanes





1925 North Intersection Southbound, near Canyon View High School



Historic Downtown Midblock Crossing at Night



Google Street View image of Southbound Approach 200 South, Typical Signalized Intersection (www.googlemaps.com)



Typical Five-Lane Cross Section, Southbound near Cemetery

Page 3 of 5



Typical Five-Lane Cross Section, Northbound near Canyon Center Drive

Figure 37. Example Project Information Sheet, Page 3





## LOCATION RECOMMENDATIONS

#### **Project Description**

Project

description

List of recommended countermeasures and applicable locations

> Planning level opinion of probable cost

#### **PROJECT NUMBER: 1**

This project recommends a series of safety countermeasures to improve pedestrian, bicyclist, and vehicle mobility while addressing crash trends and community concerns. Sidewalks, buffered bike lanes, and lighting all improve active transportation safety. To improve intersection safety and traffic flow, right-turn lanes on and off Main Street are recommended at several key intersections. High-visibility crosswalk markings are recommended at multiple locations and a pedestrian hybrid beacon at a midblock location near Canyon View High School. Leading Pedestrian Intervals (LPI) at signalized intersections for pedestrians to establish themselves in the crosswalk before vehicle movements are recommended. Additionally, it is recommended that left-turn signal timing be adjusted to Flashing Yellow Arrows at signalized intersection that are permissive only to help reduce the risk of left-turn crashes. A Roadway Safety Audit is recommended for the entire project limits to involve UDOT, the City, and the community in the discussion of additional improvements and safety needs along the corridor. Improvements that will require further evaluation include, center medians, bulbouts, and additional midblock crossing locations.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

| Recommended Improvements             | Location  |
|--------------------------------------|---|
| Sidewalk                             | DI Sargent Drive to 3000 North and from Interstate Drive to Desert Pines Drive  |
| Buffer Bicycle Lanes                 | Entire corridor   |
| Highway Lighting                     | Old Highway 91 to Desert Pines Drive  |
| Road Safety Audit                    | Entire corridor   |
| Right Turn Lanes, Left Turn Lanes    | Old Highway 91 northbound, 800 South north and southbound, 300 West north and southbound, 600 South north and southbound, 200 South all approaches, Center Street north, south, and eastbound, 200 North and southbound, Coal Creek Road south and eastbound, 1045 North and southbound |
| Left Turn Lanes                      | Fir Street, 300 West  |
| High-Visibility Crosswalks with RRFB | Midblock between Harding Avenue and Hoover Drive  |
| Leading Pedestrian Intervals         | 800 South, Center Street, 200 North, and 1925 North   |
| Intersection Control Evaluation      | 300 South   |
| Flashing Yellow Arrows               | 200 South, 800 South, Coal Creek Road, 1045 North, and 3000 North   |
| Pedestrian Hybrid Beacon or HAWK     | Midblock by Canyon View High School   |

#### **Opinion of Probable Cost**

|   | Improvement  | QTY.                 | Unit      | Unit Price                  | Item Cost    | 11.00.1          |
|---|--|----------------------|-----------|-----------------------------|--------------|------------------|
|   | Install 6 ft. Sidewalk (both sides of roadway)   | 1.75                 | MILE      | \$761,000                   | \$1,331,750  | Identified       |
|   | Install Buffered Bicycle Lanes (Curb Separated)  | 6.23                 | MILE      | \$651,000                   | \$4,055,730  | cost             |
|   | Install Highway Lighting   | 0.511                | MILE      | \$300,000                   | \$153,300    | estimates        |
|   | Conduct a Road Safety Audit  | 1                    | LOC       | \$25,000                    | \$25,000     |                  |
| , | Install Right-Turn Lanes   | 20                   | LANE      | \$127,000                   | \$2,540,000  |                  |
|   | Implement Leading Pedestrian Interval (LPI) Signal Timing                                    | 4                    | INT       | \$3,000                     | \$12,000     |                  |
|   | Perform an Intersection Control Evaluation and Implement                                     | 1                    | INT       | \$225,000                   | \$225,000    | Improvement      |
| Ц | Change Left-turn Timing from Permissive Only to Flashing Yellow Arrow                        | 4                    | INT       | \$8,000                     | \$32,000     | costs plus       |
|   | Change a 5-section "Doghouse" to Flashing Yellow Arrow                                       | 1                    | INT       | \$8,000                     | \$8,000      | mobilization,    |
|   | Install Pedestrian Hybrid Beacons (PHB) or HAWK  | 1                    | EACH      | \$250,000                   | \$250,000    | traffic control, |
|   | Install Pedestrian Hybrid Beacons (PHB) or HAWK  | 1                    | EACH      | \$250,000                   | \$250,000    | estimated and    |
|   |  |                      |           |                             |              | contingency      |
|   | 1: Includes mobilization, traffic control (5%), and items not estimated / contingency (30%). | Improvement Subtotal |           |                             | \$8,632,780  |                  |
|   | Mobilization is 10% +/- of the subtotal with minimum of \$2,500 and a maximum of \$75,000    | Estimated            | Construct | ion Cost Total <sup>1</sup> | \$11,729,253 |                  |
|   | 2: Includes preconstruction engineering/design (12%) and construction engineering/           |                      | Estimated | Project Total <sup>2</sup>  | \$14,165,000 | <                |
|   | management (15%). Utilities and right of way not included and should be evaluate during      |                      |           |                             |              |                  |
|   | 3: 20% of estimated project total toward Safe Streets for All Implementation Grants.         |                      |           | Local Match <sup>3</sup>    | \$2,833,000  |                  |
| l | <b>—</b>   |                      |           |                             | Page 4 of 5  |                  |
|   |  | Looolmat             | b.        |                             |              | Construction     |
|   |  | required fo          | n an SSA  | Δ                           |              | cost plus        |
|   |  | Implement            | ation Gra | nt                          |              | engineering,     |
|   | Jaura 20 Example Project Information Chest Dags 1  |                      |           |                             |              | ucoigii, and     |

