US 93 MISSOULA TO FLORENCE STUDY

Alternatives Analysis Report

MDT Activity 102

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Prepared for:

MONTANA Department of Transportation

MONTANA DEPARTMENT OF TRANSPORTATION

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ABBREVIATIONS / ACRONYMS

AADT	Average Annual Daily Traffic
BE	Bitterroot Ecosystem
BIL	Bipartisan Infrastructure Law
BSPR	Big Sky Public Relations
CMAQ	Congestion Mitigation and Air Quality
CRP	Carbon Reduction Program
DOT	Department of Transportation
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
HSIP	Highway Safety Improvement Program
ICE	Intersection Control Evaluation
IBA	Important Bird Area
ITS	Intelligent Transportation Systems
LOS	Level of Service
MDT	Montana Department of Transportation
MFWP	Montana Fish, Wildlife and Parks
MPH	Miles Per Hour
MSWP	Montanans for Safe Wildlife Passage
MWTP	Montana Wildlife & Transportation Partnership
MUTCD	Manual on Uniform Traffic Control Devices
NCDE	Northern Continental Divide Ecosystem
NHPP	National Highway Performance Program
NHS	National Highway System
NRHP	National Register of Historic Places
PMT	Project Management Team
RCUT	Restricted Crossing U-Turn
ROD	Record of Decision
RP	Reference Post
RPA	Robert Peccia and Associates
STIP	Statewide Transportation Improvement Program
STP	Surface Transportation Block Grant Program
TA	Transportation Alternatives
TWLTL	Two-Way Left-Turn Lane
US 12	US Highway 12
US 93	US Highway 93
USFWS	US Fish and Wildlife Service
VMS	Variable Messaging Signs
VPD	Vehicles Per Day
VSL	Variable Speed Limits
WCPP	Wildlife Crossings Pilot Program

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EXECUTIVE SUMMARY

The segment of US 93 between Missoula and Florence was expanded from two lanes to four lanes between 1998 and 2001. Since that expansion, traffic volumes have surpassed previous projections due to the development of once-vacant lands along the highway and the continued growth of the Bitterroot Valley population. The corridor now serves as a vital access route for adjacent residences, businesses, agricultural lands, and commuters traveling between smaller Bitterroot Valley communities and the City of Missoula, while also accommodating significant commercial freight traffic. This growth has resulted in safety concerns, user conflicts, increased traffic congestion, and longer travel times. To address these issues, the study team conducted a multi-step screening and evaluation process to identify a preferred corridor configuration.

PUBLIC, STAKEHOLDER, AND RESOURCE AGENCY COORDINATION

An extensive public, stakeholder, and agency involvement campaign was conducted to share information and obtain feedback over the course of the *US 93 Missoula-Florence Study*. The study team employed multiple engagement methods during the study, including website updates, event announcements and interviews with print, radio, and television outlets, social media posts, and email updates to a contact list of stakeholders and interested members of the public. Additionally, targeted outreach was conducted to encourage meaningful input and dialogue with agencies, stakeholders, and the public. The following activities helped the study team identify areas of concern and evaluate corridor improvements.

- **Project Management Team (PMT) Meetings** with MDT Consultant Design, Missoula District, and appropriate functional managers were held approximately every two to four weeks throughout the course of the study. Brief check-in meetings were used to provide status updates and discuss ongoing tasks. Additionally, a series of in-depth workshops were held to confirm methodologies, discuss detailed technical evaluations, and provide guidance to the consultant team.
- **Resource Agency Meetings** were held throughout the course of the study, including two virtual meetings and a field review. The meetings primarily focused on wildlife presence and movement within the corridor, habitat and connectivity considerations, and wildlife-vehicle conflicts. Representatives from MDT, FHWA, US Fish and Wildlife Service (USFWS), and Montana Fish, Wildlife and Parks (MFWP) participated in the meetings.
- **Stakeholder Meetings** were conducted with individuals and small groups, including landowners, residents, businesses, developers, and trail and wildlife organizations. These meetings focused on specific areas of concern or knowledge within the corridor. Additionally, meetings were held with City/County officials, schools, and local neighborhood and community groups to provide study updates and request input and guidance.
- **Public Informational Meetings** were conducted at four key milestones during the study. Each multi-day event included in-person open-house meetings where attendees could view exhibits and talk with study representatives. Additionally, virtual meetings offered an opportunity to listen to a presentation and participate in a real-time question-and-answer session with study representatives.

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RELEVANT CONDITIONS

The study conducted wide-ranging analyses of the physical roadway, safety, traffic operations, and environmental features to establish baseline conditions for the corridor. This step was important to understand key issues, needs, and constraints influencing future improvements. Key findings from this effort are summarized below.

ROADWAY CHARACTERISTICS AND CONSTRAINTS

- US 93 is configured as a four-lane undivided rural facility. Multiple public roadways and private approaches intersect the highway.
- The Bitterroot Trail, a shared use path extending between Hamilton and Missoula, is located adjacent to US 93 throughout the study corridor.
- Three park-and-ride lots are located at Chief Looking Glass Road, Carlton Creek Road, and Rowan Street.
- A single-track railroad operated by BNSF runs parallel to US 93 approximately 100 feet east of the edge of roadway pavement through much of the corridor.
- The posted speed limit ranges from 25 miles per hour (mph) in Lolo to 70 mph on the straight, rural stretch of the highway between Lolo and Florence.
- US 93 is classified as a limited access facility between Florence and Lolo and an Access Control Plan is in place between Lolo and Missoula.
- Multiple overhead and underground public utilitiesare located within the corridor.

ENVIRONMENTAL CONCERNS

- The environment surrounding the corridor shifts between urban, suburban, and rural contexts.
- The Bitterroot River crosses US 93 north of the study area and then runs parallel to US 93 east of the study corridor. Lolo Creek crosses US 93 on the southern end of Lolo, and several smaller streams also cross US 93.
- US 93 is located just outside the regulatory floodway of the Bitterroot River within the study area but crosses annual flood hazard areas of the Bitterroot River at Buckhouse Bridge and just north of Lolo. US 93 also crosses the regulatory floodway of Lolo Creek.
- Wetlands and riparian areas are located adjacent to the roadway, along streambanks, and within the Bitterroot River floodplain.
- Stormwater is primarily managed via roadside ditches and drainage culverts beneath the highway.
- The corridor provides habitat for numerous wildlife species including several species federally listed as threatened.
- White-tailed deer are abundant while elk and black bear populations are increasing.
- High-quality habitat makes the US 93 corridor a key wildlife movement corridor, especially between Lolo and Florence. Lolo Creek and McClain Creek provide important wildlife linkages in the valley.
- Currently, the corridor provides limited opportunities for safe passage for wildlife. Several large drainage crossings have potential to provide crossing opportunities.
- Traveler’s Rest State Park, Carlton Community Church, and the historic Traveler’s Rest site may be subject to Section 4(f) protections.

TRAFFIC OPERATIONAL CONCERNS

- The corridor serves a mix of local, commuter, and regional traffic with competing access and operational needs.
- Existing traffic volumes in the corridor range from 15,000 to 27,000 vehicles per day.

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- Operational issues are primarily observed during AM/PM commutes.
- Long queues occur at the urban transition points (entering Missoula and Lolo).
- During peak hours, it can be difficult for vehicles from minor approaches to turn onto US 93.
- Future traffic volumes may exceed the capacity of the current facility, particularly north of Lolo.

SAFETY CONCERNS

- During the study period, fixed object crashes were common throughout the corridor, especially with existing concrete barriers in S-curve section.
- Rear-end crashes frequently occurred at high-volume, signalized intersections.
- Head on and sideswipe crashes commonly occurred in areas without physical separation between opposing directions of traffic.
- Turning conflicts were common at high-speed locations with intersecting roadways.
- Wild animal crashes were common in rural parts of the corridor and on the fringes of developed areas.
- Adverse road, weather, or lighting conditions were contributing factors in many crashes on the corridor.
- Improper driver behaviors were often cited as contributing factors in crashes.
- Pedestrian and bicycle conflicts were not evident in the crash data, though public feedback referenced near-miss incidents.

IMPROVEMENT IDENTIFICATION AND EVALUATION

This study identified and evaluated a range of potential options to improve safety and traffic flow on US 93 between Missoula and Florence while enabling feasible implementation and minimizing impacts to adjacent landowners, the environment, and the traveling public. This effort attempted to best address the primary areas of concern identified through public and stakeholder outreach, discussions with the MDT study team, review of past and current planning documents, and technical analysis of physical features, traffic, safety, and environmental conditions while also meeting the purpose and need of the highway.

A sequential approach was used to identify, screen, and select the preferred corridor configuration with continuous public feedback integrated into the process as outlined in **Figure ES.1**.

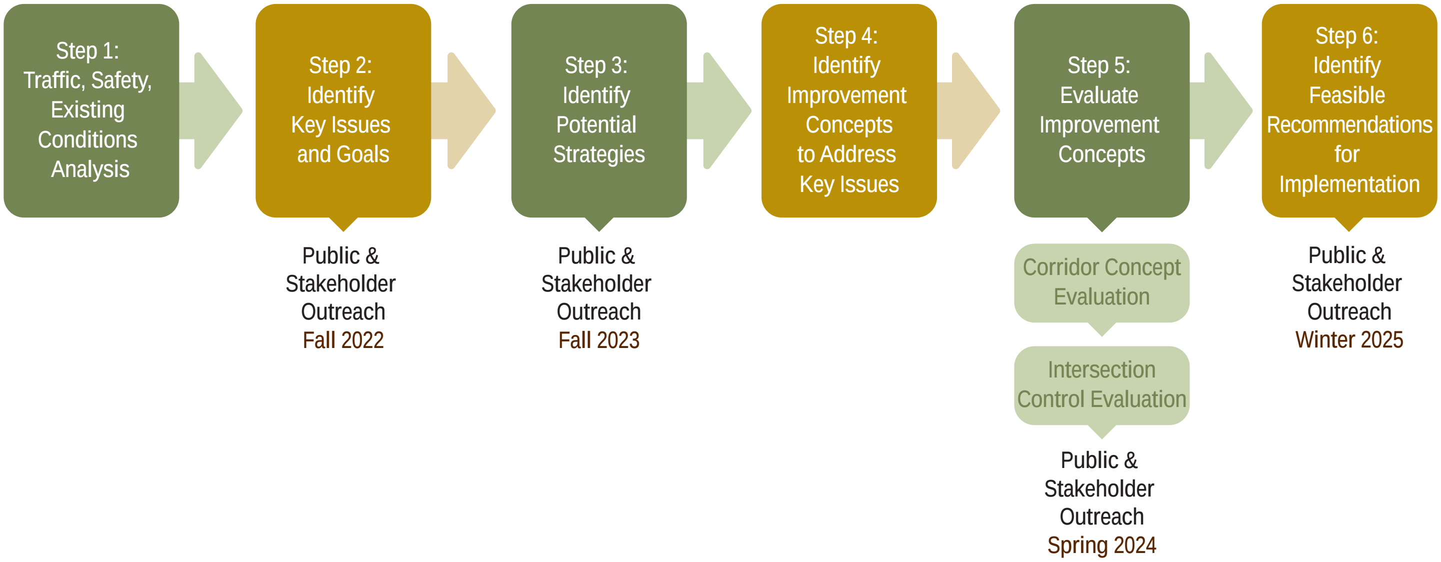

Figure ES.1: Improvement Identification and Evaluation Process

STEP 1: TRAFFIC, SAFETY, AND EXISTING CONDITIONS ANALYSIS

Results from this step are summarized previously in the relevant conditions key findings.

STEP 2: IDENTIFY KEY ISSUES AND GOALS

Study goals were identified based on key findings from the existing conditions analysis along with public, stakeholder, agency feedback.

The primary goal of this study is to **enhance roadway safety** by minimizing fatalities and serious injuries, which can be achieved by reducing conflicts and encouraging appropriate speeds.

As secondary goals, the study seeks to **improve traffic operations and mobility**, while also identifying improvements that are both **feasible and cost-effective** to implement.

STEP 3: IDENTIFY POTENTIAL STRATEGIES

In collaboration with the MDT study team, a comprehensive list of potential strategies was developed for the US 93 corridor, focusing on enhancing traffic safety and efficiency while being sensitive to the unique contexts and potential constraints within the corridor. The strategies were organized into three categories based on the scale of implementation:

- **INTERSECTION STRATEGIES** are intended to improve safety and traffic flow at key junctions along the corridor, including lane modifications, traffic signal optimization, the installation of roundabouts to promote smoother traffic flow, and innovative designs like reduced conflict intersections to minimize turning conflicts.
- **ROADWAY SEGMENT STRATEGIES** address specific sections of the highway, incorporating measures such as Intelligent Transportation Systems (ITS) for better traffic management, various roadway features to improve visibility and safety, traffic calming measures, and wildlife accommodations to reduce vehicle-wildlife conflicts.
- **CORRIDOR-WIDE STRATEGIES** are broader strategies that apply to the entire corridor, including access management to optimize vehicular access points, divided highway features for increased safety, reduced conflict highway designs, and suburban design elements to align with the transition from rural to urban settings.

This structured approach lays the groundwork for targeted improvements that address the specific needs of the US 93 corridor, enhancing safety and mobility for all road users.

STEP 4: IDENTIFY IMPROVEMENT CONCEPTS

In this step, identified strategies were refined to develop location-specific improvement concepts for the US 93 corridor and its key intersections. Four corridor improvement concepts were established and applied to five distinct segments of the corridor. These concepts aim to enhance safety, traffic flow, and the overall user experience while aligning with the land uses and unique contexts of each segment. Additionally, five intersection alternatives were designed and applied to nine key intersections within the corridor. These alternatives include a variety of traffic control options and geometric improvements identified to address operational and safety concerns.

For evaluation purposes, the corridor was split into **five segments** according to similarities in context, environmental conditions, safety concerns, and traffic volumes. Additionally, nine key intersections within the corridor were identified for an in-depth alternatives analysis based on factors such as crash histories, traffic volumes, proximity to neighboring intersections, and land constraints. **Figure ES.2** identifies the five segments and the nine key intersections used as the basis for the evaluation. A brief summary of the key concerns for each segment and intersection is provided on the following pages.

Four improvement concepts were identified for the US 93 corridor. Concepts are characterized according to a general design principle, with individual design features that can be adapted and applied to fit the context of a specific corridor segment.

- **CONCEPT 1: SUBURBAN DESIGN** would involve redesigning the roadway with a 45-55 mph design speed, installing raised center medians with minimal change to access, incorporating curb, gutter, sidewalk, and/or landscaping, installing roadway lighting, and integrating additional traffic calming features (such as ITS or speed feedback signs)
- **CONCEPT 2: MANAGED ACCESS DESIGN** would include maintaining existing design speeds, consolidating access points as much as possible while maintaining full access at remaining minor approaches, providing full movements and intersection control at major intersections, and utliizing divided highway and raised median features as appropriate to limit full access movements
- **CONCEPT 3: REDUCED CONFLICT DESIGN** would involve maintaining existing design speeds, eliminating full-movement access except at controlled locations, using reduced conflict

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intersection designs (such as continuous T, roundabout, RCUT), implementing a divided highway using raised features such as medians, grassy medians, concrete barriers, or cable rail, and providing U-turn options at periodic locations.

CONCEPT 4: INCREASED CAPACITY DESIGN would include maintaining existing design speeds, constructing three travel lanes in each direction, implementing full access control, using reduced conflict intersection designs, and prioritizing operations and accommodations for future growth.

A set of five intersection alternatives were identified including a variety of traffic control options and geometric improvements with the intent of addressing identified operational and safety concerns.

STOP CONTROL would include stop control on minor approach legs, provide additional lanes to accommodate turning vehicles as needed, and allow all turning movements.

TRAFFIC SIGNAL would use a traffic signal to direct and control traffic provide appropriate turn lanes and signal phasing, and allow all turning movements

MULTI-LANE ROUNDABOUT would use a roundabout to direct and control traffic, require entering vehicles to yield to circulating traffic, and allow all turning movements

RESTRICTED CROSSING U-TURN (RCUT) would allow right and left turns from the mainline to minor approaches, allow only right turns from minor approaches, provide U-turn opportunities at downstream locations, and provide unrestricted mainline traffic flow. RCUTs could be signalized in the future to optimize operations, if warranted.

CONTINUOUS T would only be used at three-legged intersections and would provide a channelized receiving lane for left-turning vehicles from the minor approach to merge onto the mainline, with stop control on minor approach with future signalization option if warranted.

Additionally, **potential wildlife strategies** were identified within the corridor. The most effective strategies include:

- **Animal detection systems**, which use electronic sensors to detect animals near the roadway, triggering a real-time warning to drivers and reducing the risk of collisions
- **Grade-separated crossing structures** such as underpasses and overpasses, which allow animals to safely cross underneath or over the highway, coupled with wildlife fencing to funnel wildlife away from the highway and toward the grade-separated crossing
- **Modifications to existing infrastructure** such as enlarging or retrofitting culverts at major drainage crossings to improve their utility as wildlife passageways for large mammals such as deer, elk, and bear

A variety of factors should be considered when identifying potential treatment types and implementation locations, including land ownership status at crossing locations, the existence of existing infrastructure that could be rehabilitated, known wildlife activity in the area, habitat connectivity potential, and topographic features that are favorable for construction of crossing features. and potential wildlife accommodation locations. Potential wildlife accommodation locations are illustrated in **Figure ES.3.**

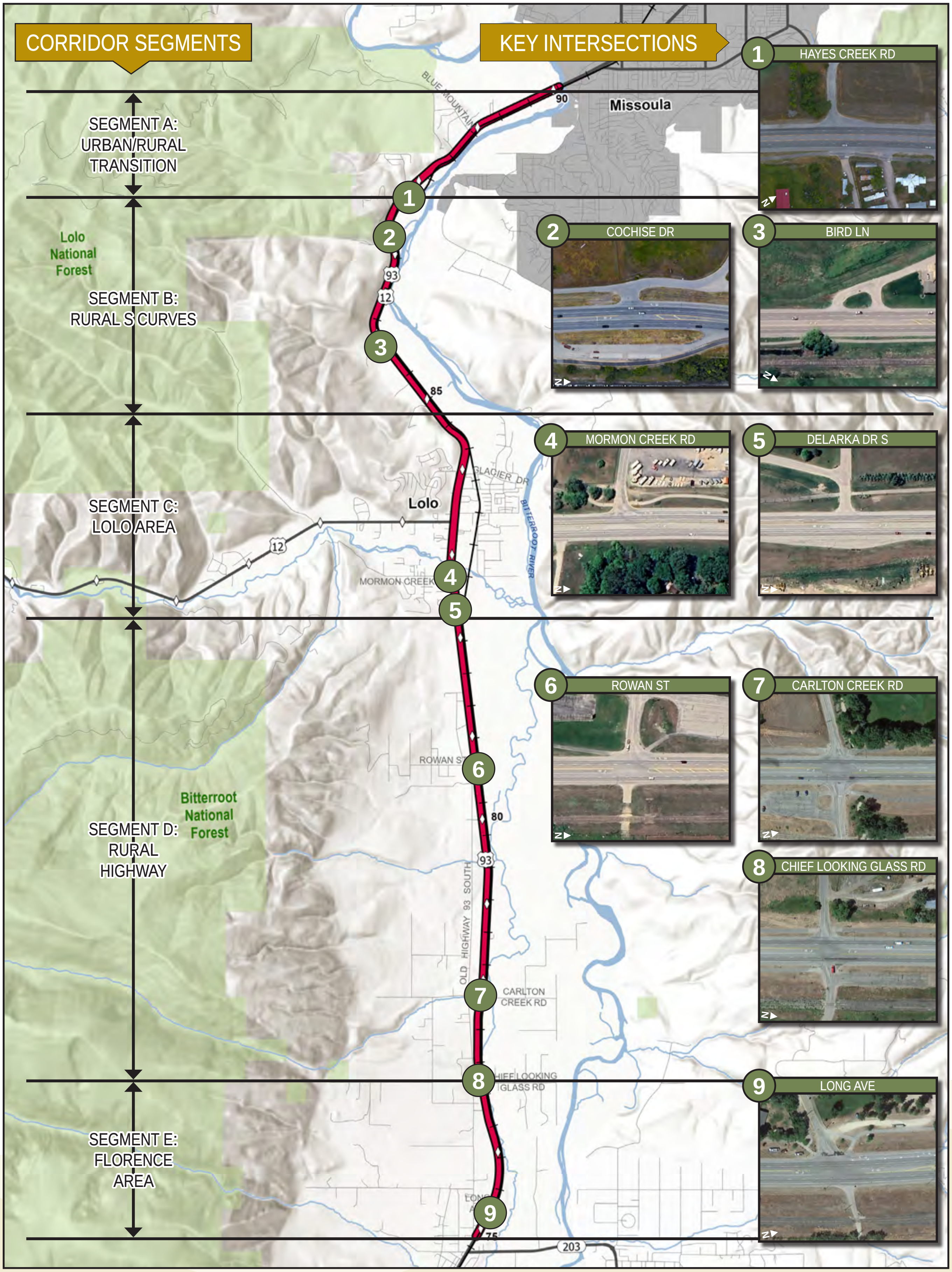

Figure ES.2: Evaluation Segments and Intersections

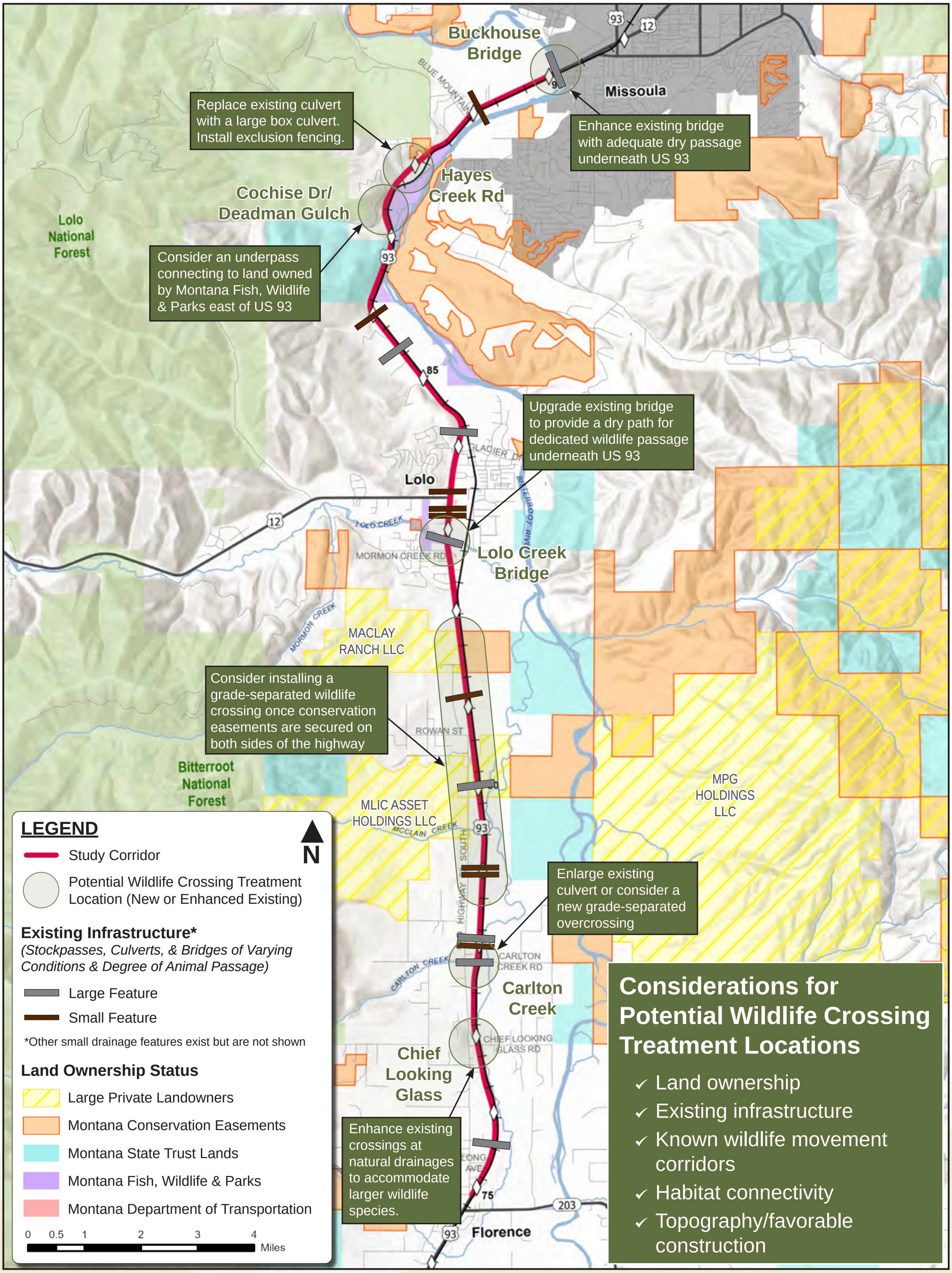

Figure ES.3: Potential Wildlife Accommodation Locations

STEPS 5 AND 6: EVALUATE IMPROVEMENT CONCEPTS AND IDENTIFY FEASIBLE RECOMMENDATIONS

A **corridor concept evaluation** process focused on assessing long-term design alternatives for each study segment. A comprehensive screening process was applied to determine which concepts best met the study goals and objectives, with the top-performing alternatives advancing for further consideration. Similarly, the **intersection control evaluation** process used an objective, data-driven framework to assess the effectiveness of various intersection treatments, considering factors such as safety, traffic flow, and feasibility.

Alternatives exhibiting fatal flaws under any of the evaluation criteria were eliminated from further consideration. The results of the analysis indicated that several alternatives may be viable for each corridor segment and intersection and will need to be evaluated in greater detail during future design phases depending on selected corridor concepts, neighboring intersection configurations, funding availability, and landowner coordination.

However, for the purposes of this study, an optimized corridor configuration was identified, integrating the most practical and effective elements from the corridor concepts and intersection control alternatives. This process involved strategically blending the design alternatives that were found to best meet the study's goals and objectives. The aim was to develop a comprehensive and feasible recommendation for the corridor that balances the overwhelming need for improved safety with efficient highway operations, while minimizing implementation costs, construction timeframes, and impacts. Recommended design concepts and intersections configurations are illustrated in **Figure ES.4**. The total estimated cost for the optimized corridor is $203M in 2025 dollars, not adjusted for future inflation.

Before implementation of the full optimized corridor configuration, various smaller-scale improvements could be installed at spot locations on an as-needed basis. A variety of short-term oriented projects were identified that can be implemented more quickly with lower overall costs and include **standalone intersection treatments**, **intelligent transportation systems**, **shared use path improvements**, **median treatments**, and **access modifications**. Spot improvements may serve as temporary solutions until funding becomes available for larger-scale improvements or may be implemented as complementary improvements to the optimized corridor configuration.

NEXT STEPS AND IMPLEMENTATION

The optimized corridor configuration has been developed as a comprehensive vision for the future corridor, however, funding limitations may require phased implementation of improvements. Reconstruction efforts may range from smaller-scale spot improvements to larger-scale implementation by corridor segment. Ultimately, the implementation of future improvements will depend on funding availability, coordination with adjacent landowners and partner agencies, and environmental mitigation activities.

For any future projects advanced from this study, next steps would need to include funding identification, project nomination, project development including environmental documentation, and appropriate collaboration with resource agencies, stakeholders, and the public.

No funding has been identified for corridor projects at the time of this report. However, multiple funding sources may be available to support development of future projects, including MDT's core funding programs for National Highway System (NHS) routes, other federal funding sources including the Highway Safety Improvement Program (HSIP), Transportation Alternatives (TA) Program and Congestion Mitigation and Air Quality (CMAQ) Improvement Program. Additionally, discretionary federal grant funding offered under the Bipartisan Infrastructure Law (BIL) may be applicable for both spot improvements and/or full corridor reconstruction, including the Wildlife Crossings Pilot Program, along with other potential partnership opportunities.

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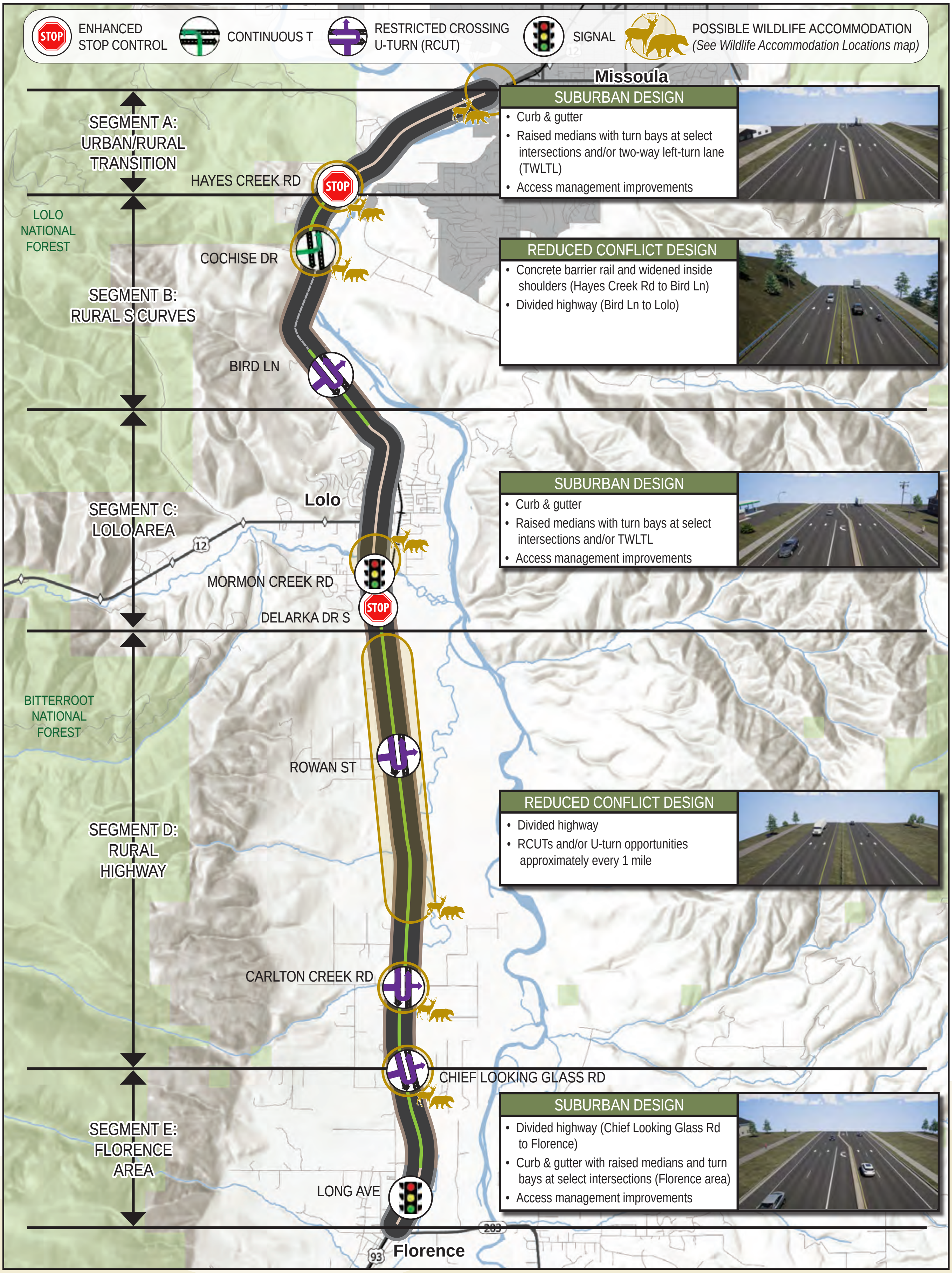

Figure ES.4: Optimized Corridor Configuration

1.0 INTRODUCTION AND BACKGROUND

US Highway 93 (US 93) was initially constructed in 1926. Since then, stretches of the highway have been widened, straightened, or rerouted as part of ongoing efforts to improve traffic operations and safety while also protecting the abundant wildlife and environmental resources within the corridor. The segment of US 93 between Florence and Missoula was expanded from two lanes to four lanes between 1998 and 2001.

Today, the study corridor is used daily by commuters, residents, and regional travelers as well as many commercial freight haulers. The highway provides access to adjacent residences, businesses, agricultural lands, and serves as a primary route between smaller Bitterroot Valley communities and the City of Missoula. As the once vacant lands surrounding US 93 begin to develop and the Bitterroot Valley population grows, traffic volumes have continued to outpace future projections made prior to the 1998 highway expansion project. This pressure has contributed to congestion, reduced travel times, increased user conflicts, and ongoing safety concerns especially at uncontrolled intersections within the corridor and during peak travel times.

The intent of the *US 93 Missoula-Florence Study* is to evaluate safety and operational conditions within the corridor and identify comprehensive, data-driven, and forward-looking solutions to address concerns over the long term given environmental resources, right-of-way needs, access management, maintenance considerations, and other potential constraints. The Montana Department of Transportation (MDT) may advance identified improvements for future design and construction as funding becomes available.

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1.1. STUDY AREA

US 93 is a major north-south highway extending from Arizona north to the Canadian border. The highway enters Montana from Idaho at Lost Trail Pass and travels north through the Bitterroot National Forest, past Missoula, through the Flathead National Forest and Stillwater State Forest before reaching its terminus at the Canadian border near Eureka. The corridor serves international and national commerce needs as well local and regional commuter needs. The study corridor includes US 93 between the communities of Missoula and Florence in the Bitterroot Valley. The corridor begins at Reference Post (RP) 75.0, just north of Old US Highway 93 in Florence, and extends north to RP 90.1, at the Bitterroot River crossing outside of Missoula. The study corridor begins in Ravalli County and ends in Missoula County, crossing the county line at Chief Looking Glass Road (RP 76.9). The Bitterroot Trail, a paved shared use path, runs adjacent to US 93 throughout the study corridor. A map of the study area is provided in **Figure 1**.

1.2. PAST PLANNING

MDT has previously considered improvements to the Missoula to Florence corridor dating back to the 1997 *US 93 – Hamilton to Lolo Final Environmental Impact Statement (FEIS) and Record of Decision (ROD)*.[1] The environmental document identified a preferred alternative which included a four-lane undivided section in rural areas and a five-lane section with a center two-way left-turn lane (TWLTL) in developed areas as well as a separated shared use path and park-and-ride lots. The preferred alternative has since been constructed and all conditions of the FEIS have been satisfied.

In 2008, MDT conducted the *US 93 Corridor Study - Missoula to Florence*[2] to address ongoing safety and operational issues in the corridor. The study considered options to add vehicular capacity, expand transit services, enhance mode choice, provide demand and system management, improve spot locations, and identify potential policy tools. Bus rapid transit and passenger rail options were evaluated in detail but were ultimately eliminated due to lack of sufficient ridership and poor cost effectiveness. Options to increase vehicular capacity were also eliminated based on lack of available funding. Some of the recommended spot improvements, policy tools, multimodal options, pedestrian crossings, and enhanced park-and-ride lots and vanpool/carpool programs have been implemented.

Since that time, safety and operational challenges have continued in the valley. Most recently, MDT conducted the *US-93 South Safety Improvements Study*[3] in 2020 to evaluate short-term solutions at key intersections along the US 93 corridor between the towns of Lolo and Florence. The effort resulted in recommendations ranging from warning signs/lights, striping, and street lighting in the short-term, to updated intersection geometry and new turn lanes in the mid-term, and grassy medians and access management including development of reduced conflict intersections in the long-term. Additionally, MDT conducted a *Speed Study – US Hwy 93 – Lolo to Missoula*[4] in 2023 that recommended maintaining existing speed limits, introducing a new speed transition zone south of Missoula, and considering traffic calming measures within the study corridor.

Public involvement was not a component of the 2020 safety study or the 2023 speed study, and MDT has continued to receive comments and requests to broadly address safety and operational challenges. Much of the input has been influenced by recent high-profile crashes and concerns about proposed developments within the US 93 corridor. This study was conducted in response to these concerns.

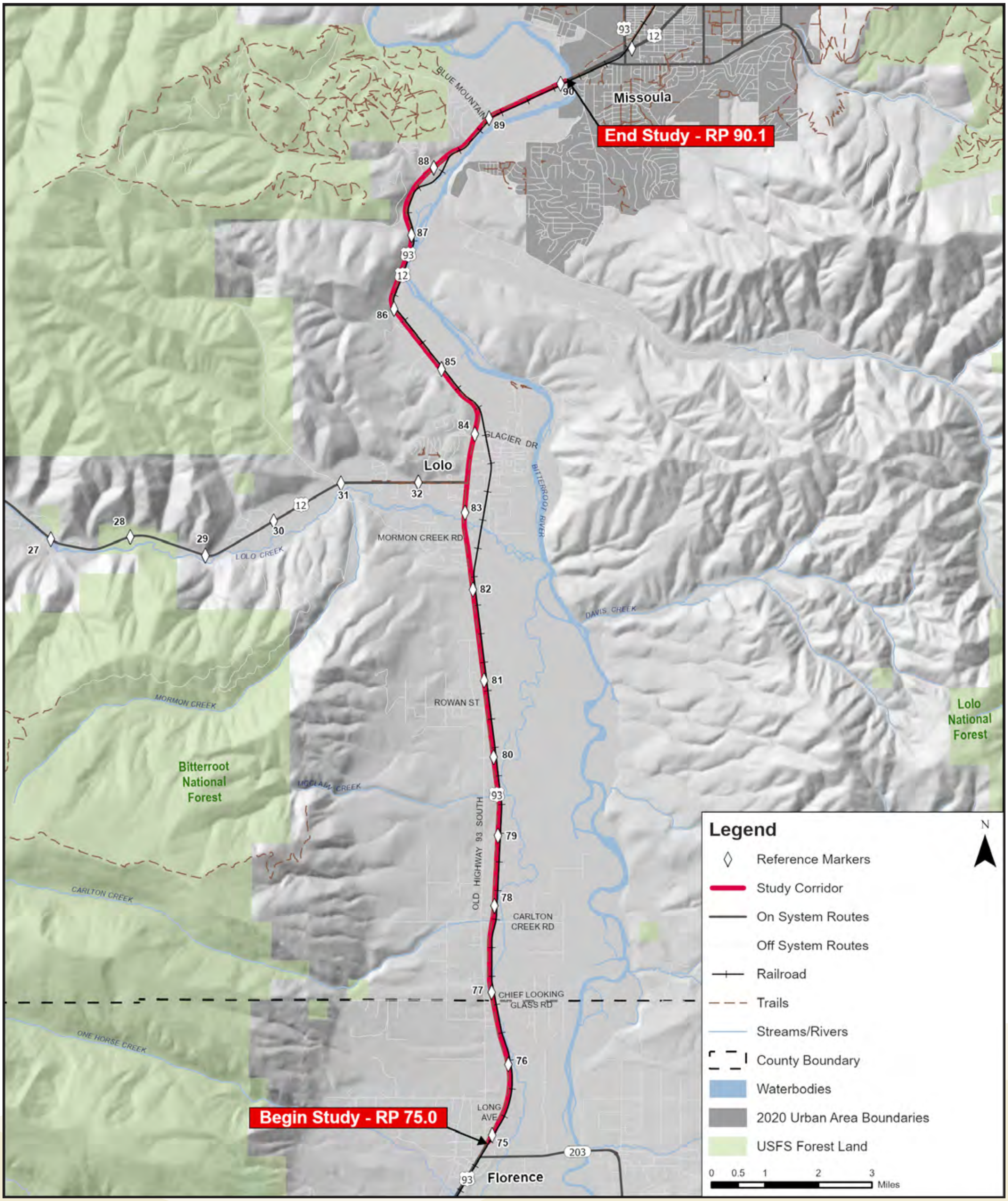

Figure 1: Study Location Map

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1.3. PUBLIC AND STAKEHOLDER INVOLVEMENT

A wide-ranging public and stakeholder involvement campaign was conducted to share information and obtain feedback over the course of the *US 93 Missoula-Florence Study*. MDT hosted a website providing an overview of the study, contact information, and links to the study area, schedule, public involvement materials, and study documents. Additionally, MDT conducted multiple in-person and virtual meetings to engage key stakeholders and members of the public. Targeted outreach activities are described in the following sections, along with a summary of public feedback topics.

1.3.1. Project Management Team (PMT) Meetings

Representatives from MDT Consultant Design, Missoula District, and other appropriate functional managers composed the PMT. Meetings were held with the PMT approximately every two to four weeks throughout the course of the study. Brief check-in meetings were used to provide status updates and discuss ongoing tasks. Additionally, a series of in-depth workshops were held to confirm methodologies, discuss detailed technical evaluations, and provide guidance to the consultant team.

1.3.2. Resource Agency Coordination

Three resource agency workshops were held in Fall 2023 and Spring 2024 to discuss the study and request resource agency input on wildlife movements and potential accommodations to minimize wildlife-vehicle conflicts in the corridor. These included virtual meetings on October 24, 2023, and May 29, 2024, and an in-person field visit on June 11, 2024. The following agencies participated in the meetings.

- Montana Department of Transportation (MDT)
- Montana Fish, Wildlife and Parks (MFWP)
- Federal Highway Administration (FHWA)
- U.S. Fish and Wildlife Service (USFWS)

Following a presentation of key findings from draft reports, meeting attendees engaged in open discussion of wildlife concerns and potential accommodations to minimize wildlife-vehicle conflicts within the corridor. During the field visit, attendees stopped at priority locations for wildlife movements and discussed preferred crossing accommodations. Feedback from agency representatives was incorporated into final study documents.

1.3.3. Stakeholder Coordination

Stakeholders were identified and contacted during outreach efforts to encourage their participation in the public meetings. Targeted stakeholder outreach meetings were also conducted throughout the duration of the study to share study methods, findings, and recommendations. Representatives from the organizations listed below participated in small-group meetings with the study team. The meetings were held both in person and virtually using an informal discussion format. In some cases, an initial presentation provided an overview of the study background and approach, concept identification and evaluation process, screening and refinement, and public involvement opportunities.

- Bitterroot Building Industry Association
- Bitterroot Trail Preservation Alliance
- Carlton School District
- Center for Large Wildlife Conservation
- City of Missoula
- Holt Heritage Museum
- Legacy Glass
- Local Neighborhood Meetings
- Lolo Community Council
- Lolo Schools
- Missoula Consolidated Planning Board
- Missoula County Commissioners
- Missoula County Public Works
- Modern Storage Solutions
- PakRat Mini Storage
- Reserve Street Working Group
- Ravalli County Commissioners Office
- Rowan Street Food Truck Park
- Various Residents and Landowners

1.3.4. Public Outreach Efforts

Public informational meetings were held at four key points during the planning study. The first informational meeting occurred after evaluation of existing and projected conditions to identify key issues. The second meeting was held to gather feedback on potential improvement strategies, and the purpose of the third meeting was to share results from the Level 1 screening process. A fourth public meeting will coincide with the release of preliminary recommendations and the draft *US 93 Missoula-Florence Study Report*.

PUBLIC OUTREACH #1 (FALL 2022)

MDT hosted two informational meetings on October 18, 2022, to provide information about the scope of the study, share existing conditions data, collect feedback, and answer questions. One of the meetings was held virtually via the online Zoom platform, while the other was held in person at the Lolo School to provide multiple opportunities for participation. Advertisements were placed in local newspapers, radio stations, and MDT's social media accounts. Approximately 60 members of the public signed in at the in-person meeting and 19 people attended the virtual meeting. Attendees were primarily residents of the corridor or stakeholders who are part of neighborhood groups or local organizations who care about improving the corridor. Members of the media were also in attendance at the in-person event.

The in-person meeting was formatted as an open house with a series of exhibits displaying information about the study. Representatives of the study team were available to answer questions and collect feedback. The virtual meeting consisted of a brief overview presentation followed by an open question and answer session with the public.

Comments and questions received during the in-person event and the virtual question and answer session can broadly be categorized into three main areas: speed limit concerns, the timing of improvements, and the types of improvements being considered. Attendees were curious about potential improvements at specific intersections in the corridor, wildlife considerations, noise mitigation and factors involved in data collection. Many participants expressed that the current speed limit in the corridor is too high and immediate action needs to be taken along the entire Bitterroot corridor. There was also discussion about local school safety, railroad land, and available funding opportunities.

PUBLIC OUTREACH #2 (FALL 2023)

The second outreach event was held on November 29 and 30, 2023, and included a virtual meeting held via Zoom and an in-person open house at the Lolo School. In addition to discussing the ongoing status of the US 93 corridor study, the outreach events also included information about the *Missoula to Hamilton Speed Study* that MDT had conducted within the corridor. The events were advertised through social media and local news outlets. The study team participated in multiple radio interviews to help boost outreach.

