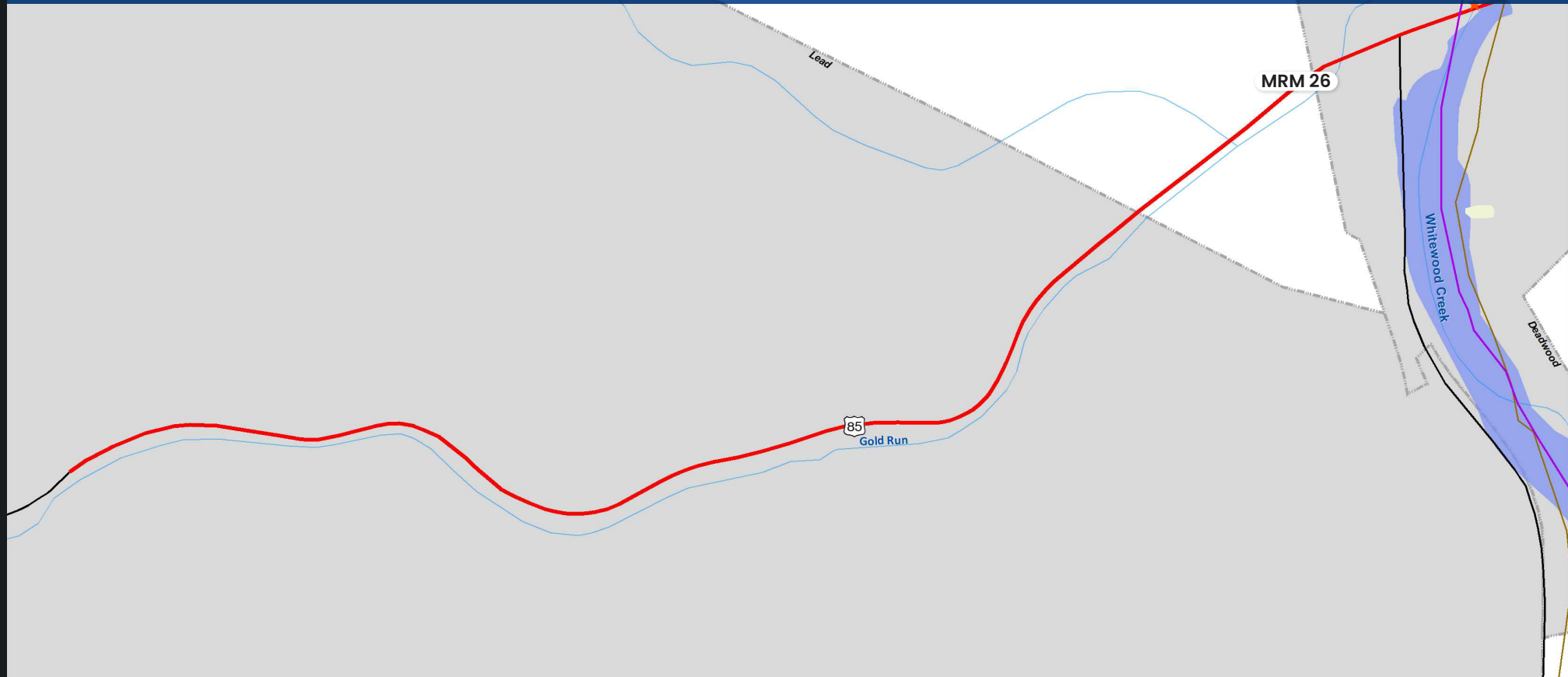
BLACK HILLS CONTEXT SENSITIVE CORRIDORS STUDY

PHASE 3 REPORT

CORRIDOR 4: US 85 - WEST OF PLUMA



Black Hills
CONTEXT SENSITIVE CORRIDORS STUDY

PHASE 3 REPORT

CORRIDOR 4 – US HIGHWAY 85
LEAD TO PLUMA

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1. INTRODUCTION

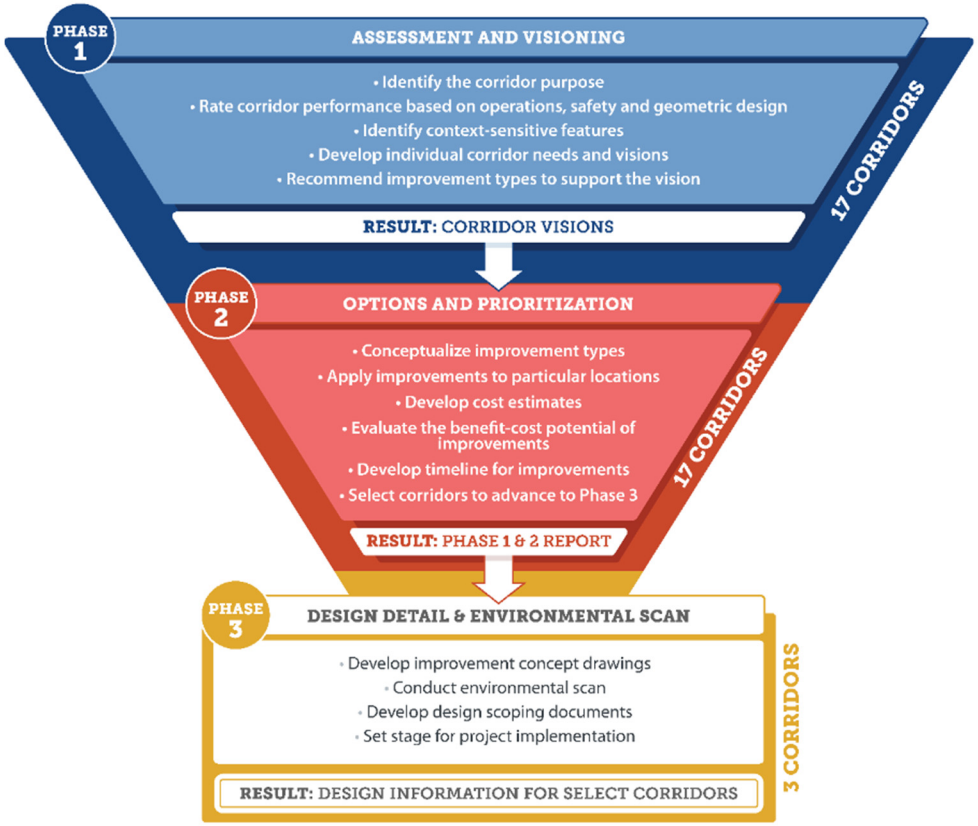
The Black Hills Context Sensitive Corridors Study team has crafted visions for improving 17 corridors in the scenic Black Hills of South Dakota. These corridors traverse topography substantially different from other areas in the state and serve functions that emphasize the drive/ride experience provided by the road along with the ability to convey traffic.

While the environment surrounding the study corridors and the reasons some travelers are present on the routes are different from South Dakota Department of Transportation (SDDOT) routes in other parts of the state, the SDDOT has the same responsibility to maintain safe routes in a good state of repair. Fulfilling this responsibility incorporates applying the SDDOT design guidelines to address lane width, curve radius, shoulder and clear zone. Even when these standards are adjusted to account for mountainous conditions, a standard design configuration may impact adjacent terrain, geologic features, and/or streams and may bring a perceived negative impact to corridor user experience. The study has addressed each impact perceived as a challenge by balancing engineering guidelines with the sensitive contextual conditions of the area.

The visions for improving these corridors were assembled through the application of Context Sensitive Solutions (CSS) principles. The visions recommend the types of transportation improvements to be applied to each corridor and provide preliminary locations and future prioritization of improvements.

The study has followed a program of three phases, as shown on **Figure 1**. Upon completion of corridor visioning through Phases 1 and 2, the study team identified a subset of corridors for further design detail and environmental evaluation in Phase 3. The vision for improving Corridor 4, US Highway 85 between Lead and Pluma, was selected for further development in Phase 3 to provide information needed for the SDDOT to implement corridor projects.

Figure 1. Study Phases



1.1 Study Area

Corridor 4, located on US85 from approximately Park Avenue in Lead to the junction of US385, is part of the northern initial group of five routes in Lawrence County. **Figure 2** displays the corridor limits. The current section of Corridor 4 is a combination of an urban section and a rural two lane. A composite figure displaying key travel and current conditions information for the corridor is included in **Appendix A**.

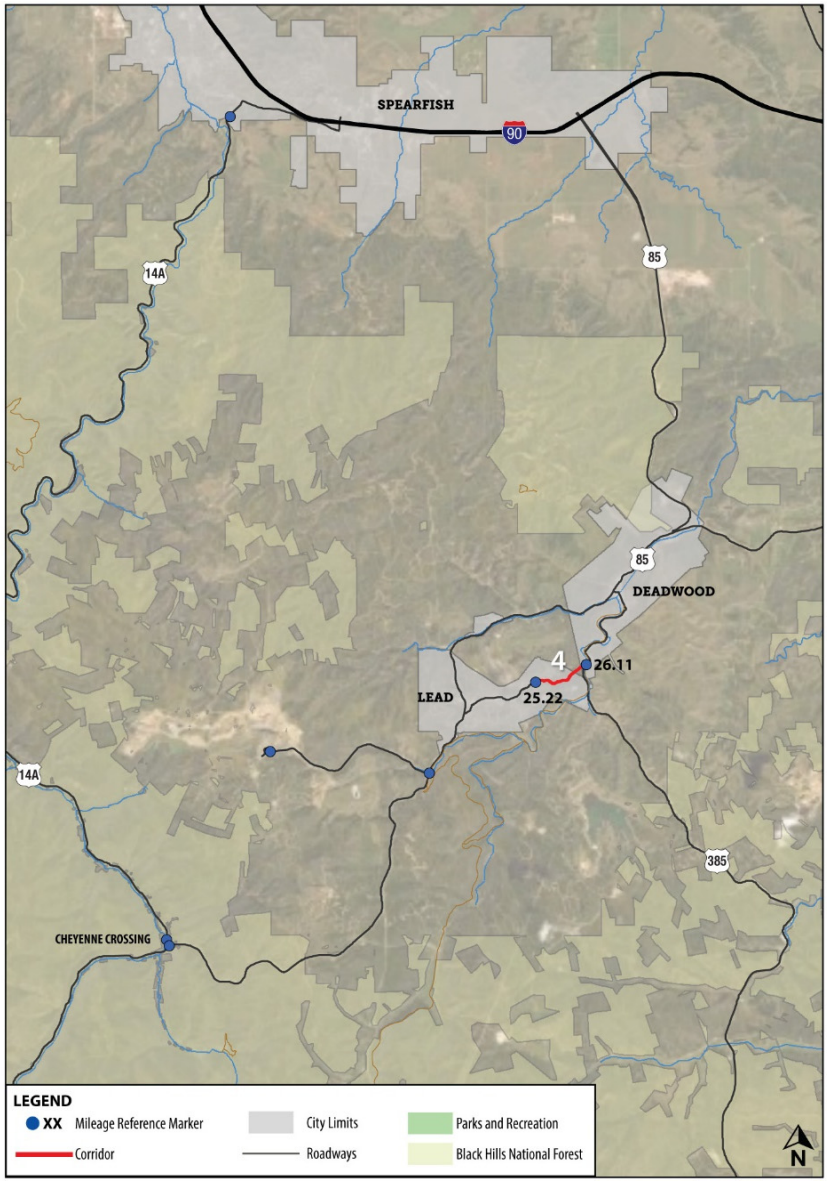
1.2 Phase 3 Report Content

The Phase 3 effort creates more detailed layouts, documents potential impacts, and provides review with project participants and the public. Phase 3 of the overall project is the focus of this document, including:

- Review the CSS steps taken to develop, evaluate, screen, and recommend concepts.
- Restate the corridor vision to support this document being standalone and separate from the Phase 1 and 2 document.
- Detail corridor enhancement design information to document the scope of potential improvement projects fitting within the defined corridor vision.
- Document corridor proposed concepts to be carried forward into conceptual and final design as improvements are advanced through project development when the need and funding are coordinated.

This report reviews the corridor vision developed in Phase 1, highlights the improvements recommended in Phase 2, and provides the additional design and environmental Phase 3 information for Corridor 4.

Figure 2. Study Corridor Location



2. CONTEXT-SENSITIVE PROCESS

CSS principles were used as a framework for developing the study. As applied in many transportation infrastructure projects, CSS provide a method for planning, designing, and constructing infrastructure improvements that are consistent with the purpose and role fulfilled by a corridor.

CSS operate with the following core principles (fhwa.dot/gov/planning/css):

- Strive toward a shared stakeholder vision to provide a basis for decisions
- Demonstrate a comprehensive understanding of contexts
- Foster continuing communication and collaboration to achieve consensus
- Exercise flexibility and creativity to shape effective transportation solutions, while preserving and enhancing community and natural environments

While the study represents a less formal implementation of CSS, these principles have guided the study team toward successful completion of Phases 1 and 2. Described as follows, stakeholder and public collaboration has supported the technical work, and the study team followed a series of steps to reach outcomes in line with CSS principles.