Figure 38. Example Project Information Sheet, Page 4

management

### **LOCATION RECOMMENDATIONS**







#### **PROJECT NUMBER: 1**

Page 5 of 5



## **CASE STUDY INFORMATION SHEETS**

The case study information sheets were developed to show typical scenarios and locations that are found throughout Iron County. The case studies may be used by agencies and jurisdictions to select effective safety countermeasures and strategies at similar locations in their community or area.

The case study information sheets are a compilation of potential safety improvement countermeasures selected from the Countermeasure Toolbox that are not specific to a particular location and may be applicable at multiple locations. The case study information sheets include the following information:

- » A general description of the overall improvement types
- » A detailed description of the different components that may be included in a safety improvement project
- » Typical application scenarios
- » Crash types the improvement may help address
- » General cost information (low, medium, high)
- » Considerations to note when evaluating the improvement type (utilities, locations, spacing, component options, etc.)
- » Potential locations in Iron County that this type of improvement may be applicable to

A total of six case study information sheets were developed to capture general safety countermeasures and improvement for typical scenario including those listed below. The complete set of case studies are provided in **Appendix F**:

- » Enhanced Pedestrian and School Crossings
- » Unsignalized Intersections
- » Signalized Intersections
- » Skewed Intersections with Major Roadways
- » Two-Lane Highways
- » Three-or Five-Lane Roadways

An example Case Study Information Sheet is provided in Figure 40 and Figure 41.



Figure 40. Example Case Study Information Sheet, Page 1



FOR ALL IRON COUNTY

Figure 41. Example Case Study Information Sheet, Page 2





# 7. POLICY AND PROCESS CHANGES



# 7. POLICY AND PROCESS CHANGES

Development of the SAP is grounded on the fundamental principles of the Safe System Approach, recognizing that transportation safety cannot be improved solely by capital improvements.

To prioritize safety, all aspects of community operations - planning, design, and maintenance – along with all users of the transportation system must prioritize safety and embrace meaningful changes to existing practices, policies, and procedures. Regional collaboration helps create a safe transportation system focused on the five key objectives of the Safe System Approach: Safer People, Safer Vehicles, Safer Speeds, Safer Roads, and Post-Crash Care.

A review of the transportation processes and policies of Iron County and local jurisdictions fulfills the Policy and Process Review requirement component of a Safety Action Plan as outlined in the FHWA Self-Certification Eligibility Worksheet:

#### **ARE BOTH OF THE FOLLOWING TRUE?**

- » The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and
- » The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.