A total of 53 community members attended the virtual meeting and approximately 120 people attended the open house. Individual residents and representatives of community organizations and neighborhood interest groups were in attendance. Many attendees provided feedback about personal experiences and persistent issues experienced by commuters and residents in the area. Key topics included wildlife accommodation concerns, speed limit concerns, and intersection-specific suggestions. Attendees were curious about potential improvements such as lighting, signage, and median barriers, law enforcement, and treatments to improve safety in the "S-curve" area of the study. Many folks expressed feedback on the value of corridor-wide wildlife solutions. Intersection solutions, such as stop lights or roundabouts, were requested at Cochise Drive, Rowan Street, and Carlton Creek Road.

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PUBLIC OUTREACH #3 (SPRING 2024)

MDT held two in-person open houses on Tuesday, June 25, 2024, to share potential corridor improvement options with the public. Both events were held at the Lolo School. One event was held mid-day and the other in the evening so media and members of the public could attend at their convenience. The mid-day event hosted about 80 attendees, with the evening session hosting close to 60. Attendees were primarily residents of the corridor, but a few local representatives and media personnel were in attendance as well.

The open houses included an overview informational video about the study's status and the improvement options being considered for the corridor. Large roll plot maps were placed on tables at stations corresponding to specific segments of the corridor. Members of the public were encouraged to write on the maps directly or to place sticky notes with their comments regarding concerns and potential improvements within each segment. Members of the study team were also available to collect verbal feedback.

Feedback indicated mixed opinions on the public's preferred improvements for the corridor. Many community members indicated a preference for traffic signals at major intersections while some prefer slower-speed roundabouts. The community was generally open to reduced conflict intersections but desired more information. Some comments expressed desire for lower speed limits throughout the corridor, especially in more developed areas, while others expressed support for maintaining high speeds to minimize travel time to and from Missoula. Pedestrian and bicycle safety improvements and wildlife crossing accommodations were frequently mentioned.

PUBLIC OUTREACH #4 (WINTER 2025)

On Wednesday, January 22, and Thursday, January 23, 2025, MDT hosted in-person open houses at the Lolo School. Both events were held from 4:00 PM to 7:00 PM. The two events drew around 100 total attendees. Several media personnel were present and conducted interviews with study team members for coverage in the local news.

Exhibits displayed around the room provided key information about the study process and goals, evaluation methods, wildlife management recommendations, optimized corridor configuration, and next steps. A large roll plot featuring planning-level design details of the optimized corridor configuration was also displayed. Attendees were encouraged to leave comments on the map to share their feedback on the proposed configuration. Representatives from the study team were available to answer questions and gather input.

Overall, the feedback was generally positive regarding the optimized corridor configuration. While some attendees disagreed on specific intersection control improvements, the focus on safety and enhanced operations was widely supported. Several community members expressed appreciation for the proposed wildlife accommodations, while others felt that additional bicycle and pedestrian accommodations are needed. The study team took these conversations into account, making adjustments to the optimized corridor configuration as appropriate.

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1.3.5. Public and Stakeholder Feedback

Public and stakeholder comments were collected and considered throughout the study process. Overall, opinions about issues, needs, and preferred improvements often varied according to area of interest, with multiple instances of contradictory perspectives. Common opinions relating to primary topics of interest are summarized in this section.

SAFETY CONCERNS

There are notable safety concerns about accessing and exiting US 93 due to high traffic volumes and speeds. Many residents have experienced near-misses and crashes, particularly when trying to turn on or off the highway. The current highway design and high traffic volumes make it risky for residents to leave their homes, and the lack of protected turning options exacerbates the problem. Issues include insufficient gaps in traffic, lack of staging areas for turns, conflicts in the center TWLTL, and difficulty judging lane use by oncoming traffic.

SPEED

Many residents feel travel speeds on US 93 are too high, and speed limits are not obeyed. High speeds make entering/exiting the highway difficult due to the speed differential. However, other highway users prefer to maintain high speeds to minimize travel time to and from Missoula.

SCHOOL TRANSPORTATION

Concerns were raised about the lack of a school bus system and the risks posed to children who need to cross US 93 to attend school. The heavy flow of traffic makes it dangerous for children to travel to and from school.

WILDLIFE CONFLICTS

There is a need for better wildlife crossings and fencing to reduce wildlife-vehicle collisions, which are frequent along the corridor. Some residents have also observed wildlife trapped between the concrete median barrier and high-speed vehicles on the highway indicating a need for safe wildlife crossing opportunities. Some feedback highlighted the need for the study to consider wildlife migration routes and the impact of traffic on local ecosystems.

NON-MOTORISTS

Conflicts between turning vehicles and adjacent shared use path users have occurred, causing rear-end crashes, near-misses, and non-motorist injuries.

NIGHTTIME AND WINTERTIME DRIVING

At night and during winter months, the absence of sufficient lighting makes turning movements more difficult and dangerous. Adverse weather and road conditions add another layer of risk to highway turning and merging activities, especially with high travel speeds on US 93.

TRAFFIC CONGESTION

Heavy traffic congestion is a common issue, especially during peak hours. As traffic volumes continue to increase due to future growth and development in the area are cause for safety and traffic related concerns. The corridor is highly used by students, school buses, commuters, and freight.

DEVELOPMENT IMPACT

The impact of new housing developments on traffic congestion and safety is a significant concern, with residents calling for coordinated planning. The addition of new commercial facilities and residential units is expected to increase traffic volumes, necessitating a comprehensive traffic control plan.

EMERGENCY RESPONSE

There are concerns about the ability of emergency services to respond effectively due to traffic congestion and accidents along Highway 93. The design of the highway needs to accommodate the movement of emergency personnel and equipment during crash mitigation activities.

LONG-TERM PLANNING

Residents urge for comprehensive, long-term planning to address the increasing traffic and safety issues, suggesting that past studies and recommendations be revisited and implemented. The goal is to design a road that meets safety standards and reduces the risk of serious or fatal injuries. Some proposed improvements from the public include installing traffic lights, reducing speed limits, creating turn lanes, and enhancing signage to improve safety and traffic flow.

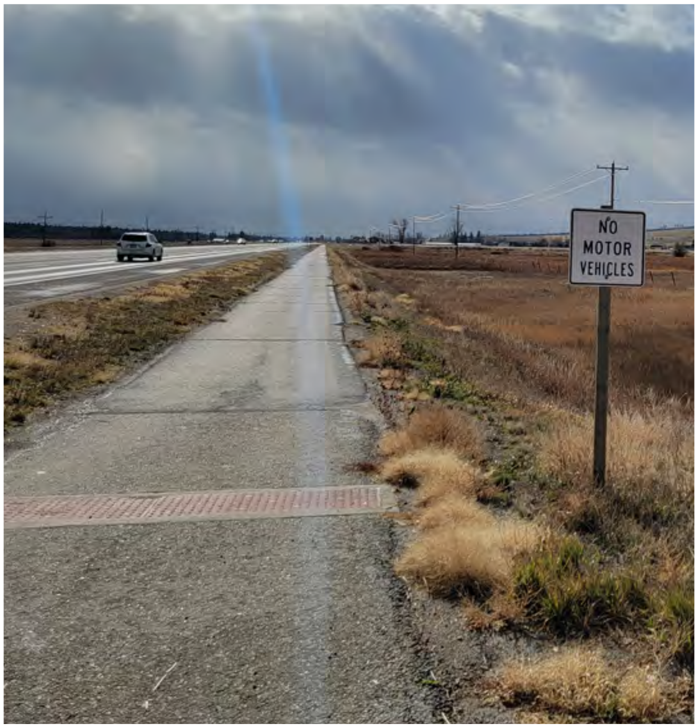
2.0 RELEVANT CONDITIONS

2.1. ROADWAY CHARACTERISTICS

US 93 is part of the Non-Interstate National Highway System (NHS) and is functionally classified as a principal arterial throughout the study limits. Most of the US 93 study corridor is configured as a four-lane undivided rural facility, with two travel lanes in each direction, shoulders of varying width, and either dedicated left-turn lanes at key intersections or a center TWLTL. A constrained portion of the corridor within the S-curves north of Lolo is divided by a concrete median barrier. Multiple public roadways and private approaches intersect the highway throughout the corridor. Three intersections within the community of Lolo are currently signalized, as well as the Blue Mountain Road intersection at the north end of the study area. All other intersections within the corridor provide stop control on the minor streets.

The Bitterroot Trail, a shared use path extending 47 miles from Hamilton to Missoula, is located primarily on the west side of US 93 from Florence to Lolo and primarily on the east side of US 93 from Lolo to the northern end of the study area south of Missoula. The multi-use trail is a paved, 12-foot-wide asphalt trail jointly maintained by Missoula and Ravalli counties. Three park-and-ride lots within the corridor are located at Chief Looking Glass Road, Carlton Creek Road, and Rowan Street. A single-track railroad operated by BNSF also runs parallel to US 93 at approximately 100 feet east of the edge of roadway pavement through much of the corridor.

The speed limit varies throughout the corridor ranging from 25 miles per hour (mph) in Lolo to 70 mph on the straight, rural stretch of highway between Lolo and Florence. Speeds are generally lower within the developed communities of Lolo and Florence as well as on the outer edges of Missoula city limits. Multiple speed studies have been conducted over the past several years to address concerns raised by community members and local government officials.



2.1.1. Land Use, Right-of-Way, and Access

Land uses adjacent to the corridor include low- to medium-density residential units, agricultural land, commercial developments, and light industrial complexes. Within the Lolo and Florence areas, US 93 becomes more developed with mixed residential and commercial uses. Outside of these communities, the lands immediately adjacent to the corridor are primarily vacant agricultural land that is privately owned and could be potentially developed in the future. Lands adjacent to the US 93/Rowan Street intersection are currently under development for mixed uses while a large subdivision is undergoing the approval process north of Lolo near Bird lane. Redevelopment plans for the old Lolo School site have also been proposed to include residential properties, open space, and commercial development.

Several residential properties are located immediately east and west of the highway throughout its length. These residents use US 93 as their primary travel corridor to access neighboring communities. There are no parallel routes that stretch the entire length of the study corridor, however, Old Highway 93 provides a parallel route on the west side of US 93 between Rowan Street and Florence.

Most of the land along the study corridor is privately owned. However, there are several parcels of Montana State Trust Lands and many lands under Conservation Easements held by organizations such as the Five Valleys Land Trust and the Rocky Mountain Elk Foundation near the corridor. MFWP manages land along the Bitterroot River between Missoula and Lolo as well as Travelers' Rest State Park and the Chief Looking Glass fishing access site and campground. The Bitterroot and Lolo National Forests provide additional public land surrounding the corridor.

Based on a review of available right-of-way plans, the existing MDT right-of-way width varies throughout the study corridor. The eastern edge of MDT right-of-way is coincident with the western BNSF railroad right-of-way boundary in all areas except through Lolo and near the intersection of Hayes Creek Road. The BNSF right-of-way width ranges from about 95 feet to 110 feet throughout the corridor. Through the rural parts of the corridor south of Lolo, the existing highway right-of-way width ranges from 230 feet to 270 feet, with some wider sections in areas of large cuts. In developed areas, the right-of-way is much narrower.

US 93 is classified as a limited access facility approximately between Florence and Lolo. The access management limits extend from just south of Highway 203 in Florence, north along US 93 to just south of the US 12 intersection in Lolo. The limited access conditions specify that no more than a total of 9 public approaches may be constructed on the east side of US 93 and no more than 16 public approaches may be constructed on the west side, whether constructed at the time the limits were put in place or at a later date. Additional approaches require the approval of the Boards of County Commissioners and MDT. Permitted private approaches are also allowable.

Additionally, an *Access Control Plan* is in place for the portion of the corridor from Lolo to Missoula.[5] The plan documents existing accesses along the corridor, defines access management guidelines and concepts applied to the corridor, and identifies future access locations, configurations, and operational characteristics for undeveloped properties and properties with redevelopment potential. The intent of the plan is for recommendations to be implemented as part of future highway design and construction projects or as redevelopment occurs. In general, the plan recommends providing new access to US 93 via public roads (with new private accesses granted only if no reasonable alternative access is available), combining multiple accesses for a single parcel, sharing access between adjacent properties, limiting new access to right-in-right out movements, and eliminating existing access if reasonable alternative access can be provided.

2.1.2. Utilities Coordination

Several overhead and underground public utilities, owned by seven entities, are located within the study corridor. Utility services include Blackfoot Communications (fiber optic and telephone), Lumen/Century Link (fiber optic), Missoula Electric Cooperative (electric), NorthWestern Energy (electric and natural gas), and Spectrum (communication and cable). The Lolo Water and Sewer District provides water and sewer service in Lolo, generally north of the US Highway 12 (US 12) and US 93 intersection on both sides of US 93. Although most of their facilities are outside US 93 right-of-way, some water and sewer lines cross the highway at Ridgeway Drive. MDT does not provide utility service within the corridor but does have several facilities served by local power utilities including traffic signals, warning beacons, and highway lighting.

2.2. ENVIRONMENTAL CONDITIONS

Environmental resources within the study area were identified and documented through field reviews of the study area, reviews of existing MDT documents, conversations with stakeholders, and reviews of online databases, aerial photography, and literature. Environmental constraints and considerations that will need to be addressed during future design phases are summarized in this section. Additional information can be found in the *Environmental Engineering Analysis Report*,[6] *Initial Site Assessment for Hazardous Materials*,[7] *Location Hydraulics Study Report*,[8] and *Biological Resources Report.*[9]

2.2.1. Surface Waters and Hydraulic Features

The most prominent water feature in the study area, the Bitterroot River, crosses US 93 just north of the study area at RP 90.1 via Buckhouse Bridge. The Bitterroot River runs parallel to US 93 east of the study corridor. Lolo Creek crosses US 93 on the southern end of Lolo. Several smaller streams cross US 93 throughout the study area including McClain Creek, Maple Creek, Carlton Creek, Sin-tin-tin-em-ska Creek, and Tie Chute Creek as well as several other unnamed intermittent streams. Sin-tin-tin-em-ska Creek and One Horse Creek parallel US 93 for brief sections of the corridor. Within the study area, only Lolo Creek is the only water feature that crosses US 93 with a bridge structure; all of the other streams are assumed to be conveyed under US 93 via culverts.

FLOODPLAINS

Based on 2015 floodplain mapping, US 93 is located just outside the regulatory floodway of the Bitterroot River within the study area.[10] However, US 93 does cross the 1% and 0.2% annual flood hazard areas of the Bitterroot River at Buckhouse Bridge and just north of Lolo. These areas indicate a low to moderate risk for flooding. US 93 also crosses approximately 140 feet of the regulatory floodway of Lolo Creek. US 93 crosses approximately 230 feet of Zone D floodplain associated with Tie Chute Creek, an intermittent stream. Areas categorized as Zone D are areas in which flood hazards are undetermined but possible.

WETLANDS

Wetlands and riparian areas are present throughout the study corridor. The wetlands are primarily adjacent to the roadway, along streambanks, and within the Bitterroot River floodplain. Available mapping shows that wetlands within the existing highway corridor consist of freshwater emergent wetlands, freshwater forest/shrub wetlands, and riverine wetlands with both forested/shrub and herbaceous riparian areas also present. A field survey was also conducted in 2023 to confirm the presence of mapped wetlands. Wetland delineations, functional assessments, and mitigation activities will be necessary during future project development phases.

STORMWATER MANAGEMENT

While some curb and gutter exist in the Lolo and Florence areas, a majority of the stormwater in the study corridor is currently managed via vegetated roadside ditches along US 93 and drainage culverts beneath the highway. General drainage within the study corridor flows from the west to the east. Numerous drainages cross beneath the roadway via culverts flowing from the mountains to the west of the highway and draining into the Bitterroot River to the east of the highway.

Within the study area, numerous public and private storm drain systems were identified clustered within the Lolo area. As-built plans also detail the installation of underdrains about 1 mile north of Florence along the west side of the study corridor.

IRRIGATION

Historic water resource surveys and as-built plans were reviewed to identify irrigation facilities within the corridor that could be impacted by future improvements. The corridor has been significantly developed and altered since the publication of these surveys and plans and many of the historic irrigation facilities have been removed, abandoned, or deactivated. Two active irrigation facilities were noted during a June 2023 site visit: the Walker Ditch, located approximately 4.5 miles north of Florence, and the Big Flat Irrigation District Canal, located approximately 1.0 mile west of Missoula.

2.2.2. Wildlife

The US 93 Missoula to Florence corridor provides habitat for numerous wildlife species including a variety of fish, amphibians, reptiles, birds, deer, various small to large mammals, and several species which are listed as threatened on the endangered species list. The following sections summarize wildlife considerations within the study corridor.

HABITAT AND VEGETATION

The study corridor is nestled within the Missoula and Bitterroot Valleys, with the Bitterroot Mountains to the west and the Sapphire Range to the east. The valleys support many habitats from grassland and riparian to forest and sagebrush. The mountain foothills at the valley edges are important winter range for elk, white-tailed deer, and mule deer while the riparian habitats along the Bitterroot River are some of the most productive wildlife habitats in the state.

Within the highway right-of-way, common grass and shrub species were observed in the uplands. Several species of wetland vegetation are present along streams and vegetation. Some noxious weeds were present in the right-of-way and along the BNSF railroad tracks but were not prevalent. MDT uses an integrated approach to roadside weed management in accordance with its *Statewide Integrated Roadside Vegetation Management Plan*.[11]

WILDLIFE SPECIES

The study corridor is likely to be occupied by a variety of birds and mammals adapted to western Montana grassland, riparian, and riverine habitats and suburban areas. White-tailed deer, elk, moose, mountain lions, grizzly bears, black bears, beavers, wild turkeys, squirrels, crows, songbirds, and snakes have all been sighted within the study corridor or in residential neighborhoods and river bottoms near the corridor.

White-tailed deer are abundant in the study corridor and their preferred habitat is along riparian areas of rivers and streams. Mule deer are much less abundant due to less suitable habitat in the area surrounding the corridor. The elk population in the area, on the other hand, has been steadily increasing with a core calving area being identified south of Lolo. Moose occupy forested landscapes throughout western Montana but exist in relatively low density within the corridor. Black bear numbers are reportedly increasing in the Bitterroot Valley. Small mammal species such as voles, mice, shrews, weasels, skunks, muskrats, raccoons, and coyotes have been documented using culverts to cross US 93 in the study corridor.

Wetlands, riverfront, and riparian woodlands provide important nesting, foraging, and stopover habitat for many birds. The Audubon Society identifies the Bitterroot Valley as an Important Bird Area (IBA) east of US 93. More than 240 species of birds have been recorded within the IBA, with at least 115 species breeding in the area. Riverfront forest is especially important for nesting and perching sites for large raptors, such as bald eagles, osprey, and geese.

The riparian habitat associated with the Bitterroot River and numerous streams in the study corridor contains various wetland types, including ephemeral pools, sloughs, and remnants of former gravel pits, that provide breeding grounds for reptiles and amphibians. Numerous species of frogs, toads, turtles, salamanders, and snakes have been documented in the areas surrounding the corridor.

Several species identified as Montana Species of Concern have been documented within the study corridor including 18 species of birds, six mammals, one fish species, one reptile, one amphibian, five invertebrates, 15 plants, and one lichen species. Multiple bald and golden eagle occurrences and nesting areas have been confirmed within the study area. These species are protected under the Bald and Golden Eagle Protection Act. Five species listed as Threatened under the federal Endangered Species Act are also present in the study corridor, including the grizzly bear, Canada lynx, North American wolverine, yellow-billed cuckoo, and bull trout. The monarch butterfly, a candidate species, is also known in the area. Critical habitat for bull trout is designated in the Bitterroot River, Lolo Creek, and Mormon Creek. Additional information about species occurrences within the study area are contained in the *Biological Resources Report*.[5]

WILDLIFE MOVEMENT CORRIDORS

High-quality habitat surrounding the highway makes the US 93 corridor a key wildlife movement corridor, especially in the flat valley lands between Lolo and Florence as evidenced by high concentrations of roadkill and high-priority wildlife linkages. The Lolo Creek riparian corridor is identified as an important corridor for wildlife movement. McClain Creek also provides a wildlife linkage connecting National Forest lands in the Bitterroot and Sapphire ranges.

The study corridor is a predicted corridor for movement of grizzly bears from the Northern Continental Divide Ecosystem (NCDE) to the Bitterroot Ecosystem (BE), though the highway is recognized as a major impediment to recolonization of the BE by grizzly bears from the NCDE. Issues that pose the greatest threat to wildlife movement in the study corridor include: 1) private land development, which could further fragment habitat, eventually limit wildlife connectivity, and increase mortality risk; and 2) US 93 itself, due to the potential barrier effects of increasing traffic volumes and highway infrastructure.

Coordination with wildlife agencies and organizations have identified two areas that are important in order to maintain existing wildlife movement opportunities, where open space on either side of the corridor currently allows for wildlife connectivity. One of these is the canyon area between Missoula and Lolo, where Deadman Gulch and surrounding ridge systems converge with the Bitterroot River riparian area and connect with the Sapphire Mountain Range. The other site is south of Lolo between Delarka Drive and Carlton Creek Road. This site is currently providing intact wildlife habitat linkage for elk, moose, deer, wolves, mountain lions, and, most recently, grizzly bears. This area has been prioritized as a place to maintain wildlife crossing opportunities.

The study corridor provides limited opportunities for safe passage for wildlife. There are 17 drainage crossings with diameters 4 feet and larger which have potential to provide crossing opportunities. Several small culverts south of Carlton Creek show evidence of wildlife use, including well-worn paths and scat from bears, raccoons, coyotes, and cats.

WILDLIFE NEEDS ASSESSMENT

The Montana Wildlife & Transportation Partnership (MWTP) Steering Committee developed a Planning Tool as a statewide resource for evaluating highway segments of interest for wildlife accommodations based on wildlife-vehicle conflicts and important areas for wildlife movement and conservation. The tool was developed by a team of biologists, road ecologists, engineers, and GIS specialists from MDT, MFWP, and Montanans for Safe Wildlife Passage (MSWP) to assist stakeholders and the interested public in working collaboratively to identify potential conservation efforts on and adjacent to transportation corridors across Montana. The tool is based on a set of five Needs Assessment Criteria which are scored on a 100-point scale using various data sets from state, federal, and private sources.

Review of the tool results, shown in **Figure 2**, indicates that several segments of the study corridor scored highly, representing a greater need for wildlife accommodations. The scores ranged from 69, near the US 12/US 93 intersection, to 89 north of Hayes Creek Road. Other high-scoring segments include the Buckhouse Bridge area (84), Deadman Creek Gulch (76), Lolo Creek (77), south of McClain Creek (86), Carlton Creek (84), and south of Chief Looking Glass Road (81).

The MWTP Steering Committee uses the Planning Tool to facilitate a standardized approach to evaluate and select project proposals for implementation of stand-alone wildlife accommodation projects. The statewide project selection process integrates information from the tool with other evaluation criteria and considerations, such as community support, surrounding land use, engineering feasibility, to rate project proposals for projects to reduce wildlife-vehicle conflicts and improve safe wildlife passage across Montana highways.

Figure 2: MWTP Planning Tool Results

2.2.3. Cultural, Historic, and Public Resources

Traveler's Rest State Park, located south of US 12 and west of US 93 along Lolo Creek may be subject protections under Section 4(f) of the *Department of Transportation Act of 1966*. The land is owned by Montana Fish, Wildlife and Parks and is designated as a state park. Chief Looking Glass Campground and Fishing Access Site, about 0.85 mile east of the corridor, also may be subject to Section 4(f), although it is unlikely to be impacted by future improvements.

Based on a review of National Register of Historic Places (NRHP) listings, there are two historic sites near the corridor that would also be subject to Section 4(f) requirements.[12] These sites include the Carlton Community Church (located at 20075 Old US 93 approximately 950 feet west of the corridor), and Traveler's Rest (located at 6717 US 12 approximately one mile south of Lolo and 0.35 mi west of the corridor). The Carlton Community Church is a one-story, wood-frame building constructed in 1884 that retains its integrity and remains in its original location.[13] Traveler's Rest State Park was established to help to preserve the historic Traveler's Rest site in 1960. The site was later listed on the NRHP in 1966 and has also been declared a National Historic Landmark by the National Park Service.[14,15] The site is the only archaeologically verified campsite of the Lewis and Clark Expedition, although the actual site was found to be located approximately 1.5 miles west of the original National Historic Landmark location.

Given the proximity of Traveler's Rest State Park to US 93, minor effects to the property could occur with future improvements. A full cultural resources investigation would be required during future design phases to determine whether any other historic properties that could be subject to Section 4(f) protection exist in the study area.

2.2.4. Hazardous Materials, Noise, and Air Quality

Initial environmental documentation was completed to identify potential hazardous materials present within the study area based on available online mapping and reporting. No field surveys were conducted. Detailed noise and air quality analyses as well as an updated hazardous materials investigation would be required during future project development phases. Initial research indicates two unresolved petroleum release sites in the corridor, one at the Town Pump in Lolo (northeast corner of the US 93/US 12 intersection) and the other at a private household on the south side of US 93 south of the Bitterroot River Bridge. There is also an active open cut mine located immediately east of US 93 across from Valley Grove Drive. All other hazardous waste/substance sites in the area have been resolved or are unlikely to be impacted by improvements forwarded from this study.

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2.3. TRAFFIC CONDITIONS

Since US 93 was expanded to four lanes over two decades ago, the Bitterroot valley has experienced many changes related to growth and development. There has been an influx of new residential and commercial development in the study area as well as significant growth in the tourism industry. Continued urban expansion of the Missoula area is also expected over the next several years.

2.3.1. Data Collection

A detailed traffic data collection effort was conducted during August 2022 and June 2023 to understand how traffic moves throughout the study corridor. The data collected included intersection turning movement counts, field observations, and vehicle classification counts. A detailed analysis was conducted using the data to assess existing and projected vehicular traffic conditions. The following sections discuss key findings from the *Preliminary Traffic Engineering Report*.[16]

ROADWAY TRAFFIC VOLUMES

MDT's Data and Statistics Bureau provided existing and historic Average Annual Daily Traffic (AADT) counts at various site sites on US 93 in and around the study corridor. MDT typically conducts counts annually at each site and adjusts the counts to represent average daily traffic conditions. There are four short-term count sites located at various points within the study corridor as well as one continuous count site located just south of the corridor that collects data on a daily basis. The AADT information was used to understand existing traffic conditions and the historic counts provided information on historic growth trends.

Based on this data, traffic volumes on US 93 range from about 12,000 to 28,000 vehicles per day with the heaviest volumes occurring north of Lolo to Missoula. Traffic volumes decrease incrementally as the corridor progresses further south, dropping by approximately 7,000 vehicles in Lolo, another 5,000 between Lolo and Carlton Creek Road, and about 3,000 in Florence.

Figure 3 provides a graphic of the historic AADT within the study area. As shown in the figure, traffic volumes have fluctuated over the past 20 years. Some of the variation may be influenced by the time of year when the data is collected, fluctuations in tourism and seasonal traffic, and construction impacts. There was a dip in traffic in 2020 caused by the COVID-19 pandemic, though traffic volumes appeared to recover quickly during 2021.

When aggregated over the past 20 years, the area has experienced an average annual growth rate of 0.50 percent per year. Looking at the past 10-year period, traffic growth is slightly higher, at 0.8 percent per year. The past five-year period experienced the highest growth rate at 2.5 percent per year. The count site south of the study corridor (A-047) is considered to be most reliable for tracking growth since it counts traffic yearround. At that site, traffic volumes have increased at an average rate of 2.3 percent per year over the last 10 years. In the past five years, the traffic growth has remained consistent with a rate of 2.5 percent per year.

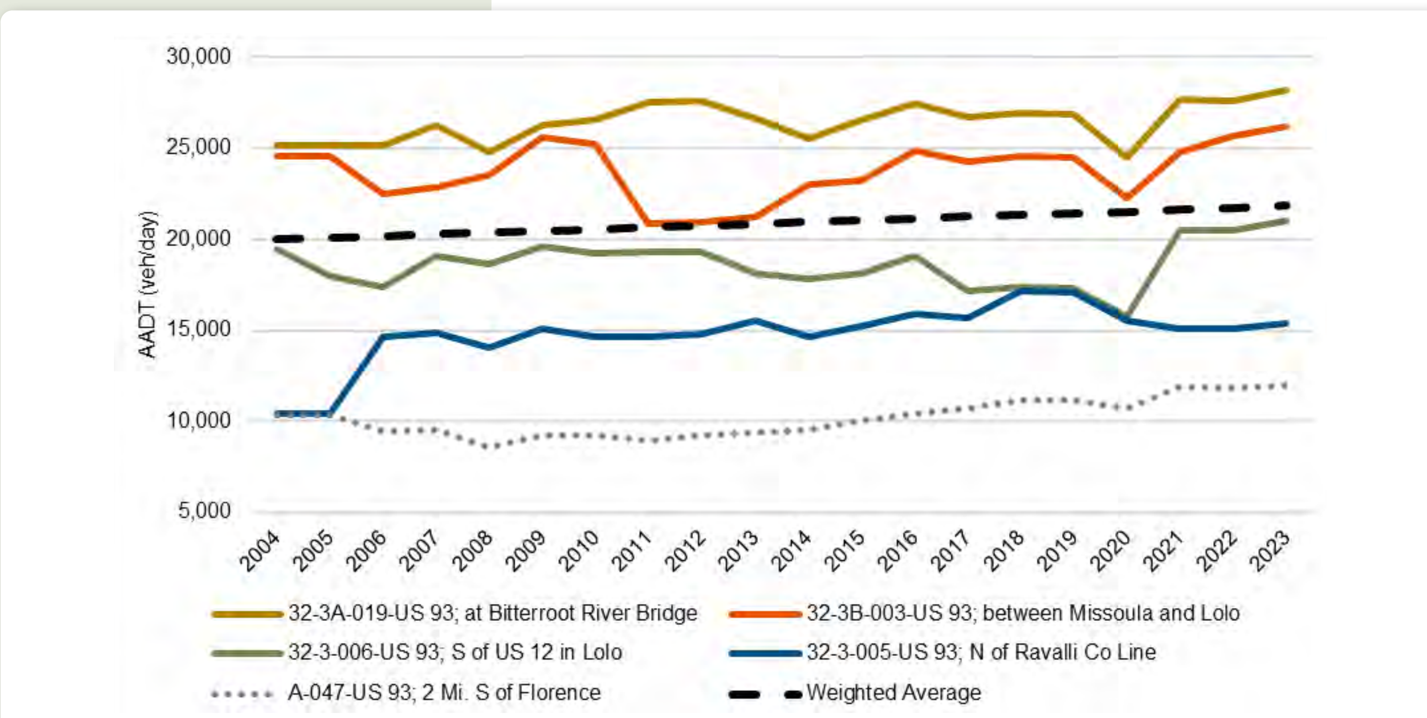

Figure 3: Historic AADT

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TURNING MOVEMENT COUNTS

Turning movement count data was collected at 12 primary intersections within the study corridor to evaluate daily peaks in traffic volumes during the summer peak period. The number of vehicles traveling on US 93 through each intersection was summed for 15-minute intervals throughout the 24-hour collection period and then averaged across all intersections. The distribution of traffic through the intersections is shown in **Figure 4**.

During the morning, traffic volumes begin to rise rapidly around 5:00 AM peaking around 7:30 AM with sustained traffic throughout the day. Beginning around 3:00 PM, traffic volumes increase further, peaking around 5:15 PM. After 5:15 PM, traffic volumes decreased steadily throughout the evening. A clear pattern of commuting traffic is present when looking at the difference between northbound and southbound traffic.

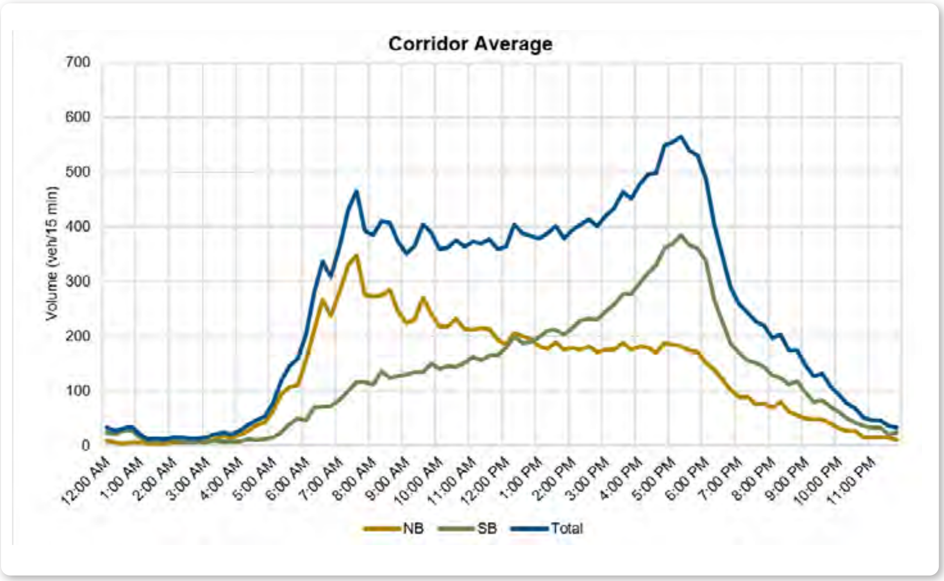

Figure 4: Daily US 93 Traffic Volume Distribution (2023)

FREIGHT AND HEAVY VEHICLES

Heavy vehicle traffic comprises about four to six percent of the vehicle mix on the corridor based on the data provided by MDT's yearly count sites. This results in about 700 to 1,000 trucks each day, on average. US 93 is a major north/south thoroughfare for freight connecting Central Idaho to Missoula and the I-90 corridor and extending further north to the Canadian border. However, the highway is not part of the Primary Highway Freight System in Montana and sees a moderate amount of truck traffic compared to other Montana highways and interstates.

REGIONAL TRAVEL TRENDS

Field-collected data was supplemented by leveraging origin-destination from *StreetLight*, a provider of on-demand traffic data collected from smart phones and navigation devices. This data provides critical information needed to understand travel patterns within the study corridor and the greater region surrounding the corridor. For this analysis, data from 2022 was used. Travel trends for the summer-time periods (June through August) were compared to the off-summer time period (September through May) and the year as a whole. Trends for both passenger vehicles and commercial trucks were examined. Takeaways from the analysis are summarized below.

- There are approximately 16 percent more daily trips during the summer (June - August) than the off-summer timeframe.
- Commercial trucks were found to typically be pass-through trips with no destination or origin along the corridor. About 15 percent of the trucks entering the corridor from the south and 20 percent of those entering from the north stop in Lolo.
- In general, Missoula was the destination for 32 percent of the commercial trucks and 72 percent of all vehicles traveling through the study corridor.
- About 25 percent of all vehicles approaching the corridor from the south end their trip somewhere within the corridor. Conversely, approximately 62 percent of vehicles approaching the study corridor from the north end their trips within the corridor. Both of these findings suggest that the majority of the traffic within the corridor is commuter traffic to Missoula.

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OBSERVED TRAFFIC PATTERNS

At the height of the AM peak (7:15 - 7:45 AM), northbound traffic dominates the highway, with about 75 percent of traffic traveling north. Mild congestion spilling back from Miller Creek Road was observed from traffic entering Missoula. In contrast, the peak PM commute (4:30 - 5:30 PM) reverses this trend, with about 65 percent of traffic traveling south, resulting in significant queuing as vehicles approach Lolo. The PM peak period is characterized by minimal gaps in traffic with notable platooning near signals. During off-peak hours, traffic moves freely throughout the corridor with ample passing opportunities and gaps in traffic for turning vehicles.

Observations and past studies indicate high speeds with large speed differentials (20-25 mph), creating challenges for vehicles trying to enter the highway from minor approaches. Many of the left-turning vehicles from minor approaches used the center TWLTL as an acceleration lane to make the turn in phased movements, crossing oncoming traffic first, then traveling in the TWLTL until a gap opened to enter the traffic stream. Right-turning traffic from US 93 onto minor approaches sometimes obscured the sight distance of turning vehicles from the minor approaches, especially if there was no dedicated right-turn bay present. Additionally, several police patrols were observed in the corridor during the PM peak hours.

In general, congested traffic conditions on US 93 were limited to the weekday AM and PM peak hours and dissipated relatively quickly. Very little queuing was observed outside of at signalized intersections.

2.3.2. Projected Traffic Growth

A variety of residential, commercial, and resource extraction developments are currently ongoing or anticipated along the study corridor. An expansion of the gravel pit located along Old Highway 93 between Rowan Street and Carlton Creek Road is in process. Further development is planned at Rowan Street in the form of a food truck park with space for ten food trucks. Since the Lolo School was relocated to a site approximately one-half mile east of US 93 along Lewis and Clark Drive/Farm Lane, the site of the former Lolo School located at Tyler Way will be redeveloped into a mix of residential, commercial, and open space. A mixed residential and commercial development is also planned for the area south of Bird Lane and west of US 93. Finally, a development including a large mechanics shop and smaller commercial condos is planned for the southwest corner of the Blue Mountain Road and US 93 intersection. These developments all have the potential to impact traffic volumes and travel patterns within the corridor.

It is expected that the corridor will continue to experience moderate traffic growth into the future due to planned and anticipated future development along the corridor in addition to continued increases in tourism activities in the area. When projecting future traffic conditions within the study area, a 1.1 annual percent growth rate was assumed for US 93, which reflects the weighted average of the annual growth rate for the four sites within the study corridor. The growth rates used are considered to be practical yet conservative.

2.3.3. Traffic Operations

Traffic conditions were primarily assessed using two methods: an intersection operational analysis and a segment operational analysis. The intersection level analysis was conducted to gain an understanding of the operational conditions at each primary intersection within the study area while the roadway segment-level operational analysis was conducted to gain an understanding of the traffic operations between the major intersections along the corridor. Additionally, a traffic signal warrant analysis was performed on all of the existing unsignalized public intersections to determine if a signal can be justified based on established criteria.

INTERSECTION OPERATIONAL ANALYSIS

The operational conditions of the study intersections are characterized by Level of Service (LOS), with LOS A representing the best operating conditions and LOS F indicating failing conditions. Under existing conditions, the US 93 approaches generally operate at LOS B or better at all intersections during both the AM and PM peak hours. An exception to this trend is at the US 12 intersection during the PM peak hour, at which time the southbound direction was found to be operating at LOS C. All of the unsignalized intersections have been shown to have operational issues during one or both peak hours due to traffic on the minor street approach. This matches with the driving experience noted during multiple field visits.

The projected conditions analysis shows general increases in delay at the study intersections. The signalized intersections all operate at an LOS of C or better during the AM peak hour. During the PM peak hour, however, the Blue Mountain Road and US 12 intersections were shown to have a LOS of D. For the unsignalized intersections, the main US 93 legs continued to have little to no delay while the LOS for the minor leg approaches degraded in all scenarios.

CORRIDOR OPERATIONAL ANALYSIS

The segment-level corridor operational analysis was used to determine the segment LOS in accordance with the HCM methodology for uninterrupted, multilane traffic flow. The analysis utilizes basic geometric features, traffic volumes, and posted speed limits to determine the average segment speed and vehicle density to calculate LOS for both the north and southbound directions of US 93. Much like the intersection LOS, the LOS scale ranges from “A” which indicates low vehicle density, to “F” which indicates significant vehicle density and traffic congestion.

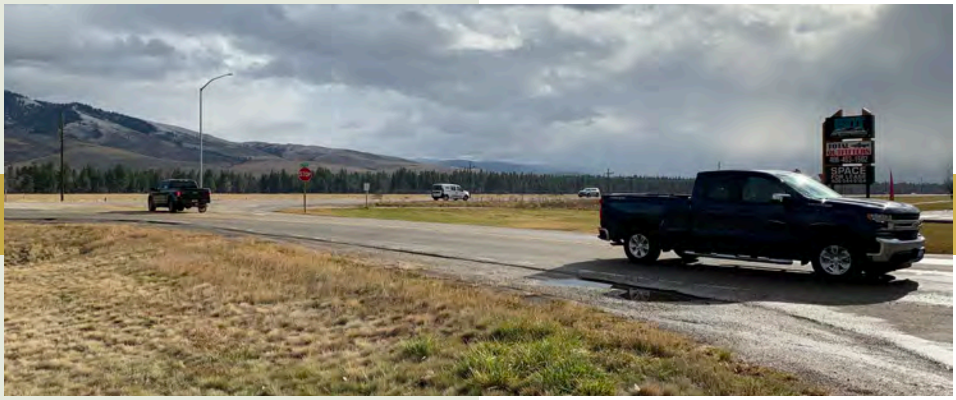
Under existing conditions, each roadway segment is shown to operate at LOS B or better during each peak period. North of Lolo, the AM peak hour demonstrates LOS B in the northbound direction and LOS A in the southbound direction. This is due to the higher volumes traveling northbound to Missoula during the typical AM work commute. This trend flips during the PM peak hour, with the southbound travel direction showing LOS B. Results such as this are common on corridors that have a strong daytime commuting trend.

Under projected conditions, the additional traffic growth resulted in an increase in the density of traffic on all segments. During the AM peak hour, the increased density in the southbound direction was not enough to reduce the LOS of any segment. In the northbound direction, the increase resulted in a worse LOS for all of the segments north of Lolo. All of the segments, however, maintained a LOS of C or better. During the PM peak hour, all of the segments showed a LOS reduced by one letter grade but still maintained a LOS of C or better.

TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant does not determine if a signal is needed at an intersection, only that a signal can be justified based on the nine criteria established in the Manual on Uniform Traffic Control Devices (MUTCD). When at least one traffic signal warrant is met, a traffic signal may be warranted at that intersection. Without meeting at least one traffic signal warrant, the traffic signal is deemed unnecessary by the MUTCD.

Of the 12 unsignalized intersections evaluated in the corridor, three meet at least one signal warrant, Lewis and Clark Drive, Mormon Creek Road, and Old Highway 93. The Long Avenue intersection does not currently satisfy any warrants based on data collected in 2023. However, this intersection is likely to satisfy at least one traffic signal warrant in the near future.



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2.4. SAFETY

More recent crash records were provided by MDT covering the ten-year period beginning January 1, 2012, and ending December 31, 2021. A total of 1,118 crashes were reported within the study area during the ten-year span. Of the 1,118 crashes, 12 resulted in fatalities, 28 resulted in suspected serious injuries, 132 resulted in suspected minor injuries, 87 resulted in possible injuries, and 831 were recorded as resulting in no apparent injuries. Overall, 23 percent of crashes resulted in injuries, while 4 percent resulted in severe (fatal or suspected serious) injuries.

Crash locations were plotted using latitude and longitude assigned to each crash record. Of the 1,118 total crashes, 18 percent occurred at or were related to an intersection and 4 percent were related to a driveway or alley access. The remaining 78 percent of crashes occurred at non-junction locations. **Figure 5** illustrates the density of crashes within the corridor as well as the locations of severe crashes.

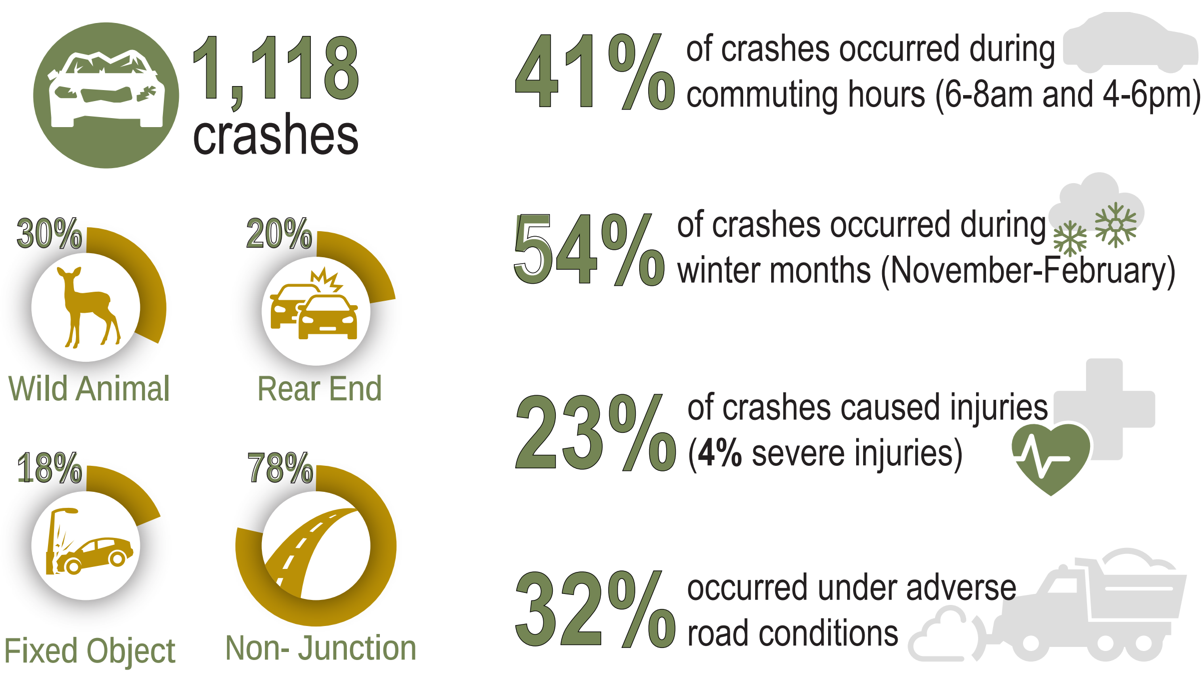
Multiple vehicle crashes involving two vehicles or more accounted for 43 percent of all reported crashes. The most common multiple vehicle crash types were rear end (227), right angle (73), and sideswipe crashes (same direction [66] and opposite direction [15]). Rear end crashes occurred most often in the stretch of highway entering Missoula and within the Lolo area, perhaps relating to congested traffic conditions.