2.1 Study Oversight

Central to creating the context sensitive plan was discussion and information sharing with state/federal agency, county, and appropriate local jurisdictions throughout plan development. Before initiating the work, the SDDOT identified and invited representatives from the following agencies to participate on the Study Advisory Team (SAT):

- United States Forest Service (USFS), including representatives from each Ranger District in the region. Districts invited to participate include Hell Canyon, Northern Hills, Mystic, and Black Hills National Forest
- United States National Park Service representatives from Jewel Cave and Mount Rushmore properties
- South Dakota Game Fish and Parks representatives from Custer State Park
- Spearfish Canyon Association
- Federal Highway Administration

SDDOT representatives from the following divisions participated in the SAT:

- Administration
- Bridge Design
- Custer Area Office
- Project Development
- Rapid City Area Office
- Rapid City Region Office
- Road Design
- Transportation Inventory Management

The SAT's role was to oversee the major project milestones, provide technical input, and monitor the progress of the planning process.

2.1 Stakeholder and Public Collaboration

In addition to ongoing guidance from the SAT, efforts were made to obtain feedback from other interested groups. The project team contacted a broad list of potential stakeholders and met with many representatives.

2.1.1 Phase 1 and 2 In-Person Public Meeting

In Phase 1, stakeholder input was received through the following efforts:

- Small group meetings with adjacent landowners/stakeholders with interest in individual or a range of corridors.
- Municipal representative meetings in which current issues and future development traffic impacts on the corridors were discussed. Entities included the cities of Custer, Hermosa, Spearfish, Lead and Deadwood.
- Meetings with the Black Hills Council of Governments and Chambers of Commerce associated with the cities of Spearfish, Lead and Deadwood, along with the School District encompassing the Lead and Deadwood area.
- Individual agency meetings with staff responsible for specific properties along one or more of the corridors, including Custer State Park.

General public meetings in support of Phases 1 and 2 were held in both the north and south regions of the study area in August 2018. Each meeting was broadcast live via YouTube. Participants had an opportunity to comment on issues they experience within one or more corridors and their perception of corridor desired functions. In-person attendees and people participating remotely (live or delayed through watching the recorded meeting) were provided with the opportunity to send comments and/or questions via email.

A website was established to provide current information and serve as a tool for public feedback throughout Phases 1 and 2 of the study.

2.1.2 Phase 3 Virtual/Remote Public Meeting

Due to restrictions associated with COVID-19, the opportunity to communicate with the public and receive feedback was provided virtually through displays and recorded presentations available through the project website. Information provided through the website included:

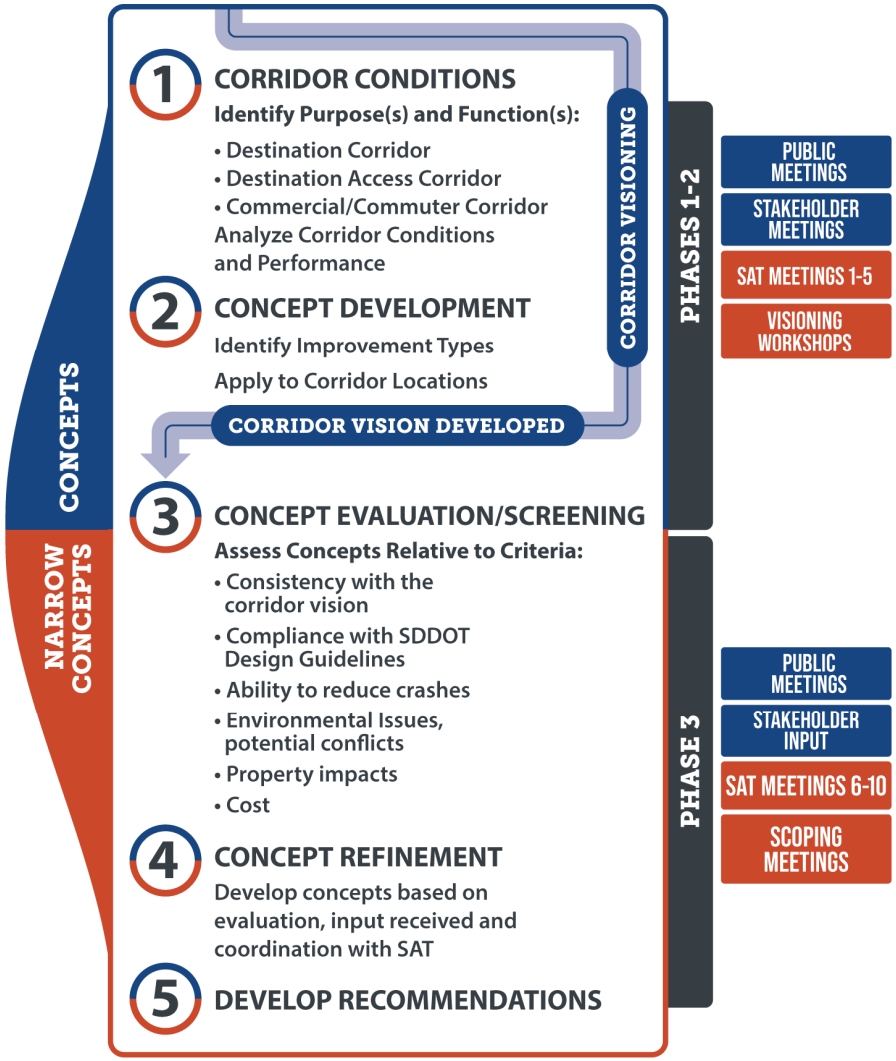
- Informational narrated recordings reintroducing the individual corridors, presenting concepts to address needs/gaps, and summarizing results of assessing the concepts relative to a consistent set of evaluation criteria.
- Detailed concept diagrams of the range of concepts being considered to address needs within the definition of context sensitivity, including potential impact areas and types of impacts.
- Contact information for residents, business representatives, and other stakeholders to provide feedback and/or discuss with members of the consultant team their questions/concerns about the study process, concepts, or findings.

2.2 Context Sensitive Visioning and Concepts

Figure 3 outlines the steps taken to reach a corridor vision and then develop, evaluate, screen, and recommend a design concept through the Context Sensitive Corridors Study. Phases 1 and 2 involved collecting pertinent information about each of the 17 corridors to understand their purpose and quantify their performance across a range of categories. Possessing this knowledge base, the study team identified improvement types that could be applied to further each corridor's purpose and meet the current and future needs. Improvement types include Design, Multimodal Operations, Safety, Intelligent Transportation Systems (ITS), and Aesthetics. The corridor vision includes locations for improvement types, assessments of costs and benefits, and timelines for implementing corridor improvements.

Criteria such as purpose/design inconsistency, safety benefit/cost, crash frequency and urgency of condition were used to advance a subset of corridors to Phase 3. In Phase 3, detail has been added to corridor improvements to better understand potential impacts associated with adding shoulder width, realigning segments, adding retaining walls and guardrail, and/or improving access into/out of the individual corridors to address safety and geometric deficiencies. The intent of Phase 3 is to narrow concepts and advance recommendations while increasing the detail provided. In addition to the concept layouts, a deliverable for Phase 3 is an environmental scan document.

Figure 3. Concept Development and Visioning Process



3. VISIONING

This section addresses the development of the context sensitive vision for US85 from Lead to Pluma.

3.1 Purpose, Performance, and Needs

The study team developed a rating system to display key corridor conditions, including:

Purpose: The corridors are assigned ratings based on their tendency to serve as Destination, Destination-Access, or Commuter/Commercial roadways. The rating system allows recognition of multiple purposes served within the same corridor.

In a Destination Corridor, driver/passenger experience of the road is the reason for the trip. Curves, narrower lanes, and slower speeds are not considered deficiencies, but rather are desirable characteristics of the adventure provided by the trip whether it is made by auto, motorcycle, or bicycle.

A Destination-Access Corridor describes a hybrid corridor whose role is to carry travelers between their accommodation location (hotel/campground/ home) and the recreation venue to be visited. In addition, as the corridor provides direct access to a nature/park site, the environment next to the road traveled may also provide a complementary scenic view as part of the trip.

A Commuter/Commercial Corridor provides connectivity between residential and employment areas and/or is intended to carry goods from one point in the region to another or through the region. A Commuter/Commercial Corridor emphasizes vehicle throughput over access to adjacent property, reduced and reliable travel time, and lane and shoulder widths commensurate with commercial vehicles.

Corridor 4 is characterized primarily as a Commuter/ Commercial Corridor, recognizing its priority to connect the developed areas of Lead and Deadwood. It is secondarily characterized as a Destination-Access Corridor, serving visitors to the Black Hills.

User Mix: Corridors were reviewed relative to the user type/vehicle mix observed in the corridor compared to the other 16 corridors in the study. The urban setting of Corridor 4 represents a unique condition relative to the other 16 corridors and influences the user mix. While all of the study corridors support some bicycle and pedestrian travel, the proximity of Lead and Deadwood, which are connected by US85, results in a higher percentage of pedestrian and bicycle travel relative to other study corridors. The urban nature of the corridor also results in higher traffic volume relative to the other corridors covered in the study.

Context: The nature and intensity of unique features "beyond the pavement" along the corridor are rated. Corridor 4 is aligned between a portion of Gold Run and steep rock outcroppings.

Traffic Operations: Traffic operations are rated based on Level of Service (LOS) findings for current and projected Year 2050 traffic levels compared with SDDOT LOS criteria. Current operations are acceptable. By 2050 traffic growth begins to be a concern assuming the current geometry and intersection control remains.

Safety: Safety is rated based on the relative magnitude of crash history compared with expected norms for roadways of similar type. Corridor 4 demonstrates moderate to high potential for crash reduction.

Road Design: Geometric features of the roadway are rated relative to conforming to established standards. Along Corridor 4, design deficiencies exist with respect to shoulder width and clear zone, and bicycle/pedestrian facilities are lacking.

Table 1 summarizes the key characteristics.

Table 1. Corridor Characteristics Summary

Characteristic Category	Description
Purpose	Primary: Commuter/Commercial Secondary: Destination-Access
User Mix	Prioritize auto and heavy commercial travel supporting commerce activities along the corridor and supported through connecting Lead and Deadwood
Context	Small urban areas on each end of the corridor; rock outcroppings and severe side slopes alongside the roadway.
Traffic/Safety Conditions	Current operations – acceptable. By 2050 traffic growth begins to be a concern assuming the current geometry and intersection control
Road Design	Primary deficiencies are limited shoulder, restricted clear zone, and minimal pedestrian/bicycle facilities

The following summarize the assessment supporting the conclusion:

- The route represents the primary connector between Lead and Deadwood, supporting a wide range of functions.
- The route carries a higher percentage of heavy commercial vehicles relative to most other corridors covered in the Context Sensitive Corridors Study.
- Daily traffic in the corridor exceeds all other corridors, with the exception of Corridor 17, SD244, the primary access to Mount Rushmore National Memorial.
- Urban portions of the corridor in Lead include a detached sidewalk on one side, which is not found in the other, more rural setting corridors.

3.1 Visioning Results

The corridor vision consists of two elements: 1) a statement describing the envisioned future of the corridor and 2) a list of improvement types and locations that demonstrate the potential to support the vision.

Vision: The urbanized corridor is highly constrained by rock walls and side slopes. It needs improved non-motorized connectivity and an updated roadway section.

List of Improvements: The initial range of concepts developed for Corridor 4 consisted of 48 improvement types categorized as follows:

- **Design:** Improvements or changes to the current physical roadway conditions that focus on lane width, shoulder width, vertical and horizontal curvature of the road, superelevation through a curve, ditch slopes, objects immediately outside the pavement area, and auxiliary lanes aiding entry or exit from the road
- **Multimodal Operations:** Improvements that reduce platooning behind slower moving vehicles, intersection control changes, better accommodating mixed traffic (bicycles, pedestrians and the range of motor vehicles) along and across a road
- **Safety:** Actions/improvements that affect visibility, speed, traction in wet/snow/ice conditions, and feedback if vehicles stray from travel lanes
- **ITS:** The range of vehicle detection and information feedback that influence driver behavior, such as speed management devices, advance warning devices, weather information systems, etc.
- **Aesthetics:** Improvements that may not have an effect on driver behavior but can be measured in crash reduction. However, such improvements are complementary to safety motivated actions and consistent with the context sensitive nature of routes covered in the study.

Improvement types demonstrating the ability to support the vision were identified from this initial list over the course of two visioning workshops, which in the context sensitive approach played a critical role in balancing the application of improvement types with the preservation of the corridor's unique surroundings. In the workshops, possessing an understanding of corridor purpose and performance, the study team, SDDOT, and agency staff set initial road design expectations for the design speed and typical section, applying judgment regarding context-sensitive implementation. The workshop attendees selected improvements to deliver safety benefits, improve consistency with SDDOT design standards, and bring corridor configuration more in line with its designated purpose.