# **Previous and Ongoing Plans Review and Summary**

Policies, plans, guidelines, and standards of agencies within Iron County were reviewed to identify opportunities for enhancing transportation safety and reducing the frequency of fatal and serious injury crashes. A summary of the reviewed documents is provided in **Table 11**.

| JURISDICTION BY GEOGRAPHIC FOCUS AREA (GFA) | PLAN/DOCUMENT NAME (YEAR COMPLETED)   |  |  |  |
|---|---|--|--|--|
| CEDAR CITY GFA                              |   |  |  |  |
| Cedar City                                  | <ul> <li><u>Transportation &amp; Active Transportation Master Plan (2021)</u></li> <li><u>General Plan (2023)</u></li> <li>UDOT Access Agreements (ongoing)</li> <li><u>Cedar Valley Belt Route Access Plan (2023)</u></li> </ul> |  |  |  |
| ENOCH CITY GFA                              |   |  |  |  |
| Enoch City                                  | <ul> <li><u>Transportation &amp; Active Transportation Master Plan (2021)</u></li> <li><u>General Plan (2023)</u></li> <li><u>Transportation Impact Fee Analysis (2022)</u></li> </ul>  |  |  |  |
| EAST AND WEST IRON COUNTY GFAS              |   |  |  |  |
| Iron County                                 | <ul> <li>Iron County General Plan (1995)</li> <li>Iron County Transportation Master Plan (2023)</li> </ul>  |  |  |  |
| Parowan City                                | <ul> <li><u>General Plan (2021)</u></li> <li><u>Transportation Master Plan (2024)</u></li> </ul>  |  |  |  |
| Paragonah Town                              | <ul> <li><u>General Regulations</u></li> <li><u>Traffic Code</u></li> </ul>   |  |  |  |
| Brian Head Town                             | <ul> <li><u>Town Center Plan (2018)</u></li> <li><u>Commercial Corridor Transportation Study (2022)</u></li> </ul>  |  |  |  |
| Iron County Rural Planning Organization     | <ul> <li><u>Regional Transportation Plan (2013)</u></li> <li><u>Access Management Agreement</u></li> <li><u>Project Priority List</u></li> <li>Concept Design Form</li> </ul>   |  |  |  |

#### Table 11. Previous Plans Reviewed



The reviewed policies, plans, guidelines, and standards are summarized to highlight transportation safety themes identified across multiple documents. Findings are synthesized for jurisdictions by GFA and are detailed in **Appendix C**.

# **Key Findings**

Many jurisdictions in the Iron County SAP study area share similar goals for improving transportation safety. Some jurisdictions already incorporate detailed guidelines such as standard street cross sections with minimum pedestrian environment standards, traffic calming practices, and transit integration. General Plans often emphasize goals relating to an efficient and safe transportation system, promoting safe pedestrian and bicycle infrastructure, and addressing access management in collaboration with UDOT. Additionally, transportation plans and corridor studies focus on addressing safety through roadway classifications, access management, and intersection improvements.

The following policies and best practices identified through the plan reviews may be further explored and recommended for adoption or integration throughout Iron County's communities to enhance transportation safety:

- » Incorporate FHWA's Proven Safety Countermeasures into design standards and future projects.
- » Collaborate with the Iron County School District to establish Safe Route to School programs.
- » Explore **traffic calming** strategies or policies in community areas, school zones, and surrounding neighborhoods.
- » Develop **speed limit setting** policies and a **speed management plan** to address high vehicle speeds and determine appropriate speed limits for different contextual environments.
- » Develop **access management standards or policies** to guide planners and engineers, especially in areas experiencing rapid growth.
- » Launch transportation safety **education programs** addressing safety concerns like distracted driving, obeying traffic laws, and pedestrian safety.

# **National Best Practices and Resources Review**

This section highlights several national transportation safety policies and manuals that can support efforts to advance transportation safety initiatives. These resources may be utilized by jurisdictions and the County in advancing and prioritizing transportation safety. A summary of each resource and a link to the document or policy is provided in **Table 12**. More detailed information and additional resources are included in **Appendix C**.