Crashes involving only one vehicle accounted for 57 percent of crashes and were primarily wild animal (335 crashes), fixed object (206), and rollover (50) crashes. A large number of fixed object crashes occurred in the S-curves, including collisions with the concrete barriers.

Overall, wild animal crashes were the most common crash type, accounting for 30 percent of all crashes. About 63 percent of wild animal crashes occurred when it was dark outside, 7 percent occurred at dawn or dusk, and the remaining 29 percent of crashes occurred during daylight hours. Location-based mapping indicates a concentration of wild animal crashes around Lolo Creek, Lazy K Ranch Road, just north of Rowan Street, and in the stretch of roadway between RP 77 and 79.

Inclement weather such as snow or rain was reported during 22 percent of crashes while 32 percent of crashes occurred on wet, snowy, icy, slushy, or frost-covered roads. Road surface conditions were reported as a contributing factor in 76 of the multiple vehicle crashes. Weather related crashes were most prevalent in the S-curve section of the highway.

Regarding timeframe, about 41 percent of crashes occurred during commuting hours, either between 6:00 AM and 8:00 AM or between 4:00 PM and 6:00 PM. Over half, 54 percent, of crashes occurred during winter months, November through February.



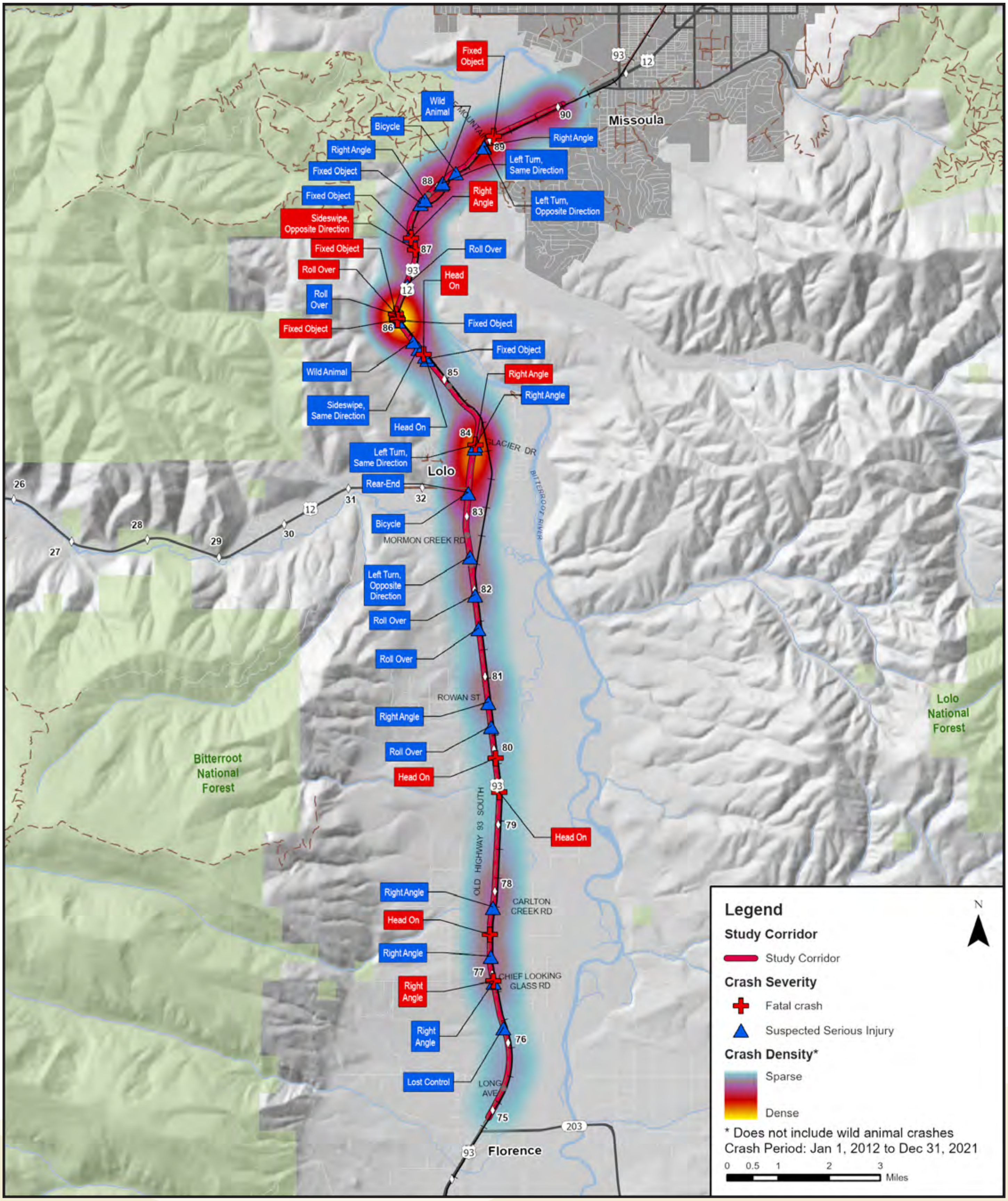


Figure 5: Crash Density and Severe Crash Locations

2.4.1. Systemic Analysis

A systemic analysis was conducted to understand common infrastructure, environmental, and behavioral conditions contributing to crashes to help identify potential corridor-wide improvements.

- Crashes occurred more often in **high speed** (65 mph+) sections of the highway [73 percent of all crashes and 85 percent of severe crashes].
- A majority (88 percent) of **head on** crashes occurred before centerline **rumble strips** were installed. About 35 percent of head on crashes occurred in sections where there is a **TWLTL** without centerline rumble strips installed today.
- About 18 percent of crashes were **fixed object** crashes -- 49 percent of which were collisions with **concrete barrier rail**.
- **Sideswipe** and **rollover** crashes were more common on high speed segments without physical medians (53 percent and 78 percent, respectively).
- **Impairment** was a factor in 35 percent of severe crashes and 7 percent of all crashes. Common driver behaviors included **distracted driving** (19 percent), speeding (12 percent), **following too closely** (7 percent), and **failure to yield right-of-way** (6 percent).
- Adverse road conditions were identified as a contributing circumstance in 20 percent of crashes, while adverse weather conditions were specifically noted as contributing factors in 6 percent of crashes. Crashes occurring under **adverse road and weather conditions** were especially prevalent in the s-curve section.

2.4.2. Severe Crash Narrative Review

At the crash scene the responding officer prepares a crash narrative detailing the sequence of events and circumstances related to crashes. The crash narratives for the **40 severe injury crashes** were reviewed to better understand the circumstances of these crashes. Key findings are summarized below.

- Over one-third (35 percent) of severe crashes involved an **impaired driver**. Two severe crashes were secondary crashes related to the scene of a prior crash, both involving impaired drivers.
- About 13 percent of severe crashes involved a **vehicle malfunction**.
- Crashes involving a driver who lost control on an **icy or snow-covered road** because they were **driving carelessly or too fast** for conditions accounted for 10 percent of severe crashes.
- About 23 percent of severe crashes involved a vehicle **misjudging the available gap** when crossing or turning on/off US 93. In 44 percent of those crashes, the driver **failed to stop** at the stop sign on the minor approach before turning onto the highway.

2.4.3. Citation Data

Citation records were reviewed to understand unlawful behavioral trends which are prominent in the corridor. Over the 10-year analysis period, **6,088 drivers were issued citations** within the corridor with about 9 percent of citations issued due to a crash. **Speed** violations were the most common (47 percent), followed by **seat belt** violations (19 percent), and **driving under the influence** (4 percent). About 4 percent of citations were issued to commercial trucks while about 1 percent of citations were issued to motorcyclists (64 percent of motorcyclists were cited with speed violations).

2.4.4. Carcass Data

Over the 2012-2021 period, **MDT maintenance crews collected 444 animal carcasses** along the study corridor. By comparison, 336 wild animal crashes were reported over the same period. **Deer accounted for the vast majority** of carcasses (89 percent) with whitetail deer being the most common species involved. Other large mammal carcasses were also collected, including 3 black bears, 1 mountain lion, 14 elk, and 31 other small mammals. Animal mortality is generally greater in **late spring** (May through June) and **winter months** (October through January). The most whitetail deer carcasses were collected in November (73), May (42), potentially corresponding to migration, mating, and breeding periods.

Figure 6 illustrates the locations of the collected carcasses. In general, carcasses were most commonly retrieved on the **fringes of more developed areas** and in parts of the corridor which are mostly surrounded by **open space**. Carcasses, and wildlife conflicts in general, were also more common in sections of the highway with **no physical median** (i.e., concrete barrier) and with reduced roadway width (i.e., no turn lanes), which are presumably easier highway crossing locations for wildlife.

Currently the study corridor provides limited opportunities for safe passage for wildlife. Known wildlife movement areas and important habitat linkages for elk, moose, deer, wolves, lions, and grizzly bears occur within the canyon between Missoula and Lolo, the Lolo Creek and McClain Creek riparian areas, and south of Lolo between Delarka Drive and Carlton Creek Road.

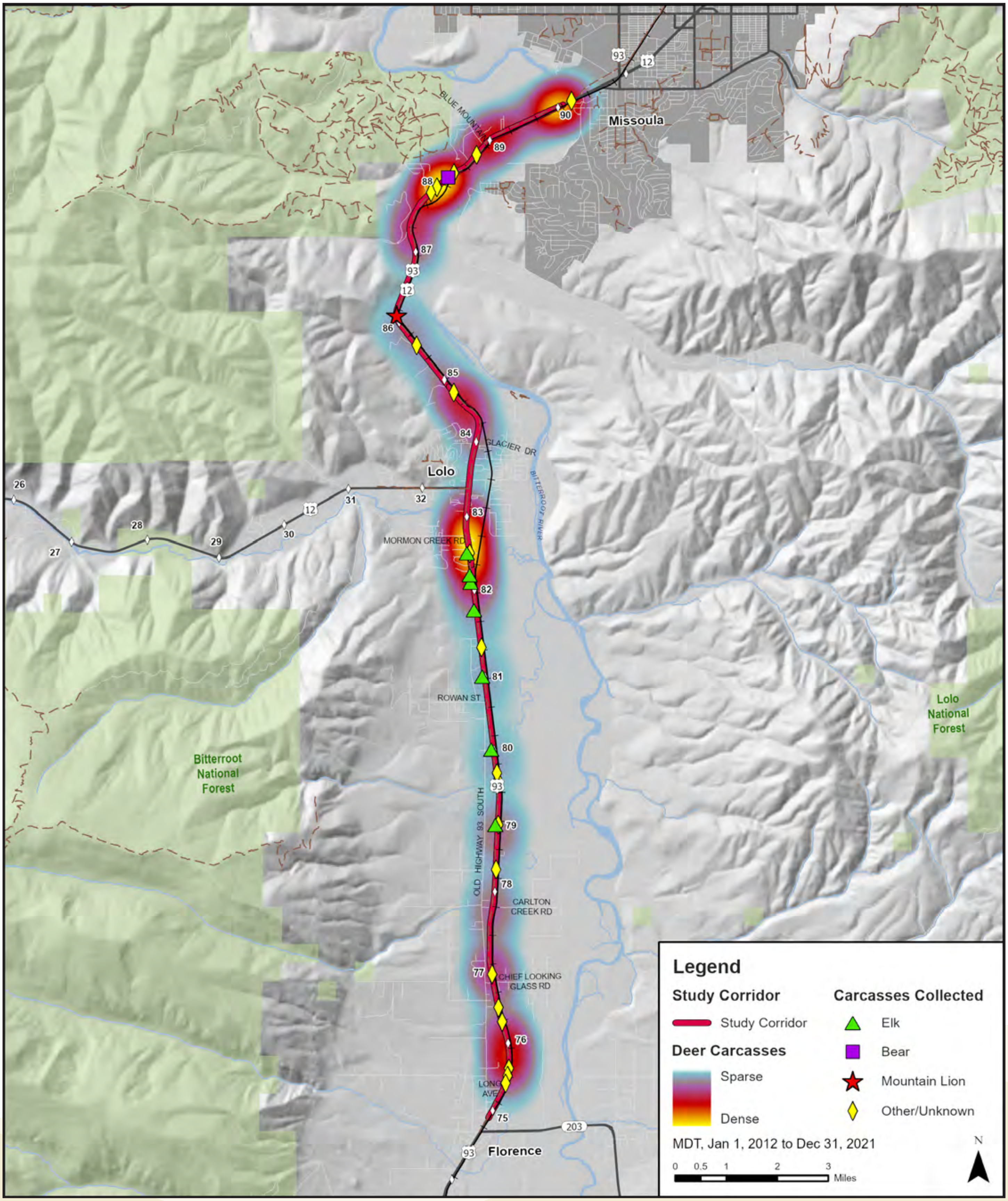


Figure 6: Wild Animal Carcasses

3.0 IMPROVEMENT IDENTIFICATION AND EVALUATION

This study identified and evaluated a range of potential options to improve safety and traffic flow on US 93 between Missoula and Florence while enabling feasible implementation and minimizing impacts to adjacent landowners, the environment, and the traveling public. This effort attempted to best address the primary areas of concern identified through public and stakeholder outreach, discussions with the MDT study team, review of past and current planning documents, and technical analysis of physical features, traffic, safety, and environmental conditions while also meeting the purpose and need of the highway.

A sequential approach was used to identify, screen, and select the preferred corridor configuration with continuous public feedback integrated into the process as outlined to the right and in **Figure 7**. The evaluation process and results are discussed in more detail in the following sections.

Step 1: Existing Conditions Analysis: Conduct an analysis of present corridor conditions to understand needs, opportunities, and constraints.

Step 2: Identify Key Issues: Synthesize the findings from the existing conditions analysis to identify the most pressing issues within the corridor and develop goals to address key issues.

Step 3: Strategy Identification: Identify a comprehensive set of big-picture ideas that may address key issues within the US 93 corridor at the intersection, segment, and corridor-wide levels.

Step 4: Identify Improvement Concepts: Refine strategies and develop location-specific improvements for the corridor and key intersections. Four corridor improvement concepts were identified and applied to five distinct segments of the corridor. Five intersection alternatives were identified and applied to nine key intersections within the corridor.

Step 5: Evaluate Improvement Concepts: Conduct two analyses to evaluate the corridor concepts and intersection alternatives based on criteria aligning with study goals. Ultimately, two corridor concepts were identified for each corridor segment and intersection alternatives exhibiting fatal flaws were removed from further consideration.

Step 6: Identification of Feasible Recommendations: Identify an optimized corridor configuration that strategically blends the corridor concepts and intersection improvements to best meet corridor goals.

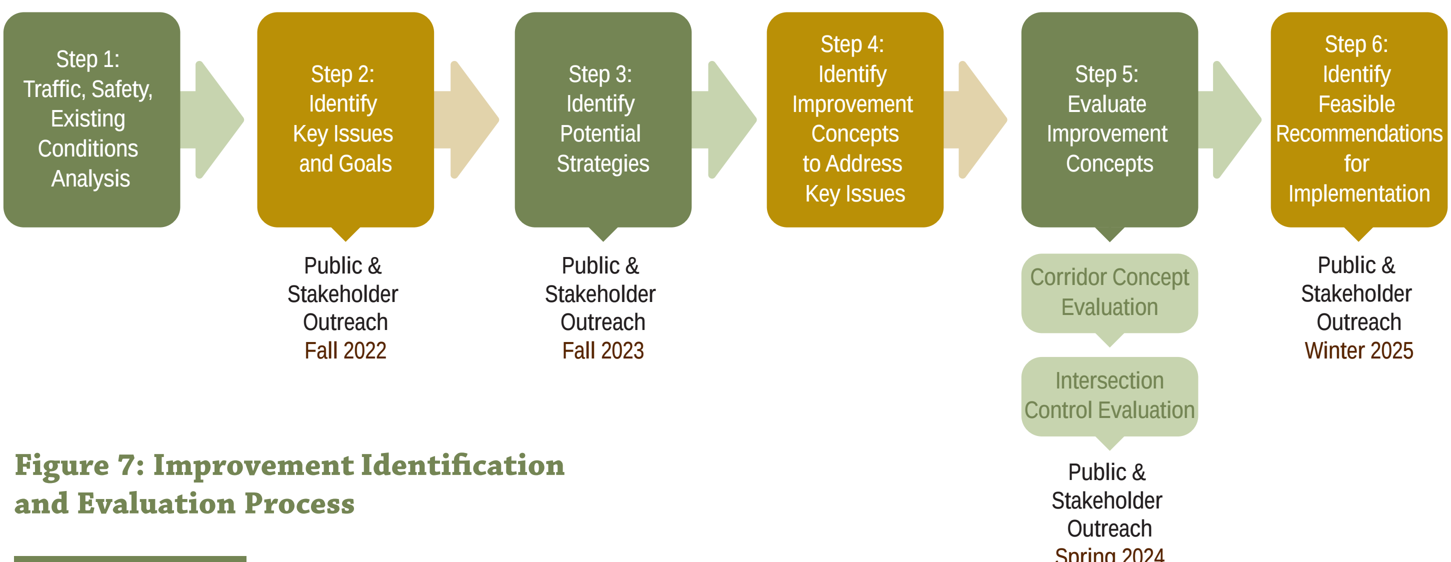


Figure 7: Improvement Identification and Evaluation Process

3.1. STUDY GOALS

A comprehensive analysis of existing traffic, safety, and environmental conditions was conducted for the study corridor. **Chapter 2** provides an overview of the analysis. Given these findings and feedback from the public and stakeholders, it was concluded that the most pressing issues within the corridor include safety and overall corridor efficiency. These issues were distilled into a focused set of goals and objectives intended to guide the development and evaluation of potential improvement options. The improvement options identified in this study are designed to address these goals and objectives to the greatest extent possible.

The identified goals and objectives are summarized in **Figure 8**. The primary goal of this study is to enhance roadway safety by minimizing fatalities and serious injuries which can be achieved by reducing conflicts and encouraging appropriate speeds. As secondary goals, the study seeks to improve traffic operations and mobility, while also identifying improvements that are both feasible and cost-effective to implement.

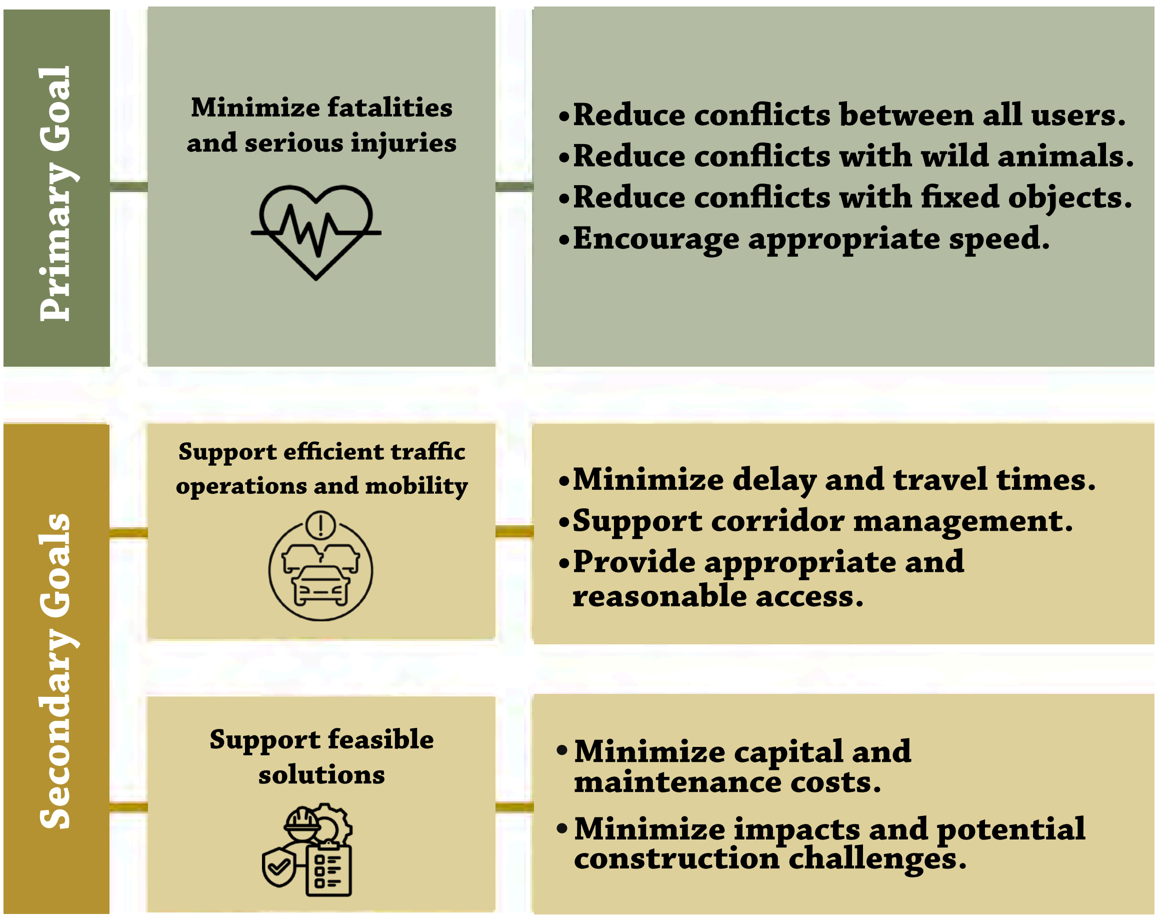


Figure 8: Study Goals and Objectives

3.2. STRATEGY IDENTIFICATION

In collaboration with the MDT study team, a comprehensive list of potential strategies was developed for the US 93 corridor, focusing on enhancing traffic safety and efficiency while being sensitive to the unique contexts and potential constraints within the corridor. The strategies were organized into three categories based on the scale of implementation: intersection, roadway segment, and corridor-wide. This structured approach lays the groundwork for targeted improvements that address the specific needs of the US 93 corridor, enhancing safety and mobility for all road users.

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INTERSECTION STRATEGIES

These strategies are intended to improve safety and traffic flow at key junctions along the corridor, including lane modifications, traffic signal optimization, the installation of roundabouts to promote smoother traffic flow, and innovative designs like reduced conflict intersections to minimize turning conflicts.

LANE MODIFICATIONS

Potential improvements include:

- Right- or left-turn lanes
- Right- or left-turn acceleration lanes
- Left-turn staging
- TWLTL

TRAFFIC SIGNALS

Potential improvements include:

- New signals (if warranted)
- Signal modifications (protected phasing, timing changes, etc.)

ROUNDABOUTS

Roundabouts can help reduce travel speeds while providing continuous traffic flow through intersections. On US 93, roundabouts would need to be configured to accommodate multiple lanes.

REDUCED CONFLICT INTERSECTIONS

Potential improvements include:

- RCUT
- Continuous T
- Continuous Green T (if warranted)

ROADWAY SEGMENT STRATEGIES

This category addresses specific sections of the highway, incorporating measures such as Intelligent Transportation Systems (ITS) for better traffic management, various roadway features to improve visibility and safety, traffic calming measures, and wildlife accommodations to reduce vehicle-wildlife conflicts.

INTELLIGENT TRANSPORTATION SYSTEMS

Potential improvements include:

- Dynamic curve warning
- Variable speed limits
- Weather alerts
- Incident alerts

ENHANCED ROADWAY FEATURES

Potential improvements include:

- High friction surfacing
- Roadside lighting
- Enhanced pavement markings and signing
- Widened medians
- Centerline rumble strips

TRAFFIC CALMING

Potential improvements include:

- Urban transition zones
- Speed feedback signs
- Landscaping
- Optical speed bars

WILDLIFE ACCOMMODATIONS

Potential improvements include:

- Fencing
- Grade-separated crossings
- Detection/activated signs
- Improved visibility (vegetation management, lighting, etc.)

CORRIDOR-WIDE STRATEGIES

These are broader strategies that apply to the entire corridor, including access management to optimize vehicular access points, divided highway features for increased safety, reduced conflict highway designs, and suburban design elements to align with the transition from rural to urban settings.

ACCESS MANAGEMENT

Potential improvements include:

- Access consolidation
- Partial movement accesses

DIVIDED HIGHWAY

Potential improvements include:

- Concrete barrier rail
- High-tension cable rail
- Vegetated median

REDUCED CONFLICT DESIGN

Potential improvements include:

- Reduced conflict intersections
- Controlled access

SUBURBAN DESIGN

To match and support suburban context, the following improvement may be used:

- Curb and concrete median
- Slower speeds
- Lighting

3.3. IMPROVEMENT CONCEPT IDENTIFICATION

In this step, the identified strategies were refined to develop location-specific improvement concepts for the US 93 corridor and its key intersections. Four corridor improvement concepts were established and applied to five distinct segments of the corridor. These concepts aim to enhance safety, traffic flow, and the overall user experience while aligning with the land uses and unique contexts of each segment. Additionally, five intersection alternatives were designed and applied to nine key intersections within the corridor. These alternatives include a variety of traffic control options and geometric improvements identified to address operational and safety concerns.

3.3.1. Corridor Segments and Key Intersections

For evaluation purposes, the corridor was split into five segments according to similarities in context, environmental conditions, safety concerns, and traffic volumes. Additionally, nine key intersections within the corridor were identified for an in-depth alternatives analysis based on factors such as crash histories, traffic volumes, proximity to neighboring intersections, and land constraints. **Figure 9** identifies the five segments and the nine key intersections used as the basis for the evaluation. A brief summary of the key concerns for each segment and intersection is provided on the following pages.

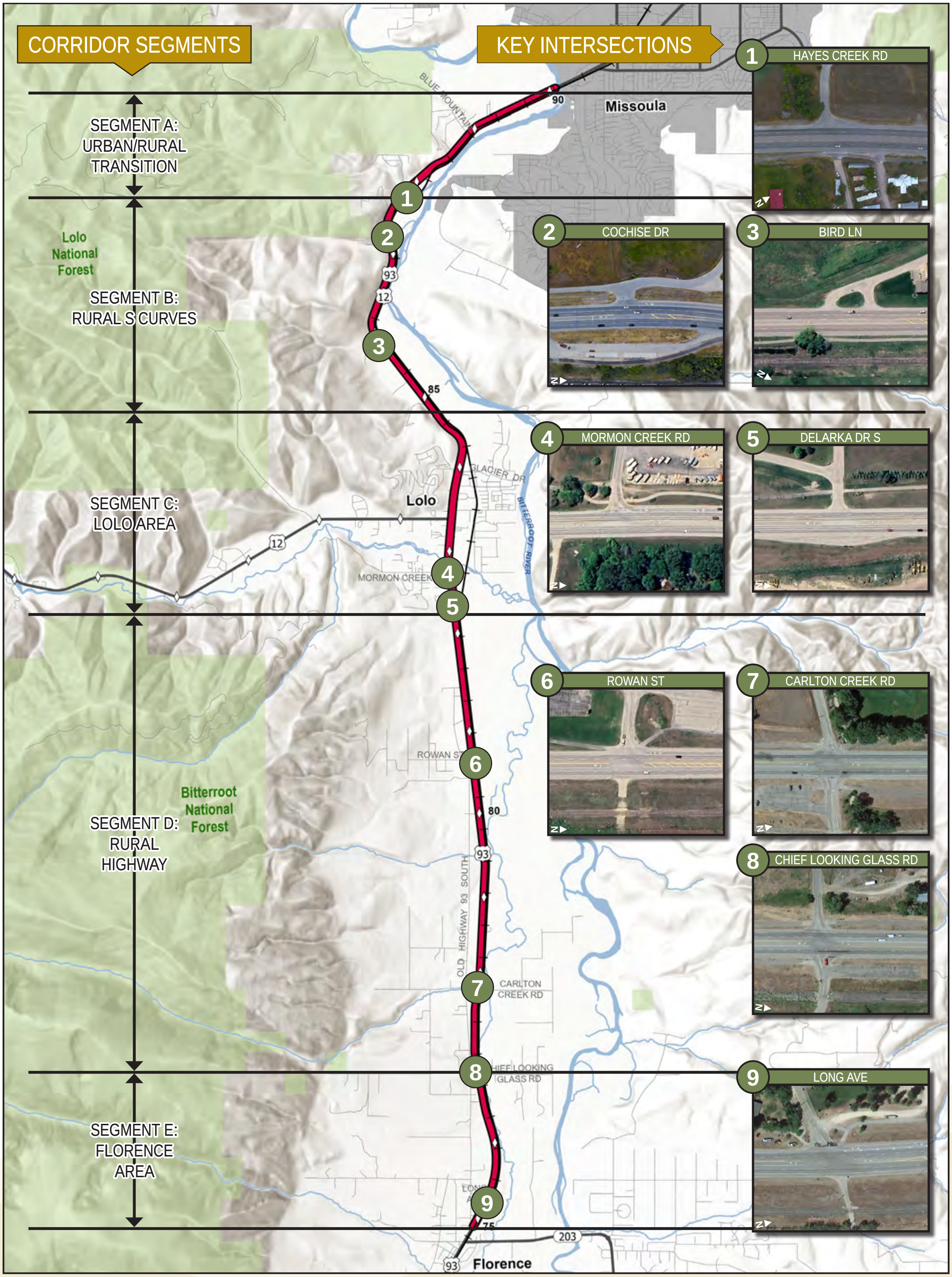


Figure 9: Evaluation Segments and Intersections

SEGMENT A: URBAN/RURAL TRANSITION

Segment A begins at Buckhouse Bridge and ends at Hayes Creek Road. It is characterized by high travel speeds with a suburban context. The transition zone into the Missoula urban context can cause conflicts especially at peak travel times.

1 HAYES CREEK ROAD is configured as a stop-controlled, four-legged intersection with a TWLTL on US 93. The surrounding area is primarily residential, and the posted speed limit on US 93 is 65 mph. Over the 2012 to 2021 period, there were 10 reported crashes at the intersection, with no severe injuries recorded.

SEGMENT B: RURAL S CURVES

Segment B starts at Hayes Creek Road and extends to the northern edge of Lolo at Valley Grove Drive. Conflicts related to limited lighting or adverse weather/road conditions are common through this section. A trend of fixed object crashes with concrete barrier rail was reported. High travel speeds occur in the transition between the straight and curved sections.

2 COCHISE DRIVE is configured as a stop-controlled, three-legged intersection with dedicated northbound left- and southbound right-turn lanes. A pullout is located on the east side of the highway. The area serves both residential and commercial land uses, with a 65 mph speed limit on US 93. Between 2012 and 2021, the intersection experienced 8 crashes, including 1 fatality.

3 BIRD LANE is configured as a stop-controlled, three-legged intersection, with the two driveways forming the minor approach leg being recently reconstructed into a single, consolidated approach. A TWLTL is provided on US 93 and the speed limit is 65 mph. The surrounding area is primarily residential. Over the 10-year analysis period, there were 10 reported crashes at the intersection, though none resulted in severe injuries.

SEGMENT C: LOLO AREA

The Lolo Area segment extends from Valley Grove Drive to Delarka Drive South. High travel speeds and poor visibility around the curve entering the suburban context of Lolo can cause conflicts especially at peak travel times.

4 MORMON CREEK ROAD is configured as a stop-controlled, three-legged intersection with a dedicated southbound right-turn lane. A TWLTL is provided on US 93 and the speed limit is 45 mph. The surrounding land use includes residential, commercial, and light industrial areas. Between 2012 and 2021, 7 crashes were reported at the intersection with no severe injuries.

5 DELARKA DRIVE SOUTH forms a loop with Delarka Drive North on US 93. The southern approach is a stop-controlled, three-legged intersection with a TWLTL on US 93. Delarka Drive provides residential access with a light industrial facility across the highway. US 93 is signed at 45 mph through the intersections. Between 2012 and 2021, there were 5 reported crashes with no severe injuries.

SEGMENT D: RURAL HIGHWAY

Segment D extends from the southern edge of Lolo at Delarka Drive South to Chief Looking Glass Road. This rural section of highway is characterized by high speeds, undivided lanes, full turning movements from all intersecting approaches, and sparse roadway lighting. These conditions contribute to conflicts between mainline and entering/exiting vehicles. Wild animal conflicts are also common through this section.

6 **ROWAN STREET** is configured as a stop-controlled, three-legged junction with an intersecting driveway on the east side of US 93. Dedicated northbound left-turn and southbound right-turn lanes are provided on US 93 with access to both residential and commercial land uses, Old Hwy 93, and a park-and-ride lot. The speed limit on US 93 is 70 mph. From 2012 to 2021, there were 9 reported crashes resulting in 1 suspected serious injury.

7 **CARLTON CREEK ROAD** is configured as a stop-controlled, four-legged intersection with a slight skew and dedicated left-turn lanes provided on US 93. The surrounding area is primarily residential, with access to Old Hwy 93 and a park-and-ride lot. The speed limit on US 93 is 70 mph. Between 2012 and 2021, there were 8 reported crashes resulting in 2 suspected serious injuries.

8 **CHIEF LOOKING GLASS ROAD** is configured as a stop-controlled, four-legged intersection with dedicated left-turn lanes on US 93. The intersection provides access to residential properties, Old Hwy 93, and a park-and-ride lot. The speed limit on US 93 is 70 mph. Between 2012 and 2021, the intersection experienced 13 crashes resulting in 1 fatality and 7 suspected serious injuries.

SEGMENT E: FLORENCE AREA

The Florence Area segment extends from Chief Looking Glass Road to the end of the corridor at Old Highway 93. As US 93 approaches Florence, the highway transitions from high-speed rural into suburban context. Traffic for Florence-Carlton School contributes to intersection conflicts at Long Ave.

9 **LONG AVENUE** is configured as a stop-controlled, three-legged junction with an intersecting driveway on the east side of US 93. Dedicated left-turn lanes are provided on US 93, along with a southbound right-turn lane. The intersection provides access to both residential and commercial land uses, Old Hwy 93, and Florence-Carlton Schools. The speed limit on US 93 is 45 mph. Between 2012 and 2021, 2 crashes were reported, with no severe injuries.

3.3.2. Corridor Concepts

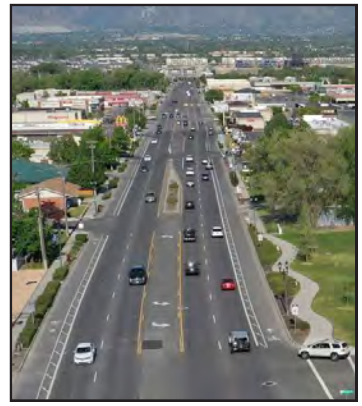
Four improvement concepts were identified for the US 93 corridor. Concepts are characterized according to a general design principle, with individual design features that can be adapted and applied to fit the context of a specific corridor segment. Generalized descriptions of the concepts are presented on the following pages.

SUBURBAN DESIGN

CONCEPT 1

Includes varying combinations of the following design features:

- Redesign roadway with 45-55 mph design speed
- Utilize raised center medians (minimal change to access)
- Incorporate curb, gutter, sidewalk, and/or landscaping, as appropriate
- Install roadway lighting
- Integrate additional traffic calming features as needed (ITS, speed feedback signs)



MANAGED ACCESS DESIGN

CONCEPT 2

Includes varying combinations of the following design features:

- Maintain existing design speeds
- Consolidate access points as much as possible and maintain full access at remaining minor approaches
- Provide full movements and intersection control at major intersections (signals, roundabouts)
- Utilize divided highway and raised median features as appropriate to limit full access movements
- No U-turn options except for emergency access

REDUCED CONFLICT DESIGN

CONCEPT 3

Includes varying combinations of the following design features:

- Maintain existing design speeds
- Eliminate full-movement access except at controlled locations
- Use reduced conflict intersection designs (Continuous T, Roundabout, Reduced Conflict U-Turn [RCUT])
- Divide highway using raised medians, grassy medians, concrete barriers, cable rail, etc.
- Provide U-turn options at periodic locations




INCREASED CAPACITY DESIGN

CONCEPT 4

Includes varying combinations of the following design features:

- Maintain existing design speeds
- Include three travel lanes in each direction
- Implement full access management
- Use reduced conflict intersection designs (Continuous T, Roundabout, RCUT)
- Prioritize operations and accommodations for future growth


CONCEPTS ELIMINATED FROM CONSIDERATION

Through public and stakeholder involvement efforts, several other potential improvements, such as light rail or alternative routes, were proposed. While these concepts were explored and considered by the project team, they were ultimately eliminated from further consideration because the concepts were determined infeasible to implement within the corridor.

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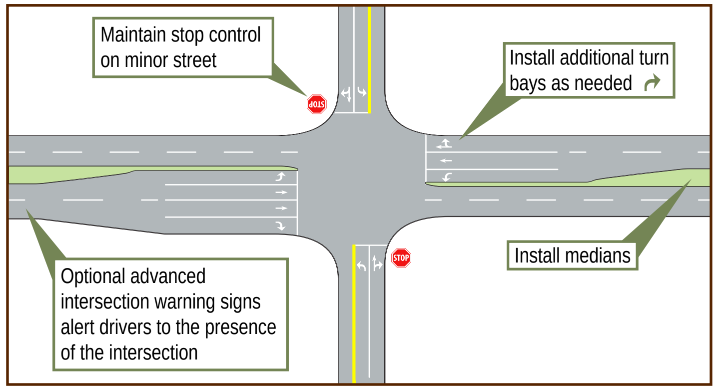
3.3.3. Intersection Alternatives

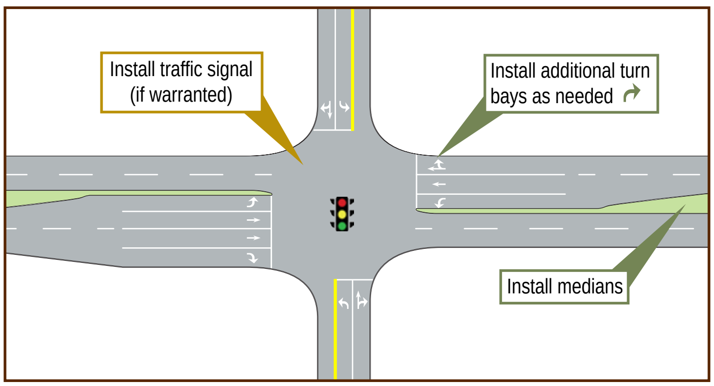
A list of improvement alternatives was developed for the major intersections within the corridor. The alternatives include a variety of traffic control options and geometric improvements with the intent of addressing identified operational and safety concerns. A total of five alternatives were identified. Due to differences in existing intersection characteristics, only the alternatives that were considered applicable to each intersection were evaluated. The alternatives are presented here.

ENHANCED STOP CONTROL



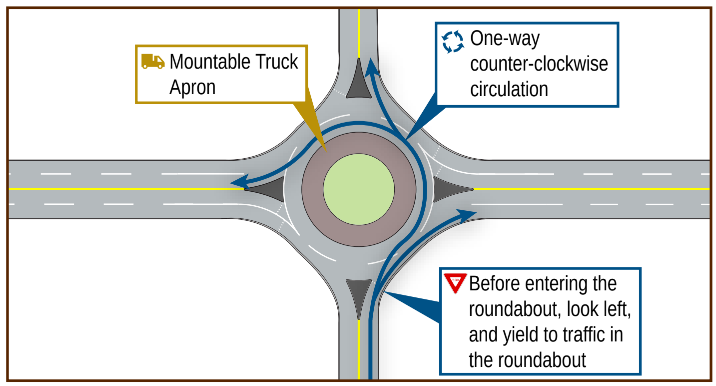
- Provide stop control on minor approach legs
- Provide additional lanes to accommodate turning vehicles as needed
- Allow all turning movements

TRAFFIC SIGNAL



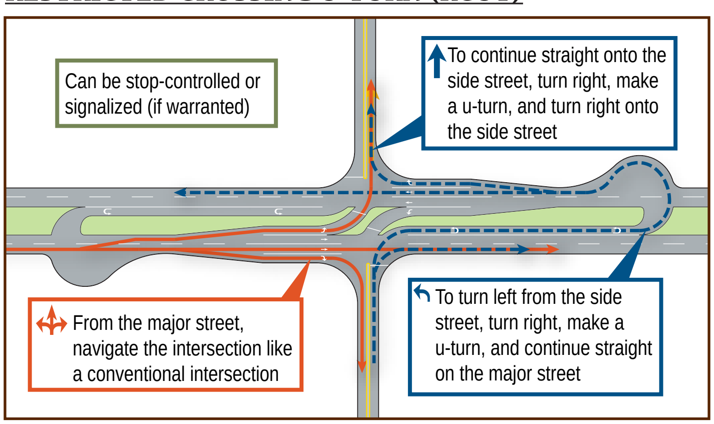
- Use a traffic signal to direct and control traffic
- Provide appropriate turn lanes and signal phasing
- Allow all turning movements

MULTILANE ROUNDABOUT



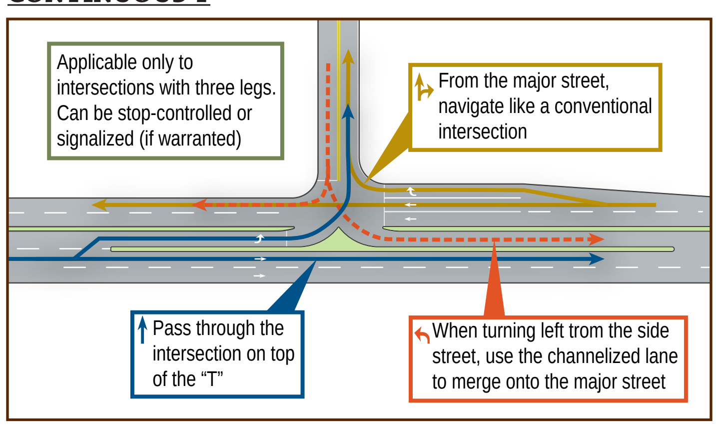
- Use a roundabout to direct and control traffic
- Entering vehicles yield to circulating traffic
- Allow all turning movements

RESTRICTED CROSSING U-TURN (RCUT)



- Allow right and left turns from mainline to minor approaches
- Allow only right turns from minor approaches
- Provide turnarounds at downstream locations
- Provide unrestricted mainline traffic flow
- Stop control on minor approach with future signalization option if warranted

CONTINUOUS T



- Use only at three-legged intersections
- Provide a channelized receiving lane for left-turning vehicles from the minor approach to merge onto the mainline
- Stop control on minor approach with future signalization option if warranted

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3.4. IMPROVEMENT CONCEPT EVALUATION

This section presents the screening and evaluation processes used to assess the proposed improvement concepts for the *US 93-Missoula to Florence Corridor Study*. The goal of this evaluation was to identify the most effective solutions for enhancing safety, promoting efficiency, and minimizing impacts within the corridor, while also aligning with the study's specific objectives.

The **corridor concept evaluation** focused on assessing long-term design alternatives for each study segment. A comprehensive screening process was applied to determine which concepts best met the study goals and objectives, with the top-performing alternatives advancing for further consideration. Similarly, the **intersection control evaluation** process used an objective, data-driven framework to assess the effectiveness of various intersection treatments, considering factors such as safety, traffic flow, and feasibility. Together, the results of these evaluations provide a solid foundation for the development of a cohesive corridor design that effectively addresses the identified needs and concerns within the US 93 corridor.