The current configuration of US85 between Lead and Pluma does not effectively serve as a multimodal community connection and possesses a narrow paved section difficult for larger vehicles to navigate efficiently and safely. Crash records indicate a moderate to high potential for crash reduction. Physical roadside features are severe and immediately adjacent to the paved surface, limiting flexibility for future design changes.

Effective improvement types would allow the corridor to better support the characterized purpose and function. A shortened list of improvement types was identified by evaluating the current conditions within the corridor relative to the vision; reviewing the findings from the operations, safety and design evaluations; and receiving input from the visioning workshops and the public meetings held in support of Phases 1 and 2. **Table 2** highlights the improvement types identified for US85.

Table 2. Summary of Improvement Types to Support Vision

Improvement Type	Supports Vision by
Pedestrian linkage along corridor	Enhancing safety and efficiency of multimodal connection between populated areas
Modification to section to optimize shoulder and lane widths	Reduction of crashes
Guardrail/roadside safety improvements	Reduction of crash severity
Improved aesthetics for transition between two communities	Visual experience of Destination Access function

4. CONCEPT EVALUATION

Understanding the desired corridor travel functions, current and future operations, and need to better support the vision, the study team undertook a series of actions to craft unique actions for each corridor. Scoping meetings were also held to identify and discuss ideas about the appropriate improvements to the corridors. The concepts developed and discussed through the scoping represent the range of improvements reviewed through Phase 3.

Considerations informing the development of concepts include:

- **SDDOT road design standards:** The guidance for road design characteristics contained within the Road Design Manual was used as the initial basis for refining the roadway typical sections, design speed, and other parameters. In developing concepts, the study team implemented a context sensitive design approach balancing the meeting of standards with preservation of the unique context of the corridor.

With this approach, the following items were considered in addition to design standards:

- **Corridor purpose and function:** Pursue concepts that assist in aligning the physical layout of the roadway corridor with its purpose and function in the transportation system as a National Highway System route conveying longer distance travel for a mix of vehicle types.
- **Corridor characteristics:** Effective concepts will address corridor conditions identified during visioning, including locations where crash frequency and/or severity is higher than expected, locations of contextual features to preserve/protect/avoid, public and stakeholder input, and information from the SAT regarding known concerns and objectives.

4.1 Concept Development

Initial design concepts for the US85 corridor from Park Avenue in Lead to US385 were developed to meet the following objectives:

- Retain the lane width to support one of the corridor's primary functions of accommodating heavy commercial vehicle travel. The minimum and preferred key cross section design elements are highlighted in **Table 3**.
- Better support pedestrian and bicycle travel in the corridor by creating more separation between auto/truck traffic and pedestrian/bicycle travel.
- Provide improvements that can address the higher than expected crash rates observed based on the speed limit, section, and setting.
- Protect travelers and the roadway from the drop-off to Gold Run.
- Limit the impacts to the rock face running along the north side of the corridor, while retaining the south travel lane position relative to the creek influence area.

Table 3. Key Cross Section Components – Minimum and Preferred (Reflecting an Urban Area)

Design Element	Design Width/Length	
	Minimum (Feet)	Preferred (Feet)
Lane Width	11	12
Shoulder (Paved)	5	8
Clear Zone	7	10
Inslope Grading Ratio	Varies, 4:1 to 2:1	
Backslope Grading Ratio	Varies, 4:1 to 1:2	

4.2 Typical Section Concepts

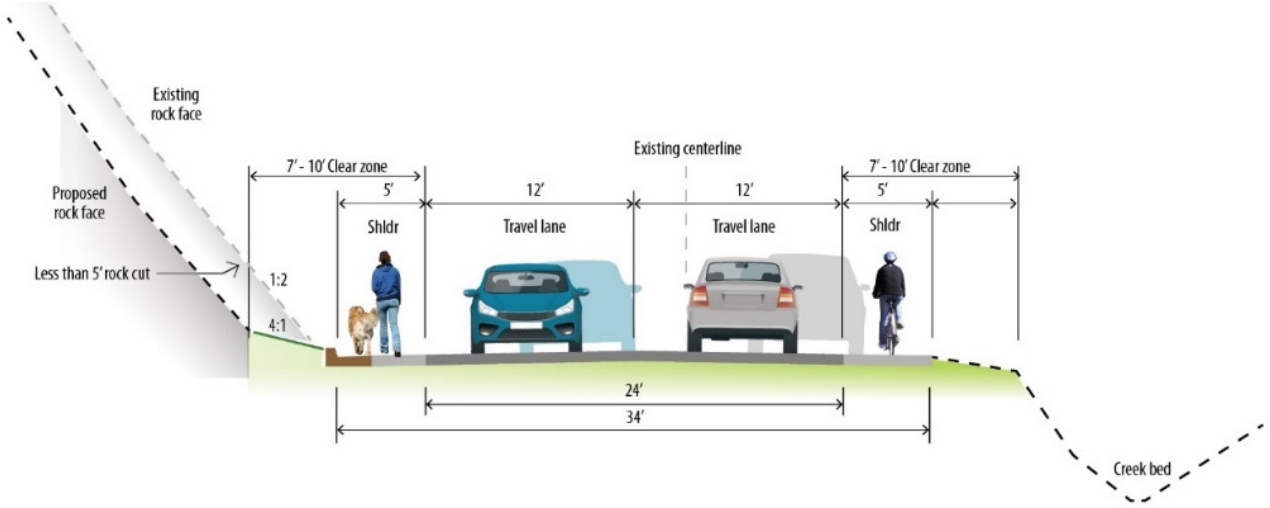
A primary goal in the corridor is to improve accommodation for pedestrians and bicyclists, while retaining the lane width needed for heavy commercial vehicles using the corridor. Understanding there are significant constraints immediately north (rock walls) and south (Gold Run Creek), the project team identified a range of alternate methods of accommodating pedestrian and bicycle improvements for the corridor. Through the concept development stage, the team discussed options for better accommodating the desired modes, while reducing impacts outside the current travel lane. Options discussed included:

- **Option 1: Expand the Shoulder to Five-Feet to Better Accommodate Pedestrians/Bicyclists.** The general method of accommodating pedestrians and bicyclists on SDDOT routes along a rural section is to provide wider paved shoulders outside the travel lane. For Option 1, the current south shoulder line would be maintained to reduce the potential for impacts to/from Gold Run. While the area north of the current travelway is predominantly a rock cut, it is in right-of-way (ROW) owned by the SDDOT.

Figure 4 displays the cross section of Option 1. The proposed concept is to provide a five-foot shoulder on the north and south sides of the travel lanes. This concept would shift the roadway approximately five feet to the north of the current alignment to accommodate the shoulder widening and provide a 10-foot clear zone, while maintaining the current south side limits. Shifting the roadway to the north would result in the need to remove material from the north side rock face to accommodate the proposed section.

The cross section representing Option 1, which maintains the current south side alignment limits and proposes including enough width to address SDDOT clear zone guidelines, creates the opportunity to remove much of the guardrail present along the south side of the alignment. Eliminating guardrail removes a viewshed barrier between travelers on the roadway and surrounding natural areas.

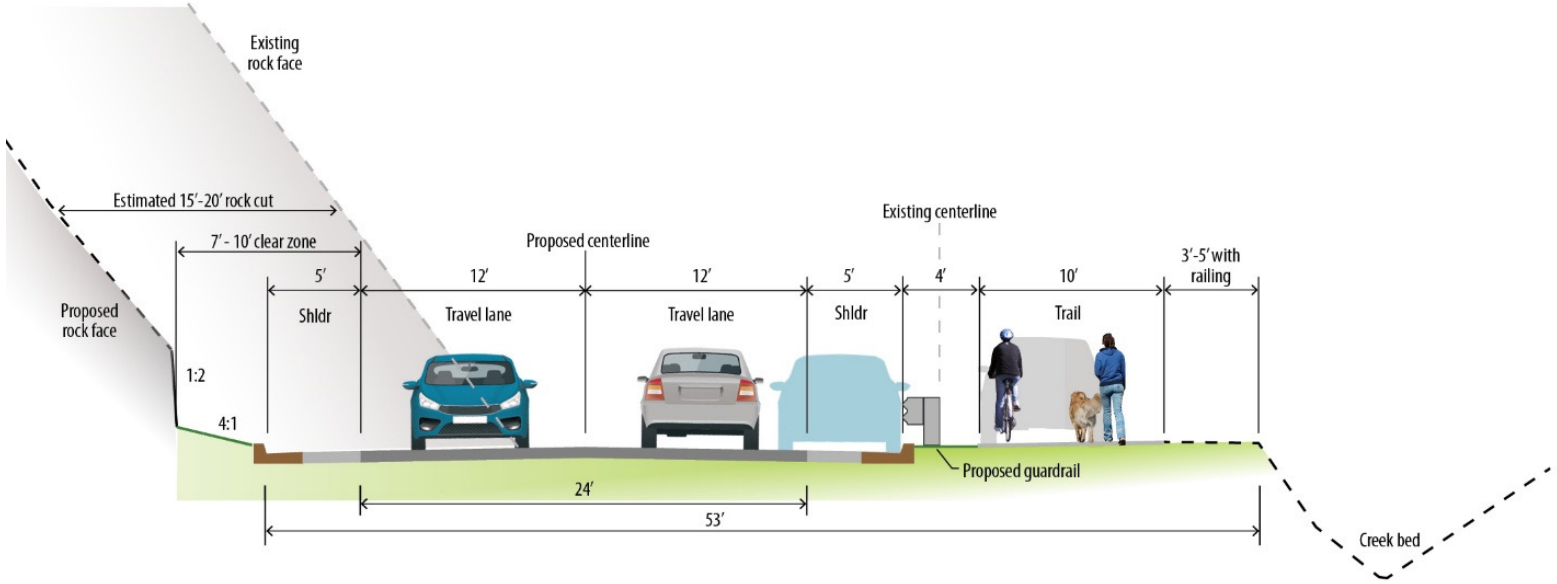
Figure 4. Option 1 Typical Cross Section



- **Option 2: 10-Foot Adjacent Multiuse Trail on the North and South Sides.** While the study area for US85 is less than 1 mile long and the west and east ends are in the urban environments of Lead and Deadwood, respectively, the corridor is predominantly rural. Thus, for many travelers seeing pedestrians and bicycles on the shoulder is not anticipated. Additionally, as the corridor carries higher levels of heavy commercial vehicles, the environment is not pedestrian friendly. Widening the portion of the roadway anticipated to carry pedestrians and bicyclists from the five-foot shoulder in Option 1 to a 10-foot trail on either side provides additional separation opportunity. To enhance the safety of the adjacent trail option, continuous guardrail was considered as a pedestrian-vehicle separator. However, as a cost savings measure, Option 2 was modified to include a two-way travel multiuse path on the south side separated by guardrail and a five-foot shoulder on the north side. By including the trail on one side, exposure to vehicles is reduced and cost can be reduced by placing guardrail on one side only.

Figure 5 displays the section for Option 2. The level of impact to the elevated area north of the alignment would be substantially greater than that associated with Option 1. In Option 2, the eastbound lane would be relocated to the north side of the current westbound lane, resulting in the need for a 15- to 20-foot cut into the adjacent rock. While there is likely adequate ROW on the north side to accommodate the expanded cut, the resulting cost would be substantial.

Figure 5. Option 2 Typical Cross Section



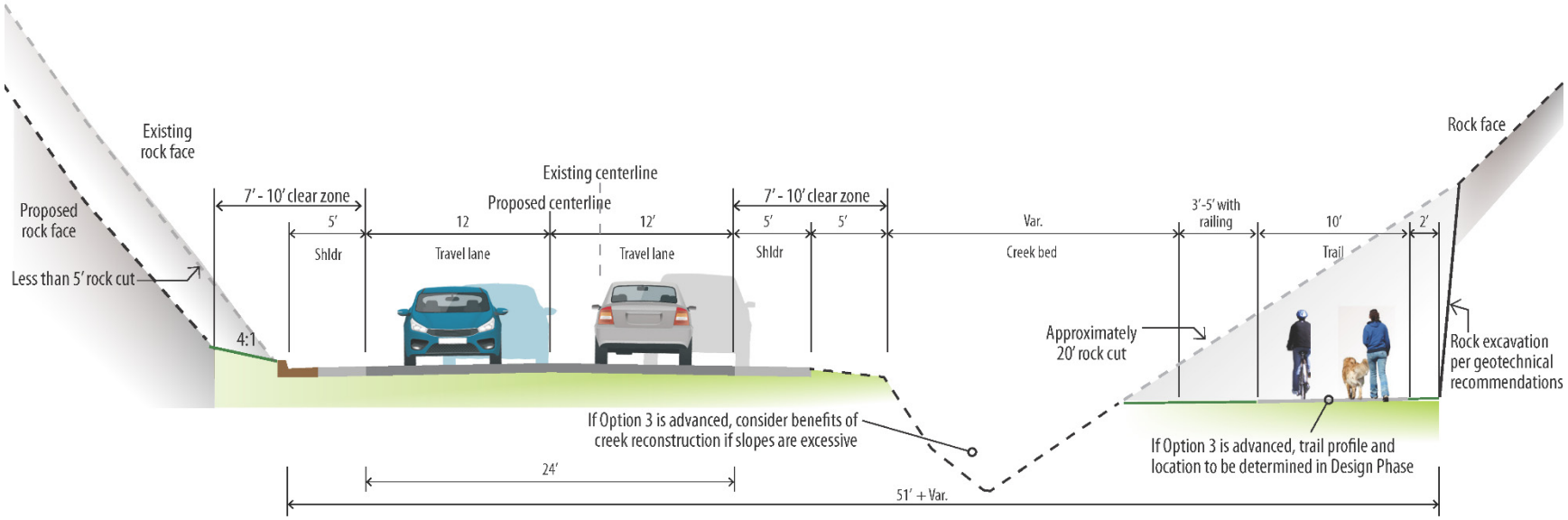
- **Option 3: Provide Five-foot Shoulders on Each Side and Establish a Separated Multiuse Trail South of Gold Run Creek.** To address safety concerns in the corridor due to the higher truck volumes, steeper grades, and mix of modes, relocating pedestrian and bicycle modes to the south side of Gold Run was proposed in Option 3. Relocating pedestrians and bicyclists to a separate path essentially eliminates the modal conflicts between motorized vehicles and pedestrians/bicycles in the study area segment of US85.