Table 12. National Best Practices and Resources Review

#### NATIONAL RESOURCE

American Association of State Highway and Transportation Officials (AASHTO): A Policy on Geometric Design of Highways and Streets (2018) - Provides guidelines for highway and street geometric design. Federal Highway Administration: Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) -Establishes national standards for the design, installation, and maintenance of traffic signs, signals, and pavement markings. National Safety Council: Road to Zero: A Plan to Eliminate Roadway Deaths (2018) - Aims to eliminate fatal and serious injuries on U.S. roads by 2050 through policy changes, data-driven decisions, public awareness, technology, and collaboration. Federal Highway Administration: Zero Deaths and Safe System - The Safe System Approach is a policy rooted in "Vision Zero" that aims to prevent deaths and serious injuries by designing road infrastructure that anticipates human mistakes. Pedestrian and Bicycle Information Center: Safe Routes to School Online Guide - The program aims to enhance the safety, accessibility, and convenience of walking and biking routes to schools through infrastructure improvements and educational campaigns. Federal Highway Administration: Traffic Calming ePrimer - The ePrimer is an online resource that guides communities in implementing traffic calming measures like speed bumps, roundabouts, and road narrowing to improve road safety and quality of life. Smart Growth America: Complete Streets - Is a planning and design approach that ensures safe and accessible streets for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. Federal Highway Administration: Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts (2016) - This publication provides guidance for practitioners aiming to develop multimodal transportation networks that are safe, comfortable, and accessible for users of all ages and abilities. Federal Highway Administration: Separated Bike Lane Planning and Design Guide (2015) - This guide offers planning and design guidance for separated bike lanes, including design options, intersection treatments, and case studies. Federal Highway Administration: Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations - Offers strategies and recommendations to enhance safety for pedestrians at crossings without signals or stop signs. American Association of State Highway and Transportation Officials: Guide for the Development of Bicycle Facilities, 4<sup>th</sup> Edition (2012) - This updated edition incorporates extensive research and current best practices in bicycle infrastructure design, covering planning, design, and on/off-road facilities like bike lanes and shared-use paths. American Association of State Highway and Transportation Officials: Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2<sup>nd</sup> Edition (2021) - The purpose of this guide is to provide guidance on the planning, design, and operation of pedestrian facilities along streets and highways. U.S. Access Board: Americans with Disabilities Act Accessibility Standards - Accessibility standards issued under the

<u>U.S. Access Board: Americans with Disabilities Act Accessibility Standards</u> - Accessibility standards issued under the Americans with Disabilities Act (ADA) apply to places of public accommodation, commercial facilities, and state and local government facilities in new construction, alterations, and additions.



### **State-Level Policies and Resources Review**

**Table 13** highlights Utah-specific best practices that were reviewed and incorporated into the policy and process change recommendations. While created at the State level, these resources can also serve as a guide for local jurisdictions or agencies in crafting policies that enhance and prioritize transportation safety.

#### Table 13. State of Utah Resources Review

#### STATE OF UTAH RESOURCES

<u>Utah Strategic Highway Safety Plan & Zero Fatalities</u> - The goal of Zero Fatalities is fundamentally based on the belief that even a single loss is one too many. To achieve this, five key behaviors were identified that contribute to fatalities: drowsy driving, distracted driving, impaired driving, aggressive driving, and not wearing seat belts. The Zero Fatalities goal is integral to the Utah Strategic Highway Safety Plan (SHSP).

The Utah SHSP aims to achieve the goal of zero fatalities through the "Five E's": Engineering, Education, Enforcement, and Emergency response are the foundational principles to improve roadway safety for Everyone.

<u>UDOT Vulnerable Road User Safety Assessment (VRU)</u> - This document analyzes safety trends and needs to vulnerable road users (VRUs), which include pedestrians, bicyclists, and other non-motorized roadway travelers.

<u>UDOT Administrative Rule R930-6</u> - UDOT Administrative Rule R930-6 details access management guidelines for different categories of state-owned and maintained roadways. The access management guidelines include spacing standards, turn lane standards, and design requirements. Threshold requirements for turning lanes, access driveways and traffic impact studies are also detailed in R930-6.

<u>UDOT's Road Map</u> - UDOT's mission statement "Enhance quality of life through transportation" weaves through the department's practices and standards. Their Quality-of-Life Framework emphasizes four areas: Better Mobility, Good Health, Connected Communities, and Strong Economy. One of the department's strategic goals is to see zero crashes, injuries, and fatalities on Utah roads, emphasizing their commitment to safety throughout the State.

<u>UDOT Speed Management Studies</u> - The UDOT Speed Management Studies document provides eleven information sheets on traffic calming measures that are considered within the FHWA's Safe System Approach as methods of slowing traffic. Information sheets include where traffic calming measures are typically applied, what speed reduction they could achieve, and high-level cost information.

<u>HB290</u> - During the 2025 legislative session, House Bill 290: Bicycle Lane Safety Amendments, passed, further enhancing bicycle safety on Utah roads. The bill more clearly defines a "bicycle lane" as part of a highway designated by a highway authority through striping, signage, pavement markings, or barriers for preferential or exclusive use of bicycle, electric-bicycles, and motor-assisted scooter traffic.



### **Engagement Feedback Review**

Feedback received at GFA workshops were combined with responses gathered from the online map and the online/ in-person surveys. The engagement process collected over 900 unique comments. Common themes emerged from the comments that did not directly translate into specific infrastructure projects. To ensure these comments were noted and reviewed for recommendations, the project team categorized comments into general themes which informed the policy and process change recommendations. Comments were organized into 10 primary themes and one "other" category that includes important, but less-frequently mentioned feedback. **Table 14** provides a summary of these themes along with a brief description. A more detailed review of the feedback can be found in **Appendix C**.