3.4.1. Corridor Concept Evaluation

Using the improvement concepts identified for each of the corridor segments, a comprehensive screening process was conducted. The screening involved a qualitative analysis of applicable corridor concepts for each of the five corridor segments to determine how well it would meet the goals and objectives of the *US 93-Missoula to Florence Corridor Study*. In support of the study goals, the objectives became screening criteria for the evaluation as shown in **Figure 10**. Concepts were rated for each screening criteria according to a Very Good to Very Poor scale as shown in **Table 1**. To be considered for further evaluation, a concept must PASS the primary goal by scoring an average FAIR rating and score highly under the secondary goals. Only the top two performing concepts for each segment were considered for further evaluation. Detailed screening results are provided in **Appendix A**.

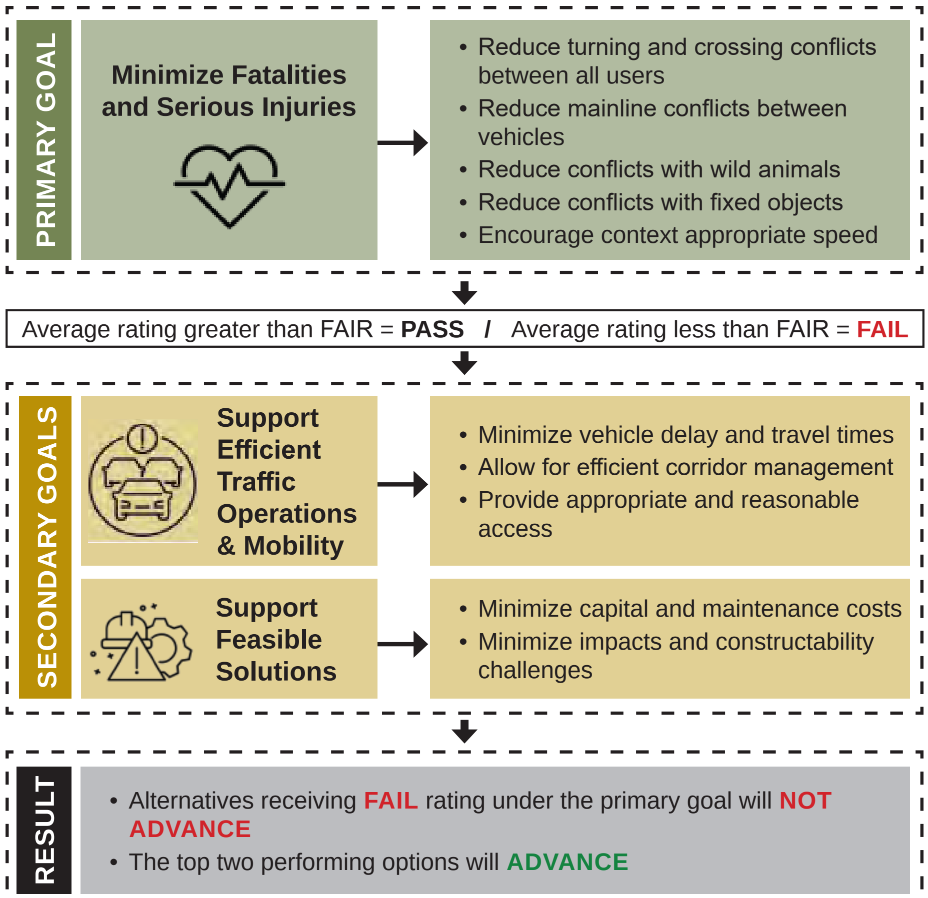

Figure 10: Corridor Concept Evaluation Process

Table 1: Corridor Concept Evaluation Rating Definitions

Goal	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
Safety	Greatest potential for reduction in conflicts and severe crashes	Potential for major reduction in conflicts and severe crashes	Potential for moderate reduction in conflicts and severe crashes	Potential for minimal reduction in conflicts and severe crashes	No anticipated reduction (or increase) in conflicts and severe crashes
Operations	Greatest improvement in traffic operations	Major improvement in traffic operations	Moderate improvement in traffic operations	Minimal improvement in traffic operations	No improvement (or deterioration) in traffic operations
Impacts	Least amount of impacts	Minimal impacts	Moderate impacts	Major impacts	Greatest amount of impacts

EVALUATION RESULTS

Based on the corridor concept screening, two long-term reconstruction concepts were advanced for each segment, as outlined in **Table 2**. Concept 4: Increased Capacity Design was not advanced for any of the segments due to significant concerns around safety, impacts, constructability challenges, and high costs. Specifically, the design's potential to increase travel speeds, introduce more weaving conflicts, and create barriers for wildlife crossings made it unsuitable for implementation. Concept 1: Suburban Design was advanced for segments in more developed areas such as Missoula, Lolo, and Florence, where the focus on slower speeds, sidewalks, medians, and traffic calming features is appropriate for the urban context and supports pedestrian safety and improved traffic flow. Concept 2: Managed Access Design was advanced across all segments for its ability to reduce redundant access points, simplify traffic flow, and enhance wildlife management through fencing and concentrated crossing points, while also allowing for efficient traffic movement. Concept 3: Reduced Conflict Design was recommended for rural portions of the highway, including the S-curves and the section between Lolo and Florence, where the design's focus on reducing turning conflicts and utilizing reduced conflict intersection designs provides the most safety benefit, especially in areas with higher crash risks. However, the potential for increased lane change conflicts and out-of-direction travel in more developed areas led to its exclusion in those locations. As a result, each segment is expected to adopt either Concept 1 or Concept 3, with key elements of access management from Concept 2 integrated across the corridor to enhance safety and traffic flow.

Table 2: Corridor Concept Evaluation Results

Segment	Concept 1: Suburban Design	Concept 2: Managed Access Design	Concept 3: Reduced Conflict Design	Concept 4: Increased Capacity Design
A Urban/Rural Transition	ADVANCE	ADVANCE	X	X
B Rural S Curves	X	ADVANCE	ADVANCE	X
C Lolo Area	ADVANCE	ADVANCE	X	X
D Rural Highway	X	ADVANCE	ADVANCE	X
E Florence Area	ADVANCE	ADVANCE	X	X

3.4.2. Intersection Control Evaluation

The screening methodology for the key intersections was developed based on FHWA's *Intersection Control Evaluation (ICE)* process. The ICE process is a data-driven approach developed to objectively evaluate and screen alternatives based on a variety of evaluation criteria. Four evaluation criteria were selected for the analysis, derived from the issues and concerns identified at the study intersections, as well as overall study goals. **Table 3** outlines the evaluation criteria, including a description of the elements and methodology used for both qualitative and quantitative components.

Table 3: Intersection Control Evaluation Criteria

Criteria	Description	Methodology
Safety	• Reduce vehicle conflicts • Address historic crash trends • Provide adequate visibility and sight distance	• Reviewed relevant Crash Modification Factors (CMFs) to understand how changes in traffic control and roadway configuration may affect safety • Compared to the crashes that occurred within 250 feet of each intersection (2012-2021)
Operations	• Improve intersection performance • Reduce vehicle delay • Accommodate all users • Facilitate efficient highway operations	• Used the FHWA *Capacity Analysis for Planning of Junctions* (Cap-X) tool to assess the overall performance of various configurations based on the volume to capacity (V/C) ratio • Assessed operations under existing conditions using 2022 and 2023 traffic data and projected (2045) conditions using a 1.0% annual growth rate • Considered potential for signal warrants to be met under existing & projected conditions • Qualitatively assessed the ability of each alternative to facilitate efficient US 93 highway operations for mainline traffic including large trucks and emergency personnel
Impacts	• Minimize impacts to the environment • Minimize adjacent land impacts • Minimize construction impacts	• Assessed the relative level of impact to the environment and adjacent land uses including potential right-of-way acquisitions or conversion of open space to developed land • Considered the constructability and traffic impacts that may be experienced during construction
Implementation	• Balance improvement benefits and costs • Enable reasonable project delivery timeframe	• Balanced relative implementation costs and anticipated project benefits • Considered overall project cost as a potentially prohibitive factor. High-cost projects may take a longer time to implement while low-cost improvements are generally easier to implement in the short term

All intersection alternatives were evaluated on a qualitative scale of very poor, poor, fair, good, and very good to compare their performance relative to other alternatives. Lower scores indicate poor performance and/or high impacts, while higher scores reflect exceptional performance and/or low impacts. Any alternative that received a very poor rating for any of the four evaluation criteria was deemed to have fatal flaws and was automatically eliminated from further consideration. Detailed screening results are provided in **Appendix B**.

3.4.3. Evaluation Results

Based on the ICE analysis, one or more intersection control alternatives were advanced for each of study intersection, as shown in **Table 4**. Alternatives exhibiting fatal flaws under any of the evaluation criteria were eliminated from further consideration. The results of the analysis indicated that several alternatives may be viable for each intersection and will need to be evaluated in greater detail during future design phases depending on selected corridor concepts, neighboring intersection configurations, funding availability, and landowner coordination. For instance, the installation of a roundabout may only be practical if all major intersections within the corridor segment are designed as roundabouts. Similarly, RCUTs are only suitable if sufficient turnout opportunities are available nearby. Furthermore, as the area develops and access needs for adjacent parcels evolve, other intersection alternatives may become viable. For example, a Continuous T would not be suitable at an intersection with four legs or in a location requiring access on both sides of the highway, but could be considered if one of the adjoining approaches were no longer needed or relocated to better align with traffic patterns and land use changes.

Table 4: Intersection Control Evaluation Results

Intersection	Intersection Control Alternative				
	Enhanced Stop Control	Traffic Signal	Roundabout	RCUT	Continuous T
Hayes Creek Road	ADVANCE	X	X	--	--
Cochise Drive	X	X	ADVANCE	ADVANCE	ADVANCE
Bird Lane	ADVANCE	X	ADVANCE	ADVANCE	ADVANCE
Mormon Creek Road	ADVANCE	ADVANCE	X	--	ADVANCE
Delarka Drive South	ADVANCE	X	ADVANCE	--	X
Rowan Street	X	ADVANCE	ADVANCE	ADVANCE	X
Carlton Creek Road	X	X	ADVANCE	ADVANCE	--
Chief Looking Glass Road	X	X	ADVANCE	ADVANCE	--
Long Avenue	X	ADVANCE	ADVANCE	--	X

"--" Indicates that the intersection control alternative was not evaluated for a given intersection.

3.5. WILDLIFE ACCOMMODATIONS

The US 93 Missoula to Florence corridor provides essential habitat for numerous local wildlife species and wildlife-related crashes are a significant concern within the corridor. Given this concern, incorporating wildlife accommodations along the corridor is crucial for minimizing wildlife-vehicle collisions and preserving these vital habitats.

The following sections discuss potential treatment types and siting considerations for wildlife accommodations that can be incorporated within the study corridor. The goal is to integrate these measures into the overall corridor vision. Collaboration between MDT and key stakeholders, including partner agencies, landowners, and wildlife organizations, will be essential to advance the implementation of wildlife accommodations in the corridor.

3.5.1. Wildlife Management Strategies

Wildlife management can be achieved through a variety of means. Key strategies include installing wildlife fencing to limit animal crossings in unsafe locations, deploying variable messaging signs (VMS) or static wildlife warning signs to alert drivers about wildlife activity, and creating grade-separated crossings through rehabilitating existing culverts, enhancing passageways beneath bridges, or installing new overpasses across the highway. These wildlife management strategies are presented as standalone options and have not been evaluated against the broader corridor concepts or intersection alternatives discussed earlier in the planning process. Each option has varying levels of effectiveness in reducing wildlife-vehicle conflicts, as well as differences in implementation costs. The *Biological Resources Report*[5] provides further detailed information on each strategy and their potential suitability for the corridor.

VEGETATION MANAGEMENT

Vegetation management, including mowing and clearing, along roadways play a critical role in both enhancing roadway safety and preserving wildlife habitat. While regular vegetation management can improve visibility for drivers and reduce the risk of wildlife-vehicle collisions, it can also negatively impact the habitat for various species by disrupting habitats during breeding seasons, fragmenting important wildlife corridors, or removing food and shelter sources for various species. On the other hand, failing to manage vegetation can attract herbivores to the roadside, increasing collision risks. To address this, using less palatable plant species for revegetation can help reduce the attraction for herbivores without sacrificing biodiversity and maintaining valuable habitat. Finding a balance between maintaining clear sightlines for drivers in strategic locations and providing safe, undisturbed habitats for wildlife can be a low-cost and effective strategy for wildlife management along roadways.

Potential Effectiveness: **MODERATE**

Relative Cost: $

SIGNAGE AND DETECTION

Enhanced warning signs, such as electronic VMS, flashing lights, or bright flags, can provide more dynamic alerts than static wildlife warning signs by programming to activate at specific times or locations based on wildlife activity patterns. These signs can be valuable for increasing driver awareness, especially in areas where large mammals are commonly encountered. However, their effectiveness is limited by the timing of activation and their placement. If signs are not appropriately placed or timed to coincide with actual wildlife movements, their impact on reducing wildlife-vehicle collisions may be minimal. Furthermore, while seasonal signs can reduce collisions by alerting drivers during peak wildlife activity, they do not address the underlying barrier effect that roads and traffic have on wildlife behavior, such as habitat fragmentation and the inability of animals to safely cross the highway.

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Animal detection systems, which use electronic sensors to detect animals near the roadway, are another tool in reducing wildlife-vehicle collisions. These systems are designed to activate when an animal approaches the road, triggering a warning to drivers. When effective, they can provide a more targeted alert to specific wildlife movements in real time, which can reduce the likelihood of collisions, particularly with large mammals. However, animal detection systems face challenges. They require reliable detection technology, and their performance can be impacted by technological issues, maintenance challenges, or environmental conditions. Additionally, false warnings could occur if the system is sensitive to non-target animals or other factors like high vehicle traffic or non-motorized traffic on a nearby path, leading to driver confusion or frustration. There is also the risk of rear-end collisions if drivers brake suddenly in response to the warning, which could create a new safety hazard. Furthermore, like enhanced warning signs, animal detection systems do not mitigate the broader barrier effect of roads on wildlife, which remains a significant issue for wildlife movement and habitat connectivity.

Currently, MDT uses a mobile VMS north of Carlton Creek Road to warn drivers about wildlife crossings. This sign, however, is not dedicated solely to the US 93 corridor and can be moved as needed. To enhance safety, MDT might consider installing permanent VMS along the corridor that can be activated during peak wildlife movement periods such as during seasonal migrations or at night when animals are more active. In addition, nighttime-activated vehicle detection warning signs that light up when vehicles pass could be placed in areas where animals are commonly observed to gather, such as near known crossings or feeding areas. Over time, as technology advances, further opportunities to integrate more sophisticated animal detection systems could be explored.

Potential Effectiveness: **LOW** *(Signage)*, **MODERATE-HIGH** *(Detection)*

Relative Cost: **$ - $$**

SLOWER SPEED ZONES

Speed management, such as reducing posted speed limits, is often suggested as a strategy to reduce wildlife-vehicle collisions, but research on its effectiveness is limited, particularly in rural areas. While slower speeds might seem intuitive for giving drivers more time to react, studies show that reducing speed limits alone does not significantly reduce collisions or address the barrier effect of roads on wildlife movement. Additionally, slower speed zones are often unpopular with the public and can create safety hazards due to speed differentials, where some drivers obey the reduced limit while others do not. This can increase the risk of crashes, making the strategy less effective overall. As a result, reducing speed limits is not recommended as a primary strategy for reducing wildlife-vehicle collisions in the study corridor.

Potential Effectiveness: **LOW**

Relative Cost: **$**

GRADE-SEPARATED CROSSING STRUCTURES AND FENCING

Wildlife fences are an effective tool for reducing wildlife-vehicle collisions and enhancing road safety by keeping animals off highways and improving human safety. However, fencing alone is not recommended, as it can exacerbate the barrier effect of the road, further fragmenting habitats and restricting wildlife movement. To address this, fences should be integrated with wildlife crossing structures, such as underpasses, overpasses, and wildlife jumpouts (ramps that allow trapped animals to escape), to allow animals to safely cross the highway for daily, seasonal, and dispersal movements. When fencing is installed in combination with crossing structures designed and placed in strategic locations, these features can significantly reduce collisions, particularly with large ungulates.

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To prevent wildlife from entering the “highway side” of fencing at fence ends, electrified wildlife deterrent mat systems could be considered. However, there is limited research on the effectiveness of these advanced fence-end treatments. MDT has recently installed electrified wildlife deterrent mat systems on Montana Highway 200 (east of Thompson River) and Montana Highway 287 (Toston Structures), and is conducting a research project to evaluate their effectiveness in reducing wildlife-vehicle collisions.

The success of wildlife crossings is also influenced by the type of structure used. Large bridge openings and wide culverts are some of the most effective solutions for facilitating wildlife movement, as they provide sufficient space and visibility for animals to feel safe crossing. Studies on US 93 south of Florence have shown that wildlife, including mountain lions, wolves, black bears, and white-tailed deer, successfully used underpasses located near human development areas, indicating that proximity to human activity doesn’t necessarily reduce the effectiveness of wildlife crossings.

Another notable success in wildlife management along US 93 north of Missoula includes a wildlife overpass, which, while expensive, has proven highly effective. Research showed that 75 percent of all elk and 100 percent of all moose crossings occurred on this overpass, underscoring the importance of providing suitable crossing options for specific species, particularly those with larger home ranges or migration patterns.

While wildlife crossing structures are effective in reducing large mammal collisions, they are most successful when paired with wildlife fences to channel animals toward safe crossings and prevent them from entering the road corridor. However, it is important to recognize that crossing structures alone do not automatically reduce collisions; their effectiveness depends on proper placement, design, and integration with fencing. Ultimately, a combined approach that includes wildlife fencing, crossing structures, and jumpouts is the most effective strategy for reducing wildlife-vehicle collisions and improving habitat connectivity.

Potential Effectiveness: HIGH

Relative Cost: $$$

MODIFICATIONS TO EXISTING INFRASTRUCTURE

Enlarging or retrofitting culverts that convey fish-bearing streams is an important strategy for improving both fish passage and floodwater conveyance. Additionally, modifications to existing culverts, such as adding ramps or shelves, can also enhance passage for small mammals at times when water is flowing in the streambed. Offering animals a natural, dry, and secure route is important to facilitate desired wildlife movements.

For large mammals, retrofitting or enlarging major drainage crossings (such as large culverts, stock passes, or bridges) can improve their utility as wildlife passageways. Large mammals, like deer, elk, and bears, often require larger openings with adequate vertical clearance and a dry path to pass through safely. When crossing structures are too small or improperly designed, these animals may avoid them and cross at-grade, leading to an increased risk of collisions. Enlarging or replacing these crossings with larger, more inviting structures helps ensure that they are effectively used by large species, reducing the likelihood of conflicts and maintaining the ecological integrity of the surrounding landscape.

As with the installation of new crossing structures, wildlife fencing should be incorporated into the design to funnel animals towards the desired crossing location.

Potential Effectiveness: HIGH

Relative Cost: $$

3.5.2. Siting Considerations

A variety of factors should be considered when identifying potential treatment types and implementation locations. Such factors include land ownership status at crossing locations, the existence of existing infrastructure that could be rehabilitated, known wildlife activity in the area, habitat connectivity potential, and topographic features that are favorable for construction of crossing features.

LAND OWNERSHIP

When planning wildlife crossing infrastructure, land ownership is one of the first and most critical considerations. The distinction between public and private land plays a major role in the ease and feasibility of installing wildlife management infrastructure. Public lands, such as wildlife reserves or protected areas, typically offer a more straightforward process for obtaining the necessary permits and approvals to install wildlife passage structures. These lands are often already designated for conservation or wildlife management, which can streamline the regulatory process. On the other hand, when the land is privately owned, there are additional complexities. Access to the land for the installation of wildlife crossings and the cooperation of the landowner are necessary, which may require negotiations, conservation easements, and/or compensation agreements.

In addition to land ownership, the willingness of adjoining landowners, as well as federal and state agencies and non-profit organizations, to collaborate on wildlife corridor projects is a critical consideration. These partnerships are essential not only for the construction of wildlife crossing infrastructure but also for ensuring its long-term maintenance, monitoring, and overall success. Local governments can also play an important role in ensuring that land uses surrounding wildlife corridors are compatible with the movement of wildlife. To avoid funneling wildlife into areas where human-wildlife conflicts may occur, such as commercial or residential developments, it may be necessary to limit or regulate development near critical crossing corridors. This can help prevent wildlife from being drawn into high-risk areas, ensuring that corridors remain functional and safe for animals.

Long-term land management and habitat protection must be factored into the planning process to maintain the integrity of wildlife corridors over time. This involves identifying key crossing corridors and protecting the corridors from future encroachments. By ensuring appropriate adjacent land uses and limiting development in critical areas, wildlife corridors can remain functional and sustainable over time, helping to reduce wildlife-vehicle collisions and protect biodiversity.

EXISTING INFRASTRUCTURE

Utilizing existing infrastructure, such as culverts or bridges, for wildlife crossings is often a cost-effective and efficient strategy compared to building entirely new structures. This approach not only reduces construction costs but also minimizes the environmental impact associated with the construction of new crossing features. The first step in this process is to analyze current infrastructure to assess its suitability for retrofits to facilitate wildlife passage.

For example, some culverts may already be sufficiently large to allow small or medium-sized wildlife to pass through, but they may need additional modifications to enhance their effectiveness. This could include adding ramps or shelves to create a smoother or safer passage for animals, as well as vegetation inside or around the culvert to provide a more natural and attractive environment for wildlife. These additions can make the structure more appealing to animals, encouraging them to use it rather than crossing the road directly, which helps reduce the risk of wildlife-vehicle collisions.

In some cases, retrofitting existing infrastructure can also involve enhancing visibility within the culvert or bridges, ensuring that animals can see the entire length of the passage, since many species tend to avoid crossing dark or enclosed spaces. These relatively simple changes can go a long way in improving wildlife passage while making efficient use of existing infrastructure, saving both time and money.

Additionally, leveraging planned road or bridge reconstruction or maintenance projects presents an ideal opportunity to integrate wildlife-friendly improvements. When roads or bridges are already scheduled for upgrades or replacement, incorporating enhanced wildlife crossings can often be done with minimal additional cost and disruption to traffic or adjacent land uses. By capitalizing on existing projects, significant improvements to wildlife connectivity can be achieved without the need for separate, costly projects.

KNOWN WILDLIFE ACTIVITY

Identifying areas with the highest wildlife activity is a critical step in prioritizing wildlife management interventions and designing strategies to reduce wildlife-vehicle collisions. To effectively pinpoint hotspots of wildlife activity and conflict, data from sources like wildlife-vehicle collisions, carcass collection, and salvage permits can be invaluable. These tools help to reveal where wildlife-vehicle interactions are most frequent and where wildlife are at the greatest risk of being killed or injured on the road.

Moreover, collaboration with landowners, universities, and non-profit organizations can play a vital role in gathering comprehensive data on wildlife movement and ensuring that crossing structures are placed in the most effective locations. For instance, game cameras installed along roadsides can capture valuable data on wildlife presence, species composition, and movement patterns, allowing wildlife managers to identify the most active crossing points. Tracking beds or GPS tracking devices can further enhance understanding of specific animals' travel routes and provide detailed insights into migration corridors or critical habitat areas.

In addition to understanding where wildlife activity is concentrated, the design and placement of wildlife crossing structures, such as underpasses and overpasses, should be informed by the data collected. For example, large overpasses may be more appropriate in areas where large mammals, like bears or elk, are known to cross, as they require more space for safe passage. In contrast, smaller underpasses may be sufficient for smaller mammals and other species. The size and design of these structures must match the needs of the species to maximize their effectiveness. For instance, larger mammals may require structures with higher vertical clearance and wider spans to comfortably navigate, while smaller species may prefer more enclosed structures with natural features like vegetation to encourage use.

With the right data and partnerships, wildlife crossings can be strategically designed and placed in locations where animals are most likely to cross to maximize their effectiveness in reducing wildlife-vehicle collisions and maintain habitat connectivity.

HABITAT CONNECTIVITY POTENTIAL

Habitat connectivity is a foundational principle of wildlife conservation, as it ensures that wildlife can move freely across landscapes to access vital resources such as food, shelter, and mating grounds. This movement is essential for maintaining healthy populations and the genetic diversity necessary for species survival. When wildlife habitats become fragmented by human infrastructure, such as highways, roads, and urban development, it can create significant barriers to wildlife movement, leading to isolated populations and increased mortality rates from wildlife-vehicle collisions.

In areas with large tracts of public lands or private lands under conservation easements, there is a significant opportunity to protect these habitats from further development and to create continuous wildlife corridors. By maintaining or enhancing these corridors through wildlife crossing structures across major roadway corridors, wildlife can safely navigate between habitats without being blocked by roads or the hazards of heavy traffic. These structures provide more than just a crossing opportunity; they are vital connectors that link fragmented habitats, enabling wildlife to move freely across landscapes in search of resources, breeding sites, and seasonal migration routes.

When strategically placed in continuous corridors, wildlife crossing structures help to mitigate the barrier effects of roads by providing safe passage for a wide range of species. This not only reduces the risk of wildlife-vehicle collisions but also helps ensure the survival of wildlife populations by maintaining genetic flow and species diversity. In the long term, maintaining habitat connectivity helps foster ecological resilience by preserving natural migration routes and protecting biodiversity.

TOPOGRAPHY AND ENVIRONMENTAL FEATURES

The natural landscape plays a crucial role in determining the feasibility of wildlife crossings, as various topographic and environmental factors can influence both the design and practicality of crossing structures. For example, hilly or mountainous terrain can present constructability challenges when trying to build grade-separated crossings, because of the steep slopes and elevation changes that would require significant engineering and potentially high construction costs. In contrast, flat or low-lying areas may offer fewer constraints for constructing wildlife crossings. However, naturally occurring grade differentials in otherwise open areas—such as embankments along the roadway or a slight hill—can provide advantageous siting opportunities for grade-separated crossings. These natural features may offer more favorable conditions that can help reduce design and construction complexity and costs.

Beyond topography, environmental factors such as soil type, vegetation, and water drainage play an important role in determining the suitability of wildlife crossings. For instance, areas with soft soils or wetlands may present challenges in constructing stable underpasses or culverts, as these areas are more prone to waterlogging or shifting. Furthermore, different species have varying preferences when it comes to crossing environments. Some animals may favor dry passages, while others are more inclined to wade through wet areas. Therefore, the land and water characteristics at each crossing should be tailored to the specific needs of the wildlife species expected to use it.

The surrounding vegetation is another important consideration, as it can influence wildlife behavior and their willingness to use the crossing. Dense or unfamiliar vegetation may deter some species from entering a crossing, while the presence of natural plantings or features that mimic the surrounding habitat can make the structure more inviting. Designing crossings that incorporate natural elements and match the local environment can improve the likelihood that animals will use the crossings, thereby enhancing the overall effectiveness of the infrastructure.

In the Missoula to Florence study corridor, the feasibility of wildlife crossings will be impacted by the potential need to span both the highway and adjacent infrastructure like the shared use path and BNSF railroad tracks. These infrastructure elements can add to construction costs and result in additional impacts that must be addressed in the design process. Furthermore, the presence of extensive wetlands in close proximity to the study corridor means that underpasses may not be feasible in many areas of the corridor. Wetland areas often have high water tables, which can complicate construction, drainage, and permitting requirements, making it more difficult to install functional wildlife underpasses without disrupting sensitive ecosystems.

Given these challenges, wildlife crossing infrastructure in the study corridor will require careful site-specific assessments of local topography and environmental conditions. Strategic placement of crossings will be crucial for ensuring that these structures are effective in promoting wildlife movement while minimizing environmental impacts and overall construction costs.

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POTENTIAL SITES

Figure 11 highlights key public lands, private landowners, and existing conservation easements within the Missoula to Florence study corridor. The map also identifies current drainage features and potential opportunities for wildlife crossing treatments, either by enhancing existing structures or by building new infrastructure. Many of these areas offer ideal wildlife habitats, such as riparian zones, wetlands, and undeveloped agricultural lands, and have been recognized as potential locations for wildlife accommodations. Continued collaboration with resource agencies, conservation organizations, wildlife advocacy groups, and landowners will be crucial in advancing these opportunities and securing long-term wildlife connectivity. The following locations have been identified as potential crossing locations due to known wildlife activity, habitat availability, existing infrastructure, topographic features, and land ownership status.

Buckhouse Bridge (~RP 90.1)
The area between Buckhouse Bridge and Blue Mountain Road is known for frequent moose crossings. The riparian corridor and connection to floodplains and open space north of US 93 make it a natural wildlife corridor. Enhancements to the existing Buckhouse Bridge could provide dry passage underneath US 93, enabling a safe wildlife undercrossing opportunity.

Hayes Creek Road (~RP 88.0)
Black bear, mountain lion, deer, moose, and coyotes typically roam along the river, floodplain, and railroad areas near Hayes Creek Road. To facilitate wildlife movement coming down Hayes Creek and toward the Bitterroot River, the existing culvert could be replaced with a box culvert large enough for bull elk and moose. Fencing would be needed to funnel wildlife toward the crossing and keep away from human development in the area.

Cochise Drive/Deadman Gulch Vicinity (~RP 87.3)
Deer, elk, mountain lions, and bears are heavily active in the Deadman Gulch area. Miller Creek to the east of US 93 is also a heavily traveled wildlife corridor. The concrete jersey barriers through the S-curves pose a challenge for wildlife attempting to cross the highway from the gulch down to the river. MFWP owns land east of US 93 between the railroad and Bitterroot River that will remain undeveloped in perpetuity. Given the terrain, this location would be ideal for an underpass to safely enable wildlife passage underneath US 93.

Lolo Creek Bridge (~RP 82.9)
The Lolo Creek Bridge was originally designed with a pathway underneath for wildlife passage. However, the riprap is no longer configured for easy passage, creating a barrier for wildlife movement as wild animals move along the river and are forced to dash through subdivisions and developed areas. Upgrades to the Lolo Creek Bridge could provide dedicated wildlife passage, with a dry path underneath the bridge. Substantial bear activity occurs near Lolo Creek, especially in the fall.

Maclay Road Vicinity (~RP 81.5)
This area offers the last remaining open east-west passage in the Bitterroot Valley. This area is particularly important for reconnecting the Davis Creek and Lantern Ridge elk herds, enhancing genetic diversity and promoting habitat connectivity. A conservation easement is already in place east of US 93, and landowners on the west side of the highway have contemplated an easement corridor. Securing conservation easements on both sides of the highway would make it possible to construct a grade-separated wildlife crossing, enabling safe passage across US 93.

South of Rowan Street (~RP 80.0)
Five Valleys Land Trust has been working with the owners of the former MetLife/Bitterroot Resort property south of Lolo (denoted as MLIC Asset Holdings LLC on **Figure 11**) to establish a conservation easement on portions of the property. The long-term conservation vision includes a wildlife crossing across Highway 93.

Carlton Creek Road (~RP 77.8)
Sin-tin-tin-em-ska Creek and nearby ridgelines provide valuable habitat and movement corridors for wildlife, including grizzly bears and black bears, particularly in the fall. A conservation easement is already in place to protect property east of the highway. The embankment on the west side of the highway could provide beneficial elevation for an overcrossing, however nearby development makes this location less ideal. Opportunity may exist to enlarge the existing culvert crossing to accommodate bull elk or moose while a potential overcrossing tying into the embankment could be explored further.

Chief Looking Glass Road (~RP 77.0)
This area is known for grizzly bear activity. Natural drainages with small culverts cross the highway in this area. Existing crossings at natural drainages could potentially be enhanced to accommodate larger wildlife species.

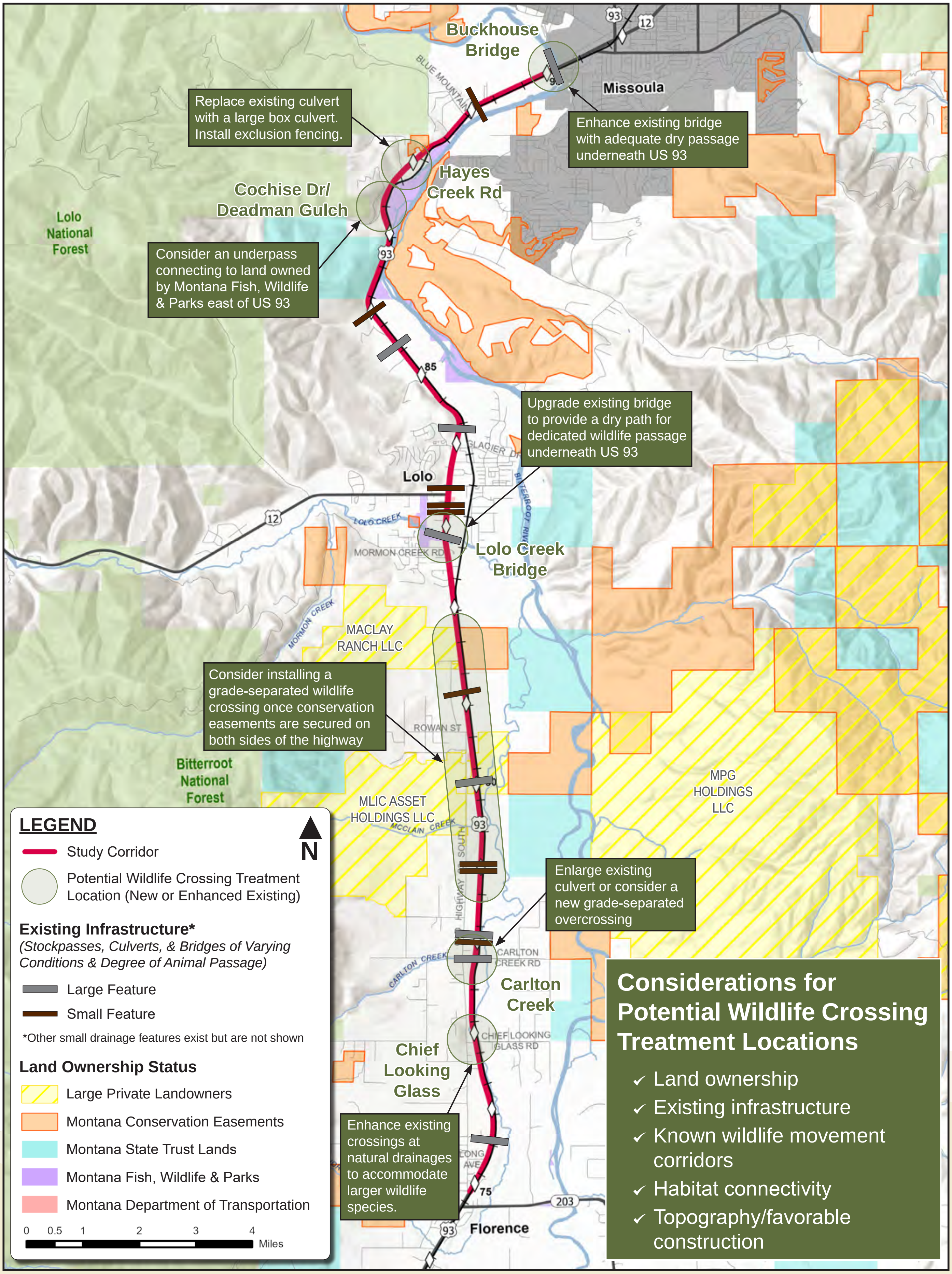

Figure 11: Potential Wildlife Accommodation Locations

3.6. OPTIMIZED CORRIDOR CONFIGURATION

As a final step, an optimized corridor configuration was identified, integrating the most practical and effective elements from the previously evaluated corridor concepts and intersection control alternatives. This process involved strategically blending the design alternatives that best met the study's goals and objectives. The intent was to develop a comprehensive and feasible recommendation for the corridor that balances the critical need for improved safety with efficient highway operations, while also carefully considering the long-term sustainability of the corridor. This includes aligning the design with current and projected land use and access needs, minimizing implementation costs, optimizing construction timeframes, and mitigating environmental or community impacts. Ensuring consistency throughout the corridor was a key consideration, with particular focus on how the selected intersection control alternatives integrate with neighboring intersections and surrounding developments, both existing and planned. By accounting for all these factors, the recommended configuration aims to provide a solution that is responsive to both current and future needs, promotes safety, optimizes operational efficiency, and minimizes impacts, all while respecting budgetary constraints and the evolving land use and access requirements of the surrounding area.

A conceptual illustration of the optimized configuration is shown in **Figure 12**, with a planning-level design provided in **Appendix C**. The following sections summarize the elements of the optimized corridor integrated into each segment. Costs estimates for each configuration are also provided. The planning-level estimates include costs for design, engineering, mobilization, construction, drainage, miscellaneous items, and indirect costs. Contingencies are provided to account for unknown factors at this planning-level stage. All costs are provided in 2025 dollars since the date of implementation is unknown at this time. **Appendix D** contains additional planning-level cost estimate information with unit pricing for each segment.

The optimized configuration encapsulates the best possible combination of high-performing alternatives at both the corridor and intersection levels. However, given the planning-level nature of this study, the design remains flexible, allowing for further refinement in future design phases to fully meet the corridor's needs.

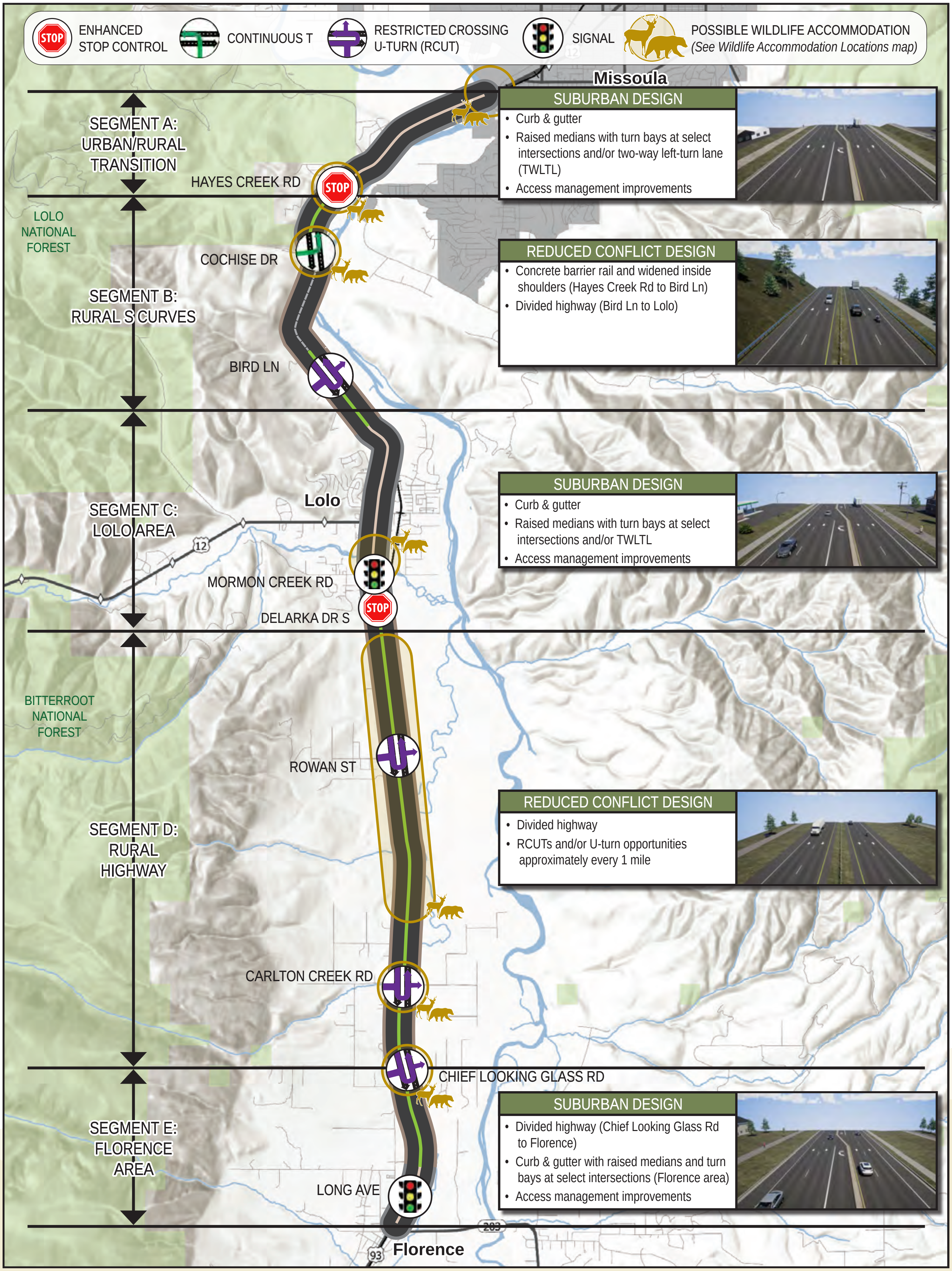

Figure 12: Optimized Corridor Configuration

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SEGMENT A: URBAN/RURAL TRANSITION

For segment A, the optimized configuration provides a transition zone from the urban design in Missoula to rural design in the southern part of the corridor. Suburban design elements such as curb and gutter and raised center medians would be used. Access management principles, such as access consolidation and realignment of approaches, would be applied throughout this segment to enhance safety while ensuring reasonable access for all adjacent landowners. To achieve this, turn bays would be provided at key intersections, although the TWLTL would remain in the Hayes Creek area due to the presence of several closely spaced driveways.

The intersection alternatives analysis determined that maintaining two-way stop control is the only feasible traffic control configuration at Hayes Creek Road, however, certain enhancements could be implemented to improve safety. This includes widening the highway to provide a wider median with a staged turning opportunity for northbound vehicles turning left from Hayes Creek Road. ITS technologies could also be incorporated to warn mainline drivers of the presence of turning vehicles at the intersection. Additionally, the vertical dip on US 93 near the intersection could be filled in to increase visibility for vehicles waiting to turn at the intersection.

With these improvements, all intersections within the segment would continue to operate under two-way stop control, with the exception of Blue Mountain Road, which would remain signalized. Continuation of the Bitterroot Trail is also recommended on the west side of the roadway extending south from Blue Mountain Road to Wornath Road.

Wildlife accommodations could be incorporated at two spots in this segment: Buckhouse Bridge and Hayes Creek Road. Modifications could be made to the crossing below Buckhouse Bridge to provide dry passage for large animals while also maintaining connectivity for aquatic species. At Hayes Creek Road, enlarging the existing culvert and installing wildlife exclusion fencing could facilitate enhanced wildlife movement.

Estimated Cost: $35.1M

SEGMENT B: RURAL S CURVES

Due to the frequency of crashes within the S-curves and the physical constraints of the canyon, a reduced conflict design approach is recommended through this segment. The configuration would generally widen the roadway to increase the clear zone around the existing concrete barriers within the S-curves and provide a center depressed median where physical conditions allow, such as the transition zone into Lolo.

In alignment with the intersection alternatives analysis, Cochise Drive is recommended to be reconfigured as a Continuous T intersection to optimize safety and operations while also minimizing overall impacts and reconstruction costs. A long, quarter-mile left turn acceleration lane would be provided to ensure left-turning vehicles from Cochise Drive can easily accelerate to merge with traffic entering the S-curves. The pullout on the east side of Cochise Drive would need to be closed to reduce potential conflicts.

MDT's Systems Impact Action Process (SIAP) team has been coordinating with Missoula County and the private developer of the proposed residential project south of Bird Lane. To accommodate the new development, it has been proposed to limit turning movements at the existing Bird Lane approach to be right-in, right-out only with a county-owned frontage road connecting Bird Lane to the main entrance of the proposed development. At the main entrance, an RCUT is recommended, with turnarounds located about one-quarter mile downstream of the intersection in both directions. This would allow for the access on the east side of the highway to be perpetuated. Alternate configurations, such as a Continuous T have been considered and will be evaluated through the MDT SIAP as landowner coordination continues. Additionally, either the RCUT or Continuous T configuration could be signalized in the future to optimize operations if traffic volumes warrant. However, the safety ramifications of a signal should be considered, including the potential for increased rear-ends from stopping mainline highway traffic.

All other minor intersections within this segment would remain minor leg stop controlled.

Within this segment, the primary wildlife crossing opportunity is located at the Cochise Drive intersection. This location aligns with key wildlife movement patterns and connection to conservation lands owned by MFWP on the east side of US 93. The terrain at this intersection is best suited for a wildlife underpass connecting the two sides of the highway.