  Figure 6 displays the proposed typical section for Option 3. The roadway portion of the concept would be consistent with the section proposed in Option 1. Relocating the pedestrian and bicycle functions to the south side of Gold Run Creek would result in the need to acquire additional ROW from private landowners and the removal of material to create the pathway. Creating the pathway would result in rock cuts. Through the planning portion of the corridor study, no inquiries were made to owners of the south side property where the path alignment was assumed.

  Relative to the current US85 alignment, the adjacent impacts of this concept are consistent with those of Option 1, which is approximately a five-foot (or less) cut into the north side rock face. Added to the northside impacts would be the south of Gold Run pedestrian/bicycle path cut impacts.

  As noted in Figure 6, if the option is selected to advance in design, need/benefits of reconstructing the creek and the actual location/alignment of the trail need to be substantially refined.

Figure 6. Option 3 Typical Cross Section



4.3 Potential Impact Areas by Corridor Concept

For each of the three corridor concept options, the project team developed a footprint area to accommodate the roadway alignment and, in the case of Option 3, the separated multiuse trail. The purpose of this step was to:

- Provide stakeholders with a visual concept of the different corridor-wide alignments to supplement the typical sections
- Support developing cost estimates
- Support a planning level environmental review of potential impacts of each option

Figure 7 through **Figure 9** display the alignment of Options 1, 2, and 3, respectively. A key difference between Option 1 or Option 2 and Option 3 is the junction location for the pedestrian and bicycle element of the concept. For Options 1 and 2, bicycle and pedestrian facilities follow the current US85 alignment. With Option 3, however, the separated trail would connect with US385 south of Gold Run culvert. From this point, it is proposed that the pedestrian/bicycle facilities be located on the west shoulder and cross over to the north side of US 385, where there is currently a wider shoulder extending to the Gold Run Creek bridge. The bridge provides sidewalks on both the north and south sides to accommodate pedestrians and bicycles.

Figure 7. Option 1 – US 85 Corridor Alignment and Estimated Impact Limits

Figure 8. Option 2 – US 85 Corridor Alignment and Estimated Impact Limits

Figure 9. Option 3 – US 85 Corridor Alignment and Estimated Impact Limits

4.4 Concept Refinement

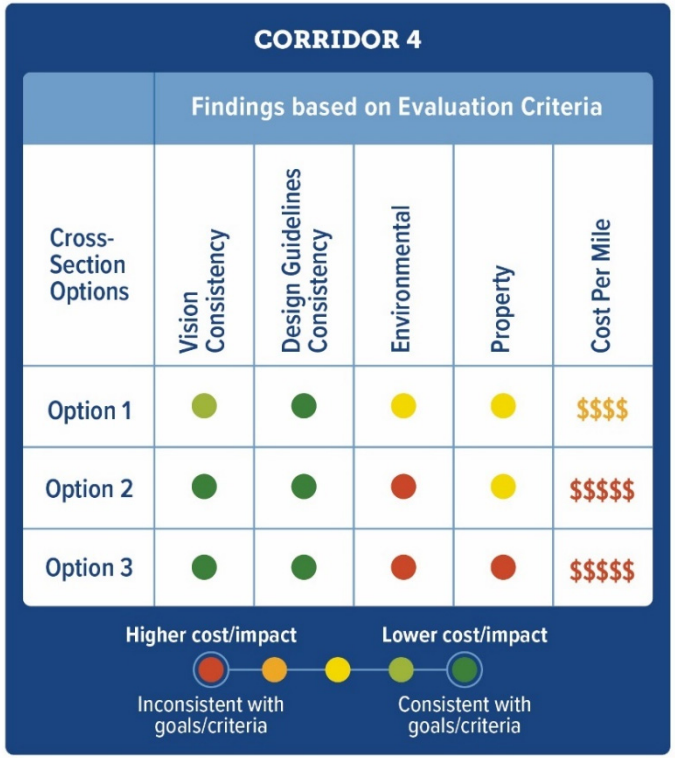
Figure 10 describes concepts identified to address needs/gaps and the vision for Corridor 4. The figure documents, for each concept, potential positive and negative impacts associated with the concept, relative to:

- **Consistency with the corridor vision**, described in **Chapter 3**.
- **Consistency with SDDOT Design Manual guidelines for the corridor setting and basic cross section**. As the corridor traverses a highly sensitive area, supporting the contextual vision is a higher priority than meeting every element outlined in the Design Manual, as long as a safe facility is provided.
- **Significance of environmental impacts**. Areas directly north and south of US85 represent environmentally sensitive areas of either Gold Run Creek or substantial rock face areas that would be significantly impacted by widening the roadway or relocating specific functions currently accommodated in the corridor.

  Appendix B includes additional detail about environmental considerations associated with the concepts that involve adding shoulder and clear zone improvements.
- **Impacts to adjacent property**. As the SDDOT owns substantially more ROW on the north side of the corridor, it was assumed impacts of construction would press to the north, while the south edge of the road would be retained to increase separation from the creek and avoid the severe drop-off. By retaining the south road limit and widening the corridor to the north, adequate separation from the creek can be provided to allow guardrail to be removed while meeting clear zone needs in Options 1 and 3.
- **Relative cost per mile**. With the more severe terrain and abutting environmental features, such as Gold Run, concepts to address operational or safety concerns will likely have a higher than typical cost per mile than projects on similar rural two-lane routes in other parts of the state. While the SDDOT understands this situation and the importance of maintaining the state of good repair in the corridor, there are limitations to the funding that is available to address needs. Costs can be addressed by identifying and accepting lower cost concepts that may not meet all of the state's goals or phasing the project such that costs can be spread over multiple budget cycles.

  For the planning level of review, the team prepared and measured a relative cost per mile estimate relative to the estimated typical for rural highways across the state.

Figure 10. Shoulder Options Screening Summary



The uniqueness of the context sensitive corridor purposes and functions, relative to others in the state, influences the application of improvements in the following ways:

- **Establishing a threshold for determining whether action is needed:** For most state routes, a lane width of less than 12 feet or a missing segment of paved shoulder would warrant review for improvement. In the context sensitive corridors, a higher level of deviation from the desired design, as defined in the SDDOT Design Manual, would be permitted to retain corridor character. Meeting the threshold of need for action in a context sensitive corridor requires an observed elevated crash rate, combined with the narrower lane or missing shoulder included in this example.
- **Defining the improvement area:** As it is desirable in most of the study corridors to maintain the current design conditions, the defined extent of an improvement area was held to a minimum to address the issue. If through a corridor, for example, a disconnected series of curves was in need of improvement, the context sensitive improvements were limited to the curved segments, whereas in other parts of the state improving tangent segments connecting the identified curves may also be addressed.
- **Types of improvements:** Across the range of context sensitive corridors, there are few congested corridor segments or intersections. There are also few segments where enhanced access management through consolidation is identified as a corridor need. The primary deficiencies for the corridors are tight curves, deficient superelevation, and/or a lack of sufficient paved shoulders, which contribute to higher crash rates and elevated severity. Thus, the predominant type of improvements are those focused on reducing run-off-the-road and head-on crashes, rather than those increasing throughput and reducing travel time.

5. RECOMMENDATIONS

Each concept presented in this Phase 3 Report meets the general vision for US85 as a Commercial/Commuter Corridor. Each concept also creates the potential for substantial impacts to the surrounding environment due to the need to cut into adjacent rock areas to provide additional facility areas to accommodate the combination of autos/trucks, pedestrians, and bicycles in the corridor. The most significant difference between the concepts comes with Option 3 as pedestrian and bicycle facilities are relocated outside SDDOT-owned ROW. As stated throughout the Phase 3 Report, outreach to the landowner(s) of the property along the south side of Gold Run to understand their willingness to accommodate the functions was not completed as it is too early in the project development process to define potential impacts in adequate detail. Thus, as project development continues, the SDDOT will need to balance the potential impacts of removing additional material along the current alignment to accommodate all modes with the feasibility and cost of acquiring added ROW for a concept that would still include substantial rock cuts to provide the alignment.

Upon discussion with the SAT and consideration of public input received, it is recommended that Option 1 be advanced due to its ability to achieve design objectives, cost-effectiveness, and management of environmental resource impacts. Other options under consideration provide less cost-effectiveness and/or would result in additional impacts.

5.1 Environmental Scan

Appendix B contains the Environmental Scan Report. This document provides a "bridge" between the three-phase corridor planning studies and the subsequent National Environmental Policy Act (NEPA) process. The sections within the Environmental Scan Report include the corridor context within the Black Hills, transportation system context, and a preliminary corridor-wide purpose and need statement to be refined during the NEPA process. The preliminary purpose and need statement was provided for public review during the Phase 3 virtual public meetings. The Environmental Resources sections within the Environmental Scan Report document known and potential environmental resources within the environmental study area for Corridor 4.

5.2 Recommended Section and Mitigation

Appendix C contains the preliminary concept for the US85 corridor from Lead to Pluma, including proposed mitigation of shoulder widening to accommodate pedestrians/bicycles, minor curve realignment, and additional guardrail.

The recommended concept balances accommodation of the range of modes, safety, and cost while addressing the vision for the corridor. The recommended reasonable concept reflects Option 1, which includes:

- Retaining the current 12-foot travel lanes in each direction.
- Adding five-foot shoulders on either side of the travelway to accommodate pedestrians and bicyclists and to assist in establishing the desired clear zone.
- Maintaining the south curb line as the southern limits of the project, which results in widening to the north. The north widening will require cutting into the rock face to provide the added width for shoulders and clear zone on either side.

5.3 Cost Estimates

Detailed survey information is not currently available for much of the US85 corridor from Lead to Pluma, and the severe terrain of the impact area creates an environment of uncertainty for preparing detailed cost estimates. As there remain concepts from which to select, it is important to provide a planning level cost estimate for each option.

The following key assumptions were used to develop the conceptual level opinion of probable cost:

- Unit cost by linear foot for roadway improvements/replacement.
- Rock face removal estimates based on U.S. Geological Survey (USGS) contour information for the elevated area to the north of the current alignment. This source will yield an order of magnitude estimate, which requires substantial refinement as project development continues.
- Similar USGS source and limitation information for the separated trail section of Option 3.
- Costs associated with drainage, utilities, erosion control, traffic control and similar elements based on a typical percentage of items, including earthwork, highway surfacing, and installation of curb and gutter if applicable.

The project team developed planning level generalized cost estimates for the improvements envisioned for each corridor. The team reviewed the improvement types with respect to the limits and locations as presented to quantify the materials needed to implement these improvements. Unit costs were developed in collaboration with SDDOT staff, using the SDDOT pay items and representative unit costs. The costs of some improvements were estimated based on past projects such as ITS improvements.

Table 4 documents the cost assumption, units required and opinion of probable construction cost for the recommended concept.