#### Table 14. Engagement Feedback Themes

| FEEDBACK THEME  | DESCRIPTION  |
|---|--|
| Access Management and Turn<br>Lanes   | Comments regarding better business access control, clear turn lanes, roadway widening (lanes, turn lanes, or shoulders)  |
| Active Transportation and School<br>Zone Safety                             | Comments related to bicycle and pedestrian safety, including the need for safer active transportation infrastructure (sidewalks, crossings, school zone safety, connectivity, and infrastructure). |
| Congestion and Growth   | Concerns regarding traffic congestion and increased traffic on roadways due to planned growth in the area.   |
| Enforcement   | Drivers not obeying traffic laws (such as speeding and red-light running) and the need for increased enforcement.  |
| Intersection and Roadway<br>Geometry/Design (including access<br>driveways) | Difficulty navigating larger intersections. Comments regarding narrow shoulders, drainage, and curves.   |
| Intersection Control  | Request for new/upgraded control devices at intersections, including signals and stop-controlled intersections. Desire for longer left-turns at traffic signals.                                   |
| Limited Visibility  | Comments regarding limited or blocked visibility due to vegetation, signage, or parked vehicles.   |
| Roadway Maintenance and<br>Pavement Markings                                | Comments regarding maintenance for roadways (to address cracks, breaking, potholes, etc.) and faded or missing pavement markings and striping.   |
| Speed Limits and Speeding   | Comments related to vehicle speeding, wanting adjusted speed limits, or speed limit signage.   |
| Street Lighting   | Requests for additional street lighting particularly at intersections and areas with pedestrian activity.  |
| Other   | Education, livestock/wildlife crashes, on-street parking, and transit.   |



### **Jurisdictional Interviews**

The project team met with jurisdictions in the Iron County SAP study area to identify specific needs and potential gaps in existing transportation safety policies and processes. These discussions focused on the current integration of safety within policies or resources, potential enhancements to those resources, and discussion of new policies or guidelines to prioritize transportation safety. The following jurisdictions provided information as part of the policy and process change task:

» Iron County » ICRPO » Cedar City » Enoch City » Brian Head Town

#### INTERVIEWS SUMMARY

The following topics were discussed with interviewees as part of the plans and policy review.

#### **Communication and Coordination**

There is strong interest among agencies for improved coordination for regional planning, project prioritization, and jurisdictional coordination. Guidance on policies, standards, procedures, and points of contact for agencies were identified as a key need.

#### **Growth and Development**

Expected regional growth has prompted several agencies to consider developing standards and policies to guide development of communities, commercial areas, and roadways that are constructed or change. Not all communities have implemented or established clear standards for access management, traffic impact study warrant thresholds or requirements, traffic calming policies or guidance, or specific transportation impact fees.

#### Active Transportation Use Safety & Transit

Most jurisdictions mentioned the need for expanded and improved active transportation infrastructure. Opportunities for cross-jurisdictional collaboration are limited and typically involved the ICRPO or UDOT. Additionally, there is a lack in coordination between jurisdictions and schools in planning Safe Routes to School programs.

While some jurisdictions operate private or public transit services, others have shown interest in expanding transit options to expand transportation for residents and visitors. However, gaps remain in regional transit coordination and funding strategies. UDOT, in partnership with Cedar City, is currently conducting the Cedar City Transit Study to identify strategies for enhancing public transit within the Cedar City area.

#### **Project Prioritization & Funding**

Although the ICRPO plays a vital role in unifying planning efforts to address the County's expected growth, it operates without dedicated implementation funding. The need for guidance for prioritization and funding was identified. Currently, agencies and communities must navigate competitive application processes to secure funding.

### Recommendations

The review of policies, plans, and resources, along with stakeholder and community engagement, and jurisdictional interviews were conducted to inform the recommendations related to policies and procedures. These recommendations aim to develop resources and tools, or build upon existing resources and tools, to enhance transportation safety in Iron County for all roadway users. The following recommendations are summarized in the sections below:

- » Access Management Plan
- » Active Transportation Planning
- » Speed Limit Setting and Speed Management
- » Proven Safety Countermeasures in Design Standards
- » Safe Routes to School Plans

- » Development Review Standards
- » Project Programming
- » Transportation Safety Education Programs
- » Safety Terminology
- » Clear Cross-Agency Communication



#### ACCESS MANAGEMENT PLAN

An Access Management Plan is a policy framework that guides the design, application, placement, and operation of driveways, intersections, and other access points on roadways to maintain roadway safety for all modes, including facilitating safe pedestrian and bicyclist movements.