Estimated Cost: $29.8M

SEGMENT C: LOLO AREA

As US 93 transitions into the Lolo area, suburban design standards are recommended. This includes curb and gutter, raised medians, slower design speeds, and access management improvements. Due to the density of existing approaches through the Lolo area, some of the minor approaches may be reduced to right-in, right-out movements only while other, more prominent approaches may be provided with dedicated left-turn lanes.

The existing traffic signals at Glacier Drive/Ridgeway Drive, Tyler Way, and US 12 would remain, while the Lewis and Clark Drive and Mormon Creek Road intersections are also recommended to be configured as traffic signals when warrants are met. Signalizing these intersections in a corridor that is already primarily signalized, offers improved traffic control, consistency, and flexibility for managing traffic in an urban environment. Signals are also more cost effective in more constrained areas such as Lolo. It is anticipated that reducing turning movements at minor approaches through access control improvements, will help funnel more traffic to these major intersections to help meet future signal warrants.

Due to the generally low traffic volumes at Delarka Drive, it is recommended to restrict access at the northern approach to right-in, right-out movements only, while providing full access at the southern approach via two-way stop control to minimize impacts and costs. Enhancements to the intersection such as lighting or advance warning signage may be appropriate to increase safety.

Wildlife accommodations in this segment are challenging due to the density of human development in the area. However, Lolo Creek offers an attractive crossing location for many species due to its habitat connectivity. The existing bridge was designed to provide wildlife passage, although over time the riprap has deteriorated making the bridge difficult for most species to pass under. Upgrades at this location could include installation of a dry path for wildlife underneath US 93.

Estimated Cost: $38.7M

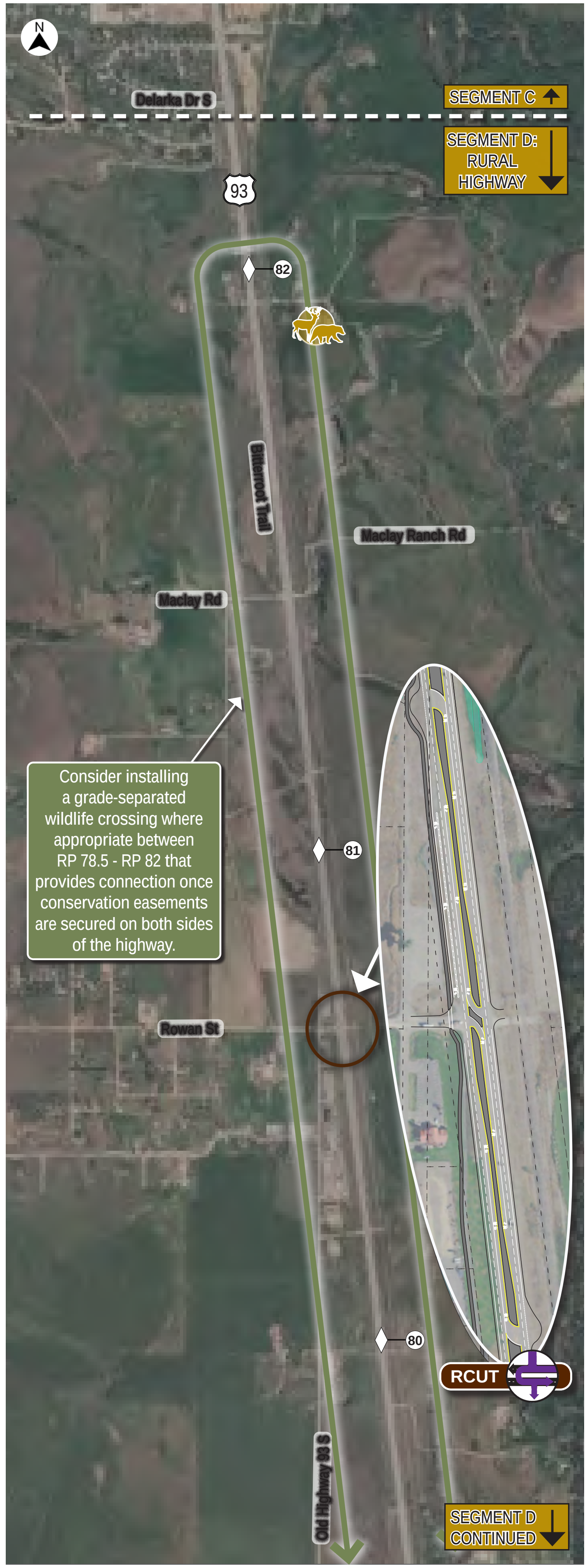
SEGMENT D: RURAL HIGHWAY

South of Delarka Drive, a reduced conflict design is recommended with the north and southbound directions of traffic separated by a wide depressed median. With the presence of medians, most of the minor intersections within the segment would be restricted to right-in, right-out movements, though dedicated left turn bays may be warranted at intersections with higher traffic volumes.

As recommended in the intersection alternatives analysis, RCUTs would be most appropriate at key intersections within the segment to maintain operational efficiency on US 93 while facilitating safer and easier left turns from minor approaches, such as Rowan Street, Carlton Creek Road, and Chief Looking Glass Road. Additionally, implementing RCUTs throughout the segment would provide a consistent reduced conflict design, enhancing safety and improving traffic flow across the entire corridor. Although not a primary study intersection, converting Maclay Ranch Road to an RCUT would further support the overall consistency of the corridor's reduced conflict design, enhancing safety and operational efficiency across the segment.

For all RCUT intersections, turnarounds can be provided approximately 0.25 to 0.5 mile downstream of the intersection in both directions. Intersections with dedicated left-turn lanes can also provide a U-turn option for smaller vehicles. Ultimately, turnaround locations could be provided at least every mile throughout the segment. Additionally, RCUTs could be signalized in the future to accommodate increasing traffic demands, if signal warrants are met. However, the safety ramifications of signalization should be considered, as signals can increase the potential for rear-ends by stopping mainline traffic, while still minimizing angle crashes due to restricted left turns.

Concerns regarding slow moving vehicles merging across multiple lanes to make the left-turn turnaround maneuver at RCUTs have been noted, especially at intersections with high volumes of heavy vehicle traffic. There is potential to address this concern with lengthened left-turn bays extending from the turnaround location all the way to the intersection, and allowing vehicles to turn directly into the turn bay. The appropriate turn bay length and configuration should be considered during the design phase.

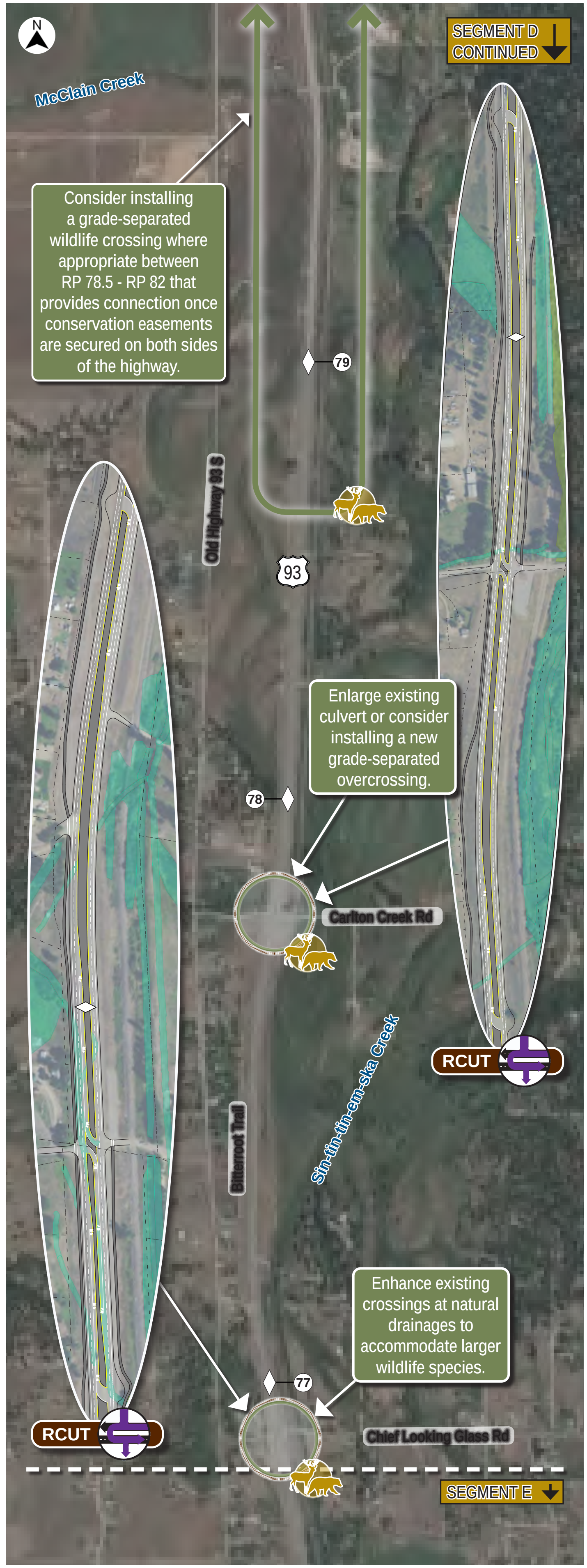


SEGMENT D (CONTINUED)

At Rowan Street, alternate intersection configurations, such as a Continuous T intersection, have been contemplated by MDT. The RCUT was ultimately chosen for the optimized corridor configuration for consistency with other intersections in the segment, safety concerns for left-turning vehicles, and the need to provide access to the land parcels on the east side of the highway. However, other configurations may be suitable for the intersection depending on future development needs. Ultimately, the Rowan Street intersection configuration will be determined in coordination with MDT, Missoula County, and land owners through the SIAP as development occurs.

Given the rural nature of this corridor segment, many wildlife crossing opportunities are available. In the stretch between Delarka Drive South and Carlton Creek Road, there are several large landowners who may be interested in placing conservation easements on their land to protect wildlife movement and habitat connectivity. A wildlife overpass would be ideal in the segment between RP 78.5 and 82.0 if conservation easements could be secured on both sides of the highway. Additionally, the Carlton Creek Road and Chief Looking Glass Road intersections convey natural drainages via small culverts, which could be upgraded to provide enhanced wildlife passage. While the topography in the Carlton Creek area is favorable for an overcrossing, the proximity of human development may be less ideal.

<u>Estimated Cost:</u> $69.2M



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SEGMENT E: FLORENCE AREA

The reduced conflict design from Segment D is recommended to continue in Segment E from Chief Looking Glass Road south to approximately Tie Chute Creek. As US 93 transitions into Florence, a suburban design standard with access management improvements is recommended. Curb and gutter with raised medians is recommended to help slow travel speeds through the community. Dedicated left-turn bays would be provided at most intersections while some approaches may be restricted to right-in, right-out movements.

Both Long Avenue and Old US Highway 93 are potential locations for future traffic signals if warranted by traffic volumes. Signals would maintain access to adjacent parcels, ease left-turning movements during peak hours, and minimize land impacts by avoiding the need for complex designs or extensive right-of-way acquisition, while aligning with the suburban character of the southern portion of this segment.

No wildlife crossing opportunities were identified in this segment.

Estimated Cost: $29.9M

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3.6.1. Optimized Corridor Performance

The primary objective of this study is to reduce fatalities and serious injuries along the US 93 corridor. To achieve this, corridor design concepts and intersection control alternatives were chosen with a strong emphasis on enhancing safety. This approach focuses on minimizing conflicts between roadway users, reducing wildlife-related incidents, addressing infrastructure conflicts, and promoting context-appropriate travel speeds.

The optimized corridor incorporates consistent design elements tailored to the unique characteristics of each segment. These elements prioritize safety for motorists, pedestrians, bicyclists, and wildlife, while aiming to reduce crash risk, enhance traffic flow, and minimize conflicts. Notable features include:

- **Suburban Segments:** Implementation of curb and gutter, raised medians, and traffic control measures to manage speeds and define access.
- **Rural Segments:** Use of median separation through concrete barriers or depressed medians, reduced conflict intersection designs, and strategic access management practices.
- **Wildlife Accommodations:** Infrastructure designed to reduce animal-vehicle collisions.
- **Non-Motorist Infrastructure:** Enhanced pedestrian and bicyclist facilities to improve safety and mobility.

A primary focus of the corridor optimization is to implement access management principles to reduce vehicle conflicts. Improvements include the use of raised or depressed medians, restricted left-turn movements, driveway consolidation, and the alignment of opposing approaches. Implementing the optimized corridor has the potential to reduce full movement access by half, while also providing better alignment at additional locations.

The optimized corridor design introduces changes that are likely to influence travel times and traffic flow. Key findings include:

- **Travel Speeds:** Adoption of appropriate design speeds in suburban segments to align with context-sensitive design and improved safety.
- **Intersection Delay:** Installation of new signals at key intersections (e.g., Long Avenue, Mormon Creek Road, and Lewis and Clark Drive) contributes to minor increases in delay and reduced average speeds along the mainline but reduces overall delay due to improvements on the minor approaches. Intersections with reduced conflict designs demonstrate improved operations, with most showing substantial reductions in delay.
- **Access Consolidation:** Resulting in some out-of-direction travel due to restricted turning movements and the inclusion of RCUT intersections.
- **Overall Travel Time:** Some minimal increases, with a total rise of up to 0.3 minutes during the AM peak hour and less than 0.7 minutes during the PM peak hour, representing less than a 4% increase.

The optimized corridor configuration achieves the primary goal of improving safety while balancing operational performance and anticipated impacts. By addressing conflict points, promoting appropriate design speeds, and improving access management, the design aims to enhance safety for all users while maintaining efficient traffic flow.

3.6.2. Summary of Total Project Costs

The estimated cost of reconstructing individual segments to achieve the optimized corridor configuration ranges from $29.8M (Segment B) to $69.2M (Segment D), with a combined total of $203M, as shown in **Table 5**. Depending on funding availability, the corridor may be reconstructed incrementally by targeting individual intersections or segments as funding becomes available. Alternatively, the reconstruction process could proceed in phases, where pieces of multiple segments are addressed within each phase to optimize resource allocation and project timelines. This approach allows for flexibility in project execution and ensures that progress can be made even if full funding for the entire corridor is not secured at once.

Table 5: Summary of Estimated Project Costs

Segment		Estimated Cost (2025$, Rounded)
A	Urban/Rural Transition	$35,100,000
B	Rural S Curves	$29,800,000
C	Lolo Area	$38,700,000
D	Rural Highway	$69,200,000
E	Florence Area	$29,900,000
Missoula to Florence Corridor		$203,000,000

3.7. SPOT IMPROVEMENTS

Prior to implementation of the full optimized corridor configuration, various smaller-scale improvements could be installed at spot locations on an as needed basis. A variety of short-term oriented projects were identified that can be implemented more quickly with lower overall costs. Spot improvements may serve as temporary solutions until funding becomes available for larger-scale improvements or may be implemented as complementary improvements to the optimized corridor configuration. As such, the following spot improvements are presented as standalone options and were not evaluated against the broader corridor concepts or intersection alternatives discussed in earlier sections. A description of potential spot improvements and possible implementation locations is provided in the following sections. Additional project development activities will be required to advance implementation of spot improvements.

STANDALONE INTERSECTION TREATMENTS

Standalone intersection treatments focus on improving traffic flow and safety at individual intersections. Strategies include dedicated right- or left-turn lanes to reduce delays and conflicts, acceleration/deceleration lanes for smoother vehicle transitions, and improved lighting for better visibility. Modified signal timing at existing signalized intersections—such as implementing leading pedestrian intervals, extended pedestrian walk times, and protected left-turn phasing—can enhance both vehicle and pedestrian safety. Pedestrian accommodations, like center median refuge islands, curb bulb-outs, and enhanced crossings, can also help make intersections safer for non-motorists.

Standalone intersection treatments could be beneficial at any of the nine key intersections as well as other major intersections throughout the corridor which are already built out. For example, Blue Mountain Road could benefit from pedestrian accommodations and potential signal timing changes. Interim improvements at key study intersections could include left-turn acceleration lanes at Bird Lane and Cochise Drive or improved lighting and additional turn bays at Rowan Street, Carlton Creek Road, and Chief Looking Glass Road. Other standalone intersection treatments may be beneficial in the corridor, such as installing pedestrian accommodations at Lewis & Clark Drive and potentially installing a traffic signal if warrants are met.

In addition to smaller-scale intersection treatments, it may be advantageous to prioritize the reconstruction of individual intersections before proceeding with full corridor reconstruction. For instance, implementing a reduced conflict intersection design, such as an RCUT or Continuous T, could offer a cost-effective solution that delivers significant safety benefits in the short term. These treatments would immediately reduce traffic conflicts and improve flow, thereby enhancing safety and operational efficiency while funding for larger-scale corridor reconstruction is secured.

INTELLIGENT TRANSPORTATION SYSTEMS

ITS can enhance roadway safety and efficiency through technology-driven strategies. Potential treatments include advance or dynamic warning systems to alert drivers of upcoming hazards, variable speed limits (VSL) that adapt to changing road conditions, and VMS to relay timely weather and incident alerts to the traveling public. Advance queue detection could be used to manage traffic flow by warning drivers of congestion ahead, while speed feedback signs could be used to promote increased compliance with speed limits.

ITS strategies could be beneficial at multiple locations throughout the corridor such as the northbound transition zone into Missoula where VSL or queue detection could help reduce conflicts during the morning commute or VMS could be installed in the southbound direction to warn drivers of incidents within the corridor. Within the S-curves, dynamic curve warnings, VSL, and VMS could be installed to encourage slower speeds, especially during inclement road conditions. At the Glacier Drive intersection queue detection could be useful for southbound vehicles approaching Lolo. Speed feedback signs could be installed in the Lolo and Florence areas to help promote slower speeds through these more developed and congested zones. Additionally, Rowan Street, Carlton Creek Road, and Chief Looking Glass Road could benefit from advance warning systems to warn drivers of potential conflicts at upcoming intersections.

SHARED USE PATH IMPROVEMENTS

Shared use path improvements focus on enhancing the safety and usability of the highway corridor for pedestrians and bicyclists. Potential improvements include reviewing the distance between paths and intersections to reduce conflicts and improve visibility, addressing drainage and flooding issues to ensure year-round path accessibility, performing continual maintenance including sweeping, snow removal, and surface repairs, or implementing directional signage and pavement markings at highway path crossings to improve visibility and navigation.

Potential locations for path enhancements include Carlton Creek Road near the park-and-ride lot to address flooding issues, or at the Rowan Street, Chief Looking Glass Road, Long Avenue, and Old US Hwy 93 intersections for various crosswalk enhancements. These upgrades aim to create a safer and more efficient experience for all users.

ACCESS MODIFICATIONS

Access modification strategies are incorporated into the optimized corridor configuration but could be implemented in the near-term in spot locations to improve traffic flow and reduce crash risks by managing how and where vehicles enter and exit roadways. Strategies include consolidating driveways to reduce the number of access points, implementing right-in/right-out restrictions to limit left-turning conflicts, and aligning offset driveways to improve visibility and minimize driver confusion.

Changes to access could be particularly useful in the urban transition zones leading into the Missoula, Hayes Creek, Lolo, and Florence areas, where high traffic volumes and frequent access points lead to congestion and safety concerns.

MEDIAN TREATMENTS

Median treatments aim to improve safety on rural highways by reducing the risk of head on and lane departure crashes. Potential strategies include centerline rumble strips for auditory driver warnings, divided medians (raised or depressed) to physically separate directional traffic, physical median barriers (such as concrete or cable rail) to prevent vehicles from crossing into oncoming lanes, and median widening to create more recovery space.

The installation of median treatments would be especially beneficial along the US 93 corridor, particularly in the rural section between Lolo and Florence, where high speeds and the absence of existing barriers increase the risk of severe injuries. Enhancements at other locations with existing physical separation could also provide significant safety benefits. For example, while concrete barrier rail is already in place in the S-curves section to reduce the risk of head-on collisions, widening the median could create additional recovery space and further reduce the likelihood of fixed-object collisions with the barriers.

4.0 ADDITIONAL CONSIDERATIONS AND NEXT STEPS

The optimized configuration outlined in this report represents the best combination of high-performing alternatives for both the corridor and intersection levels, based on the defined evaluation criteria. However, given the planning-level nature of this study, the design remains flexible, allowing for refinement in future design phases as traffic patterns and developments within the corridor evolve.

As described in **Section 1.4.2**, although a preferred configuration has been selected for each intersection, the alternatives analysis indicates that several configurations could be viable for each intersection. Alternative configurations should be evaluated in further detail during future design phases to ensure alignment with the selected corridor concepts, adjacent intersection configurations, and other relevant factors as outlined in this chapter.

Should projects proceed to future development phases, a range of additional considerations will need to be addressed, including multimodal accommodations, considerations of visibility and speed, access to adjacent properties, and mitigation of impacts. Final decisions regarding these aspects will be made during subsequent design phases, should a single or multiple projects move forward.

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4.1. FUTURE GROWTH AND TRANSPORTATION NETWORK CHANGES

Several factors can influence how traffic is distributed across the transportation system. Traffic growth assumptions for the US 93 corridor were based on historical trends and anticipated future growth patterns. The location, type, and design of future developments will ultimately affect the corridor's operational characteristics. If traffic grows at the rates projected in this report, it is expected that the study corridor will continue to face worsening operational conditions. However, if actual growth diverges from these assumptions or if alternative routes are introduced, the traffic operational analysis may no longer accurately reflect the future conditions predicted in this report.

Furthermore, this report summarizes evaluations of traffic volumes during summer peak hours, which represent the periods of highest traffic demand. Given the corridor's proximity to Missoula and nearby recreational areas, the Bitterroot Valley has become an increasingly popular tourist and recreational destination. Accordingly, during the peak summer season, traffic volumes are approximately 30 to 40 percent higher compared to the off-peak winter season. Seasonal variations in traffic conditions, driven by a variety of factors including tourism, school traffic, and commercial freight activity, should be considered when finalizing design-level details.

4.2. LANDOWNER COORDINATION

Landowner coordination will be crucial in the future design phases of the project, particularly concerning right-of-way negotiations, access management improvements, and wildlife accommodations. The concept-level typical sections were developed to fit within the existing right-of-way along US 93. However, as the design of the preferred configuration evolves, additional right-of-way may be required to accommodate the optimized design. A detailed property record search and land survey will be necessary to accurately define the boundaries of the existing right-of-way, and negotiations with adjacent landowners may be needed to acquire additional right-of-way for the construction of improvements.

A key aspect of the optimized corridor configuration is the recommendation for increased access management to enhance safety. Limiting full access maneuvers and promoting consolidated access points at appropriate distances from intersections will improve both traffic flow and safety. A field review identified over 200 access points along the corridor, including public roadways, residential driveways, and commercial accesses. The high concentration of closely spaced access points contributes to congestion and increases the risk of crashes, particularly involving vehicles turning on and off the highway. These driveways also pose hazards for pedestrians and bicyclists, who may need to cross multiple driveways along their routes.

Additionally, on-going landowner coordination will be important to secure conservation easements to maintain wildlife habitat connectivity and create opportunities for wildlife crossing structures over the highway.

To ensure improved traffic flow and safety within the corridor while maintaining reasonable access for adjacent properties, ongoing landowner coordination will be essential. This process will help ensure that property access is preserved in a way that balances safety and optimal traffic conditions for the traveling public throughout the corridor.

4.3. MULTIMODAL CONSIDERATIONS

Designing the US 93 corridor requires careful consideration and a balanced approach to meet the needs of all road users, including drivers, large trucks, cyclists, pedestrians, and transit riders. As the corridor serves a diverse range of transportation modes, the design must address the safety, mobility, and accessibility of each user group while also minimizing conflicts between them. This includes ensuring that truck traffic can operate efficiently and safely, providing safe and accessible facilities for non-motorized users, and promoting effective transit options to reduce congestion. Achieving this balance is essential for creating a corridor that supports economic vitality, enhances public safety, and accommodates future growth, while maintaining the quality of life for all who rely on the roadway.

TRUCKS

Trucks and other heavy vehicles make up approximately 4-5% of the vehicle mix on US 93 within the study area, accounting for around 700 to 1,000 trucks daily, including agricultural, construction, logging, and other freight vehicles. Freight activity is vital to the region's economic prosperity, and as such, must be carefully considered during future project development. In the design process, it is crucial to consider details such as wider lane widths, larger turning radii, and reinforced shoulders to enable the safe and efficient operation of large trucks. The design should also address appropriate grade and slope considerations, adequate clearance for bridges and overpasses, and durable pavement designs to support the height and weight of trucks. Additionally, incorporating truck speed limits and safety features such as reinforced barriers and noise mitigation can also help enhance safety, reduce congestion, and support freight needs.

Specifically, within the Missoula to Florence corridor, features like RCUTs will need to allow sufficient space for large trucks to turn around, and curbing in suburban design sections should ensure that trucks can easily maneuver. However, accommodating large trucks often requires tradeoffs between ensuring truck maneuverability while maintaining safe conditions for other road users, including passenger vehicles, bicyclists, and pedestrians. For example, wider lanes and larger turning radii for trucks can increase the size of intersections, making them more challenging for non-motorized users to cross. Similarly, increased access management can enhance safety for passenger vehicles and non-motorists but may limit truck maneuverability, particularly for U-turns. Ultimately, design of the optimized corridor must strike a balance between meeting the needs of large trucks and ensuring safety, mobility, and accessibility for all road users.

NON-MOTORISTS

The Bitterroot Trail runs adjacent to US 93 throughout the study corridor. The paved non-motorized trail is located primarily on the west side of the highway with some segments of the trail crossing to the east side of the highway, connecting to points of interest and park-and-ride facilities at Chief Looking Glass Road, Carlton Creek Road, and Rowan Street. To address these concerns, a variety of spot improvements, discussed in **Section 3.7**, could be implemented.

When designing intersection improvements for the optimized configuration, it will be crucial to consider non-motorized crossing accommodations, such as crosswalk markings, curb bulbouts, wayfinding signage, and pedestrian signals, where appropriate. At signalized intersections, adjustments to signal timings may also be considered to provide dedicated non-motorist crossing phases. As with other improvements, it will be essential to balance non-motorized safety and mobility with the potential impacts to vehicular operations to ensure the needs of all users are addressed within the corridor.

TRANSIT

The 2008 *US 93 Corridor Study - Missoula to Florence* explored options to increase vehicle occupancy, including expanded transit services and enhanced mode choice. While bus rapid transit and passenger rail options were thoroughly evaluated, they were ultimately eliminated due to insufficient ridership and poor cost-effectiveness. However, recommendations for park-and-ride lots and enhanced vanpool/carpool programs have been successfully implemented.

Ongoing collaboration with regional transit providers to expand service options and increase ridership could help reduce overall traffic volumes in the corridor by decreasing personal vehicle use. Additionally, promoting greater use of existing park-and-ride facilities may alleviate congestion both within the corridor and in the Missoula area. The refinement of the optimized configuration may also consider the inclusion of bus stops, shelters, and other transit features, in coordination with transit operators, if deemed feasible within the corridor.

4.4. FUNDING CONSIDERATIONS

Primary funding for US 93 highway improvements would likely come from federal sources coupled with state matching funds as applicable. Projects eligible to receive funds from MDT's core funding programs for NHS routes must support progress toward the achievement of national performance goals including improving infrastructure condition, improving safety, reducing congestion, increasing system reliability, and facilitating freight movement. Smaller-scale enhancements such as intersection improvements and non-motorized accommodations may be eligible for other federal funding sources.

If one or multiple projects are found eligible for federal or state funds, the Montana Transportation Commission and MDT will decide how to distribute the state's limited funding to address highway improvement needs across the state. When funding has been identified, the project will be included in the annual Statewide Transportation Improvement Program (STIP) which identifies proposed transportation projects programmed for the next five years. It may be several years before sufficient funds are identified for improvements. The following are potential funding sources for which projects in the Missoula to Florence study corridor may be eligible.

- **National Highway Performance Program (NHPP)**
  The NHPP provides funding for construction, reconstruction, resurfacing, restoration, and rehabilitation of segments of NHS roadways; construction, replacement, rehabilitation, preservation and protection of bridges on the NHS; and projects as part of a program supporting national goals for improving infrastructure condition, safety, mobility, or freight movements on the NHS.

- **Bridge Formula Program**
  This program provides funding to replace, rehabilitate, preserve, protect, and construct bridges on public roads.

- **Surface Transportation Block Grant Program (STP)**
  STP funding may be used to preserve or improve conditions and performance on federal-aid highways. STP funds are allocated to sub-programs by system (primary, secondary, urban, bridge, off-system).

- **Highway Safety Improvement Program (HSIP)**
  HSIP is a funding category that helps states implement a data-driven and strategic approach to improving highway safety on all public roads. In accordance with *Montana's Comprehensive Highway Safety Plan*, the primary focus of the HSIP program involves identifying locations with crash trends and prioritizing work according to benefit/cost ratios. However, MDT also advances systemic improvements to address network-wide safety issues.

- **Carbon Reduction Program (CRP)**
  The federal CRP provides formula funds to states to develop carbon reduction strategies and implement projects that support the reduction of transportation emissions. Eligible projects include: the construction, planning, and design of trail facilities for pedestrians, bicyclists, and other non-motorized forms of transportation; public transportation projects; and congestion management technologies.

- **Transportation Alternatives (TA) Program**
  The TA program provides assistance to local governments, tribal entities, transit providers, resource agencies and/or school districts for community improvements. Eligible projects include pedestrian and bicycle facilities; turnouts, overlooks, and viewing areas; historic preservation and vegetation management; environmental mitigation related to stormwater and habitat connectivity; recreational trails; safe routes to school; and vulnerable road user safety assessments. MDT awards funds to eligible entities on a competitive basis.

- **Congestion Mitigation and Air Quality (CMAQ) Program**
  The CMAQ Program provides funding for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality. A portion of CMAQ funds goes to projects in Missoula, Montana's only designated and classified air quality non-attainment area. The remaining funds (approximately 90%) are primarily directed to areas of the state with emerging air quality issues through the Montana Air and Congestion Initiative Program. Under this program, projects are selected through a proposal process based on air quality benefits.

- **Discretionary Programs**
  The Bipartisan Infrastructure Law (BIL) passed in 2021, contains significant new funding for roadways, bridges, and other major projects funded through both formula funds and discretionary grant programs administered by FHWA and the US Department of Transportation. Funding under BIL is authorized through 2026, and grant funds are awarded on a competitive basis. Additionally, discretionary funding offered under various infrastructure grant programs may be applicable for both spot improvements and/or full corridor reconstruction projects. Additional information about discretionary grant funding opportunities under BIL is provided by FHWA.[17]

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4.4.1. Wildlife Funding Availability

Implementing effective wildlife accommodations such as wildlife fencing and crossing structures can be a costly endeavor, requiring substantial upfront investment with continued maintenance costs. Given the limited funding available for these measures, it is essential to explore all possible funding avenues and leverage partnerships to make these projects feasible. The following are key funding sources and strategies that can support wildlife accommodation projects in the Missoula to Florence study corridor.

- **MDT Core Funding**
  MDT considers wildlife accommodations as part of its highway improvement projects through MDT's core funding programs for NHS routes in the Missoula District. For example, there could be opportunities to integrate wildlife passage improvements when reconstructing or enhancing segments of the highway, such as upgrading existing culverts to facilitate better wildlife movement. However, at present, no specific funding has been identified for a dedicated MDT project in the corridor, making it essential for future projects to leverage other funding opportunities.

- **Highway Safety Improvement Program**
  Wildlife-vehicle conflict areas, especially where severe and fatal crashes involving wildlife are common, may qualify for funding under the HSIP. MDT prioritizes HSIP projects across the state based on a benefit/cost analysis and available funding.

- **Montana Wildlife & Transportation Partnership**
  Projects may also proceed through the MWTP, involving collaboration with MDT, MFWP, and MSWP. The Partnership accepts applications for wildlife accommodations in May and November each year from members of the public, non-profit and non-governmental organizations, public agencies, local governments, community groups, and tribal governments. MDT usually assumes responsibility for operations and maintenance of roadway structures, but other features such as fencing or modifications outside of MDT right-of-way and/or the roadway prism are the responsibility of the applicant and must be maintained in perpetuity through an agreement with a public entity (such as a county or conservation district). This option requires a champion external to MDT to coordinate with appropriate entities, determine available funding sources, and submit an application.

- **Wildlife Crossings Pilot Program (WCPP)**
  BIL includes several provisions aimed at improving habitat connectivity and conserving fish and wildlife. One of the most significant opportunities is the $350,000,000 Wildlife Crossings Pilot Program, which is designed to fund wildlife crossing projects nationwide. Additionally, the new law makes habitat connectivity projects eligible for funding from more than a dozen other transportation funding programs. Eligible applicants for the WCPP include federal land management agencies, local governments, regional transportation authorities, special purpose districts, tribes, and state departments of transportation (DOTs). Since all applicants must include documentation of consulting with the state DOT in which the applicant is located, MDT encourages local entities to pursue these funding opportunities and is committed to being an engaged partner in the application process. The application period for the final round of funding will open on May 1, 2025, and close on August 1, 2025.

- **Other Partnerships**
  In addition to public funding sources, collaborations with non-profit organizations focused on wildlife conservation could play an important role in funding wildlife accommodation projects. These organizations can often access specialized grant funding or direct donations for conservation efforts. They may also be able to assist in securing conservation easements on private land, working in partnership with landowners and agencies to create continuous wildlife corridors.

While funding for wildlife accommodation measures can be challenging, a variety of potential funding sources and partnerships exist. Moving forward, it will be essential for MDT and partners to collaborate on identifying viable locations for wildlife crossings, design suitable accommodations, secure appropriate funding, and ensure the long-term success of these projects.

4.5. IMPLEMENTATION CONSIDERATIONS

This effort was initiated in response to public concerns about safety and operational issues along the Missoula to Florence corridor, particularly in light of recent high-profile crashes and proposed developments. In 2020, MDT conducted the *US-93 South Safety Improvements Study*, followed by the *Speed Study – US Hwy 93 – Lolo to Missoula* in 2023. Both studies identified several short-term solutions for specific locations along the corridor but lacked a comprehensive vision for the corridor's long-term configuration. Furthermore, these studies were conducted internally by MDT without public involvement. The goal of this study was to develop that long-term vision by establishing clear objectives and identifying practical improvements to meet the corridor's future needs. A key focus of the *US 93-Missoula to Florence Study* was actively soliciting frequent public and stakeholder feedback to ensure that community perspectives were carefully considered in the planning effort.

With the long-term vision now established, MDT can begin addressing the most urgent safety and operational concerns through short-term improvements, within existing budgetary constraints, while working toward more comprehensive, long-term solutions. For instance, the S-curve section, which has seen frequent and severe crashes recently, has benefited from recent high friction pavement surfacing treatments but may also be a candidate for dynamic curve warning signage. Meanwhile, the growing development around the Rowan Street intersection may necessitate short-term traffic interventions, such as turn bays or advanced warning systems, until funding is secured for more substantial long-term improvements like an RCUT. Continued collaboration with landowners and resource agencies will be crucial to identify target locations for wildlife accommodations and pursue final rounds of wildlife grant funding opportunities under BIL. Progress toward the long-term vision can be made incrementally by implementing improvements in distinct segments, prioritizing those based on safety needs and traffic operations. Ultimately, the successful implementation of these improvements will depend on funding availability, collaboration with adjacent landowners and partner agencies, and the completion of environmental mitigation activities.

4.6. NEXT STEPS

Figure 13 illustrates the next steps in the project implementation process. As funding is identified, projects will be advanced into the project development and eventual construction phases. Public involvement should occur throughout all phases. The general next steps for implementation are as follows:

- Identify and secure a funding source or sources.
- For MDT-led projects, follow MDT guidelines for project nomination and development, including a public involvement process and environmental documentation.
- For projects that are developed by others and may impact MDT routes, coordinate with MDT via the Systems Impact Action Process or other appropriate collaborative processes.

The purpose and need statement for any future project should be consistent with and address one or more of the goals and objectives contained in this study. Should this planning study lead to one or multiple projects, compliance with state and federal environmental regulations will be required. This study may be used as reference for determining the impacts and subsequent mitigation for the improvement options in future environmental documentation. Any future project must comply with Code of Federal Regulations Title 23 Part 771 and Administrative Rules of Montana 18, sub-chapter 2, which outline the requirements for documenting environmental impacts on highway projects.

The optimized corridor configuration has been developed as a comprehensive vision for the future corridor, however, funding limitations may require phased implementation of improvements. Reconstruction efforts may range from smaller-scale spot improvements to larger-scale implementation by corridor segment.

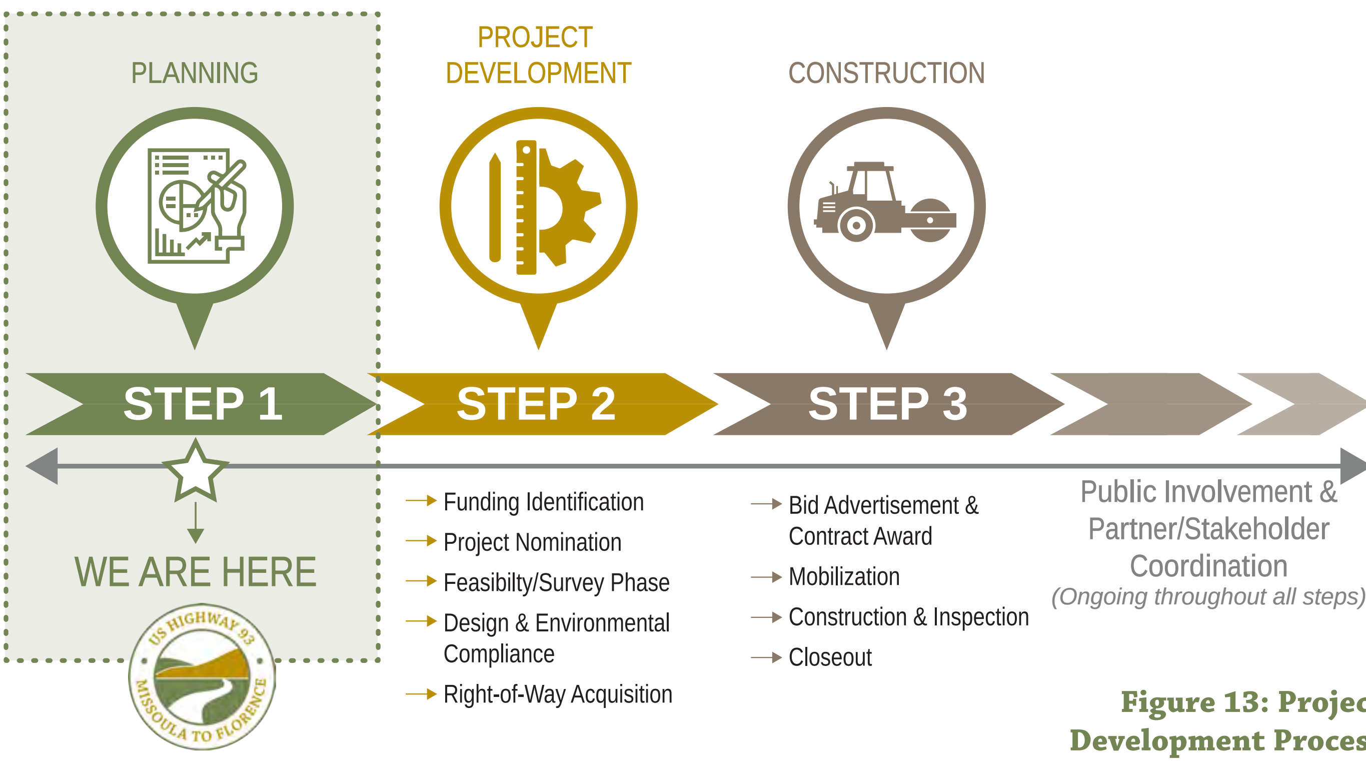

Figure 13: Project Development Process

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DRAFT

US HIGHWAY 93 · MISSOULA TO FLORENCE

APPENDIX A:

Corridor Concept Evaluation

CORRIDOR CONCEPTS

Four improvement concepts were identified for the US 93 corridor and are characterized according to a general design principle, with individual design features that can be adapted and applied to fit the context of a specific corridor segment. Generalized descriptions of the concepts are presented below. Illustrations of the concepts applied to each of the five corridor segments are provided on the following pages. These illustrations were used to assist the Corridor Concept Evaluation Process.

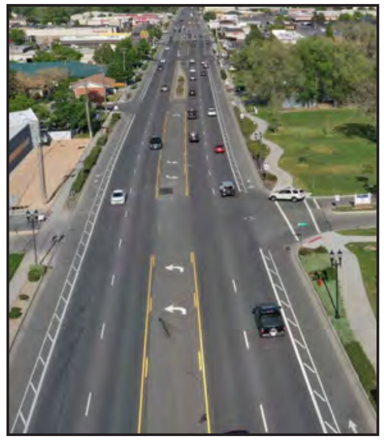
CONCEPTS ELIMINATED FROM CONSIDERATION

Through public and stakeholder involvement efforts, several other potential improvements, such as light rail or alternative routes, were noted. Though these concepts were explored and considered by the project team, they were ultimately eliminated from further consideration because the concepts were determined infeasible.