Black Hills CONTEXT SENSITIVE CORRIDORS STUDY

Table 4. Corridor 4 – Recommended Concept Cost Estimate

Black Hills CONTEXT SENSITIVE CORRIDORS STUDY

PCN0786
FHU PROJ NO. 117385-01
CONCEPTUAL LEVEL OPINION OF PROBABLE COST

FELSBURG HOLT & ULLEVIG

Alternative: Corridor 4 (US Highway 85: Deadwood to Lead)
Prepared By: Troe/Johnson Date: 3/15/2022

ITEM	DESCRIPTION	UNIT	CONTINGENCY	UNIT COST	QUANTITY	COST
110	Earthwork and Removals (2' Depth)	SY		$ 22	8000	$ 176,000
110	Earthwork (Rock Excavation)	CY		$ 50	31400	$ 1,570,000
380	Surfacing (Highway)	SY		$ 145	3900	$ 565,500
380	Surfacing (Access Road)	SY		$ 110	400	$ 44,000
650	Curb and Gutter	LF		$ 50	5500	$ 275,000
	SUBTOTAL (A)					**$ 2,630,500**
450	Drainage - New	% of (A)	3%	$ -		$ 78,920
451	Utility Relocations	% of (A)	1%	$ -		$ 26,310
632/633	Traffic - Signing/Striping	% of (A)	1%	$ -		$ 26,310
634	Traffic Control	% of (A)	3%	$ -		$ 78,920
734	Erosion Control/Environmental	% of (A)	5%	$ -		$ 131,530
	SUBTOTAL (B)					**$ 341,990**
009	Mobilization	% of (A)+(B)	9%	$ -		$ 267,530
	Contingency	% of (A)+(B)	30%	$ -		$ 891,750
	SUBTOTAL (C)					**$ 1,159,280**
	CONSTRUCTION TOTAL (D)	**(A)+(B)+(C)**				**$ 4,131,770**
18	Design Engineering	% of (D)	5%	$ -		$ 206,590
900	Construction Engineering	% of (D)	10%	$ -		$ 413,180
						$ 4,751,540
	PROJECT TOTAL (E)					**$ 4,752,000**
	Construction + ROW Cost					**$ 4,200,000**

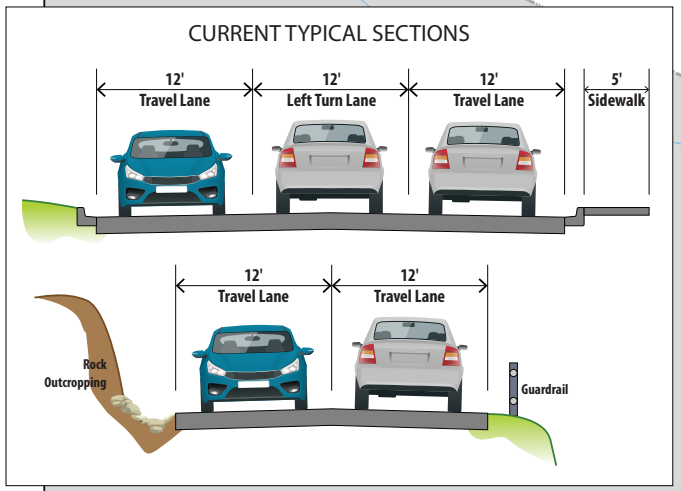
* Surfacing Unit Cost Includes Base Course

Note: In providing opinions of probable construction cost, the Client understands that Felsburg Holt & Ullevig has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing. The unit prices and percentages shown above were applied under the direction of the South Dakota Department of Transportation and FHU makes no warranty, expressed or implied, as to the accuracy of such opinions as compared to bid or actual costs.

APPENDIX A. CORRIDOR 4 CHARACTERISTICS

CORRIDOR 4
US 85: West of Pluma

Corridor Characteristics



CORRIDOR WIDE CHARACTERISTICS

- Pavement in good condition
- Unstable rock outcroppings very close to roadway
- Roadside lighting present along corridor
- 1 curve has a reduced advisory speed

	WEEKDAY		WEEKEND	
Characteristic	Existing	2050	Existing	2050
Daily Traffic	5400	8300	6100	9300
Daily % Trucks	11%	11%	10%	10%
Daily % Motorcycles	3%	3%	4%	4%

	WEEKDAY		WEEKEND	
Characteristic	Existing	2050	Existing	2050
Daily Traffic	4000	6100	4200	6400
Daily % Trucks	4%	4%	4%	4%
Daily % Motorcycles	4%	4%	6%	6%

LEGEND

- XX Mileage Reference Marker
- Recreation Sites
- 6(f) Resource
- Corridor
- Roadways
- County Boundary
- Stream
- 303(d) Impaired Waters
- Trails
- Parks and Recreation
- Black Hills National Forest
- 100-Year Floodplain
- Wetlands
- XX Directional Regulatory Speed Limit Sign
- City Limits
- High Crash Location (Types Noted)
- Tight Curves or Curve Sections With Advisory Speeds

2013-2017 CRASH LOCATIONS

- Fatal (FAT)
- Injury (INJ)
- Property Damage Only (PDO)

SDDOT Black Hills CSC Study 17-385 2/3/20

APPENDIX B. ENVIRONMENTAL SCAN REPORT

Environmental Scan

Black Hills Context Sensitive Corridors Study – Corridor 4

US 85: West of Pluma

Environmental Review and Design

Lawrence County, South Dakota
NH 0085 (107)25 N CN 0786

View west toward US 85 approximately 0.4 miles east of the US 85 and US 385 Intersection.

Prepared for:
South Dakota Department of Transportation

Prepared by:
Felsburg Holt & Ullevig
6400 S Fiddlers Green Circle, Suite 1500
Greenwood Village, CO 80111
303.721.1440

October 2022

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List of Acronyms

ACS	American Community Survey
ADA	Americans with Disabilities Act
AEP	Area of Potential Effect
AMM	Avoidance and Minimization Measure
BGEPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMR	Contaminated Materials Review
EDR	Environmental Data Resources
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
GLO	General Land Office
IPaC	Information, Planning and Conservation system
LEP	Limited English Proficiency
LOS	Level of Service
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
SDARC	South Dakota Archaeological Research Center
SDCL	South Dakota State Law
SDDENR	South Dakota Department of Environment and Natural Resources
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Department of Game Fish and Parks
SDSHPO	South Dakota State Historic Preservation Office

TMDL	total maximum daily load
USC	United States Code
USCB	U.S. Census Bureau
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

1. INTRODUCTION

South Dakota Department of Transportation (SDDOT) is conducting a context sensitive analysis of highway corridors in the Black Hills through a three-phase program, in conjunction with the Federal Highway Administration, US Forest Service, South Dakota Game, Fish & Parks Department, and the National Park Service. The study is being conducted to identify existing conditions, anticipated challenge areas, safety, and operational needs along these corridors and to determine its short-term and long-term transportation priorities.

The first phase encompassed an overall traffic and safety needs analysis of 17 corridors, and the second phase involved an assessment of opportunities for transportation-related improvements for each corridor. These initial corridor planning investigations are documented in the *Black Hills Context Sensitive Corridors Study, Phase 1 & 2 Report* (Study), May 2020.

In the Phase 3 studies, these corridors were then prioritized for their ability to deliver safety benefits and address urgent infrastructure needs, based on current level of service, crash history, road purpose, and public review and comment. Five high priority corridors were selected for more detailed planning, conceptual design, and public review, including Corridors 2, 3, 4, 5, and 7 (see **Figure 1**).

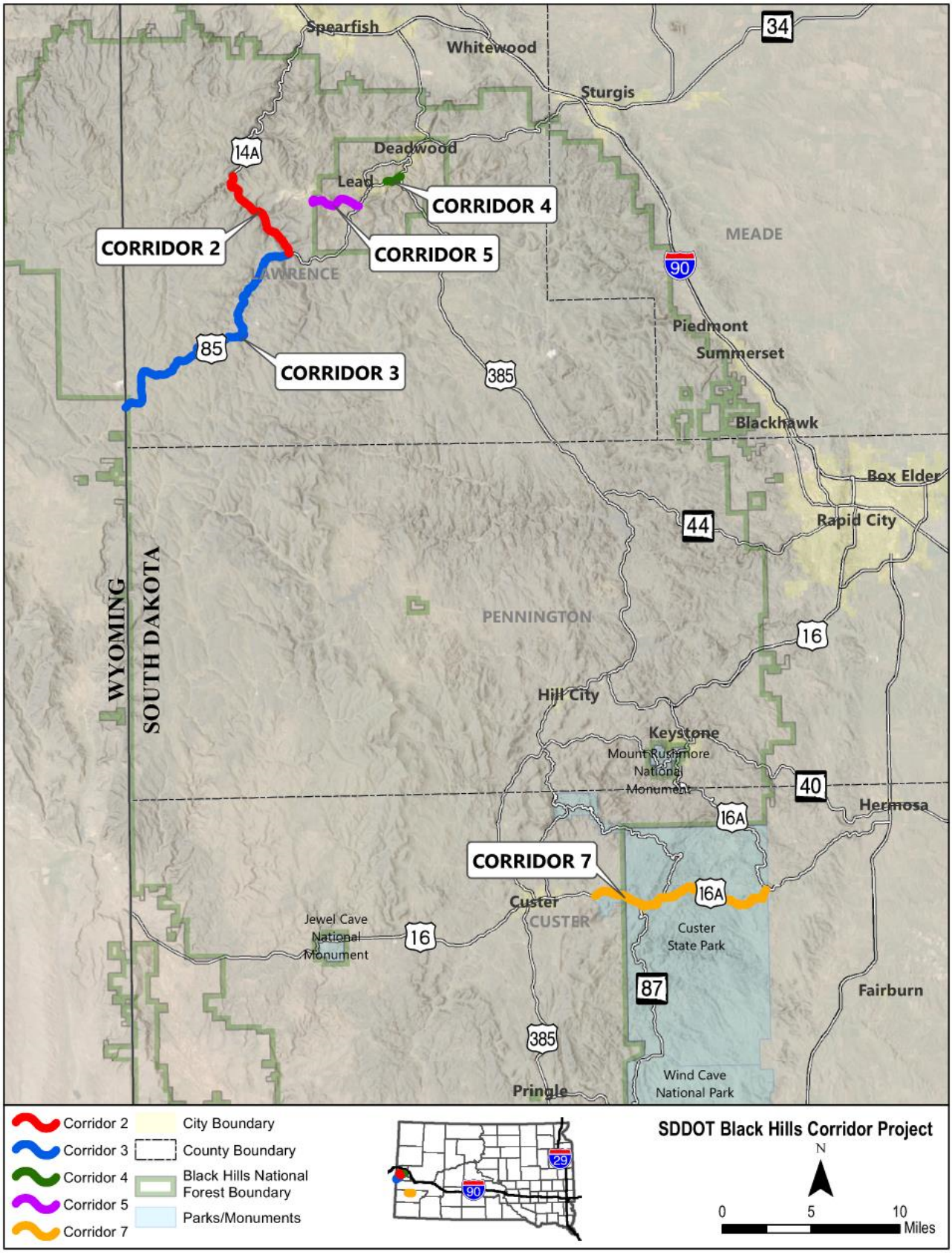
This study is establishing a corridor-wide preliminary purpose and need statement as well as goals and objectives that will be later developed and refined as project-specific purpose and needs for use in the National Environmental Policy Act (NEPA) process. The results of analyses from the previous transportation planning process are being used to shape the corridor-wide preliminary purpose and need statement, and, thereby, the range of alternative concepts. The corridor-wide preliminary purpose and need statement and the goals and objectives will be used to comparatively measure the effectiveness of alternatives. This comparison could occur in the Environmental Scan document but could also occur in the NEPA process. The corridor-wide purpose and need addresses the primary transportation issue in the corridor. Subsequent NEPA projects may address portions of the corridor needs but could have a project-specific purpose and need.

This Environmental Scan addresses the US 85 corridor west of Pluma (Corridor 4) which is 0.89 mile in length. The regional location of Corridor 4 within the Black Hills is shown on **Figure 1.**

The purpose for this Environmental Scan Report is to create a “bridge” between the 3-phase corridor planning studies, and a subsequent National Environmental Policy Act (NEPA) process.

The following sections include the *corridor context* within the Black Hills; *transportation system context*; and a preliminary corridor-wide *purpose and need statement* to be refined during the NEPA process. The *Environmental Resource* sections document known and potential environmental resources within the environmental study area for **Corridor 4**.

FIGURE 1. REGIONAL LOCATION MAP



1.1 Corridor Context

This corridor is the most urban of the original 17 corridors and connects Deadwood and Lead, through the Pluma area**.** The corridor provides connectivity between residential areas and employment areas or is intended to carry goods from one point in the region to another or through the region. Residential-to-work areas may be relatively close (within a community) or be separated by longer distances (from one community to another). Characteristics defining a **commuter/commercial corridor** are:

The primary functions of Corridor 4 are to serve **Commuters and Commercial Goods Movement.**

Vehicle throughput is of greater importance than providing access to adjacent property.

Reducing travel time through the corridor is of high importance.

Providing or maintaining a reliable travel time is of high importance.

Providing lane widths and shoulders to better accommodate commercial vehicles is important.

Curves, narrower lanes, slower speeds are typically considered deficiencies associated with Corridor 4, and are not desirable characteristics in fulfilling the commuter/commercial function.

Providing access to key recreational venues (Destination Access) in the region is a secondary function of Corridor 4. This corridor lies withing a forested valley where the roadway follows the valley bottom. This corridor has a relatively low presence of contextual elements.