Access Management Plans can streamline and establish clear standards for driveway and curb cut spacing, therefore minimizing conflict points, improving safety, and maintaining traffic flow while reducing congestion on major roads. Access Management Plans should be created in partnership with regional and state transportation agencies to ensure consistency on regionally important roads owned and maintained at the state or county level.

Additional access management resources include <u>Access Management</u> practices as outlines in FHWA's Proven Safety Countermeasures and the USDOT's Office of Operations <u>Access Management</u> page.

An access management plan may be something individual jurisdictions and/or the County consider developing and adopting.

#### **ACTIVE TRANSPORTATION PLANNING**

A need was identified for active transportation planning and improved coordination among agencies in Iron County. Currently, the County does not have an official County-wide Active Transportation Plan. An Active Transportation Plan can be a resource for the County and other agencies by promoting regional coordination, enhancing the connectivity of the transportation network, and improving safety for some of the most vulnerable roadway users.

A County or Regional Active Transportation Plan may identify high-priority safety improvements, address infrastructure gaps, establish design standards to foster safe, consistent facilities for all ages and abilities A plan may also, identify and prepare agencies to engage funding sources.

#### SPEED LIMIT SETTING AND SPEED MANAGEMENT

It is recommended that Iron County develop a speed limit setting procedure and a speed management plan. These tools would help jurisdictions set appropriate speed limits and focus improvements on areas with high vehicle speeding or locations or where vehicles and vulnerable road users share facilities. Addressing speed is fundamental in the Safe System Approach for creating safer streets.

FHWA provides guidance on how to develop a <u>Speed Management Program</u> specific to local, small urban areas and rural roads. The <u>USLIMITS2 Tool</u> is designed to assist in setting reasonable, safe, and consistent speed limits for roadways. The tool uses not only the 85<sup>th</sup> percentile speed, but also 50<sup>th</sup> percentile speeds and incorporates other roadway aspects such as segment lengths, average daily traffic, alignment, roadway characteristics, presence of bike lanes or on-street parking, number of driveways, number of signals, number of crashes, and the number of injury and fatal crashes to determine a recommended posted speed limit.

Consider a Speed Management Plan or policy/procedure in speed limit setting.



#### **PROVEN SAFETY COUNTERMEASURES IN DESIGN STANDARDS**

FHWA Proven Safety Countermeasures (PSCs) are valuable strategies to assist Iron County and its communities to prevent fatal and serious injury crashes. These countermeasures should be considered when revising design standards or establishing new standards for design elements such as bicycle lanes, shoulder widths and types, signage, and other roadway features.

Consider PSCs and their application guidance when updating or creating new design standards.

#### SAFE ROUTES TO SCHOOL PLANS

Iron County and its jurisdictions should participate in the development of Safe Routes to School plans (SRTS), as they are critical for ensuring that children can safely walk and bike to school. Collaboratively creating SRTS plans opens opportunities to implement improvement projects such as traffic calming or neighborhood slow zones.

The Safe Routes Partnership created a <u>toolkit</u> in 2015, that offers rural specific best practices and strategies for developing Safe Routes to School programs. Rural school children face distinct challenges such as long distances, high vehicles speeds, limited sidewalks, and schools situated near regional highways.

Coordinate with Iron County School District and other agencies in developing Safe Routes to School plans to promote school zone safety.

#### **DEVELOPMENT REVIEW STANDARDS**

Jurisdictions should update existing standards or establish clear guidelines for reviewing new development. It is recommended that development review checklists include elements such as public amenities in the area, traffic impact study thresholds, design considerations, active transportation connectivity and design, and how development impact fees are collected and used. Additionally, jurisdictions may consider transportation impact fees specifically dedicated to address transportation improvements or providing public amenities like sidewalks or trails.

Jurisdictions should ensure development review standards are clear, include the appropriate considerations for their community, and prioritize transportation safety.

#### **PROJECT PROGRAMMING**

Establishing a collaborative and county-wide project programming process to identify and prioritize transportation infrastructure projects, similar to a capital improvement plan, could help secure consistent funding for safety improvements.

This process should engage all local jurisdictions and regional agencies such as the ICRPO, the school district, and UDOT. A well-defined project programming will help the County align priorities with state-level objectives. Programming practices could be developed as part of the County Transportation Master Plan, County General Plan, or Active Transportation Plan, or built upon the existing RPO project list coordination.