CONCEPT 1: SUBURBAN DESIGN

Includes varying combinations of the following design features:

- Redesign roadway with 45-55 mph design speed
- Utilize raised center medians with roadway lighting (minimal change to access)
- Incorporate curb, gutter, sidewalk, and/or landscaping, as appropriate
- Install roadway lighting
- Integrate additional traffic calming features as needed (ITS, speed feedback signs)

CONCEPT 2: MANAGED ACCESS DESIGN

Includes varying combinations of the following design features:

- Maintain existing design speeds
- Consolidate access points as much as possible and maintain full access at remaining minor approaches
- Provide full movements and intersection control at major intersections (signals, roundabouts)
- Utilize divided highway and raised median features as appropriate to limit full access movements
- No u-turn options except for emergency access and maintenance needs



CONCEPT 3: REDUCED CONFLICT DESIGN

Includes varying combinations of the following design features:

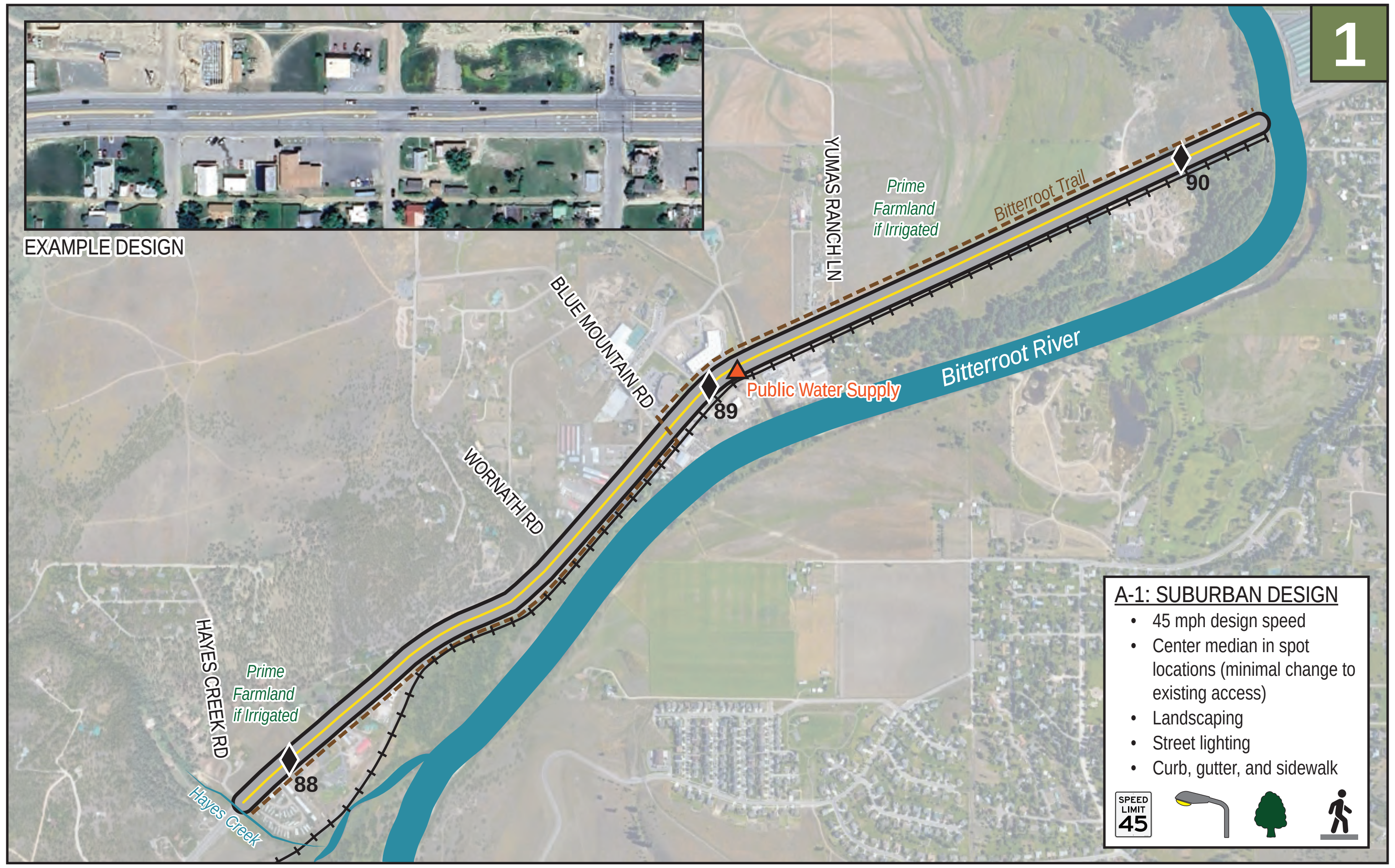
- Maintain existing design speeds
- Eliminate full-movement access except at controlled locations
- Use reduced conflict intersection designs (continuous T, roundabout, RCUT)
- Divide highway using raised medians, grassy medians, concrete barriers, cable rail, etc.
- Provide u-turn options at periodic locations

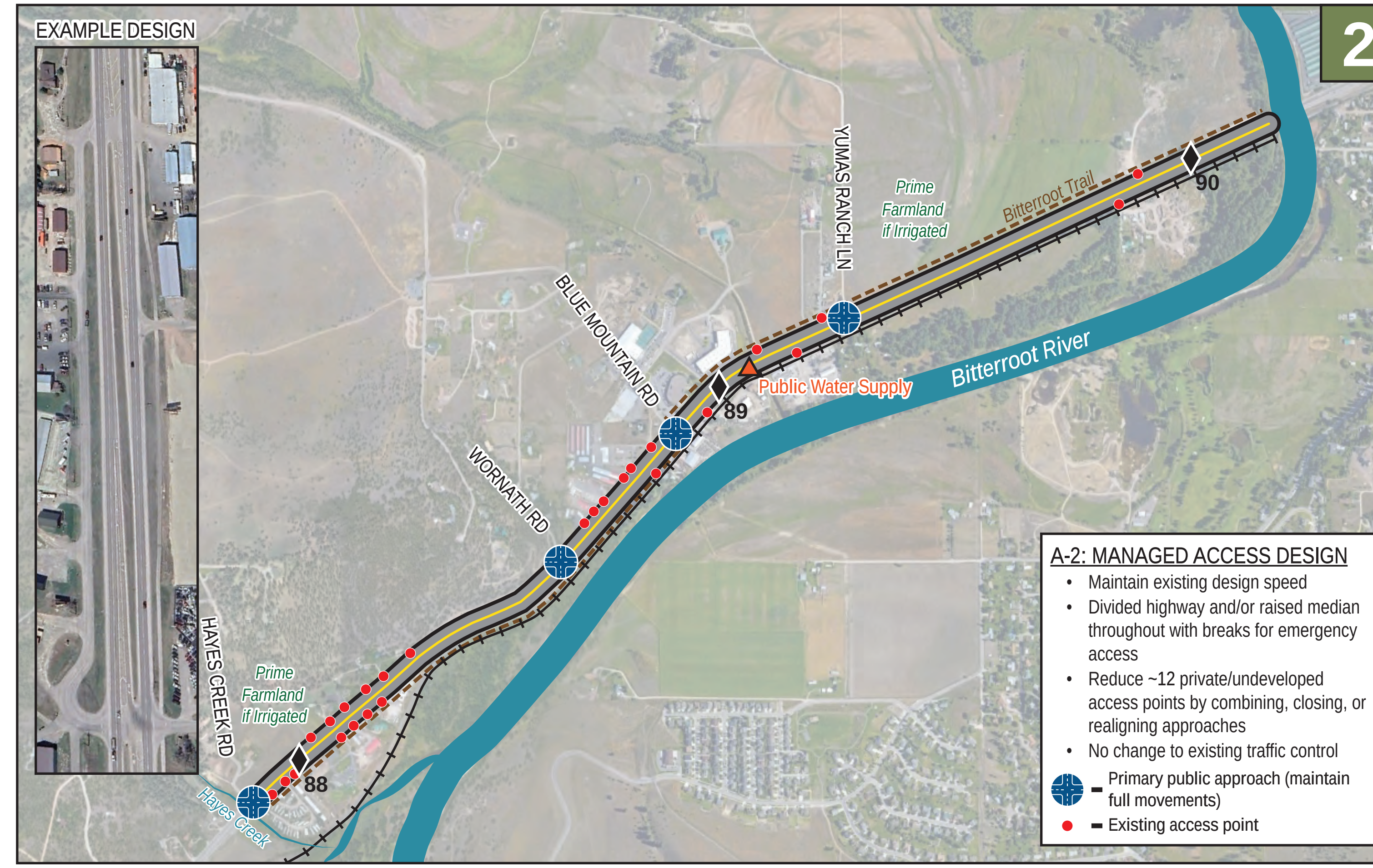



CONCEPT 4: INCREASED CAPACITY DESIGN

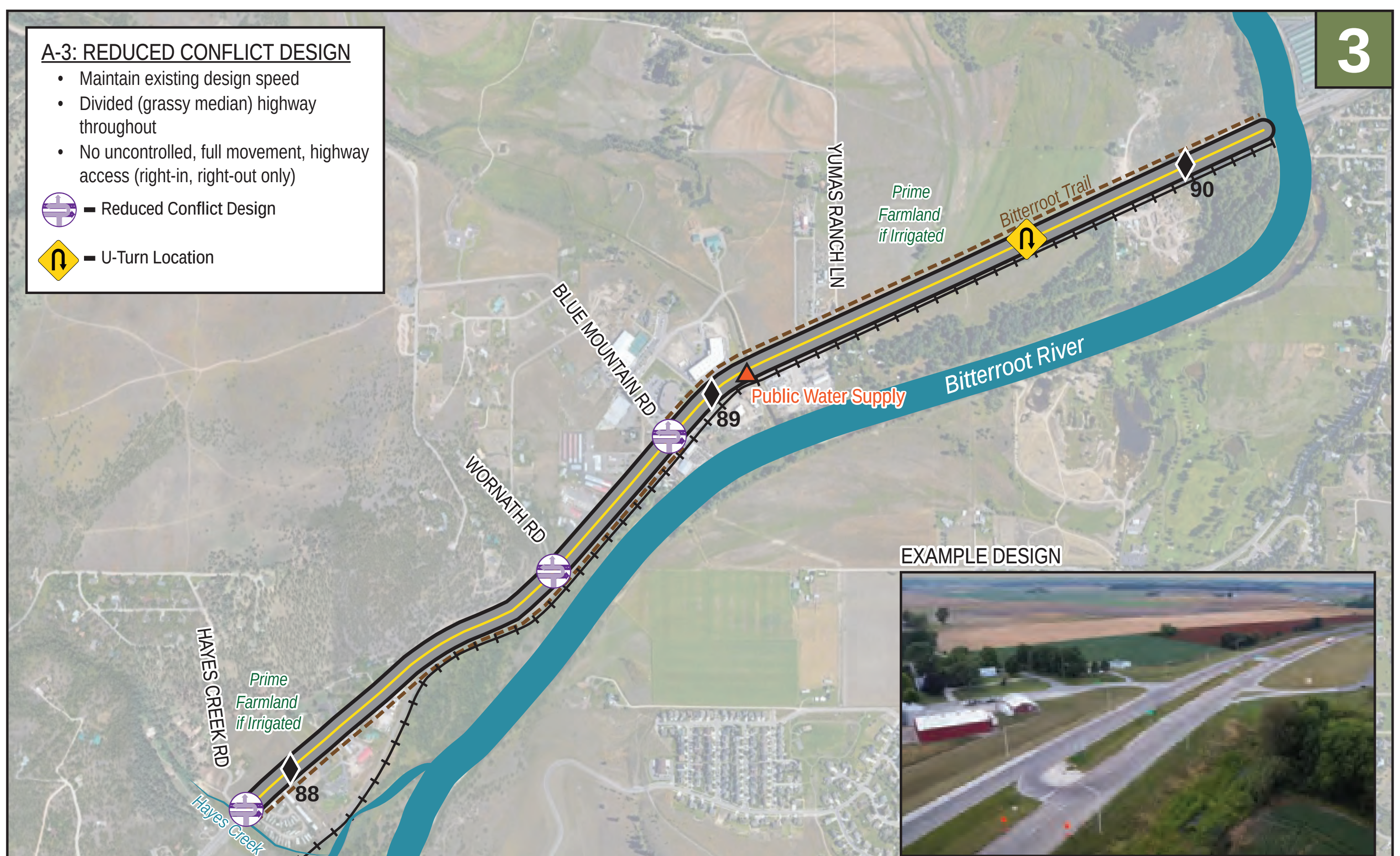
Includes varying combinations of the following design features:

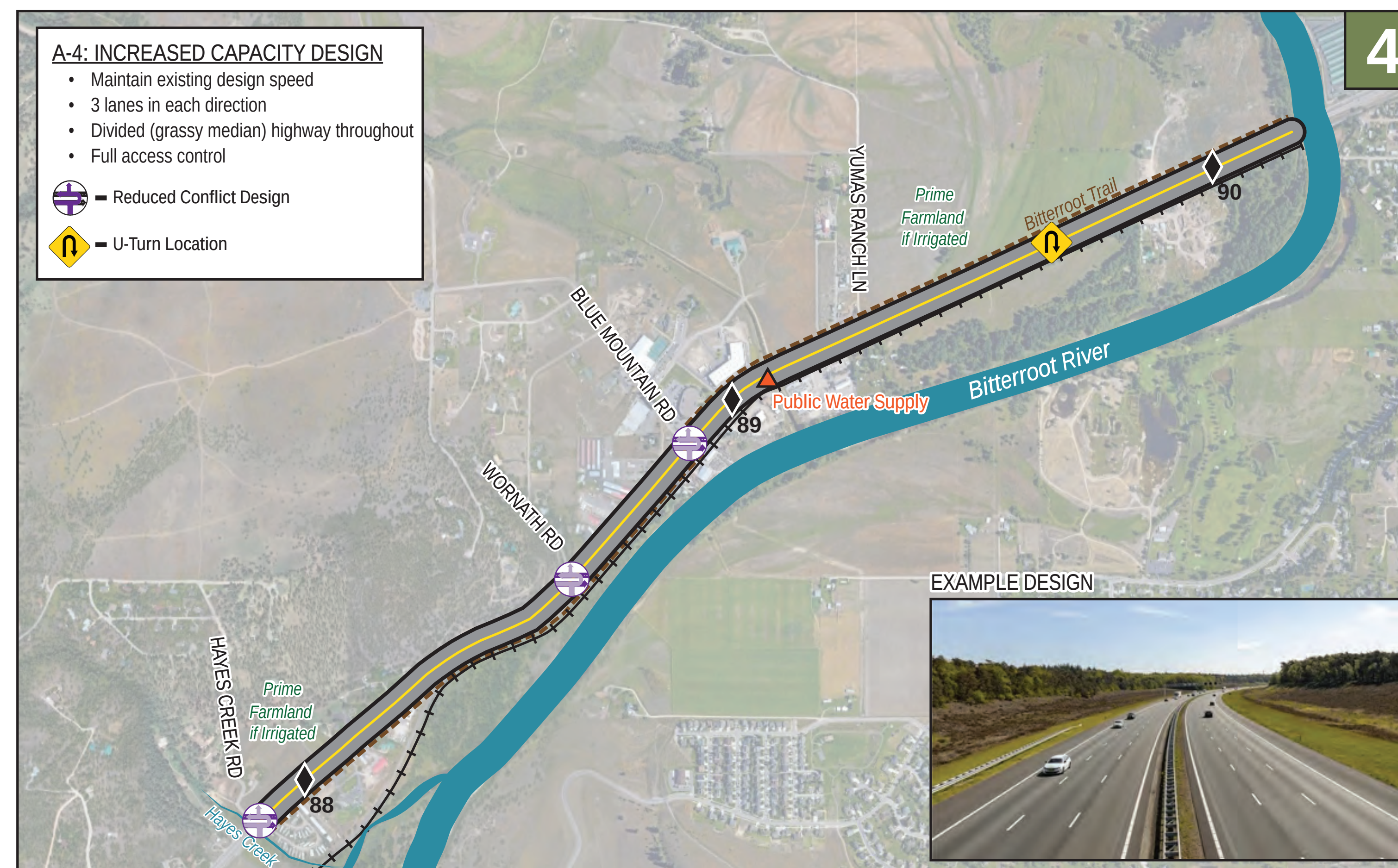
- Maintain existing design speeds
- Include three travel lanes in each direction
- Implement full access control
- Use reduced conflict intersection designs (continuous T, roundabout, RCUT)
- Prioritize operations and accommodations for future growth

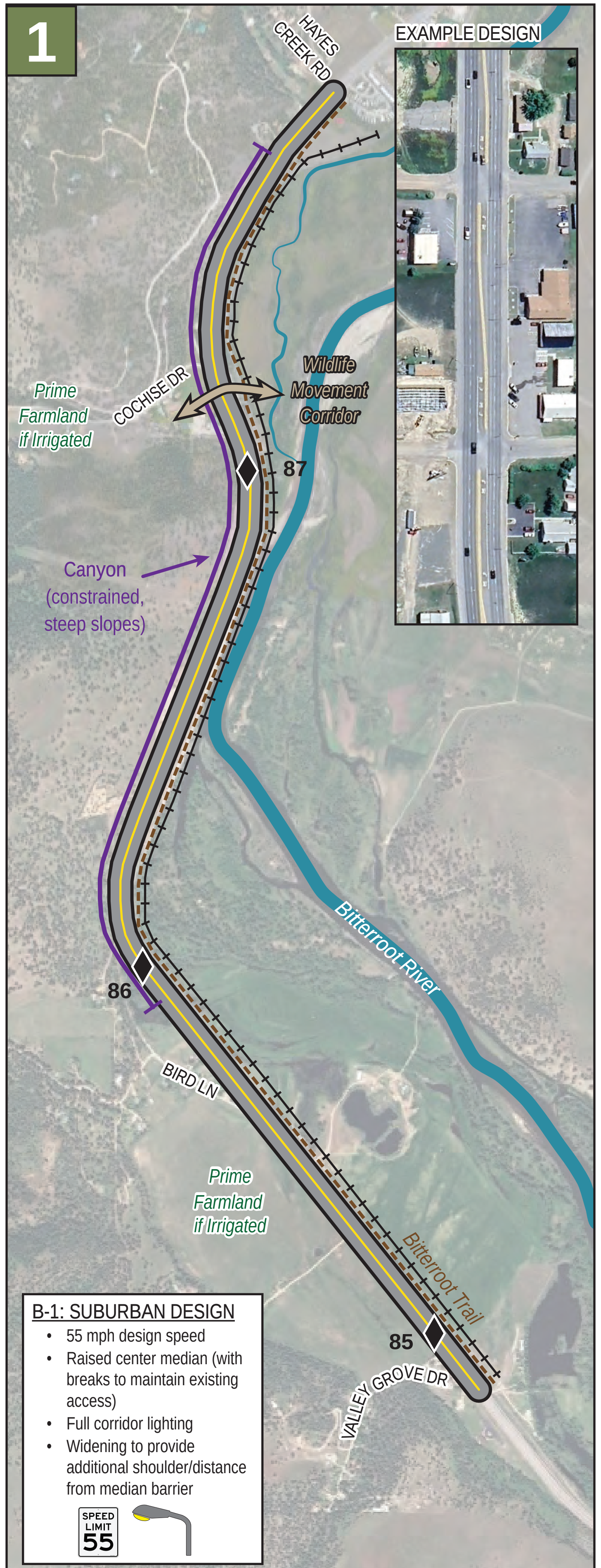



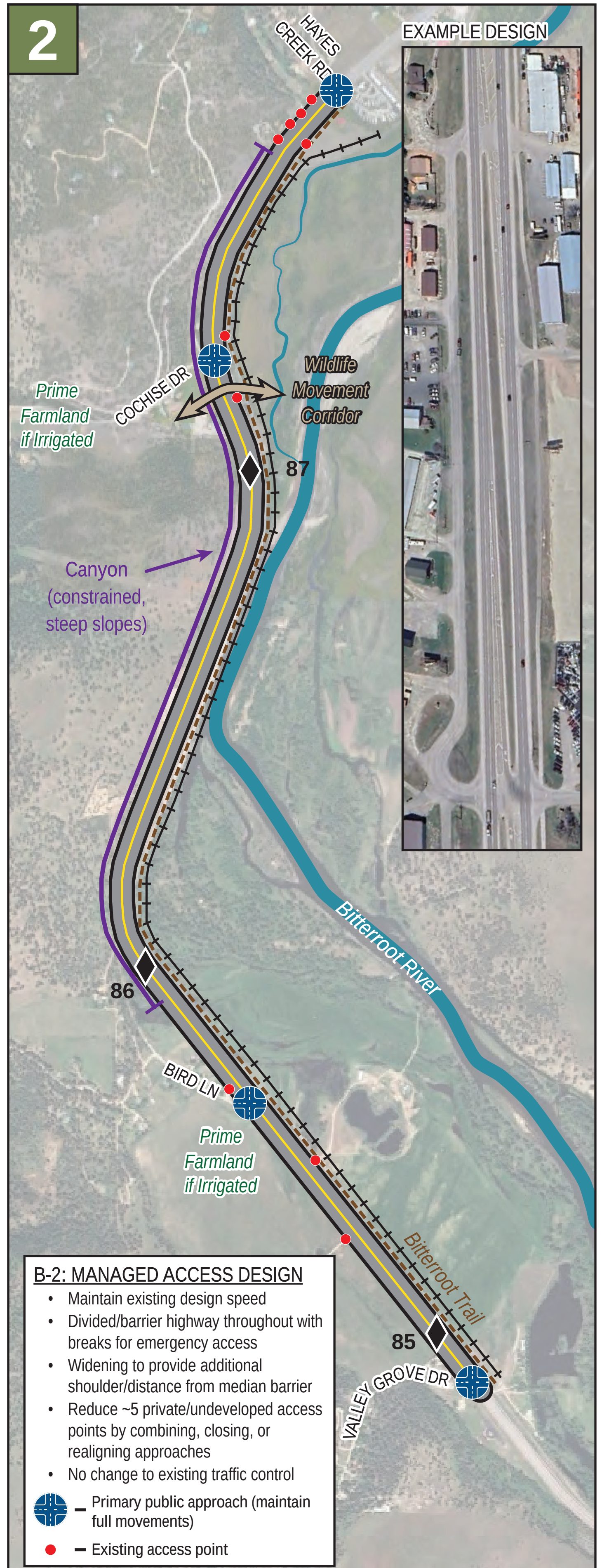


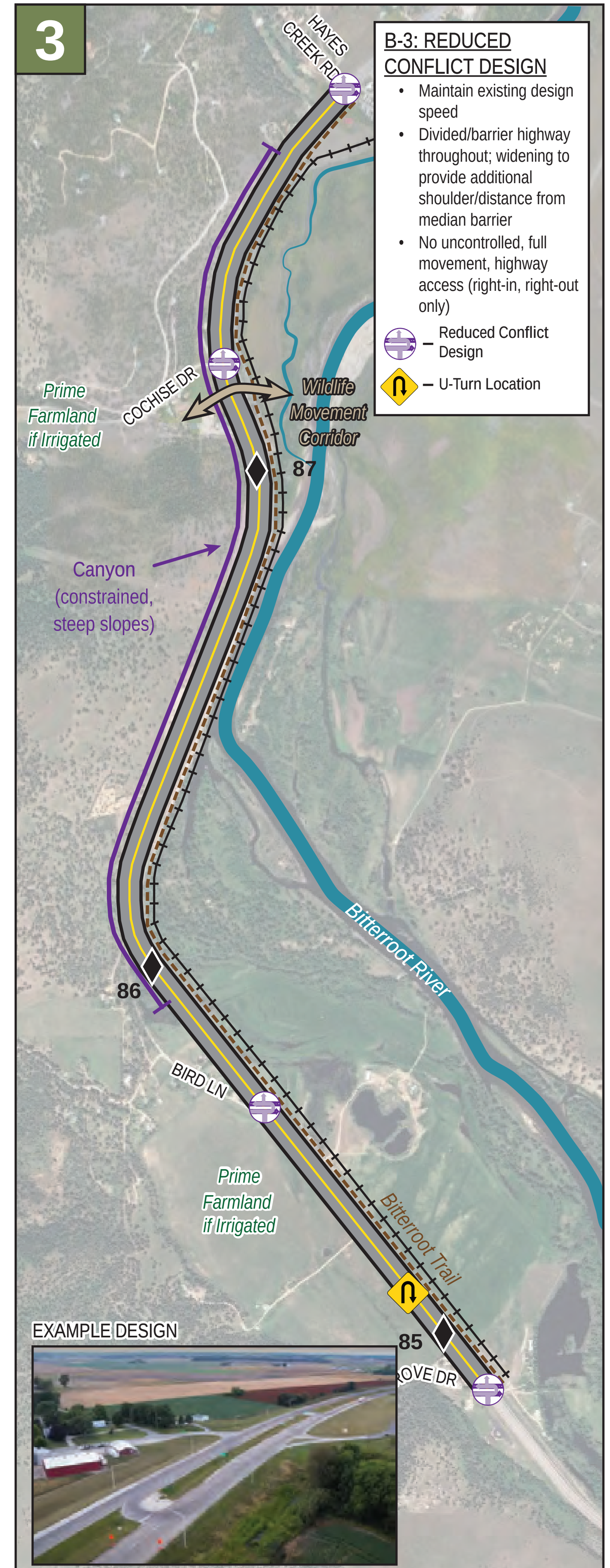
SEGMENT A: URBAN/RURAL TRANSITION (Buckhouse Bridge to Hayes Creek Rd)

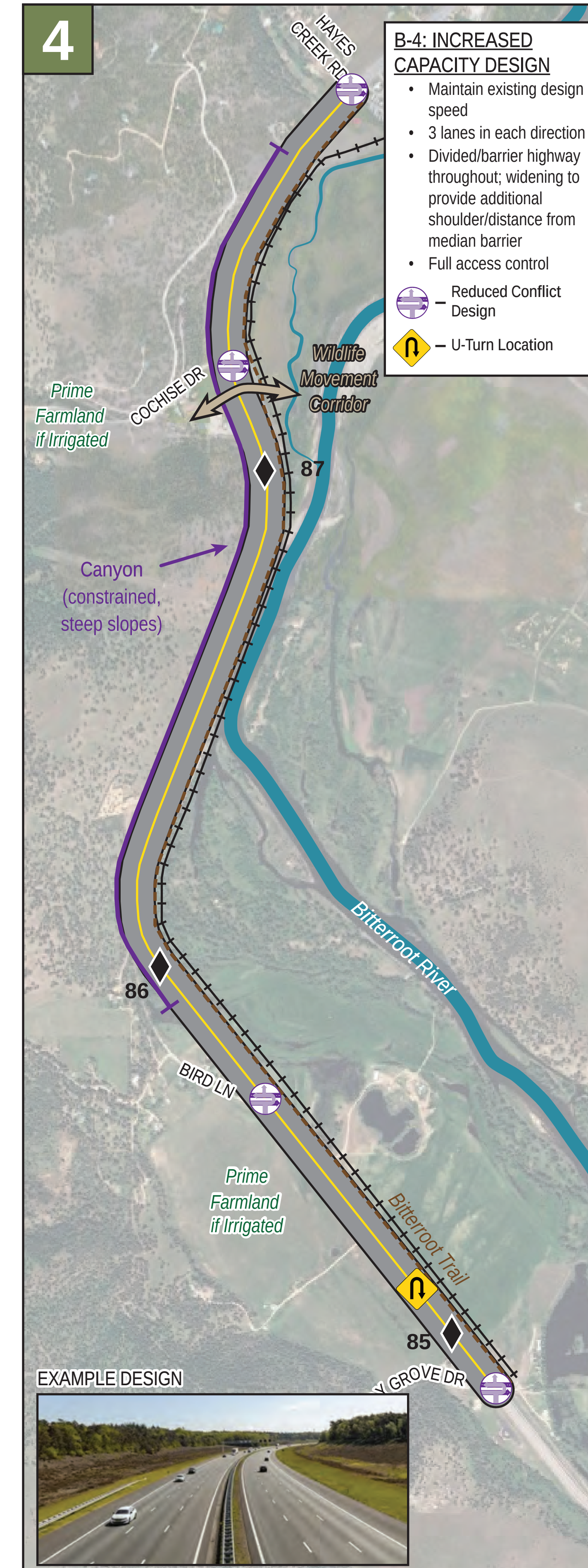




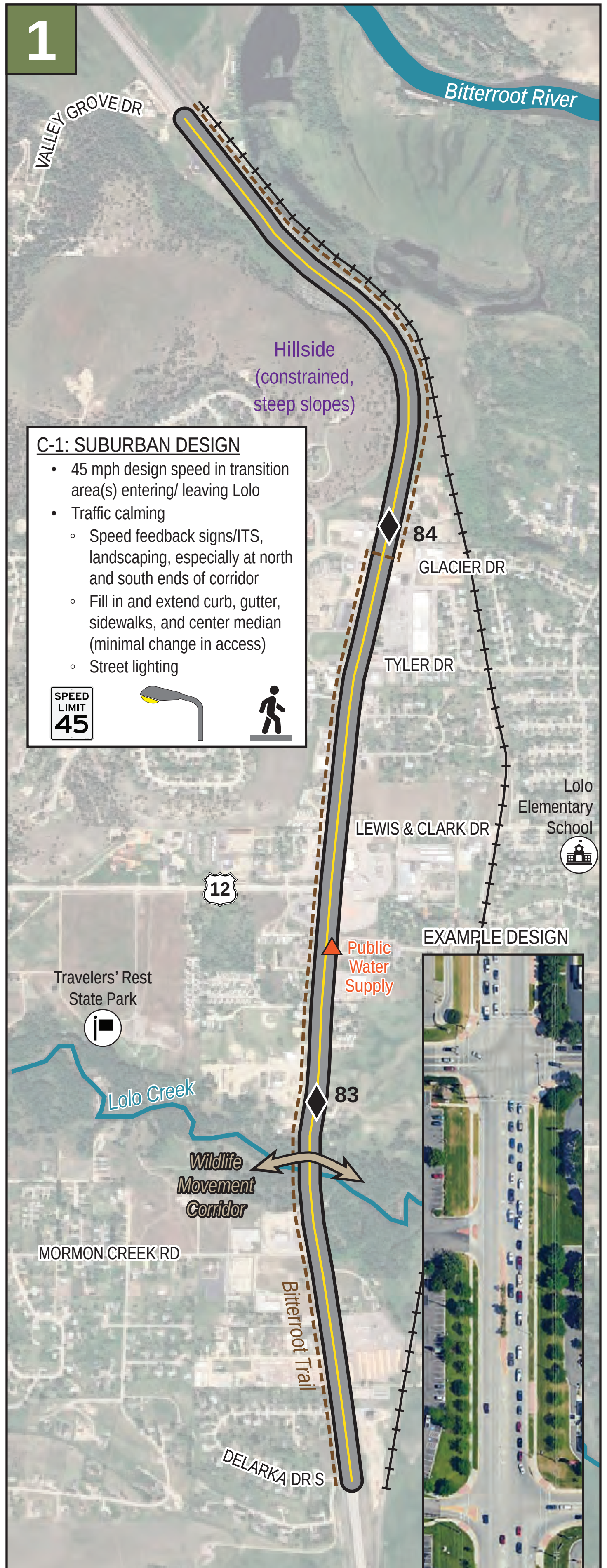


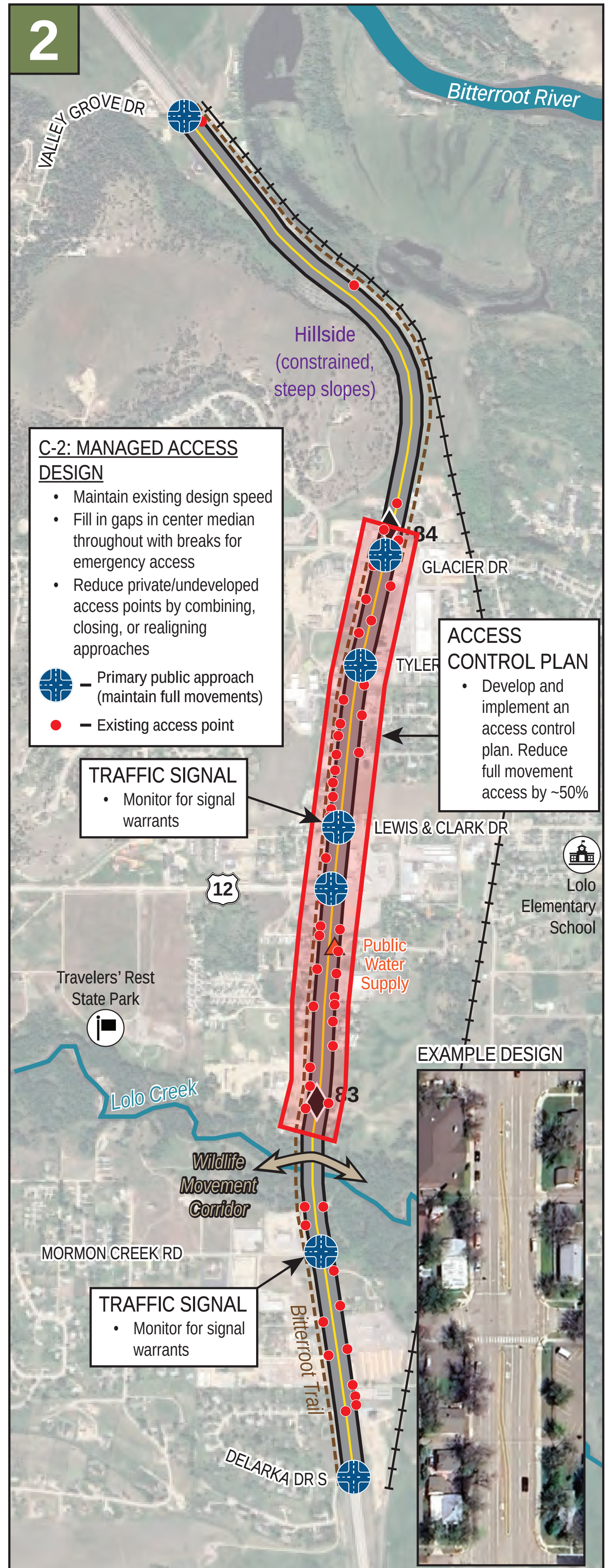


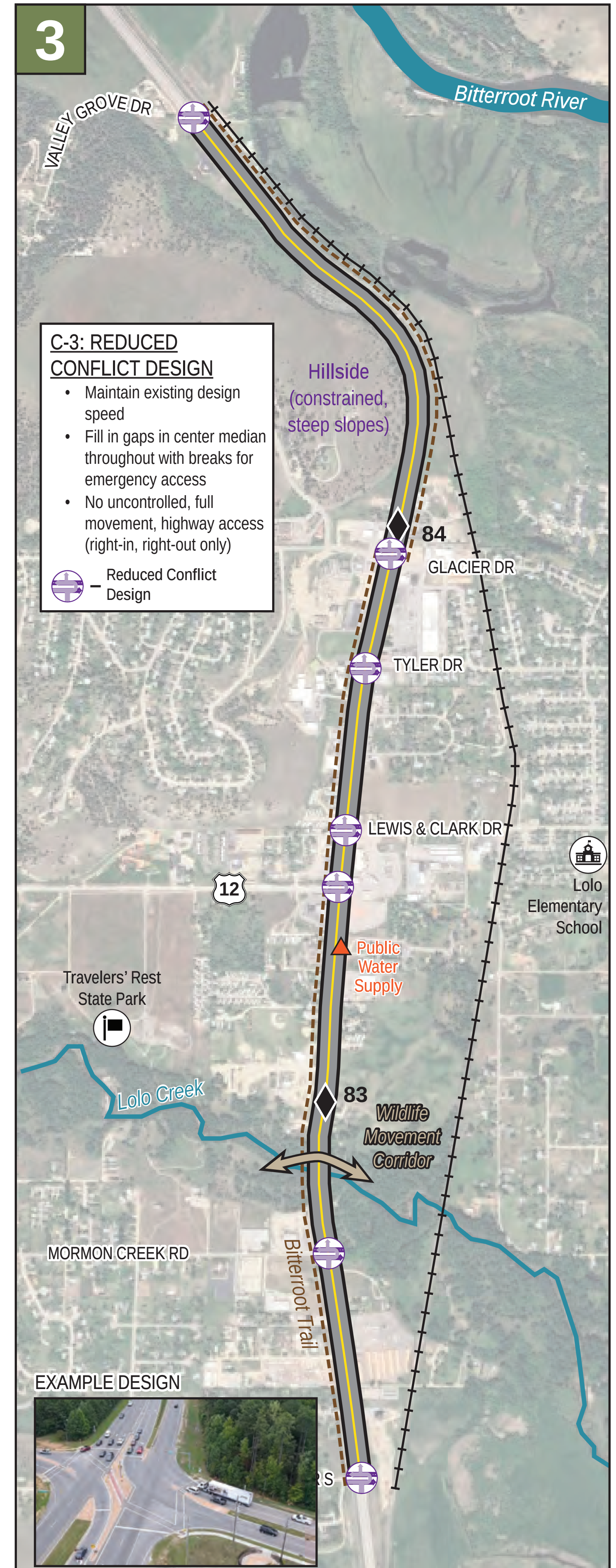


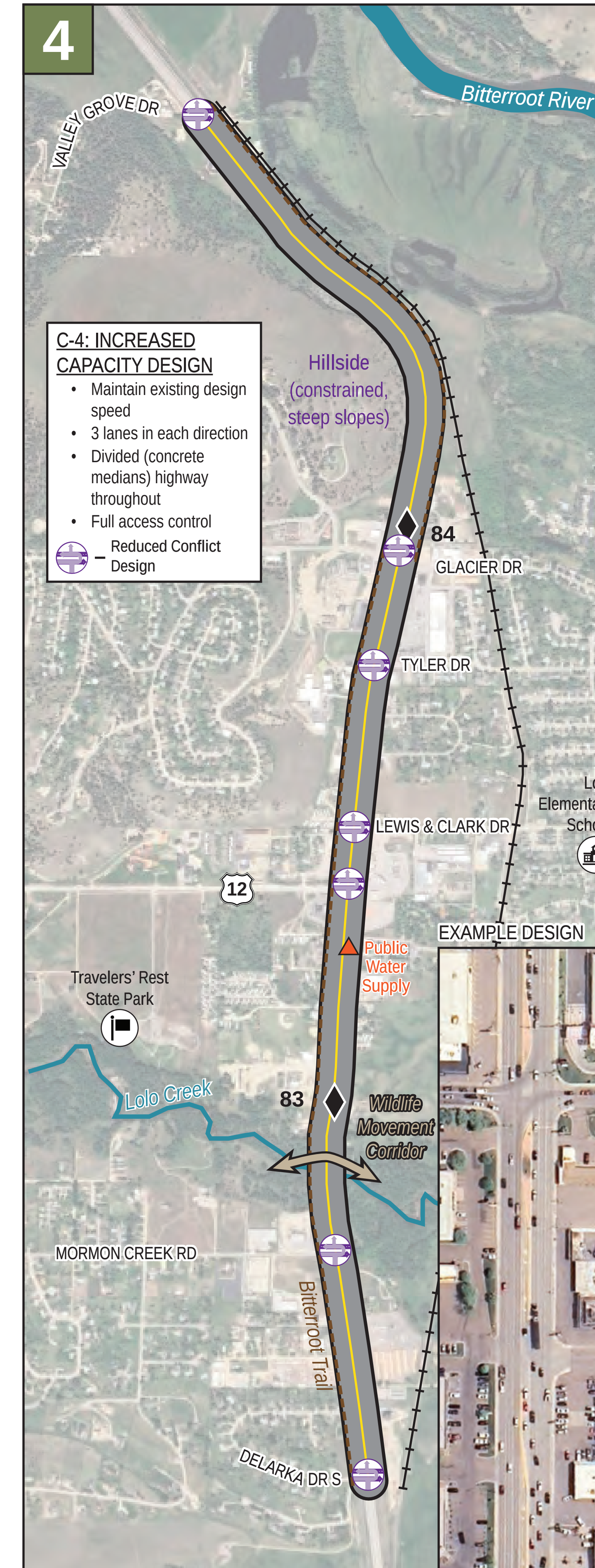


SEGMENT B: RURAL S CURVES (Hayes Creek Rd to Valley Grove Dr)

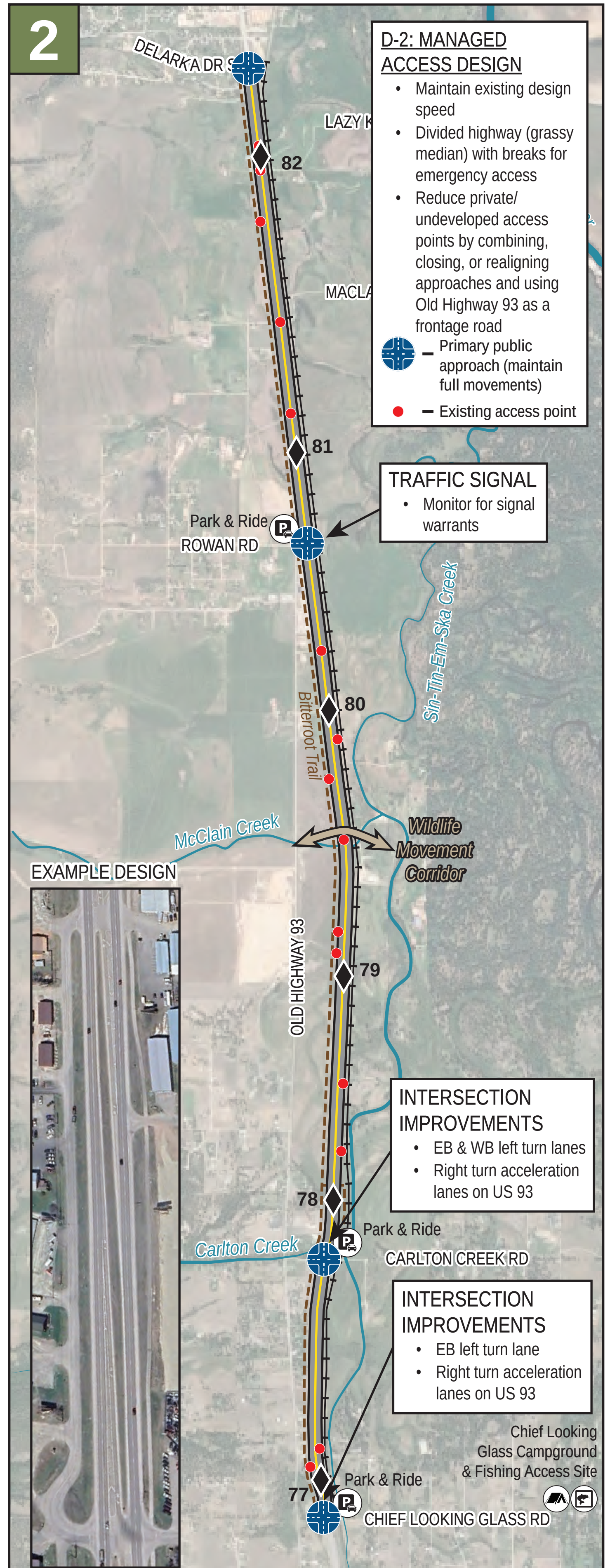




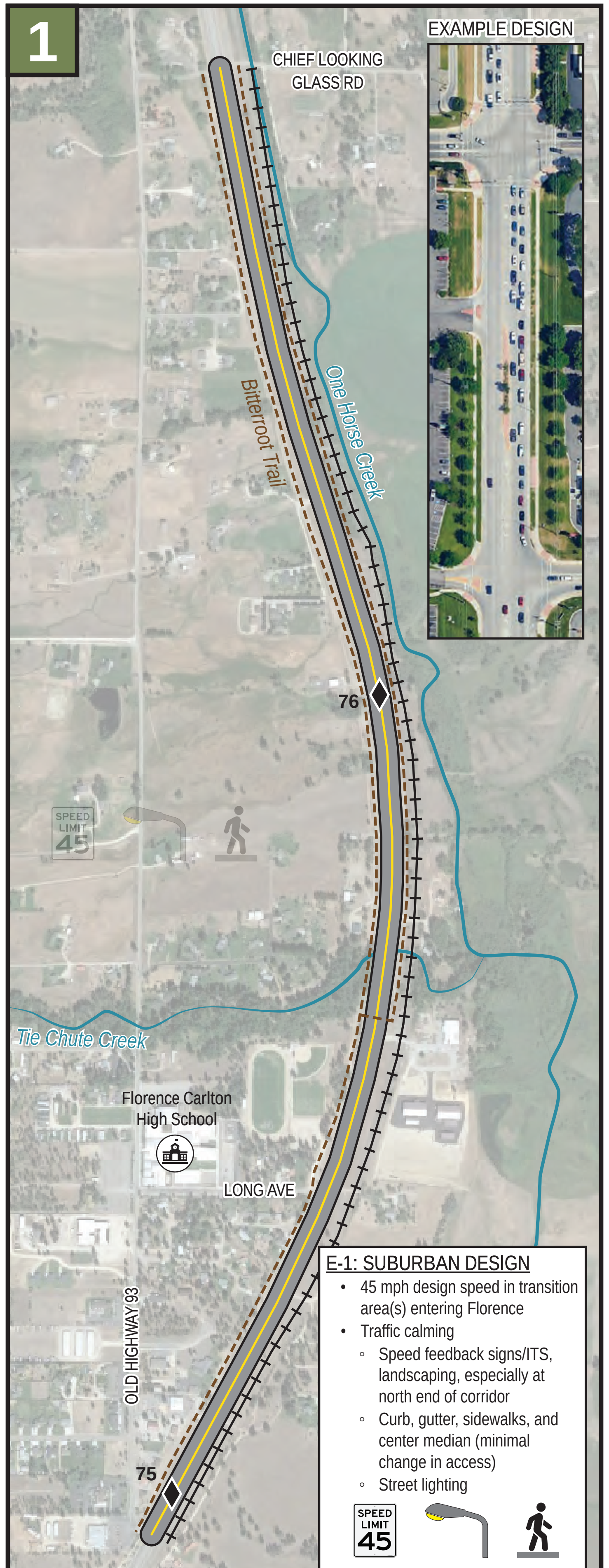


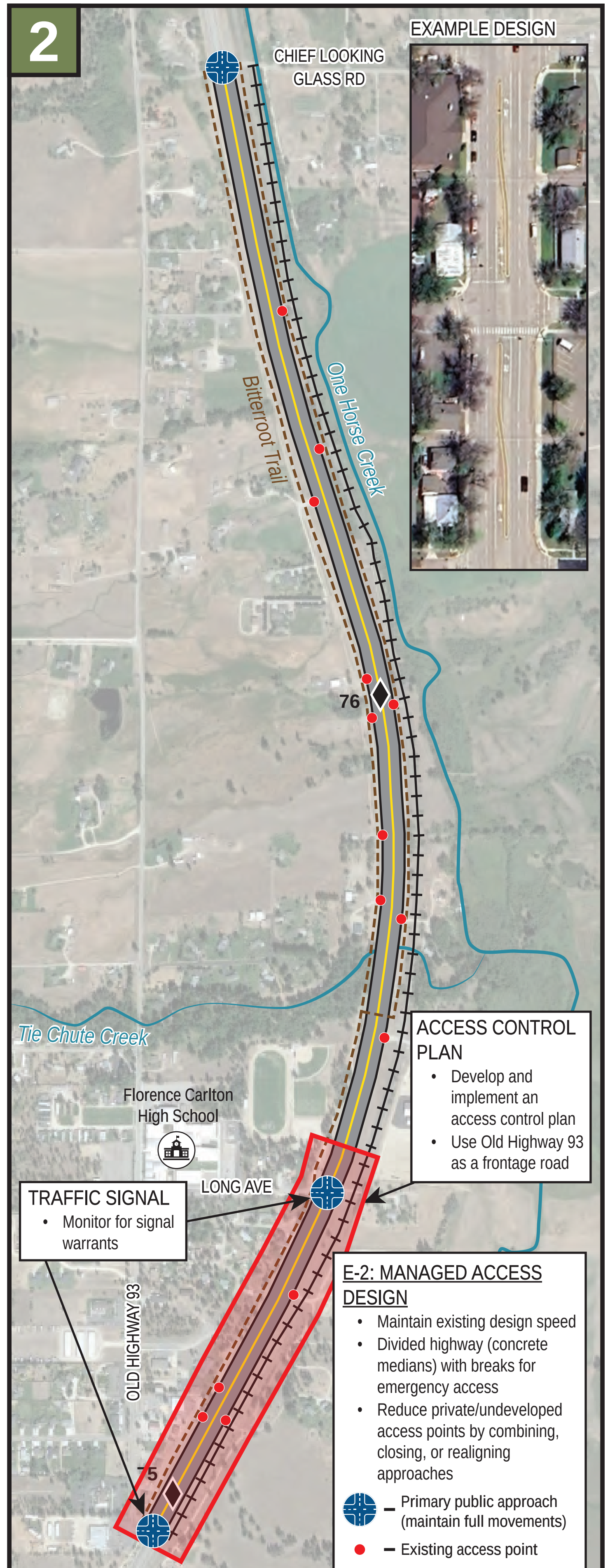


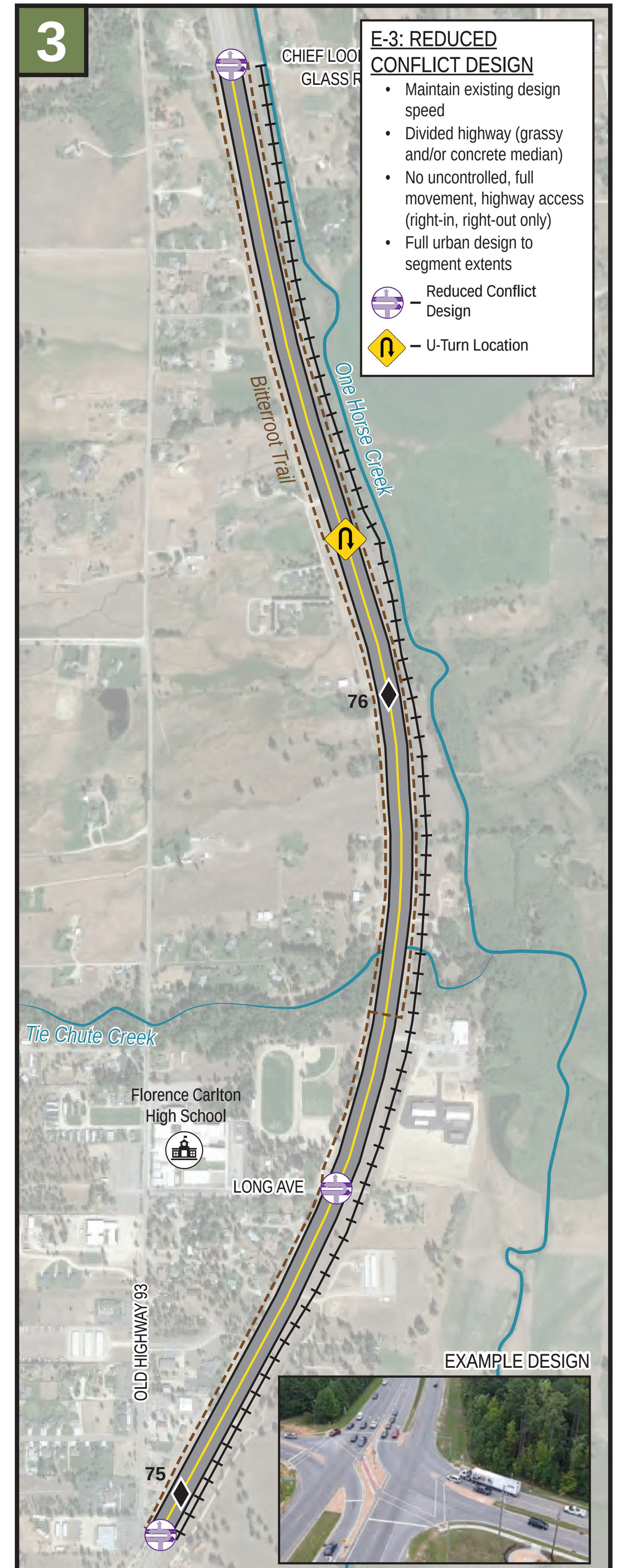
SEGMENT C: LOLO AREA (Valley Grove Dr to Delarka Dr S)



SEGMENT D: RURAL HIGHWAY (Delarka Dr S to Chief Looking Glass Rd)







SEGMENT E: FLORENCE AREA (Chief Looking Glass Rd to Old Highway 93)

CORRIDOR CONCEPT EVALUATION METHODOLOGY

Using the improvement concepts identified for each of the corridor segments, a comprehensive screening process was conducted. The screening involved a qualitative analysis of applicable corridor concepts for each of the five corridor segments to determine how well it would meet the goals and objectives of the *US 93-Missoula to Florence Corridor Study.* The primary goal of this study is to improve roadway safety by minimizing fatalities and serious injuries. As secondary goals, this study aims to improve traffic operations and mobility and identify improvements that are feasible to implement. In support of these goals, specific screening criteria were developed, as shown in the screening process outlined below. Each alternative was rated for each screening criteria according to a Very Good to Very Poor scale as shown in the table below. To be considered for further evaluation, a concept must PASS the primary goal by scoring an average FAIR rating and score highly under the secondary goals. Only the top two performing concepts for each segment were considered for further evaluation. The evaluation results are provided on page 8.