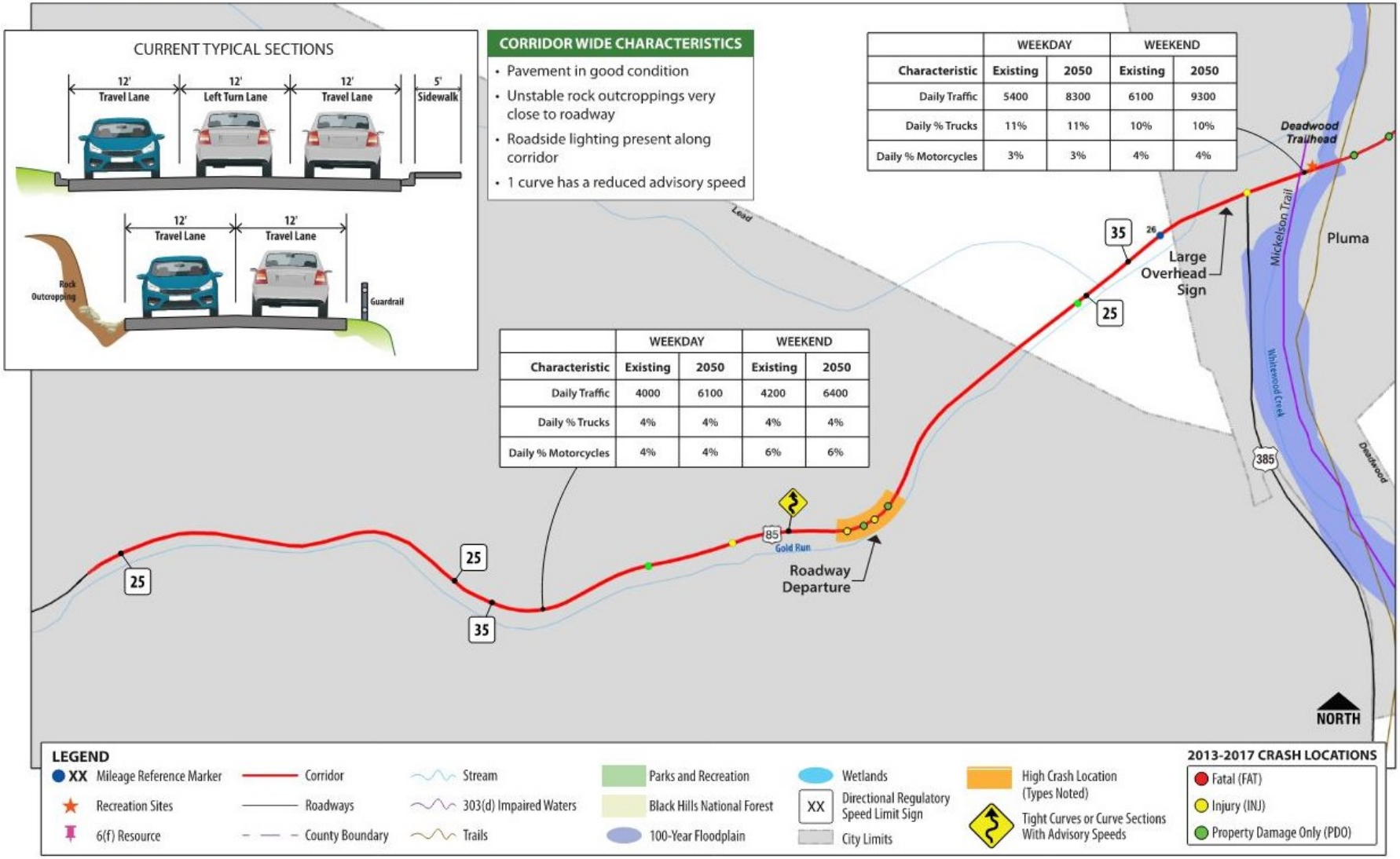
1.2 Transportation System Context

For corridor transportation system context, **Figure 2** illustrates the current typical roadway section, high crash locations, daily traffic data, tight curves, and an overview of corridor-wide characteristics. The typical section of Corridor 4 is a 2-lane road with 12-foot lanes and portions have left turn lanes with a 5-foot detached sidewalk.

Additional portions of the or have rock outcroppings near the edge of the roadway surface and guardrail on the opposite. There is little to no shoulder along the entire stretch of the corridor, with sections of curb and gutter. Overall, the pavement is in good condition. There is one curve in the corridor that has reduced advisory speeds. There are also issues with roadway grade and clear zone issues.

Pedestrian and bicycle travel currently occurs along the highway, though accommodations for non-motorized traffic are currently lacking. Public and stakeholder involvement efforts further underlined safety concerns for bicycle and pedestrian travelers.

FIGURE 2. CORRIDOR 4 CHARACTERISTICS



The biggest transportation issue in the corridor is current and future (2050) Level of Service (LOS). There is a one area of a high crash location and concentration of roadway departure crashes that coincides with a nearby curve with advisory speed identified. The corridor has an overall level of service of safety (LOSS) of III, which means the crash history with the Sturgis rally weeks included, is above the expected for this roadway type, as shown in **Figure 3.**

Much of the corridor on the western side (west of US 385) has slightly less traffic than the section east of US 385. The current daily traffic west of US 385 ranges from 4,000-4,200 vehicles and in 2050 ranges from 6,100 to 6,400 vehicles. The current daily traffic east of US 385 ranges from 5,400 to 6,100 and in 2050 ranges from 8,300 to 9,300 and additional heavy vehicle percentages are noted in this portion of the corridor. Pedestrian and bicycle traffic is routinely observed along the highway.

1.3 Purpose and Need

The following purpose and need sections include descriptions of the *preliminary corridor-wide purpose and need* for the proposed Action, and project goals, to be refined during the NEPA process.

1.3.1 Preliminary Corridor-wide Purpose for the Proposed Action

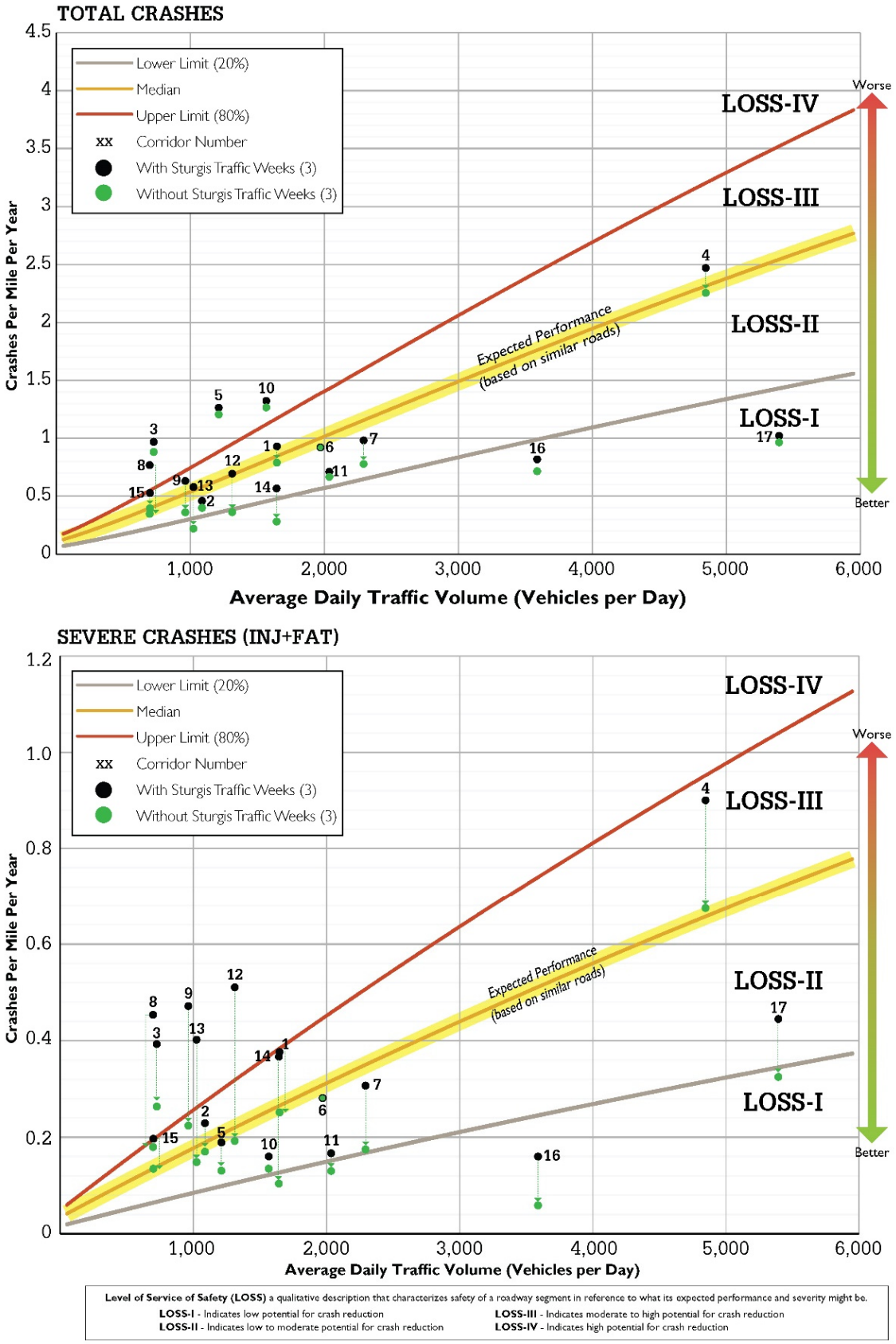
The US 85 corridor between Deadwood and Lead transportation improvements are to address inadequate roadway design configuration; provide a roadway design that accommodates bicycle and pedestrian traffic with greater safety; improve travel time; and enhance the user experience along the corridor. The improvements should be resilient and support the underlying context that adds to the corridor being categorized as a Scenic Byway, while also increasing safety.

1.3.2 Preliminary Corridor-wide Need for the Proposed Action

This section summarizes the transportation needs for the US 85 between Deadwood and Lead Corridor. The transportation improvements are needed to address:

- **Bicycle and Pedestrian Roadside Accommodation**: The efficient movement of people, goods, and services along the corridor is critical and the roadway has several deficiencies that need to be brought to appropriate engineering standards. There is a demand for bicycle and pedestrian travel along the corridor and additional measures are needed to provide enhanced safety and efficiency for non-motorized users.
- **Inadequate shoulders:** There is currently little to no shoulders throughout the corridor. Maximizing shoulders width as much as physically practicable, when considering substantial physical constraints (to a minimum of five feet) would allow for an appropriate accommodation of engineering standards.
- **Guardrail/Roadside Safety Improvement:** Areas of the corridor could be enhanced by the presence of guardrails and other roadside safety improvement that could improve the overall bicycle and pedestrian safety through the corridor.

FIGURE 3. CORRIDOR SAFETY PERFORMANCE, 2013-2017



Level of Service of Safety (LOSS) a qualitative description that characterizes safety of a roadway segment in reference to what its expected performance and severity might be.

LOSS-I - Indicates low potential for crash reduction
LOSS-II - Indicates low to moderate potential for crash reduction
LOSS-III - Indicates moderate to high potential for crash reduction
LOSS-IV - Indicates high potential for crash reduction

1.3.3 Project Goals

This section address goals of the project that each improvement type is intended to address. These goals are important to the character of the corridor but does not rise to actual transportation need for the corridor. These goals may result in the selection of alternatives when other needs are equal, and one alternative addresses the goals better than other alternatives.

- **Safety:** The corridor has experienced higher than expected safety concerns. Three road departure crashes were reported through the advisory speed curve in the five-year period, indicating potential for reduction.
    - ***Vehicular crashes***: Address the higher-than-expected frequency of road departure crashes in the middle of the corridor through the advisory speed curve. Improvements attempt to result in a LOSS II for the entire year, including Sturgis Rally weeks.
- **User Experience:** The context of the corridor serving as a destination for travelers requires consideration of transportation improvements that further enhances this use. Users experience this corridor via passenger vehicles, motorcycles, bicycles, and as pedestrians. These uses should all be considered when infrastructure improvements are implemented.
- **Clear Zone:** A design consideration advanced by project stakeholders is the provision of a 7-to-10-foot clear zone along the roadway, meeting the applicable minimum as documented in the AASHTO Roadside Design Guide. Some improvement locations may not be fully able to achieve this width through improvements. This is due to substantial physical constraints such as substantial steep grades, rock ridges, and the presence of waterbodies. Achieving standard clear zone widths may not be practical when balancing reasonableness and context sensitivity.

1.4 1.4 Proposed Project

1.4.1 Project Termini

The project termini are described as follows:

- **Western Terminus:** Mile Reference Marker (MRM) 25.22, at the intersection of US 85 and Short Street. Located at the transition from developed roadside surroundings with vehicular accesses to undevelopable roadside conditions, characterized by steep rock faces north of the roadway and a stream bed south of the roadway.
- **Eastern Terminus:** MRM 26.11, approximately 300-ft east of the US 385 and US 85 intersection. Located at the transition from undeveloped land and no vehicular accesses into Deadwood city limits, where development of surrounding land reappears along with vehicular accesses and intersections.