Develop a programming and prioritization process for transportation projects.



#### **TRANSPORTATION SAFETY EDUCATION PROGRAMS**

Education and awareness campaigns/programs can be implemented and build on existing programs provided by the NHTSA and FHWA for bicycle safety, distracted driving, pedestrian safety, speeding, or seat belt safety. Jurisdictions should develop tailored initiatives targeting specific safety concerns relevant to their jurisdictions and surrounding areas.

Coordination with UDOT's Zero Fatalities Program, health departments, community centers, schools, and affected establishments can strengthen driver education and promote safe practices for all road users.

Implement education and awareness campaigns/programs by promoting existing programs provided by FHWA, NHTSA, or UDOT for bicycle safety, distracted driving, pedestrian safety, speeding, or seat belt safety.

#### SAFETY TERMINOLOGY

Future updates to plans, studies, and policies should adopt consistent and accurate terminology when describing crashes involving vehicles. A review of previous plans revealed instances where the term "accident" is used to describe vehicle crashes. It is recommended to replace the term "accident" or "collision" with "crash" throughout these documents. Using the word "crash" aligns with industry best practices, emphasizing the role of human actions.

Include consistent and appropriate terminology, using the term "crash" when referring to an event involving a vehicle and a collision to help promote transportation safety as a responsibility of everyone in the community.

#### **CLEAR CROSS-AGENCY COMMUNICATION**

Strengthening cross-agency communication is essential to achieving the County's transportation and safety goals. Establishing a structured forum or regular meetings among government agencies, local jurisdictions, law enforcement, and other interested parties, would facilitate the efficient sharing of information and alignment of priorities. Improved collaboration helps prevent redundancy in efforts and financial expenditures, while promoting a unified vision for addressing shared challenges.

Establishing clear cross-agency communication practices can be applied countywide, encouraging collaboration between jurisdictions and agencies, but also internally for each jurisdiction.



# 8. PROGRESS MONITORING AND EVALUATION



### 8. PROGRESS MONITORING AND EVALUATION

The Iron County SAP serves as a guide for Iron County, the ICRPO, local jurisdictions, and others responsible for transportation safety to advance implementation of strategies, improvements, and polices.

Recognizing the importance of accountability and performance monitoring to reduce transportation fatalities and serious injuries, Iron Couty in partnership with the ICRPO will oversee the implementation of ongoing monitoring of the SAP. The SAP, as noted on the FHWA Self-Certification Eligibility Worksheet includes the following questions:

#### DID THE ACTION PLAN INCLUDE ALL THE FOLLOWING?

- » A description of how progress will be measured over time that includes, at a minimum, outcome data.
- » The plan is posted publicly online.

The recommended approach to monitoring SAP implementation progress includes the following:

**Leadership:** Iron County staff in partnership with the ICRPO will assume leadership of the SAP and promote its implementation in the County. The ICRPO will be responsible for regular implementation tracking and operate as the regional leaders in supporting partners as needs arise.

**Annual Evaluation:** When the most recent, complete year's crash data is available, the ICRPO will assess Iron County's progress toward eliminating transportation fatalities and serious injuries as proposed in the Regional Safety Commitment Resolution detailed in **Section 2**.

Refreshing the SAP: The County and ICRPO anticipate that the SAP will be refreshed or updated as needed.

**Other Planning Efforts:** Iron County and the ICRPO will remain informed of current and new local and statewide safety programs, policies, and guidelines or standards. Iron County and the ICRPO continually review this information to identify opportunities to build upon the current SAP and coordinate with local communities.



### **Crash Monitoring Dashboard**

The project team developed a Crash Monitoring Dashboard to help agencies monitor safety trends and progress towards eliminating fatalities and serious injuries. The crash dashboard is an online tool that provides Iron County and agencies an accessible way to visualize and summarize annual crash details, trends, contributing factors, and safety emphasis areas.

Utah's statewide crash data is housed on AASHTOware's Numetric platform and is regularly updated with the most recent crash reports. Having the Dashboard as part of UDOT's crash reporting system eliminates the need for the County or ICRPO to externally process crash data. Iron County and the ICRPO have access to the dashboard with the crash data linked to UDOT's database. This dashboard will aid the County and ICRPO to fulfill the annual monitoring and reporting element of an Action Plan. **Figure 42** shows a portion of the dashboard and the presentation of historic crash data.