CORRIDOR CONCEPT EVALUATION PROCESS

PRIMARY GOAL

Minimize Fatalities and Serious Injuries →

- Reduce turning and crossing conflicts between all users
- Reduce mainline conflicts between vehicles
- Reduce conflicts with wild animals
- Reduce conflicts with fixed objects
- Encourage context appropriate speed

↓

Average rating greater than FAIR = **PASS** / Average rating less than FAIR = **FAIL**

↓

SECONDARY GOALS

Support Efficient Traffic Operations and Mobility →

- Minimize vehicle delay and travel times
- Allow for efficient corridor management
- Provide appropriate and reasonable access

Support Feasible Solutions →

- Minimize capital and maintenance costs
- Minimize impacts and constructability challenges

↓

RESULT

- Alternatives receiving **FAIL** rating under the primary goal will **NOT ADVANCE**
- The top two performing options will **ADVANCE**

CORRIDOR CONCEPT EVALUATION RATING DEFINITIONS

GOAL	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
SAFETY	Greatest potential for reduction in conflicts and severe crashes	Potential for major reduction in conflicts and severe crashes	Potential for moderate reduction in conflicts and severe crashes	Potential for minimal reduction in conflicts and severe crashes	No anticipated reduction (or increase) in conflicts and severe crashes
OPERATIONS	Greatest improvement in traffic operations	Major improvement in traffic operations	Moderate improvement in traffic operations	Minimal improvement in traffic operations	No improvement (or deterioration) in traffic operations
IMPACTS	Least amount of impacts	Minimal impacts	Moderate impacts	Major impacts	Greatest amount of impacts

CORRIDOR CONCEPT EVALUATION RESULTS

ALTERNATIVE		PRIMARY GOAL					PRIMARY GOAL RESULT	SECONDARY GOAL					EVALUATION RESULT
		Minimize Fatalities & Serious Injuries						Support Efficient Traffic Operations & Mobility			Support Feasible Solutions		
		Reduce turning and crossing conflicts between all users	Reduce mainline conflicts between vehicles	Reduce conflicts with wild animals	Reduce conflicts with fixed objects	Encourage context appropriate speeds		Minimize vehicle delay and travel times	Allow for efficient corridor management	Provide appropriate and reasonable access	Minimize capital and maintenance costs	Minimize impacts and constructability challenges	
SEGMENT A: URBAN / RURAL TRANSITION													
A-1	**Suburban**	Fair	Very Good	Good	Fair	Very Good	PASS	Good	Good	Good	Fair	Very Good	ADVANCED
A-2	**Managed Access**	Good	Very Good	Good	Good	Fair	PASS	Good	Good	Very Good	Good	Very Good	ADVANCED
A-3	**Reduced Conflict**	Very Good	Good	Good	Good	Fair	PASS	Fair	Good	Fair	Good	Good	NOT ADVANCED
A-4	**Increased Capacity**	Fair	Good	Poor	Fair	Poor	FAIL	Very Good	Very Good	Fair	Very Poor	Very Poor	FAILED PRIMARY
SEGMENT B: RURAL "S" CURVES													
B-1	**Suburban**	Fair	Fair	Fair	Poor	Fair	FAIL	Fair	Fair	Good	Good	Fair	FAILED PRIMARY
B-2	**Managed Access**	Good	Good	Good	Fair	Good	PASS	Good	Fair	Very Good	Good	Fair	ADVANCED
B-3	**Reduced Conflict**	Very Good	Fair	Good	Fair	Good	PASS	Fair	Good	Good	Fair	Fair	ADVANCED
B-4	**Increased Capacity**	Poor	Fair	Very Poor	Poor	Very Poor	FAIL	Very Good	Very Good	Good	Very Poor	Very Poor	FAILED PRIMARY
SEGMENT C: LOLO AREA													
C-1	**Suburban**	Fair	Good	Good	Fair	Very Good	PASS	Good	Good	Good	Fair	Good	ADVANCED
C-2	**Managed Access**	Good	Good	Good	Fair	Fair	PASS	Good	Good	Very Good	Good	Good	ADVANCED
C-3	**Reduced Conflict**	Fair	Fair	Good	Fair	Fair	PASS	Poor	Fair	Poor	Poor	Poor	NOT ADVANCED
C-4	**Increased Capacity**	Poor	Fair	Fair	Poor	Poor	FAIL	Good	Very Good	Poor	Very Poor	Very Poor	FAILED PRIMARY
SEGMENT D: RURAL HIGHWAY													
D-1	**Suburban**	Fair	Good	Fair	Poor	Poor	FAIL	Poor	Fair	Fair	Good	Very Good	FAILED PRIMARY
D-2	**Managed Access**	Good	Very Good	Good	Very Good	Very Good	PASS	Good	Good	Very Good	Fair	Good	ADVANCED
D-3	**Reduced Conflict**	Very Good	Very Good	Good	Very Good	Very Good	PASS	Good	Good	Good	Fair	Good	ADVANCED
D-4	**Increased Capacity**	Fair	Good	Poor	Good	Good	PASS	Very Good	Very Good	Good	Poor	Poor	NOT ADVANCED
SEGMENT E: FLORENCE AREA													
E-1	**Suburban**	Fair	Good	Good	Fair	Very Good	PASS	Good	Good	Good	Fair	Very Good	ADVANCED
E-2	**Managed Access**	Good	Good	Good	Good	Fair	PASS	Good	Good	Very Good	Good	Good	ADVANCED
E-3	**Reduced Conflict**	Good	Fair	Good	Good	Fair	PASS	Fair	Fair	Poor	Fair	Fair	NOT ADVANCED
E-4	**Increased Capacity**	Poor	Fair	Fair	Fair	Poor	FAIL	Good	Very Good	Poor	Very Poor	Very Poor	FAILED PRIMARY

APPENDIX B:

Intersection Control Evaluation

INTERSECTION CONTROL EVALUATION

A sequential approach was used to identify and evaluate 9 of the key intersections within the corridor (Hayes Creek Rd, Cochise Dr, Bird Ln, Mormon Creek Rd, Delarka Dr S, Rowan St, Carlton Creek Rd, Chief Looking Glass Rd, and Long Ave). The approach was developed based on FHWA's *Intersection Control Evaluation (ICE)* process, but tailored to the needs of each location. The ICE process is a data-driven approach developed to objectively evaluate and screen alternatives. For this study, the evaluation process was used to determine fatal flaws that warrant elimination from further consideration. Several options may be appropriate for each intersection and will need to be evaluated in greater detail during future design phases depending on selected corridor improvement strategies.

Alternatives Identification

A list of improvement alternatives was developed for the major intersections within the corridor. The alternatives include a variety of traffic control options and geometric improvements. The alternatives were identified with the intent to address identified operational and safety concerns. A total of five alternatives were identified. Due to differences in existing intersection characteristics, only the alternatives that were considered applicable to each intersection were evaluated. The alternatives are presented in the table below.

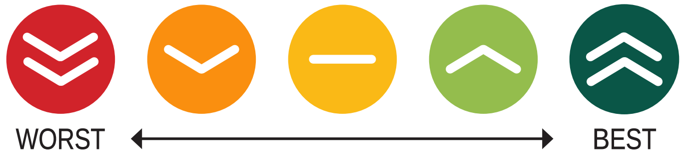
ALTERNATIVE	DESCRIPTION
ENHANCED STOP CONTROL	• Provide stop control on minor approach legs • Provide additional lanes to accommodate turning vehicles as needed • Allow all turning movements
TRAFFIC SIGNAL	• Use a traffic signal to direct and control traffic • Provide appropriate turn lanes and signal phasing • Allow all turning movements
MULTI-LANE ROUNDABOUT	• Use a roundabout to direct and control traffic • Entering vehicles yield to circulating traffic • Allow all turning movements
RCUT	• Allow right and left turns from mainline to minor approaches • Allow only right turns from minor approaches • Provide u-turn opportunities at downstream locations • Provide unrestricted mainline traffic flow
CONTINUOUS T	• Use only at three-legged intersections • Provide a channelized receiving lane for left-turning vehicles from the minor approach to merge onto the mainline • Stop control on minor approach

Evaluation Criteria

An evaluation was conducted to screen the identified alternatives for each intersection and to eliminate those exhibiting fatal flaws. Four evaluation criteria were selected for the analysis. The criteria were identified based on the issues and concerns identified at the study intersections. The table below lists the evaluation criteria and a description of the elements and evaluation methodology for each, including both qualitative and quantitative components.

CRITERIA	DESCRIPTION	METHODOLOGY
SAFETY	• Reduce vehicle conflicts • Address historic crash trends • Provide adequate visibility and sight distance	• Reviewed relevant Crash Modification Factors (CMFs) to understand how changes in traffic control and roadway configuration may affect safety • Compared to the crashes that occurred between 2012 and 2021 within 250 feet of each intersection
OPERATIONS	• Improve intersection performance • Reduce vehicle delay • Accommodate all users • Facilitate efficient highway operations	• Used the FHWA *Capacity Analysis for Planning of Junctions* (Cap-X) tool which offers a planning-level assessment of the overall performance of various intersection configurations based on the volume to capacity (V/C) ratio • Assessed operations under existing conditions using traffic volumes collected in 2022 and 2023 and long-term (2045) conditions using a 1.0% annual growth rate • Considered potential for signal warrants to be met under existing and projected conditions • Qualitatively assessed the ability of each alternative to facilitate efficient US 93 highway operations for mainline traffic including large trucks and emergency personnel
IMPACTS	• Minimize impacts to the environment • Minimize impacts to adjacent land • Minimize construction impacts	• Assessed the relative level of impact of each alternative to the environment and adjacent land uses including the potential acquisition of right-of-way or conversion of open space to developed land • Considered the constructability and traffic impacts that may be experienced during construction
IMPLEMENTATION	• Balance improvement benefits and costs • Enable reasonable project delivery timeframe	• Considered the relationship between relative implementation costs and anticipated project benefits • Considered overall project cost as a potentially prohibitive factor. High-cost projects may take a longer time to implement while low-cost improvements are generally easier to implement in the short term

Evaluation Scale



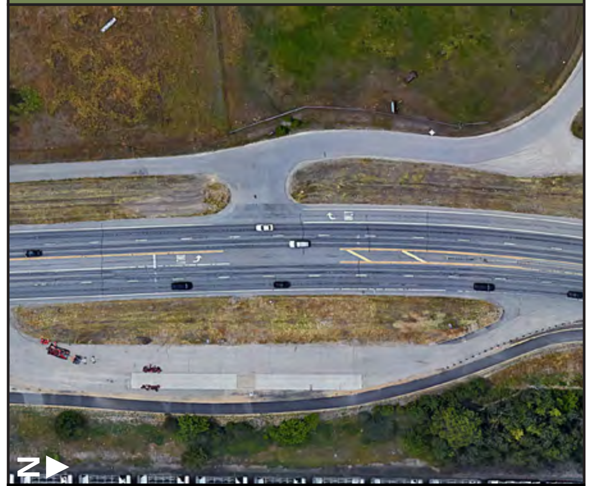
All intersection alternatives were evaluated on a qualitative scale based on their respective performance compared to other intersection alternatives. Lower scores represent poor performance and/or high impacts while higher scores represent exceptional performance and/or low impacts. Any alternative receiving a (worst) for any of the four evaluation criteria was considered to exhibit fatal flaws and was automatically removed from further consideration.

BASELINE CONDITIONS

HAYES CREEK RD

- Stop-controlled, 4-leg intersection
- Center two-way left-turn lane (TWLTL) on US 93
- Primarily residential land use
- 65 mph - US 93 speed limit
- 10 crashes, 0 severe injuries (2012 - 2021)

COCHISE DR



- Stop-controlled, 3-leg intersection
- Dedicated NB left-turn and SB right-turn lanes
- Pullout on east side of highway
- Residential and commercial land use
- 65 mph - US 93 speed limit
- 8 crashes, 1 fatality (2012 - 2021)

BIRD LN

- Stop-controlled, 3-leg intersection
- Two driveways make up minor approach leg (recently reconstructed/consolidated into one approach leg)
- Center TWLTL on US 93
- Primarily residential land use
- 65 mph - US 93 speed limit
- 10 crashes, 0 severe injuries (2012 - 2021)

MORMON CREEK RD

- Stop-controlled, 3-leg intersection
- Dedicated SB right-turn lane
- Center TWLTL on US 93
- Residential, commercial, light industrial land use
- 45 mph - US 93 speed limit
- 7 crashes, 0 severe injuries (2012 - 2021)

DELARKA DR S

- Stop-controlled, 3-leg intersection
- Center TWLTL on US 93
- Primarily residential land use
- 45 mph - US 93 speed limit
- 5 crashes, 0 severe injuries (2012 - 2021)

ROWAN ST

- Stop-controlled, 3-leg intersection with intersecting driveway on east side of highway
- Dedicated NB left-turn and SB right-turn lanes
- Residential and commercial land use
- Access to Old Hwy 93 and Park & Ride lot
- 70 mph - US 93 speed limit
- 9 crashes, 1 suspected serious injury (2012 - 2021)

CARLTON CREEK RD

- Stop-controlled, 4-leg intersection with slight skew
- Dedicated left-turn lanes on US 93
- Primarily residential land use
- Access to Old Hwy 93 and Park & Ride lot
- 70 mph - US 93 speed limit
- 8 crashes, 2 suspected serious injuries (2012 - 2021)

CHIEF LOOKING GLASS RD

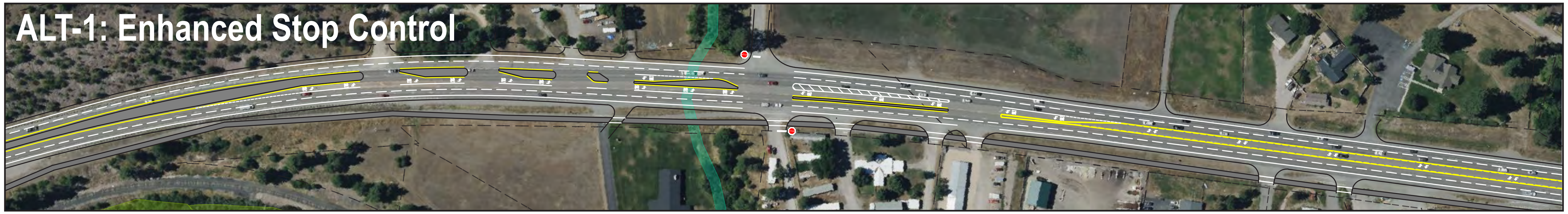
- Stop-controlled, 4-leg intersection
- Dedicated left-turn lanes on US 93
- Primarily residential land use
- Access to Old Hwy 93 and Park & Ride lot
- 70 mph - US 93 speed limit
- 13 crashes, 1 fatality, 7 suspected serious injuries (2012 - 2021)

LONG AVE

- Stop-controlled, 3-leg intersection with intersecting driveway on east side of highway
- Dedicated left-turn lanes on US 93 with SB right-turn lane
- Residential and commercial land use
- Access to Old Hwy 93 and Florence-Carlton Schools
- 45 mph - US 93 speed limit
- 2 crashes, 0 severe injuries (2012 - 2021)

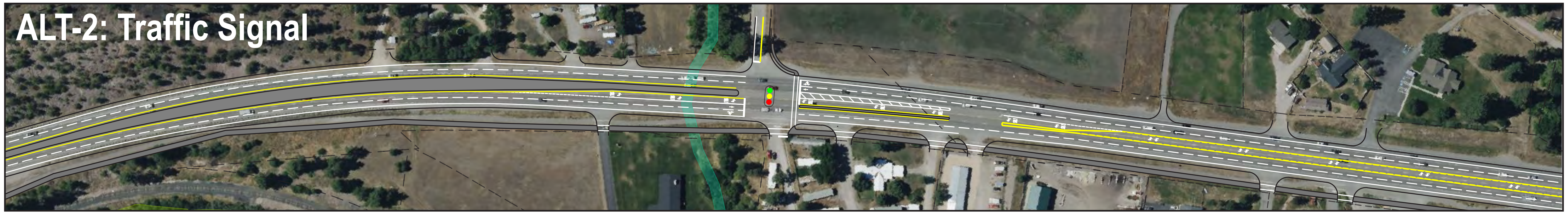
HAYES CREEK RD

ALT-1: Enhanced Stop Control



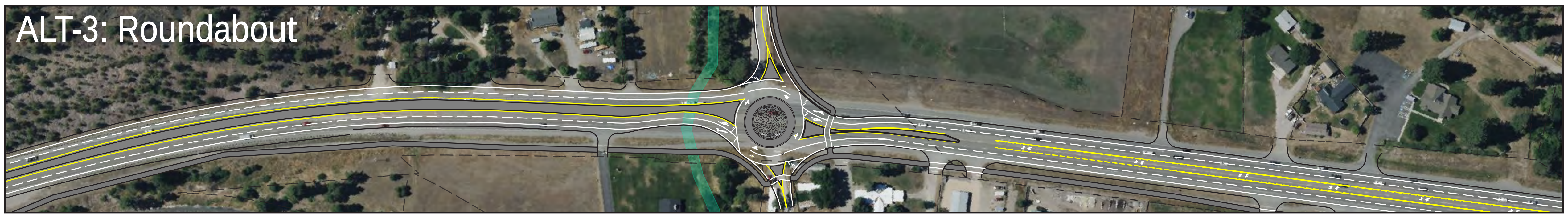
ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-2: Traffic Signal



DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

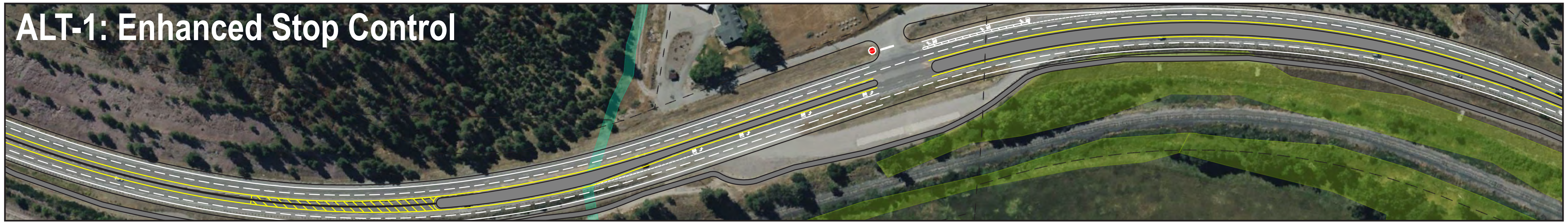
ALT-3: Roundabout



DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

COCHISE DR

ALT-1: Enhanced Stop Control

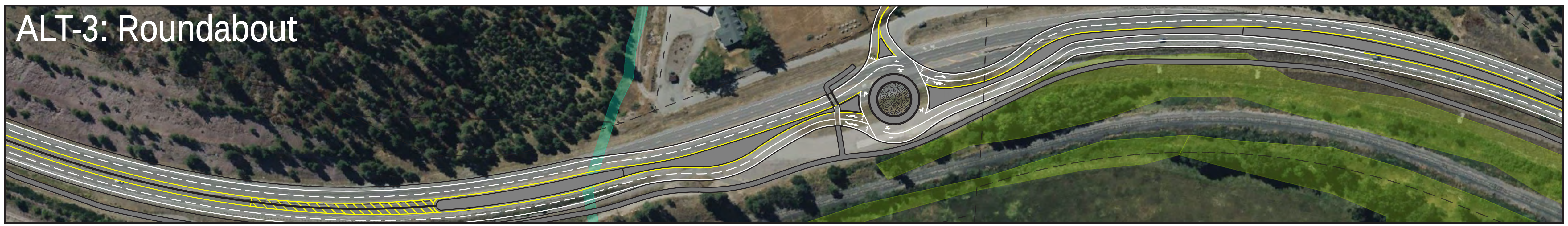


DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-2: Traffic Signal

DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-3: Roundabout

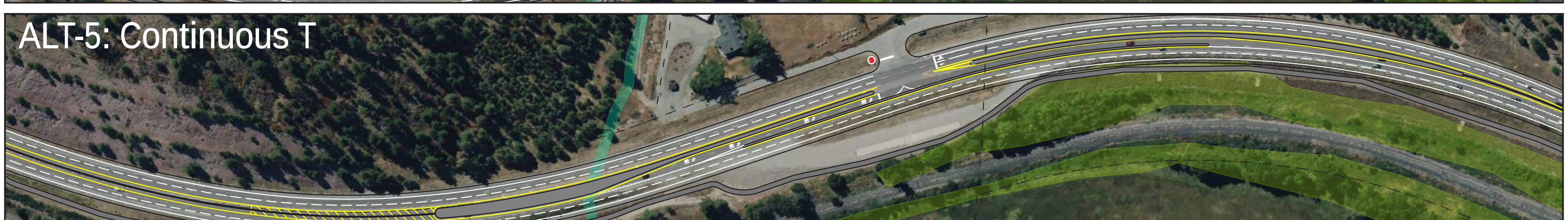


ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-4: RCUT

ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-5: Continuous T

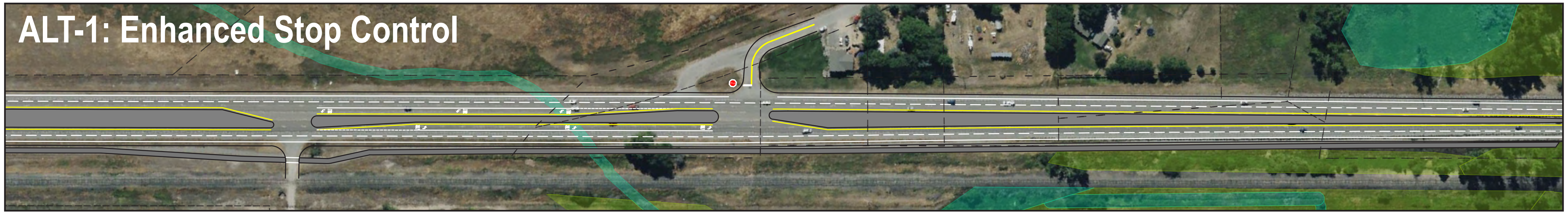


ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

FOR PLANNING PURPOSES ONLY

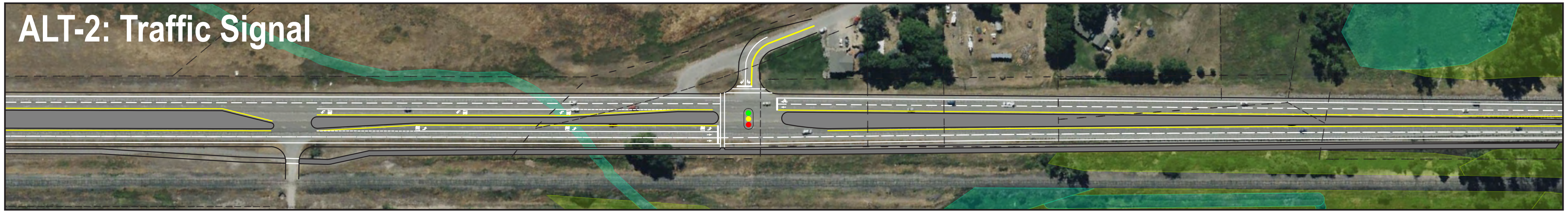
BIRD LN

ALT-1: Enhanced Stop Control



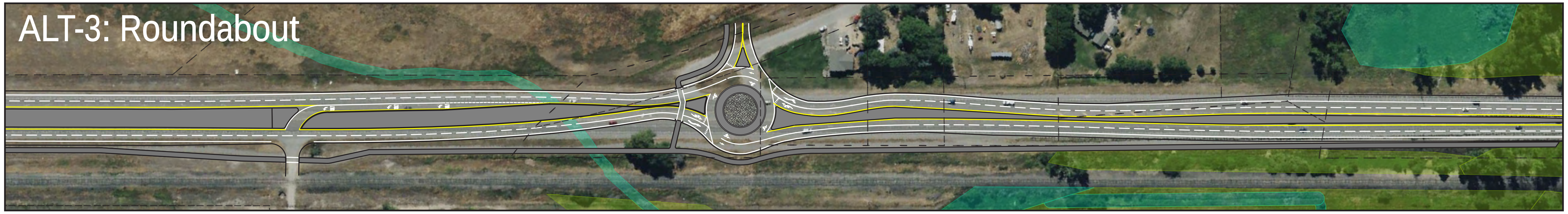
ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-2: Traffic Signal



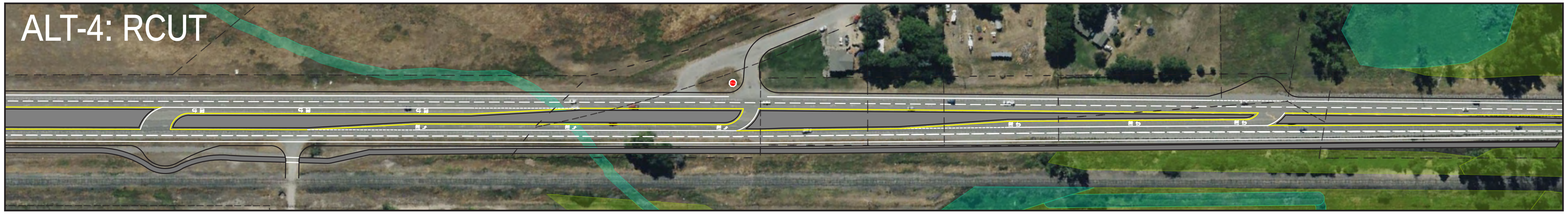
DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-3: Roundabout



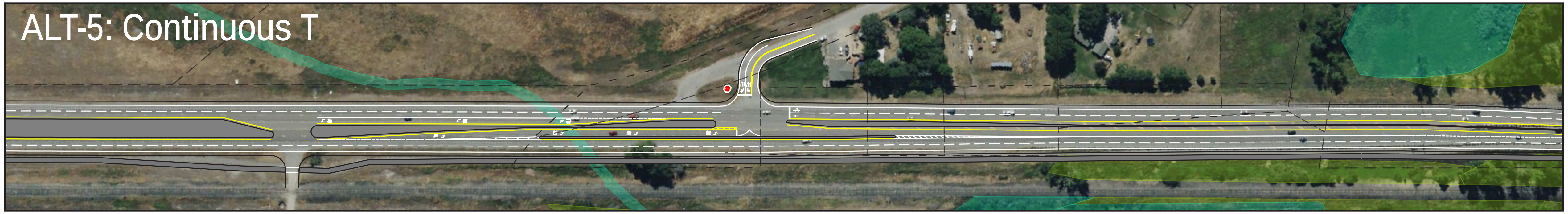
ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-4: RCUT



ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

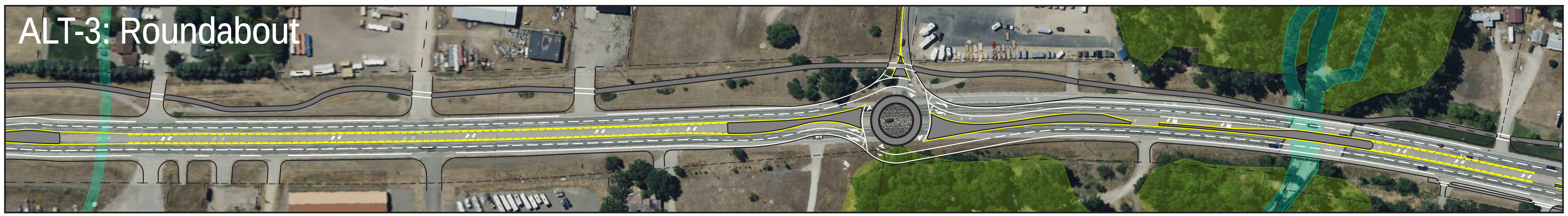
ALT-5: Continuous T



ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

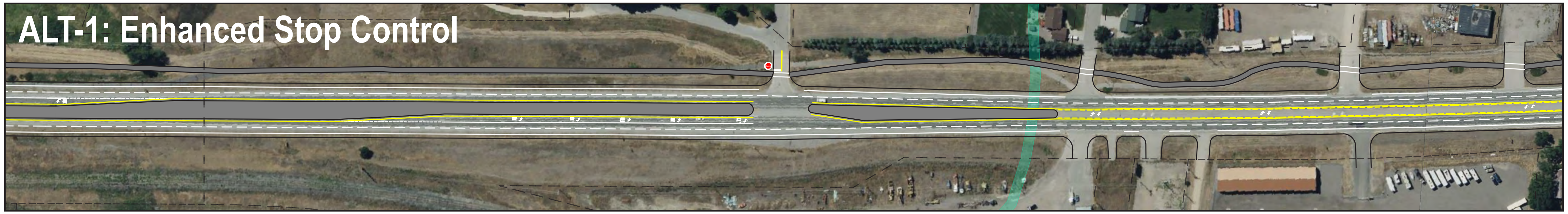
ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	



DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

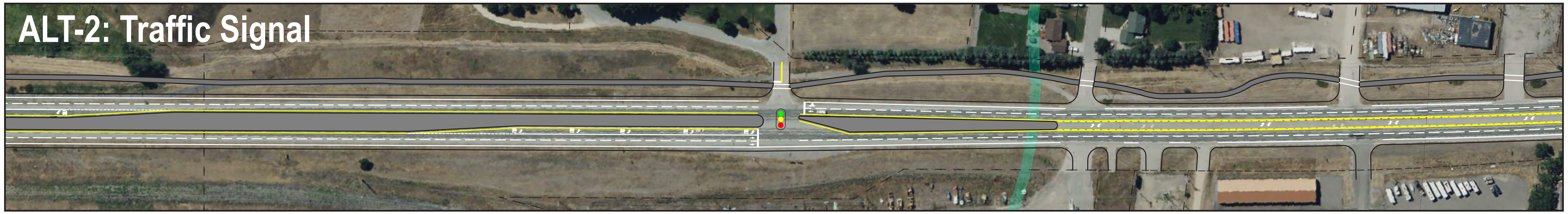
ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

ALT-1: Enhanced Stop Control



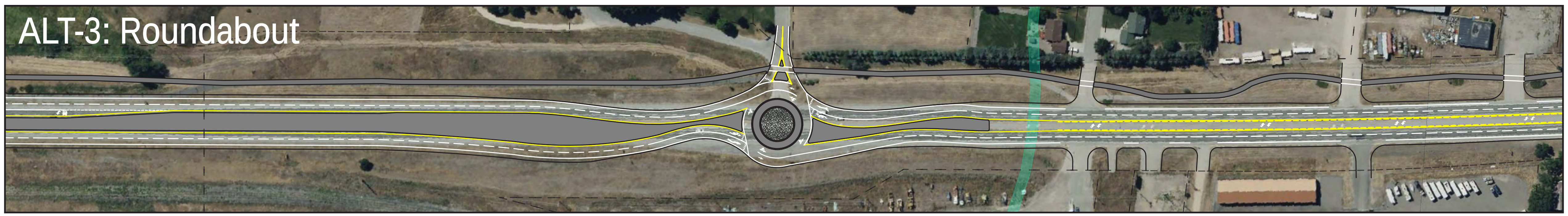
ADVANCE		
	SAFETY	⌄
	OPERATIONS	⌄
	IMPACTS	⌃
	IMPLEMENTATION	⌄

ALT-2: Traffic Signal



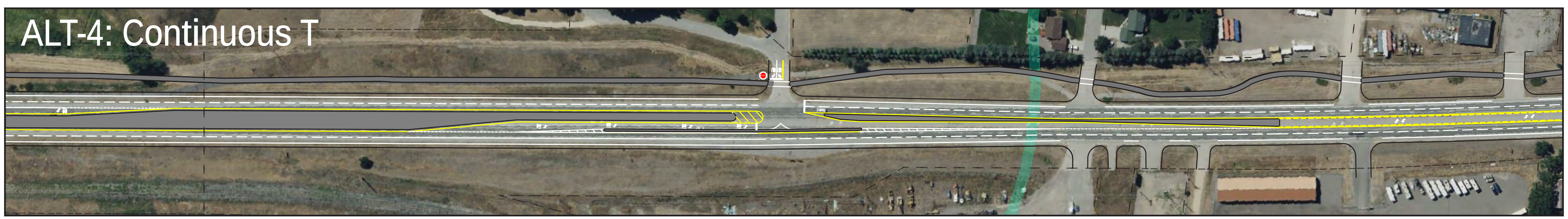
DO NOT ADVANCE		
	SAFETY	–
	OPERATIONS	⌄
	IMPACTS	⌃
	IMPLEMENTATION	⌄⌄

ALT-3: Roundabout



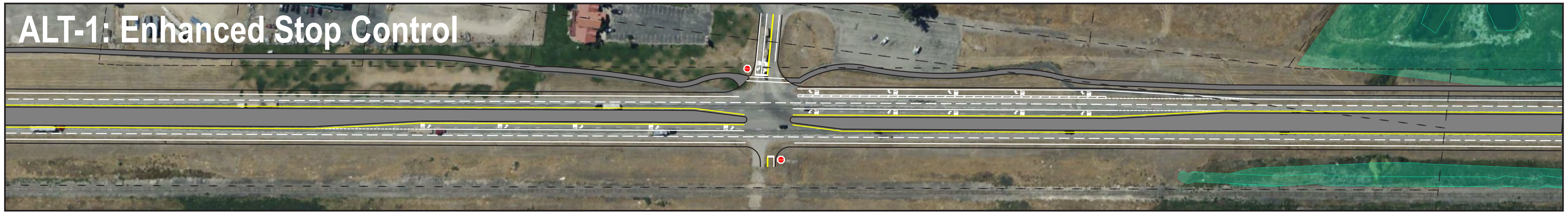
ADVANCE		
	SAFETY	⌃⌃
	OPERATIONS	⌃⌃
	IMPACTS	⌃
	IMPLEMENTATION	⌃

ALT-4: Continuous T

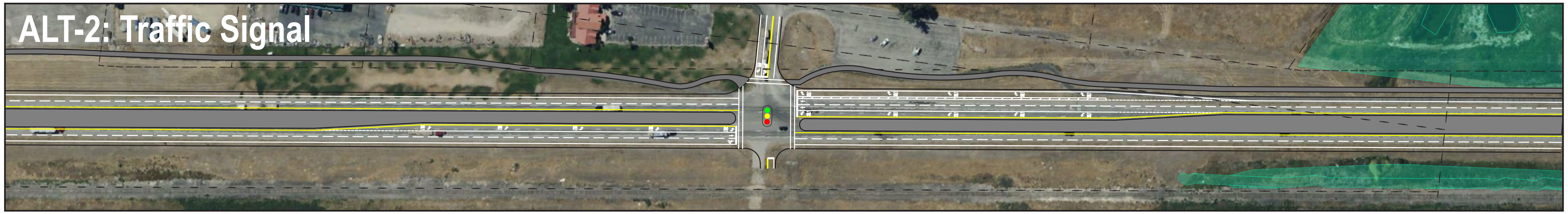


DO NOT ADVANCE		
	SAFETY	⌃
	OPERATIONS	⌄
	IMPACTS	⌄⌄
	IMPLEMENTATION	⌄

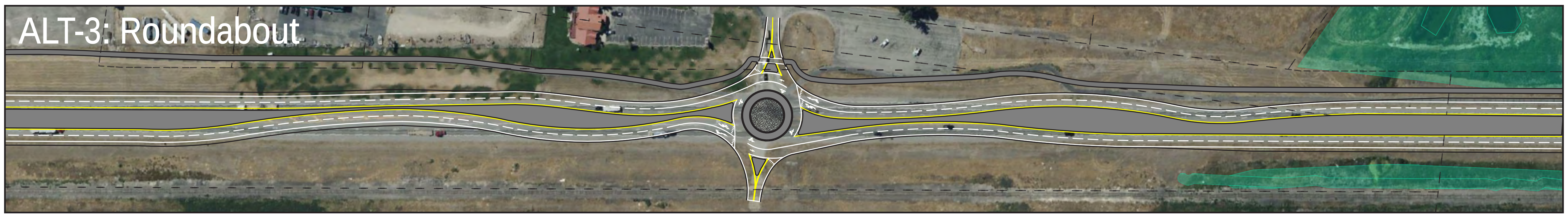
ROWAN ST



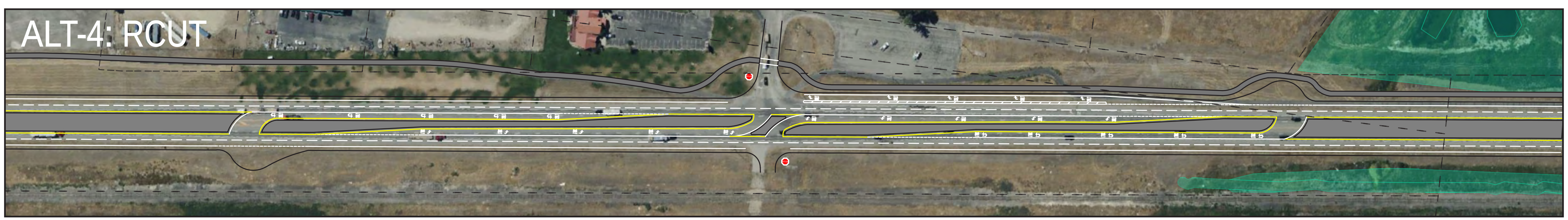
DO NOT ADVANCE
SAFETY
OPERATIONS
IMPACTS
IMPLEMENTATION



ADVANCE
SAFETY
OPERATIONS
IMPACTS
IMPLEMENTATION



ADVANCE
SAFETY
OPERATIONS
IMPACTS
IMPLEMENTATION

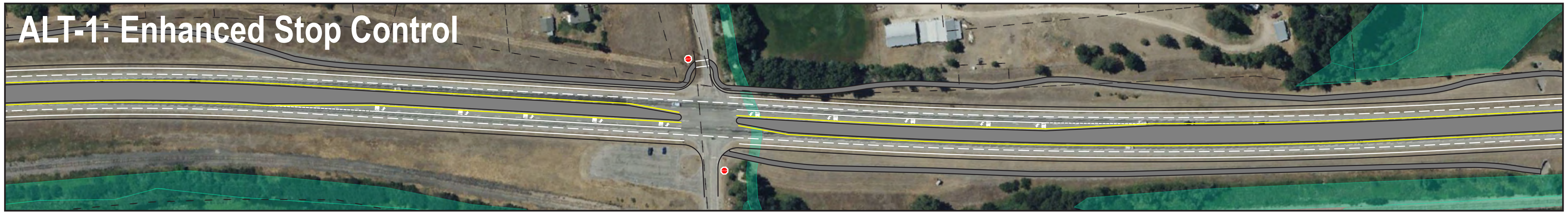


ADVANCE
SAFETY
OPERATIONS
IMPACTS
IMPLEMENTATION

DO NOT ADVANCE
SAFETY
OPERATIONS
IMPACTS
IMPLEMENTATION

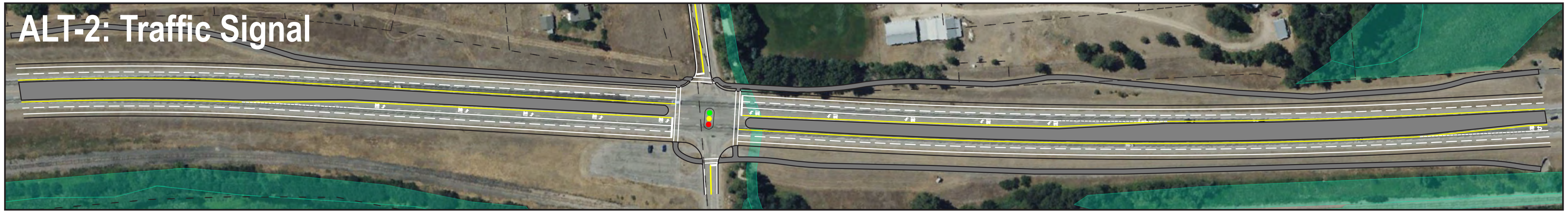
CARLTON CREEK RD

ALT-1: Enhanced Stop Control



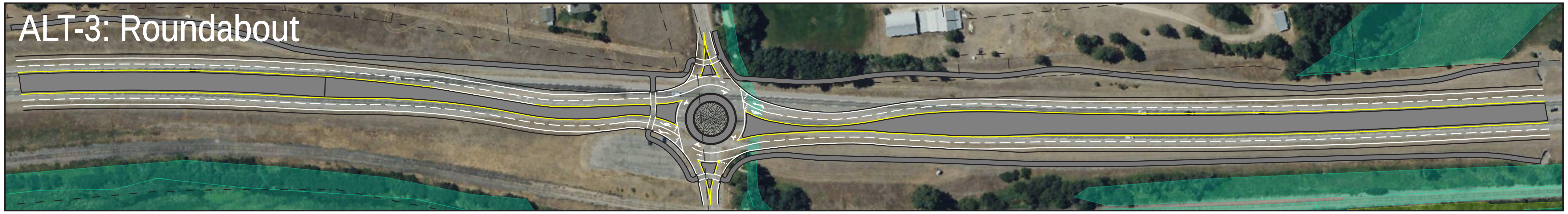
DO NOT ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