1.4.2 Proposed Improvements

A corridor visioning exercise was completed during the Black Hills Context Sensitive Corridors Study. The visioning exercise included technical analyses and intensive consultation with the SDDOT, partner agencies, stakeholders and the general public. The vision includes a list of appropriate improvement types to support the vision, summarized below:

Vision Statement: The urbanized corridor is highly constrained by rock walls and side slopes. It needs improved non-motorized connectivity and an updated roadway section.	
Improvement Type:	**Supports Vision by:**
Pedestrian linkage along corridor	Enhancing safety and efficiency of multimodal connection between populated areas
Modification to section to optimize shoulder and lane widths	Reduction of crashes
Guardrail/roadside safety improvements	Reduction of crash severity
Improved aesthetics for transition between two communities	Visual experience of Destination Access function

Upon reaching and confirming the vision, the study team compiled and evaluated concepts to improve the corridor. Concepts were developed to address SDDOT road design standards, advance the corridor's purpose and function, and address corridor safety and operational needs. Design concepts were presented during public meetings to gather feedback and discussed with the Study Advisory Team to review impacts to the corridor context and adjust the concept to more effectively balance such impacts. A recommended concept emerged from the refinement, including the following components:

- Retaining the current 12-foot travel lanes in each direction.
- Adding five-foot shoulders on either side of the travelway to accommodate pedestrians and bicyclists and to assist in establishing the desired clear zone.
- Maintaining the south curb line as the southern limits of the project, which results in widening to the north. The north widening will require cutting into the rock face to provide the added width for shoulders and clear zone on either side.
- Remove guardrail where possible to improve landscape character

The scope of the environment scan data and mapping would cover future considerations of other corridor improvements.

1.5 Stakeholder and Public Involvement

General public meetings in support of Phases 1 and 2 were held in August of 2018 and both meetings were broadcast live via YouTube. Participants had the opportunity to provide comments on issues they have experienced within one or more of the corridors and their perception of corridor desired functions. A website was established to provide information and serve as a tool for public feedback throughout Phases 1 and 2. Meetings with various stakeholders were also held, which included:

- Small group meetings with adjacent landowners/stakeholders.
- Municipal representative meetings with the cities of Custer, Hermosa, Spearfish, Lead, and Deadwood.
- Black Hills Council of Governments and Chambers of Commerce associated with the cities of Spearfish, Lead, and Deadwood, along with the School District encompassing the Lead and Deadwood area.
- Individual agency meetings, including Custer State Park.

Two Visioning Workshops were held in Phases 1 and 2. These workshops helped to facilitate proper identification of corridor purposes, needs and improvement types.

Public engagement tasks for Phase 3 included presenting previous findings of the corridor studies, improvement options, and engagement tools for receiving public input. A project website was created, and it served as the primary portal of information for members of the public wanting to learn more about the study and to provide feedback.

A virtual public meeting was hosted instead of an in-person meeting due to the recommendations by the Centers for Disease Control. Information about participating in the public meeting was posted on the project website, as well as through different channels of communication. The project website included general project information, access to the interactive public meeting platform, and information on how to subscribe and access documentation form previous public meetings.

The meeting website and public comment period was launched on June 23, 2021 and closed at noon on August 20, 2021. Press releases, flyers, and mailing lists were all used to notify the public of the start of the comment period. Agency stakeholders included in the notifications included:

- City of Custer
- Black Hills Council of Governments
- Town of Hermosa
- Custer County
- Lawrence County
- City of Keystone
- City of Lead
- City of Deadwood
- City of Spearfish

Social Pinpoint, a community engagement platform, was used for the virtual public meeting. The virtual public meeting had almost two thousand visits to all corridors from 420 unique users. Corridor 4 had a total of one response and zero emails. The Corridor option with the bicyclists completely separated and on the opposite side of the creek, was preferred, though there was only one respondent.

Agency involvement included coordination and correspondence with agencies for identifying issues and understanding needs and concerns in the corridors. The Study Advisory Team (SAT) was comprised of the following members:

- U.S. Forest Service (USFS)
- U.S. National Park Service (USNPS)
- South Dakota Game, Fish, and Parks
- Spearfish Canyon Association
- Federal Highway Administration
- SDDOT

The SAT's role was to oversee the major project milestones, provide technical input, and to monitor the progress of the planning process. A total of nine SAT meetings have been held to date, four of which has been during Phase 3 of the study.

2. Environmental Resources

This chapter provides a review of known and potential environmental resources within the environmental study area that may be important considerations for construction of the potential improvements. The environmental study area consists of a 500-ft buffer of the existing US 85 roadway between MRM 25.22, at the intersection of US 85 and Short Street in Lead and MRM 26.11, approximately 300-ft east of the US 385 and US 85 intersection in Deadwood. **Figure 4** provides an overview of the study area.

Included are sections documenting *regulatory requirements*, study *methodology*, descriptions of *existing conditions*, and *next steps* in the NEPA evaluation process for implementing improvements identified for Corridor 4. Evaluated resources are as follows:

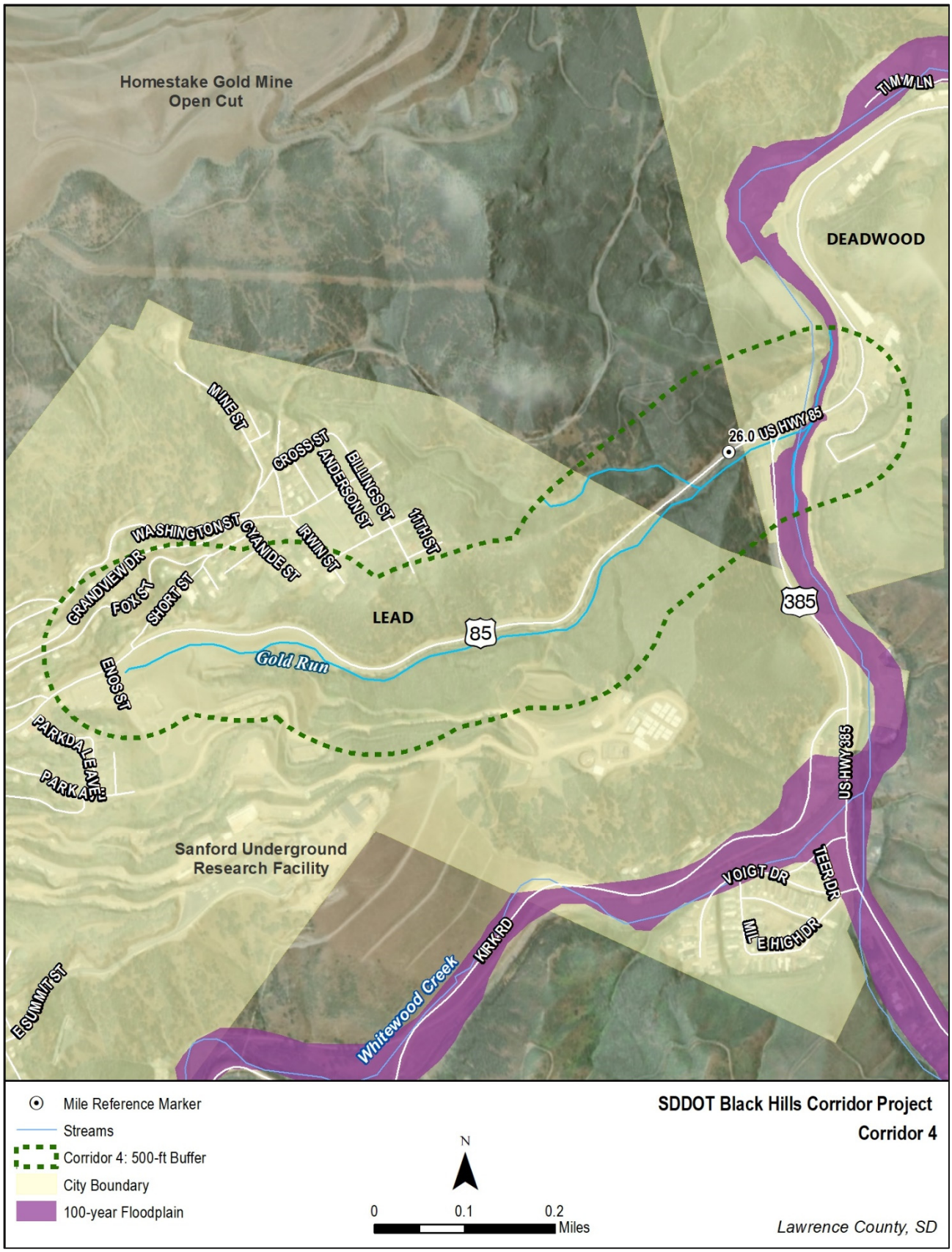
- Soils/Geology
- Air Quality
- Water Quality
- Floodplains
- Wetlands and Waterways
- Vegetation and Wildlife
- Threatened and Endangered Species
- Environmental Justice
- Historic and Cultural Resources
- Federal and Tribal Lands
- Traffic Noise
- Section 4(f) and 6(f)
- Visual Resources
- Hazardous Materials

Several environmental resources with regulatory drivers but without applicability to the environmental study area for Corridor 4 were excluded from further review, including contaminated materials, farmlands, invasive species, wild and scenic rivers, socioeconomic resources. The following subsections provide an overview of the environmental resources, findings of this evaluation and, where appropriate, additional considerations for the proposed project.

2.1 Soils/Geology

This section highlights the soil and rock outcrop constraints associated with the Black Hills adjacent to US 85 west of Pluma. Soil constraints associated with roadway widening or realignments into the moderate to very steep side slopes include erosion, instability, rock outcrops, and revegetation challenges. The focus of this section is on selected soils on steep to very steep slopes with rock outcrops. The primary source of information is from the Soil Survey of Lawrence County, South Dakota (USDA, 1976).

FIGURE 4. ENVIRONMENTAL STUDY AREA



2.1.1 Existing Conditions

There are extensive areas of rock side slopes adjacent to Corridor 4. The following is a profile of constraints associated with selected soil types adjacent to Corridor 4 side slopes:

- **Q0231G: Buska-Rock outcrop complex (40 – 80% slopes)**
  - **General Characteristics:** Deep, well drained soils and Rock outcrop in the Black. It is on smooth upland divides and sides of mountain valleys and drainageways Hills.
  - **Revegetation**: Most areas are ponderosa forest with some areas with native grasses and shrubs.
  - **Hazards**: Shrinking and swelling soils. Strengthening the base material is needed to help overcome the low strength of the Buska soil and to support vehicular traffic. Control of roadside erosion is needed in borrow and cut areas.
  - **Erosion:** 0.24K; 3T; wind erosion group 8 = Very Severe
- **Q0108G: Grizzly-Mineshaft complex (40 – 80% slopes)**
  - **General Characteristics:** Very deep, well drained soils formed in residuum from igneous rocks on mountains.
  - **Revegetation**: Native vegetation is dominantly ponderosa pine with lesser amounts of aspen, birch, and Black Hills spruce. The understory is shrubs and grasses.
  - **Hazards**: This soil has severe limitations for buildings with basements, septic tank absorption fields, sewage lagoons, and local roads and streets because of high shrink and swell of the soil. Local roads and streets need to be graded to shed water, and the base material needs to be strengthened to support vehicular traffic. Control of roadside erosion is needed in borrow and cut areas.
  - **Erosion:** 0.28K; 5T; wind erosion group 8 = Very Severe
- **Q0112G: Grizzly-Rubbleland-Rock outcrop complex (40 – 80 % slopes)**
  - **General Characteristics:** Very deep, well drained soils fromed in residuum from igneous rocks on mountains.
  - **Revegetation**: Native vegetation is dominantly ponderosa pine with lesser amounts of aspen, birch, and Black Hills spruce. The understory is shrubs and grasses.
  - **Hazards**: This soil has severe limitations for buildings with basements, septic tank absorbtion fields, sewage lagoons, and local roads and streets because of high shirnk and swell of the soil. Local roads and streets need to be graded to shed water, and the base material needs to be strengthened to support vehicular traffic. Control of roadside erosion is needed in borrow and cut areas.

- **Erosion:** 0.28K; 5T; wind erosion group 8 = Very Severe

Q0213G: Hisega-Buska outcrop complex (40 – 80% slopes)

- **General Characteristics:** Deep, well drained soils and Rock outcrop on mountain ridges and on the sides of mountain valleys in the Black Hills.
- **Revegetation**: Low fertility, most areas are in ponderosa pine forest. Some areas also have native and seeded grasses and shrubs.
- **Hazards**: Erosion hazard during tree removal (timbering). Shrinking and swelling of the soils. Slippage occurs if the soils are disturbed. This soil type is generally not well suited for building sites, local roads and streets, or sanitary facilities. Strengthening the base material is needed to help overcome the low strength of the Buska soil and to support vehicular traffic. Control of roadside erosion is needed in borrow and cut areas.
- **Erosion:** 0.43K/0.28K; 3T/5T; wind erosion groups 6/8 = Very Severe

Figure 5 provides an overview of the corridor and areas of potential unstable soil types.