Figure 42. Iron County Fatal and Serious Injury Dashboard Preview

### **Regional Monitoring and Performance Measures**

Monitoring progress towards the goals established in the Regional Safety Commitment Resolution and the implementation of this SAP is critical. Performance measures will be evaluated annually by Iron County and the ICRPO and reported on the project website. The following information and performance measures are recommended to be monitored:

- » County-wide fatal and serious injury crash totals
- » Fatal and serious injury crash totals, excluding I-15
- » Annual crash totals and trends
- » Time of day crash trends



- » Contributing factors
  - » Manner of collision crash trends
  - » Weather condition crash trends
  - » Lighting condition crash trends
  - » Roadway surface condition crash trends
  - » Crash summary trends
  - » Posted speed limit crash trends
- » SHSP Emphasis Areas
- » Vulnerable Roadway Users
  - » Fatal and serious injury crash totals involving pedestrians
  - » Fatal and serious injury crash totals involving bicycles
  - » Manner of collision crash trends
  - » Weather condition crash trends
  - » Lighting condition crash trends
  - » Roadway surface condition crash trends
  - » Crash summary trends
  - » Posted speed limit crash trends of day crash trends

To ensure continued progress in implementing the SAP, Iron County will update the SAP, as needed, to reflect recent safety performance measure data. Future revisions to the SAP for Iron County will evaluate progress toward established safety goals in the Regional Safety Commitment Resolution. Updates will also identify upcoming safety projects for inclusion in Statewide programs such as the FCAOG RTP and UDOT LRTP.

As there are no federal mandates governing updates to Safety Action Plans, Iron County has the flexibility to tailor the update process to meet regional needs. If data sources remain unchanged or indicate that no modifications to the safety emphasis areas are necessary, a streamlined update may focus on tracking project implementation and progress toward performance targets. However, if analysis reveals shifts in crash patterns that require adjustments to safety priorities, a more in-depth process that includes enhanced community and stakeholder engagement may be warranted.



### **APPENDICES**

#### Appendix A. Technical Memorandum #1 – Safety Analysis Results

Appendix A.1. Cedar City GFA Safety Analysis and Results Appendix A.2. Enoch City GFA Safety Analysis and Results Appendix A.3. East Iron County GFA Safety Analysis and Results Appendix A.4. West Iron County GFA Safety Analysis and Results Appendix A.5. Interstate 15 GFA Safety Analysis and Results

Appendix B. Technical Memorandum #2 – Engagement Summary

Appendix C. Technical Memorandum #3 – Policy and Process Changes

Appendix D. Safety Countermeasure Toolbox and Cost Estimate Assumptions

#### **Appendix E. Project Information Sheets**

- Appendix E.1. Cedar City GFA Project Information Sheets
- Appendix E.2. Enoch City GFA Project Information Sheets
- Appendix E.3. East Iron County GFA Project Information Sheets
- Appendix E.4. West Iron County GFA Project Information Sheets

**Appendix F. Case Study Information Sheets** 



### APPENDIX A. TECHNICAL MEMORANDUM #1 – SAFETY ANALYSIS RESULTS



# **APPENDIX A.1. CEDAR CITY GFA SAFETY ANALYSIS AND RESULTS**



# **APPENDIX A.2. ENOCH CITY GFA SAFETY ANALYSIS AND RESULTS**



# **APPENDIX A.3. EAST IRON COUNTY GFA SAFETY ANALYSIS AND RESULTS**



### APPENDIX A.4. WEST IRON COUNTY GFA SAFETY ANALYSIS AND RESULTS



### APPENDIX A.5. INTERSTATE 15 GFA SAFETY ANALYSIS AND RESULTS



# **APPENDIX B. TECHNICAL MEMORANDUM #2 – ENGAGEMENT SUMMARY**



### APPENDIX C. TECHNICAL MEMORANDUM #3 – POLICY REVIEW AND BEST PRACTICES



# APPENDIX D. SAFETY COUNTERMEASURE TOOLBOX AND COST ESTIMATE ASSUMPTIONS



# **APPENDIX E. PROJECT INFORMATION SHEETS**



# **APPENDIX E.1. CEDAR CITY GFA PROJECT INFORMATION SHEETS**



# **APPENDIX E.2. ENOCH CITY GFA PROJECT INFORMATION SHEETS**



# **APPENDIX E.3. EAST IRON COUNTY GFA PROJECT INFORMATION SHEETS**



### APPENDIX E.4. WEST IRON COUNTY GFA PROJECT INFORMATION SHEETS



# **APPENDIX F. CASE STUDY INFORMATION SHEETS**