ALT-2: Traffic Signal



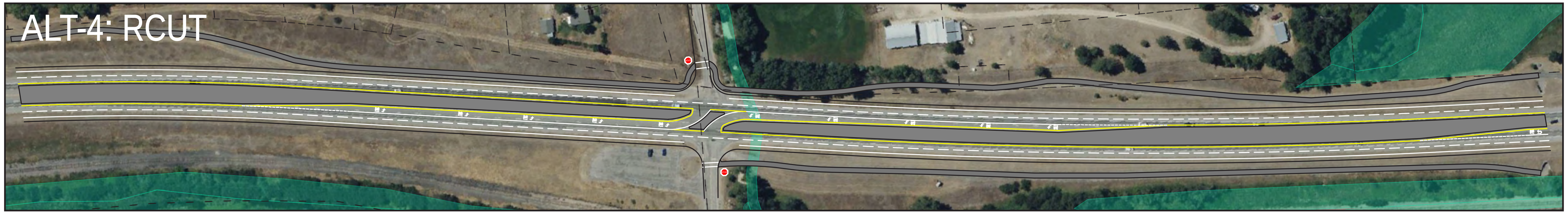
DO NOT ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

ALT-3: Roundabout



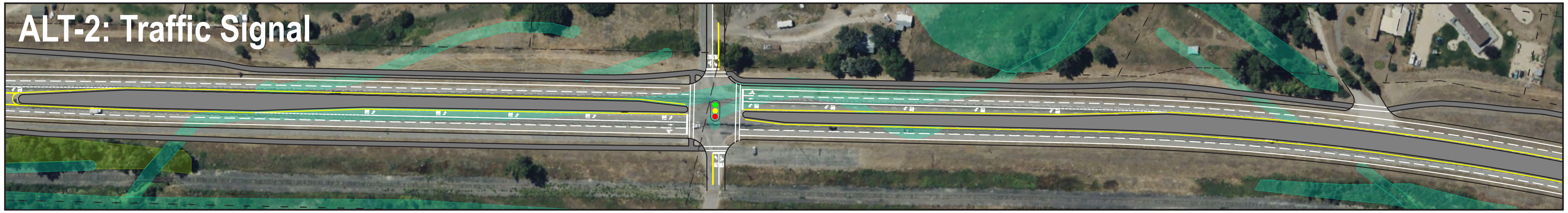
ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

ALT-4: RCUT

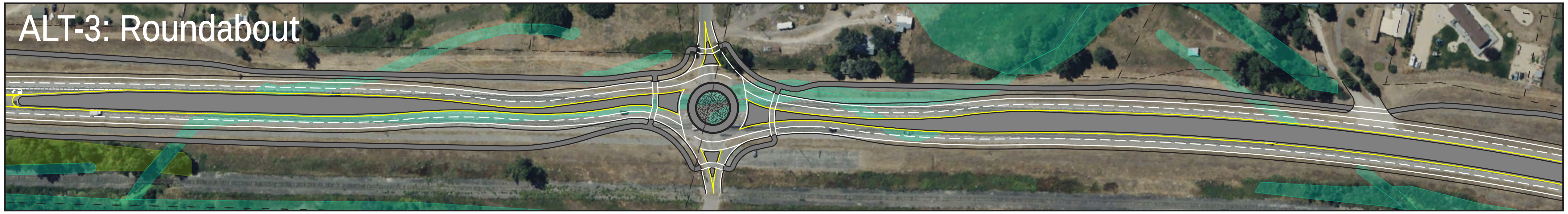


ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

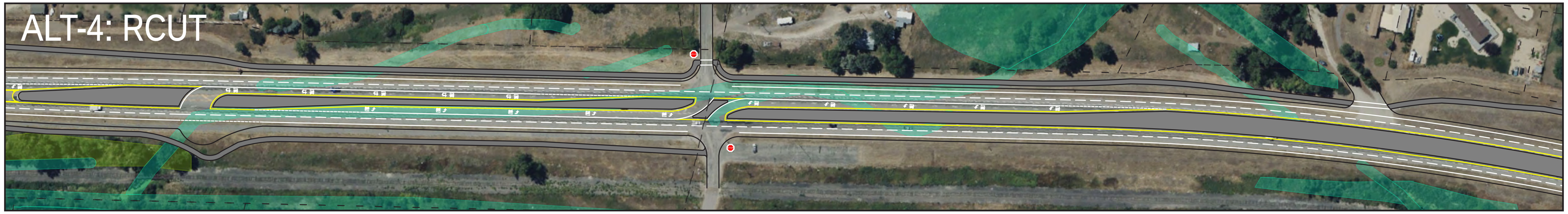
DO NOT ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION



DO NOT ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

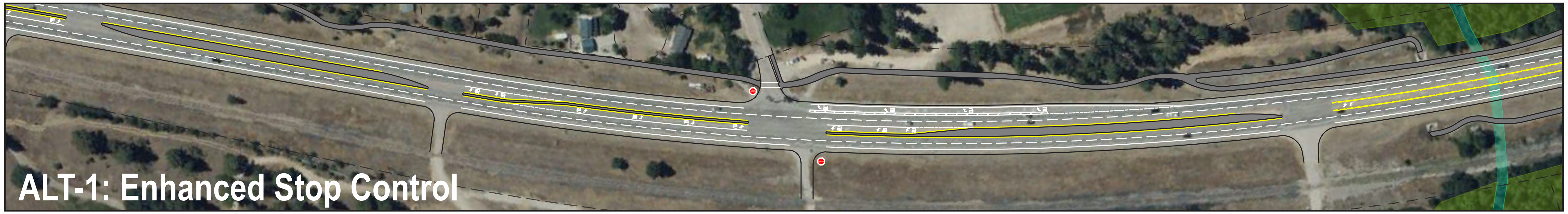


ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

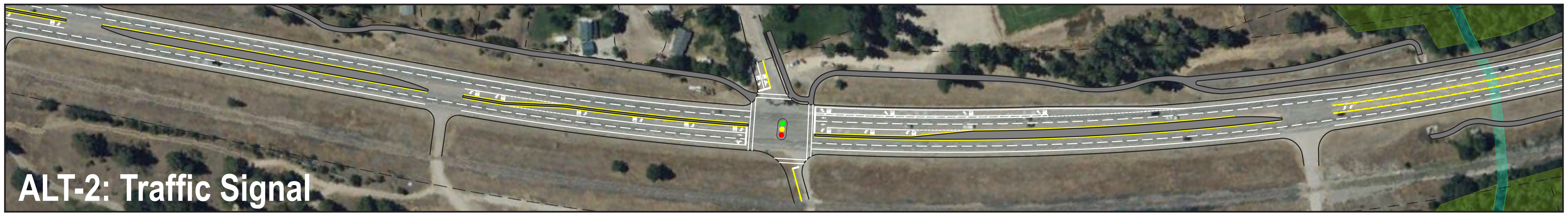


ADVANCE	
	SAFETY
	OPERATIONS
	IMPACTS
	IMPLEMENTATION

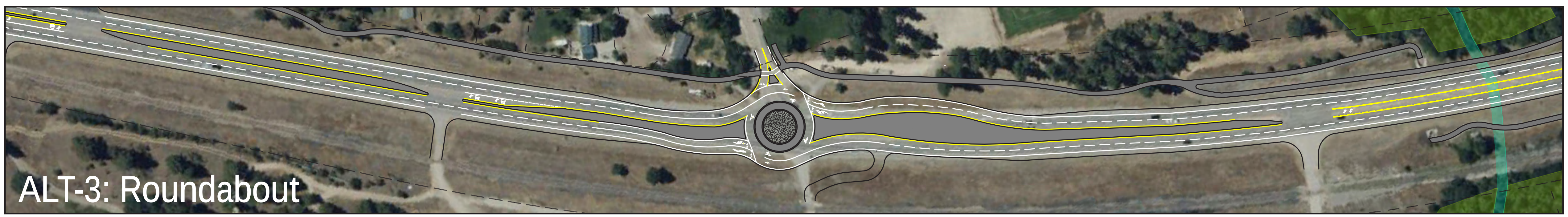
LONG AVE



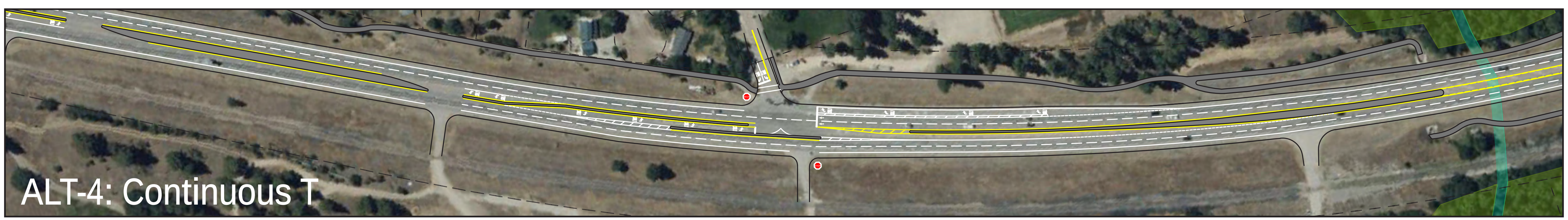
DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	



ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	



ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	



DO NOT ADVANCE	
SAFETY	
OPERATIONS	
IMPACTS	
IMPLEMENTATION	

SCORING SUMMARY

	ALTERNATIVE	SAFETY	OPS.	IMPACTS	IMPLEMENT.	SUMMARY
HAYES CREEK	**ALT-1: Stop Control**	⌄	⌄	—	⌄	ADVANCE
	ALT-2: Traffic Signal	—	—	—	⌄⌄	DO NOT ADVANCE
	ALT-3: Roundabout	⌃⌃	—	⌄⌄	⌄	DO NOT ADVANCE
COCHISE DR	**ALT-1: Stop Control**	⌄⌄	⌄	⌃	⌄⌄	DO NOT ADVANCE
	ALT-2: Traffic Signal	—	⌄	⌃	⌄⌄	DO NOT ADVANCE
	ALT-3: Roundabout	⌃⌃	⌃	⌄	⌃⌃	ADVANCE
	ALT-4: RCUT	⌃	⌃	—	⌃	ADVANCE
	ALT-5: Continuous T	—	—	—	—	ADVANCE
BIRD LN	**ALT-1: Stop Control**	⌄	⌄	⌃	⌄	ADVANCE
	ALT-2: Traffic Signal	—	⌄	⌃	⌄⌄	DO NOT ADVANCE
	ALT-3: Roundabout	⌃⌃	⌃	⌄	—	ADVANCE
	ALT-4: RCUT	⌃	⌃⌃	—	⌃⌃	ADVANCE
	ALT-5: Continuous T	⌃	⌃	⌃	⌃⌃	ADVANCE
MORMON CREEK RD	**ALT-1: Stop Control**	⌄	⌄	⌃	⌄	ADVANCE
	ALT-2: Traffic Signal	—	⌄	⌃	⌄	ADVANCE
	ALT-3: Roundabout	⌃⌃	⌃	⌄⌄	—	DO NOT ADVANCE
	ALT-4: Continuous T	⌃	⌃	⌄	—	ADVANCE

- HAYES CREEK ROAD: The Traffic Signal (Alt-2) was eliminated due to its inability to meet signal warrants, potential for increased same-direction conflicts, and red-light running risks. The Roundabout (Alt-3) was discarded because its large footprint would impact residential structures, and it could degrade operations as mainline traffic grows. Both options had high costs and limited benefits. In contrast, the Enhanced Stop Control (Alt-1) was advanced for its moderate cost and feasible safety improvements, despite marginal benefits.

- COCHISE DRIVE: The Enhanced Stop Control (Alt-1) was eliminated due to its failure to address the crash history and minimal operational improvements. The Traffic Signal (Alt-2) was not advanced because it could increase same-direction conflicts, red-light running risks, and doesn't meet signal warrants. The Roundabout (Alt-3) was advanced for its strong safety benefits and improved operations, though its large footprint and right-of-way constraints may limit feasibility. The RCUT (Alt-4) was advanced due to its ability to reduce conflict points and offer high safety benefits, despite slight increases in footprint and realignment. The Continuous T (Alt-5) was so advanced for its moderate safety improvements and neutral overall benefit-to-cost ratio, with slight roadway expansion required.

- BIRD LANE: The Traffic Signal (Alt-2) was eliminated as it didn't meet signal warrants, would contribute to increasing delays on the mainline, and had a low benefit-to-cost ratio. The Enhanced Stop Control (Alt-1) was advanced for its moderate safety benefits, despite a low benefit-to-cost ratio. The Roundabout (Alt-3) was advanced for its strong safety performance and improved short-term operations, though future mainline traffic increases could impact its effectiveness. The RCUT (Alt-4) was advanced for reducing severe crossing conflicts and improving safety, despite requiring significant roadway expansion. The Continuous T (Alt-5) was also advanced for its moderate safety improvements and favorable benefit-to-cost ratio, with slight roadway expansion needed.

- MORMON CREEK ROAD: The Traffic Signal (Alt-2) was advanced despite not currently meeting traffic volume warrants, as it offers moderate safety and operational benefits and may meet warrants in the future. The Roundabout (Alt-3) was eliminated due to the need for substantial right-of-way, despite its high safety benefits. The Enhanced Stop Control (Alt-1) was advanced with marginal safety and operational improvements, and comparatively low construction costs. The Continuous T (Alt-5) was also advanced due to its moderate crash reduction potential and overall neutral benefit-to-cost ratio.

SCORING SUMMARY

- <u>DELARKA DRIVE SOUTH:</u> Despite potential safety and operational improvements, the Traffic Signal (Alt-2) was not advanced because it did not meet traffic volume warrants. The Continuous T (Alt-5) was eliminated due to its high impacts with moderate safety and operational benefits. The Enhanced Stop Control (Alt-1) was advanced because it provides marginal safety and operational improvements with moderate construction costs and minimal impacts. The Roundabout (Alt-3) was also advanced due to its safety performance and favorable benefit-to-cost ratio, though it may experience increased delays as mainline traffic grows.

- <u>ROWAN STREET:</u> The Enhanced Stop Control (Alt-1) was not advanced due to low safety and operational benefits and its inability to address the historic crash history. The Traffic Signal (Alt-2) was advanced, as it provides moderate safety improvements and could be warranted in the future based on traffic volumes, despite a neutral benefit-to-cost ratio. The Roundabout (Alt-3) was also advanced for its high safety performance and favorable benefit-to-cost ratio, although delays may increase with higher future traffic. The RCUT (Alt-4) was advanced for its potential to reduce severe crossing conflicts, efficient operations, moderate impacts, and favorable benefit-to-cost ratio. The Continuous T (Alt-5) was not advanced due to potential access issues with only moderate safety and operational improvements.

- <u>CARLTON CREEK ROAD:</u> The Enhanced Stop Control (Alt-1) and Traffic Signal (Alt-2) alternatives were not advanced due to low safety and operational benefits, as well as their failure to address the history of severe crashes. The Roundabout (Alt-3) was advanced due to its high safety performance, although it may not be appropriate to the high speed context of the roadway through this segment. The RCUT (Alt-4) was also advanced for its potential to reduce severe crossing conflicts, with a favorable benefit-to-cost ratio.

- <u>CHIEF LOOKING GLASS ROAD:</u> The analysis for this intersection is similar to Carlton Creek Road. The Enhanced Stop Control (Alt-1) and Traffic Signal (Alt-2) alternatives were not advanced due to limited safety and operational benefits. The Roundabout (Alt-3) and RCUT (Alt-4) were advanced for their safety performance and favorable benefit-to-cost ratios.

- <u>LONG AVENUE:</u> The Enhanced Stop Control (Alt-1) was not advanced due to its limited safety improvements and minimal operational changes compared to the existing configuration. The Traffic Signal (Alt-2) was advanced, as it offers moderate safety benefits by reducing left-turn conflicts, although it may increase same-direction conflicts. Despite its impacts, the Roundabout (Alt-3) was also advanced due to its high safety performance and favorable operational benefits. The Continuous T (Alt-5) was not advanced because of impacts to the adjacent driveway and limited safety and operational benefits.

	ALTERNATIVE	SAFETY	OPS.	IMPACTS	IMPLEMENT.	SUMMARY
DELARKA DR S	**ALT-1: Stop Control**	v	v	^	v	ADVANCE
	ALT-2: Traffic Signal	–	v	^	vv	DO NOT ADVANCE
	ALT-3: Roundabout	^^	^^	^	^	ADVANCE
	ALT-4: Continuous T	^	v	vv	v	DO NOT ADVANCE
ROWAN ST	**ALT-1: Stop Control**	vv	vv	^	v	DO NOT ADVANCE
	ALT-2: Traffic Signal	–	–	^	–	ADVANCE
	ALT-3: Roundabout	^	–	–	–	ADVANCE
	ALT-4: RCUT	^^	^^	–	^	ADVANCE
	ALT-5: Continuous T	^	–	vv	v	DO NOT ADVANCE
CARLTON CREEK RD	**ALT-1: Stop Control**	vv	v	^	v	DO NOT ADVANCE
	ALT-2: Traffic Signal	–	–	^	vv	DO NOT ADVANCE
	ALT-3: Roundabout	^	–	v	–	ADVANCE
	ALT-4: RCUT	^	^	^	^	ADVANCE
CHIEF LOOKING GLASS	**ALT-1: Stop Control**	vv	v	^	v	DO NOT ADVANCE
	ALT-2: Traffic Signal	–	–	^	vv	DO NOT ADVANCE
	ALT-3: Roundabout	^	–	v	–	ADVANCE
	ALT-4: RCUT	^	^	^	^	ADVANCE
LONG AVE	**ALT-1: Stop Control**	v	vv	^	v	DO NOT ADVANCE
	ALT-2: Traffic Signal	–	–	^	–	ADVANCE
	ALT-3: Roundabout	^^	^	v	^	ADVANCE
	ALT-4: Continuous T	^	^	vv	–	DO NOT ADVANCE

US HIGHWAY 93 • MISSOULA TO FLORENCE •

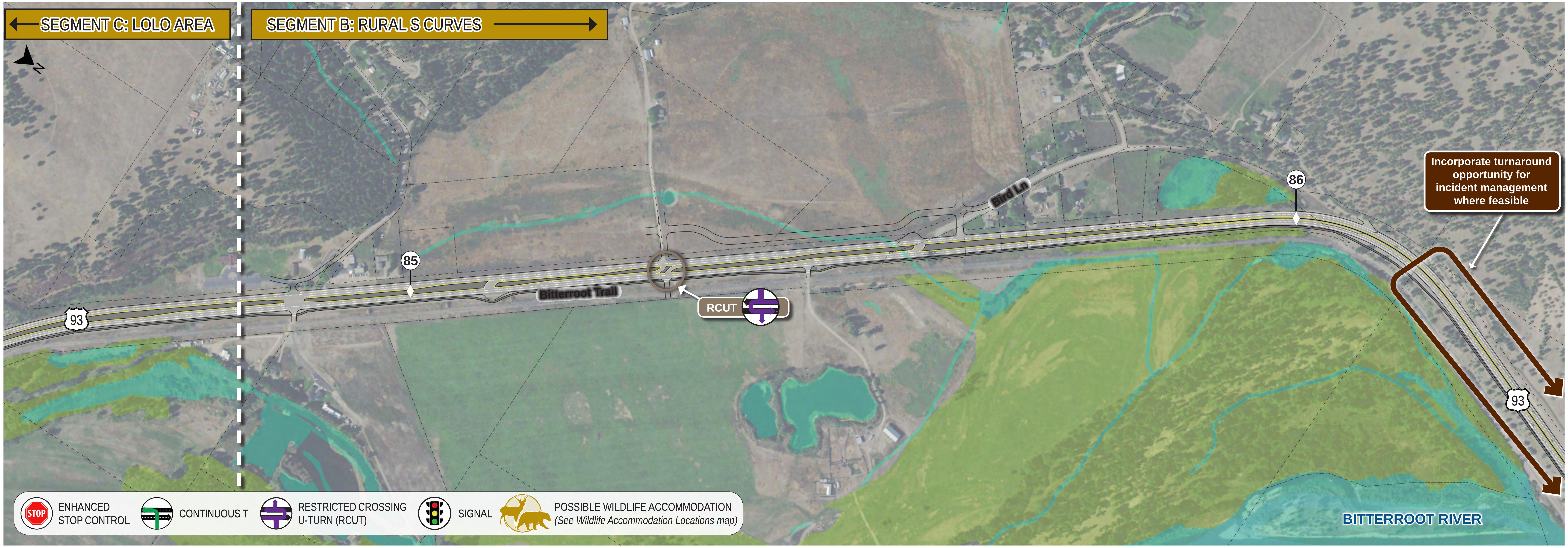
APPENDIX C:

Optimized Corridor Configuration

FOR PLANNING PURPOSES ONLY

Sheet 1

Sheet 2

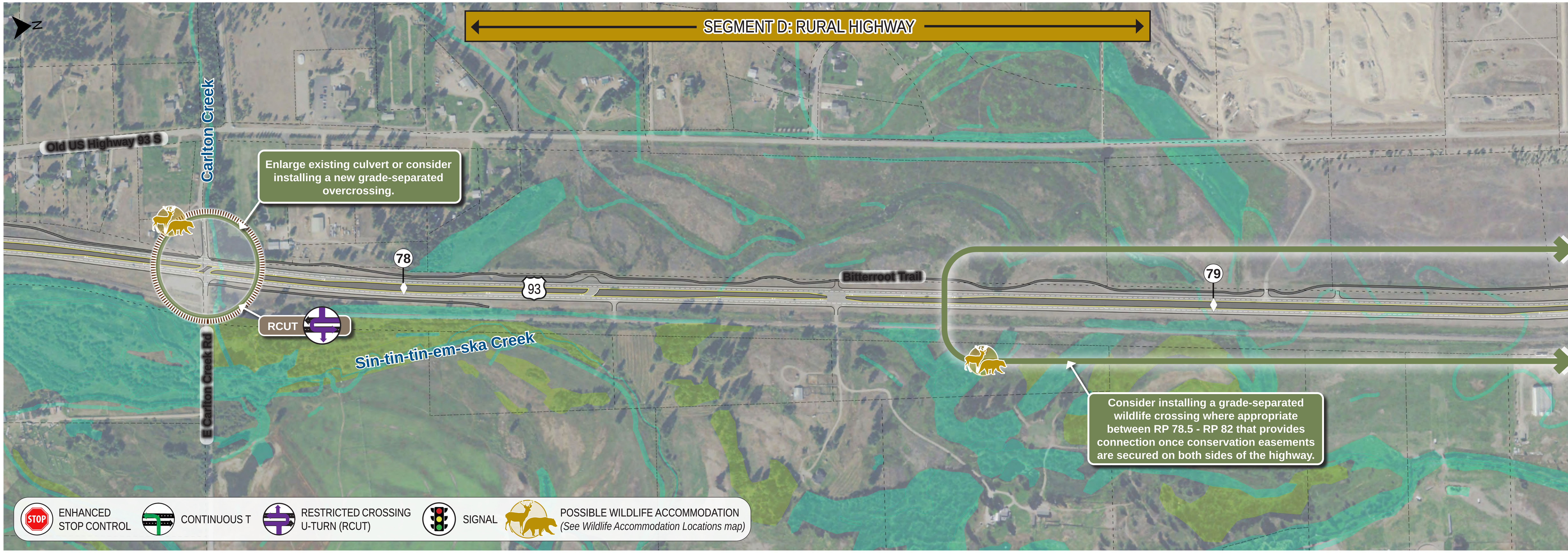


Sheet 3

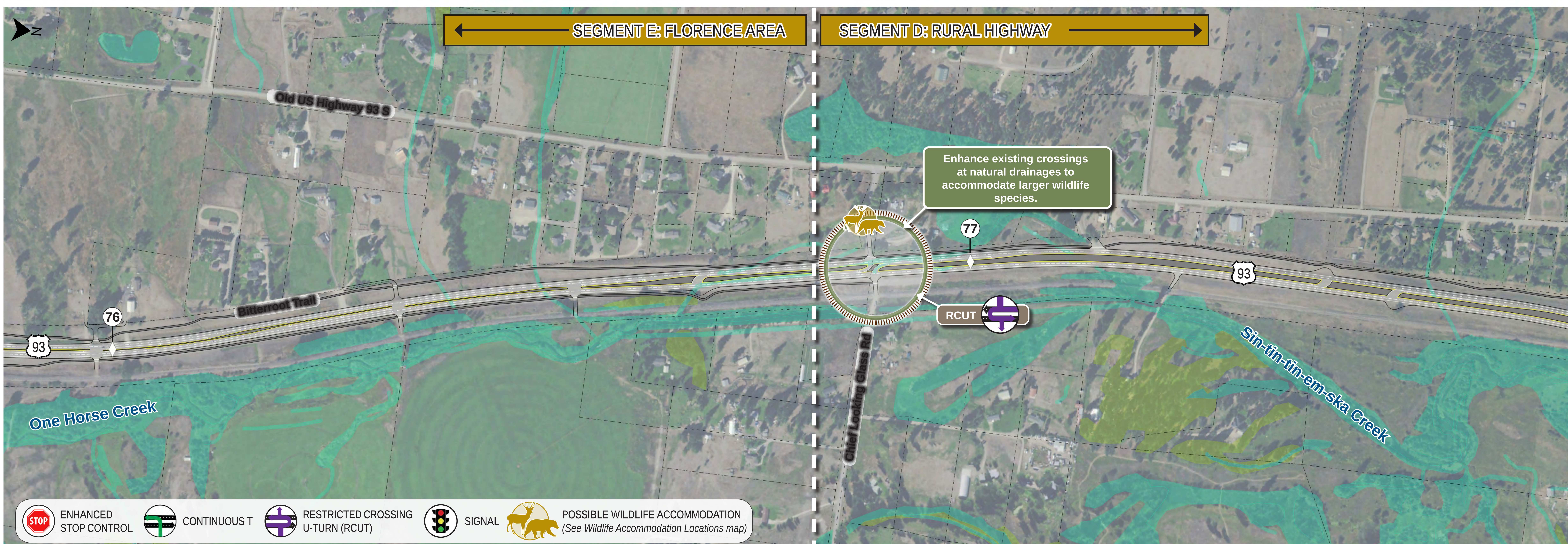
Sheet 4

Sheet 5

Sheet 6



Sheet 7



Sheet 8


SEGMENT E: FLORENCE AREA
Old US Highway 93 S
Tie Chute Creek
Potential Future Signal
75
Long Ave
Potential Future Signal
Bitterroot Trail
93
Long Ave
One Horse Creek
TO FLORENCE
ENHANCED STOP CONTROL
CONTINUOUS T
RESTRICTED CROSSING U-TURN (RCUT)
SIGNAL
POSSIBLE WILDLIFE ACCOMMODATION
(See Wildlife Accommodation Locations map)

APPENDIX D:

Planning-Level Cost Estimates

APPENDIX A

Planning Level Cost Estimates

Planning-level costs were developed for each segment. Costs include estimates for construction, engineering, miscellaneous items, indirect costs. Construction cost estimates are based on unit quantity estimates and price information determined from the MDT Preliminary Estimating Tool (PET), MDT AASHTOWARE Software, and 2023 Bid Archives.

NOTES:

Miscellaneous items include unknown factors and minor bid items. Examples include: right-of-way, utilities, slope and surface treatments, erosion control, and public relations.

Estimates are shown in 2025 dollars and have not been adjusted for inflation to account for an estimated year of expenditure.

MISSOULA TO FLORENCE CORRIDOR	**$**	**203,000,000**	**TOT**
Segment A: Urban/Rural Transition	**$**	**35,100,000**	**TOT**
Segment B: Rural S Curves	**$**	**29,800,000**	**TOT**
Segment C: Lolo Area	**$**	**38,700,000**	**TOT**
Segment D: Rural Highway	**$**	**69,200,000**	**TOT**
Segment E: Florence Area	**$**	**29,900,000**	**TOT**

SEGMENT A: URBAN/RURAL TRANSITION $ 35,100,000 TOT

Suburban Reconstruction $ 35,100,000

Buckhouse Bridge to Hayes Creek Rd
RP 90.10 to 87.85

LENGTH (MI)	2.25
WIDTH (FT)	80
SURFACING (IN)	5
CRUSHED TOP (IN)	6
BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	8961.1	$ 16.33	$ 146,310
EXCAVATION-UNCLASS BORROW	CUYD	896.1	$ 5.40	$ 4,839
SPECIAL BORROW-NEAT LINE	CUYD	448.1	$ 29.76	$ 13,333
CRUSHED AGGREGATE COURSE	CUYD	35640.0	$ 56.09	$ 1,999,040
COVER - TYPE 2	SQYD	101640.0	$ 3.39	$ 345,056
PLANT MIX SURF - 1/2 IN	TON	27209.9	$ 52.62	$ 1,431,801
ASPHALT BINDER PG 58V-34	TON	1469.3	$ 954.81	$ 1,402,934
EMULSSIFIED ASPHALT CHFRS-20	TON	181.5	$ 1,764.19	$ 320,201
SIDEWALK-CONCRETE 4"	SQYD	10560.0	$ 61.30	$ 647,315
SIDEWALK-CONCRETE 6"	SQYD	2640.0	$ 231.71	$ 611,717
CURB AND GUTTER-CONC	LNFT	23760.0	$ 88.64	$ 2,106,044
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	2.25	$ 31,827.00	$ 71,611
DRAINAGE PIPE - URBAN	MILE	2.25	$ 425,000.00	$ 956,250
SIGNS - URBAN	MILE	2.25	$ 85,000.00	$ 191,250
LIGHTS - URBAN	MILE	2.25	$ 275,000.00	$ 618,750
SIGNAL UPGRADE	LS	1	$ 75,000.00	$ 75,000
WILDLIFE UNDERCROSSING IMPROVEMENT	EACH	2	$ 500,000.00	$ 1,000,000
MISCELLANEOUS ITEMS			25%	$ 2,735,363
Subtotal 1				$ 14,676,814
TRAFFIC CONTROL (URBAN)			5%	$ 733,841
Subtotal 2				$ 15,410,655
MOBILIZATION			10%	$ 1,541,065
Subtotal 3				$ 16,951,720
CONTINGENCY (MEDIUM RISK)			55%	$ 9,323,446
Subtotal 4				$ 26,275,166
CONSTRUCTION ENGINEERING (CE)			10%	$ 2,627,517
PRELIMINARY ENGINEERING (PE)			10%	$ 2,627,517
Subtotal 5				$ 31,530,200
INDIRECT COSTS (IDC)			11.32%	$ 3,569,219
TOTAL				**$ 35,099,418**

SEGMENT B: RURAL S CURVES $ 29,800,000 TOT

Rural Reconstruction (Median Barrier) $ 20,500,000

Hayes Creek Rd to North of Bird Lane
RP 87.85 to 86.00

LENGTH (MI)	1.85
WIDTH (FT)	76
SURFACING (IN)	5
CRUSHED TOP (IN)	6
BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	19592.6	$ 16.33	$ 319,894
EXCAVATION-UNCLASS BORROW	CUYD	1959.3	$ 5.40	$ 10,580
SPECIAL BORROW-NEAT LINE	CUYD	979.6	$ 29.76	$ 29,152
CRUSHED AGGREGATE COURSE	CUYD	34516.6	$ 56.09	$ 1,936,029
COVER - TYPE 2	SQYD	82486.0	$ 3.39	$ 280,030
PLANT MIX SURF - 1/2 IN	TON	22911.3	$ 52.62	$ 1,205,607
ASPHALT BINDER PG 58V-34	TON	1237.2	$ 954.81	$ 1,181,301
EMULSSIFIED ASPHALT CHFRS-20	TON	147.3	$ 1,764.19	$ 259,865
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	1.85	$ 13,261.25	$ 24,533
DRAINAGE PIPE - RURAL	MILE	1.85	$ 150,000.00	$ 277,500
SIGNS - RURAL	MILE	1.85	$ 13,500.00	$ 24,975
WILDLIFE UNDERCROSSING IMPROVEMENT	EACH	1	$ 500,000.00	$ 500,000
MISCELLANEOUS ITEMS			25%	$ 1,512,367
Subtotal 1				$ 7,561,834
TRAFFIC CONTROL (URBAN)			5%	$ 378,092
Subtotal 2				$ 7,939,925
MOBILIZATION			10%	$ 793,993
Subtotal 3				$ 8,733,918
CONTINGENCY (HIGH RISK)			75%	$ 6,550,438
Subtotal 4				$ 15,284,356
CONSTRUCTION ENGINEERING (CE)			10%	$ 1,528,436
PRELIMINARY ENGINEERING (PE)			10%	$ 1,528,436
Subtotal 5				$ 18,341,228
INDIRECT COSTS (IDC)			11.32%	$ 2,076,227
TOTAL				**$ 20,417,455**

Rural Reconstruction (Divided Median) $ 9,300,000

North of Bird Lane to South of Valley Grove Dr
RP 87.85 to 84.75

LENGTH (MI)	1.00
WIDTH (FT)	80
SURFACING (IN)	5
CRUSHED TOP (IN)	6
BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	7965.4	$ 16.33	$ 130,054
EXCAVATION-UNCLASS BORROW	CUYD	796.5	$ 5.40	$ 4,301
SPECIAL BORROW-NEAT LINE	CUYD	398.3	$ 29.76	$ 11,852
CRUSHED AGGREGATE COURSE	CUYD	19439.9	$ 56.09	$ 1,090,377
COVER - TYPE 2	SQYD	46934.0	$ 3.39	$ 159,335
PLANT MIX SURF - 1/2 IN	TON	13012.7	$ 52.62	$ 684,737
ASPHALT BINDER PG 58V-34	TON	702.7	$ 954.81	$ 670,932
EMULSSIFIED ASPHALT CHFRS-20	TON	83.8	$ 1,764.19	$ 147,839
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	1.00	$ 13,261.25	$ 13,261
DRAINAGE PIPE - RURAL	MILE	1.00	$ 150,000.00	$ 150,000
SIGNS - RURAL	MILE	1.00	$ 13,500.00	$ 13,500
MISCELLANEOUS ITEMS			25%	$ 769,047
Subtotal 1				$ 3,845,236
TRAFFIC CONTROL (RURAL)			6%	$ 230,714

	Subtotal 2		$	4,075,950
MOBILIZATION		10%	$	407,595
	Subtotal 3		$	4,483,545
CONTINGENCY (MEDIUM RISK)		55%	$	2,465,950
	Subtotal 4		$	6,949,495
CONSTRUCTION ENGINEERING (CE)		10%	$	694,949
PRELIMINARY ENGINEERING (PE)		10%	$	694,949
	Subtotal 5		$	8,339,393
INDIRECT COSTS (IDC)		11.32%	$	944,019
	TOTAL		**$**	**9,283,413**

SEGMENT C: LOLO AREA — $ 38,700,000 TOT

Suburban Reconstruction — $ 38,700,000

South of Valley Grove Dr to Delarka Drive S	LENGTH (MI)	2.4
RP 84.75 to 82.35	WIDTH (FT)	80
	SURFACING (IN)	5
	CRUSHED TOP (IN)	6
	BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	9558.5	$ 16.33	$ 156,064
EXCAVATION-UNCLASS BORROW	CUYD	955.9	$ 5.40	$ 5,162
SPECIAL BORROW-NEAT LINE	CUYD	477.9	$ 29.76	$ 14,222
CRUSHED AGGREGATE COURSE	CUYD	38016.0	$ 56.09	$ 2,132,309
COVER - TYPE 2	SQYD	108416.0	$ 3.39	$ 368,059
PLANT MIX SURF - 1/2 IN	TON	29023.9	$ 52.62	$ 1,527,254
ASPHALT BINDER PG 58V-34	TON	1567.3	$ 954.81	$ 1,496,463
EMULSSIFIED ASPHALT CHFRS-20	TON	193.6	$ 1,764.19	$ 341,548
SIDEWALK-CONCRETE 4"	SQYD	11264.0	$ 61.30	$ 690,470
SIDEWALK-CONCRETE 6"	SQYD	2816.0	$ 231.71	$ 652,499
CURB AND GUTTER-CONC	LNFT	25344.0	$ 88.64	$ 2,246,446
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	2.40	$ 31,827.00	$ 76,385
DRAINAGE PIPE - URBAN	MILE	2.40	$ 425,000.00	$ 1,020,000
SIGNS - URBAN	MILE	2.40	$ 85,000.00	$ 204,000
LIGHTS - URBAN	MILE	2.40	$ 275,000.00	$ 660,000
SIGNALS - NEW	LS	2	$ 350,000.00	$ 700,000
SIGNAL UPGRADE	LS	3	$ 75,000.00	$ 225,000
WILDLIFE UNDERCROSSING IMPROVEMENT	EACH	1	$ 500,000.00	$ 500,000
MISCELLANEOUS ITEMS			25%	$ 3,128,970
Subtotal 1				$ 16,144,852
TRAFFIC CONTROL (URBAN)			5%	$ 807,243
Subtotal 2				$ 16,952,094
MOBILIZATION			10%	$ 1,695,209
Subtotal 3				$ 18,647,304
CONTINGENCY (MEDIUM RISK)			55%	$ 10,256,017
Subtotal 4				$ 28,903,321
CONSTRUCTION ENGINEERING (CE)			10%	$ 2,890,332
PRELIMINARY ENGINEERING (PE)			10%	$ 2,890,332
Subtotal 5				$ 34,683,985
INDIRECT COSTS (IDC)			11.32%	$ 3,926,227
TOTAL				**$ 38,610,212**

SEGMENT D: RURAL HIGHWAY $ 69,200,000 TOT

Rural Reconstruction (Divided Median) **$ 69,200,000**

Delarka Drive S to Chief Looking Glass Road
RP 82.35 to 76.85

LENGTH (MI)	5.50
WIDTH (FT)	80
SURFACING (IN)	5
CRUSHED TOP (IN)	6
BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	43809.9	$ 16.33	$ 715,296
EXCAVATION-UNCLASS BORROW	CUYD	4381.0	$ 5.40	$ 23,657
SPECIAL BORROW-NEAT LINE	CUYD	2190.5	$ 29.76	$ 65,185
CRUSHED AGGREGATE COURSE	CUYD	106919.2	$ 56.09	$ 5,997,074
COVER - TYPE 2	SQYD	258134.0	$ 3.39	$ 876,334
PLANT MIX SURF - 1/2 IN	TON	71569.9	$ 52.62	$ 3,766,053
ASPHALT BINDER PG 58V-34	TON	3864.8	$ 954.81	$ 3,690,125
EMULSSIFIED ASPHALT CHFRS-20	TON	460.8	$ 1,764.19	$ 812,940
STRIPING & PAVEMENT MARKINGS - RURAL	MILE	5.50	$ 13,261.25	$ 72,937
DRAINAGE PIPE - RURAL	MILE	5.50	$ 150,000.00	$ 825,000
SIGNS - RURAL	MILE	5.50	$ 13,500.00	$ 74,250
WILDLIFE UNDERCROSSING IMPROVEMENT	EACH	2	$ 500,000.00	$ 1,000,000
WILDLIFE OVERPASS STRUCTURE	EACH	1	$ 5,000,000.00	$ 5,000,000
MISCELLANEOUS ITEMS			25%	$ 5,729,713
Subtotal 1				$ 28,648,563
TRAFFIC CONTROL (RURAL)			6%	$ 1,718,914
Subtotal 2				$ 30,367,477
MOBILIZATION			10%	$ 3,036,748
Subtotal 3				$ 33,404,225
CONTINGENCY (MEDIUM RISK)			55%	$ 18,372,324
Subtotal 4				$ 51,776,549
CONSTRUCTION ENGINEERING (CE)			10%	$ 5,177,655
PRELIMINARY ENGINEERING (PE)			10%	$ 5,177,655
Subtotal 5				$ 62,131,858
INDIRECT COSTS (IDC)			11.32%	$ 7,033,326
TOTAL				**$ 69,165,185**

SEGMENT E: FLORENCE AREA $ 29,900,000 TOT

Suburban Reconstruction $ 29,900,000

Chief Looking Glass Road to Old US 93
RP 76.85 to 74.95

LENGTH (MI)	1.9
WIDTH (FT)	80
SURFACING (IN)	5
CRUSHED TOP (IN)	6
BASE (IN)	12

TYPE	UNITS	QUANTITY	UNIT PRICE	COST
EXCAVATION-UNCLASSIFIED	CUYD	13242.5	$ 16.33	$ 216,214
EXCAVATION-UNCLASS BORROW	CUYD	1324.3	$ 5.40	$ 7,151
SPECIAL BORROW-NEAT LINE	CUYD	662.1	$ 29.76	$ 19,704
CRUSHED AGGREGATE COURSE	CUYD	30096.0	$ 56.09	$ 1,688,078
COVER - TYPE 2	SQYD	85830.0	$ 3.39	$ 291,383
PLANT MIX SURF - 1/2 IN	TON	22977.2	$ 52.62	$ 1,209,076
ASPHALT BINDER PG 58V-34	TON	1240.8	$ 954.81	$ 1,184,700
EMULSSIFIED ASPHALT CHFRS-20	TON	153.3	$ 1,764.19	$ 270,451
SIDEWALK-CONCRETE 4"	SQYD	8917.3	$ 61.30	$ 546,622
SIDEWALK-CONCRETE 6"	SQYD	2229.3	$ 231.71	$ 516,561
CURB AND GUTTER-CONC	LNFT	20064.0	$ 88.64	$ 1,778,437
STRIPING & PAVEMENT MARKINGS - URBAN	MILE	1.90	$ 31,827.00	$ 60,471
DRAINAGE PIPE - URBAN	MILE	1.90	$ 425,000.00	$ 807,500
SIGNS - URBAN	MILE	1.90	$ 85,000.00	$ 161,500
LIGHTS - URBAN	MILE	1.90	$ 275,000.00	$ 522,500
SIGNALS - NEW	LS	2.00	$ 350,000.00	$ 700,000
MISCELLANEOUS ITEMS			25%	$ 2,495,087
Subtotal 1				$ 12,475,435
TRAFFIC CONTROL (URBAN)			5%	$ 623,772
Subtotal 2				$ 13,099,207
MOBILIZATION			10%	$ 1,309,921
Subtotal 3				$ 14,409,127
CONTINGENCY (MEDIUM RISK)			55%	$ 7,925,020
Subtotal 4				$ 22,334,147
CONSTRUCTION ENGINEERING (CE)			10%	$ 2,233,415
PRELIMINARY ENGINEERING (PE)			10%	$ 2,233,415
Subtotal 5				$ 26,800,977
INDIRECT COSTS (IDC)			11.32%	$ 3,033,871
TOTAL				**$ 29,834,847**