2.1.2 Next Steps

Certain soil types along the corridor could pose a risk to the roadway. These soils will need to be further evaluated during the preliminary design phase and NEPA process.

2.2 Air Quality

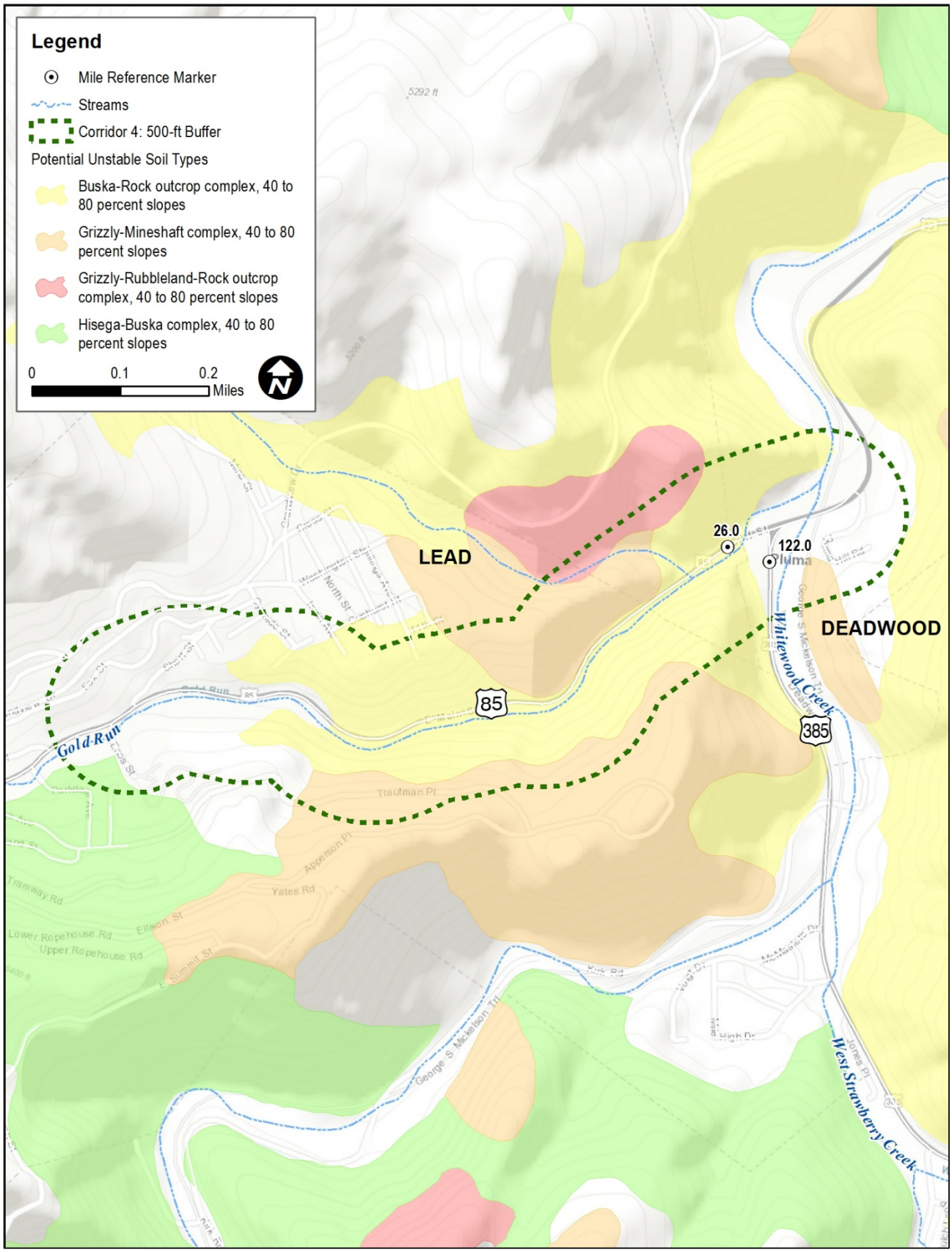
Air quality is primarily regulated under the federal 1970 Clean Air Act (CAA) and amendments from 1977 and 1990. The purpose of the CAA is to protect and enhance air quality to promote public health, welfare, and the productive capacity of the nation.

2.2.1 Regulatory Setting

Through the CAA, National Ambient Air Quality Standards (NAAQS) were established for six criteria air pollutants: carbon monoxide, particulate matter, lead, sulfur dioxide, nitrogen dioxide and ozone. Each of the states have evaluated their air quality with respect to the NAAQS. Any areas that exceeded the NAAQS were designated as nonattainment areas and are subject to more rigorous air pollution control measures. Over time and with air quality improvements, nonattainment areas may transition into NAAQS maintenance areas or NAAQS attainment areas. Transportation sources are most closely associated with carbon monoxide, particulate matter, nitrogen dioxide and chemical precursors of ozone.

A group of hazardous air pollutants are regulated under the CAA; a subset of which are called mobile source air toxics (MSAT). Greenhouse gases (GHG) are also covered by the CAA.

FIGURE 5. POTENTIAL UNSTABLE SOIL TYPES



The CAA established mandatory Class I federal areas, which receive extra protection and consideration from impairment from man-made air pollution. This primarily focuses on visibility/haze and aerosols from large industrial sources and includes prevention of significant deterioration to the air quality.

For reasons described in the following section, the CAA transportation conformity regulations do not apply in South Dakota. However, the SDDOT Environmental Procedures Manual (2019) states:

> "Air quality is an environmental concern within the broad purview of NEPA and the thresholds/screening criteria included in the transportation conformity regulations and guidance can be helpful in deciding whether an air quality analysis of a proposed transportation project is warranted for NEPA purposes."

SDDOT has the option to consider transportation conformity concepts voluntarily. Such voluntary analyses are determined case by case. Construction may temporarily affect air quality (e.g., fugitive dust). Permits are likely to be needed when construction begins.

2.2.2 Existing Conditions

South Dakota currently has no air quality nonattainment or maintenance areas designated by the U.S. Environmental Protection Agency for NAAQS pollutants under the CAA. This is indicative of good overall air quality across the state, including the Black Hills. Consequently, the federal CAA transportation conformity regulations do not apply in South Dakota and transportation projects, in general, would be expected not to be concerns regarding the NAAQS.

There are two Class I areas in South Dakota and both are in the vicinity of the corridor. Wind Cave National Park is approximately 50 miles south of the corridor. Badlands National Park (Badlands/Sage Creek Wilderness Area) is approximately 75 miles southeast of the corridor. Road improvement projects typically would not be a concern for Class I areas, particularly at these distances.

2.2.3 Next Steps

If a NEPA clearance is required for the corridor improvements, an appropriate air quality analysis will be scoped and completed. Transportation conformity analysis under the CAA will not be required, but SDDOT has the option to choose voluntary conformity-based analyses—that decision will be made at that time in response to the circumstances and concerns in place.

The need for and extent of MSAT or GHG analyses generally depends on the NEPA class of action. These analyses may be either qualitative or quantitative. An EA or EIS generally requires progressively greater consideration of MSAT and GHG. The level of analysis needed for these will be determined when the NEPA decision for the corridor is made.

The corridor improvements are unlikely to be a concern for either of the two Class I areas nearby and no associated air quality analysis is expected, but the two areas should be acknowledged.

Analysis of construction emissions is not needed for most projects. Permits are likely to be needed for construction and typical best practices should be required to minimize construction emissions and address air quality issues.

2.3 Water Quality

2.3.1 Regulatory

Water Quality is regulated under the Federal Water Pollution Control Act Amendments of 1972 (CWA). The objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and non-point pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. Each state has jurisdiction for managing water quality in its respective state.
Section 303(d) of the CWA requires each state to evaluate water quality conditions in designated waterbodies and list as impaired any waterbodies not meeting water quality standards; this is to be reported every other year.

2.3.2 Methodology

The 2020 South Dakota Integrated Report lists five categories to present information on the Section 303(d) finding in a descriptive and comprehensive manner (SDDANR, 2020). Category 5 waterbodies where one or more beneficial uses are determined to be impaired by one or more pollutants and a total maximum daily load (TMDL) has not been developed. States must develop and implement TMDLs (i.e., pollutant management plans) for waterbodies identified as having a Category 5 impairment.

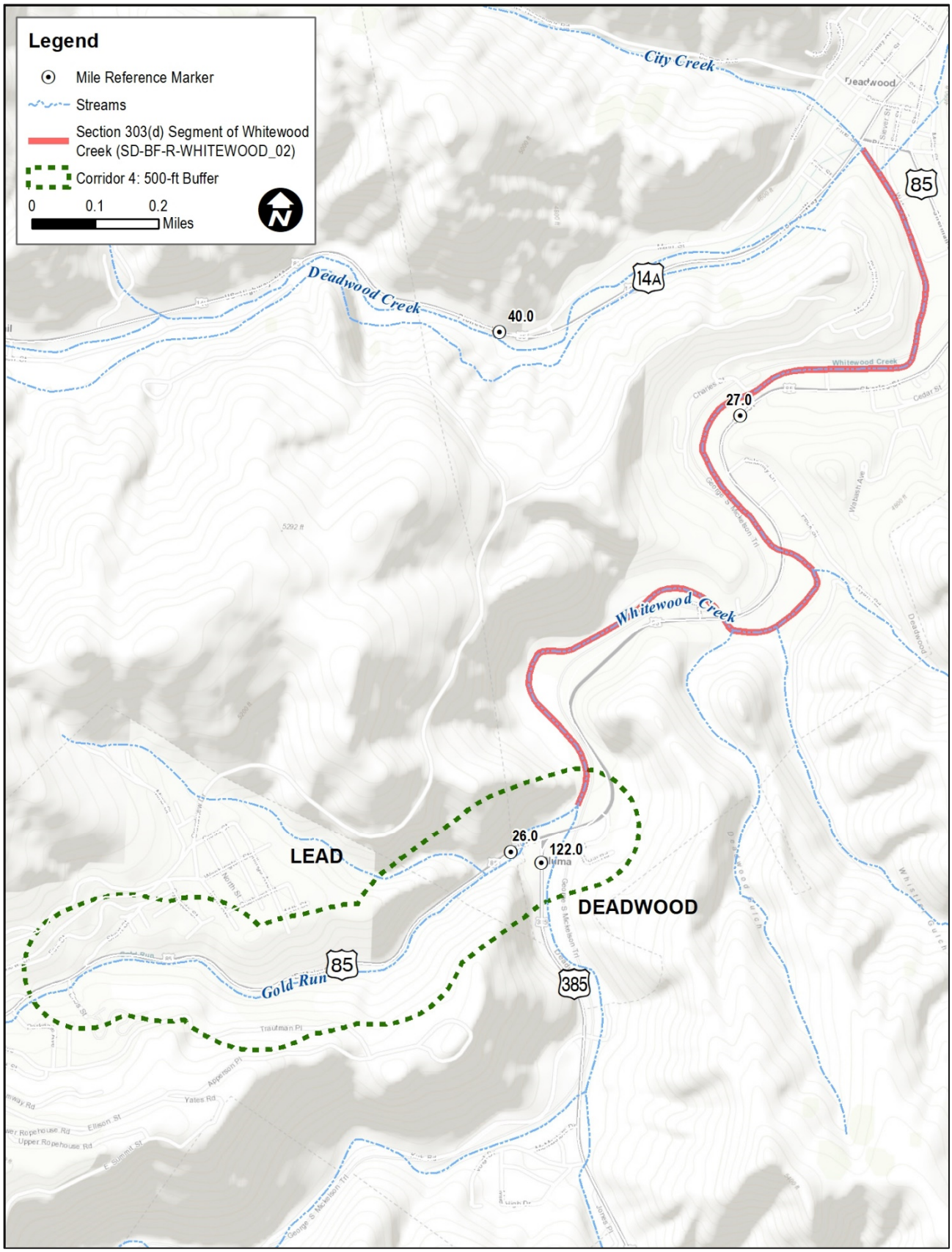
2.3.3 Existing Conditions

The *2020 South Dakota Integrated Report for Surface Water Quality Assessment* (SDDANR, 2020) list of water quality limited segments requiring TMDLs includes the segment of Whitewood Creek (SD-BF-R-WHITEWOOD_02) from Gold Run Creek to Deadwood Creek (see **Figure 6**). For this segment, a TMDL is required for those parameters that are identified as impairments. Whitewood Creek is listed as having an impaired use due to Escherichia coli (ECOLI), which affects Immersion Recreation.

2.3.4 Next Steps

The construction of the proposed project would not be expected to contribute ECOLI to Whitewood Creek. During the NEPA process, mitigation measures to reduce impacts to water quality would be incorporated and includes developing a Storm Water Pollution Prevention Plan (SWPPP) and a National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit would be required from the South Dakota Department of Agriculture and Natural Resources (SDDANR). Furthermore, best management practices (BMPs) from the South Dakota DOT Erosion Control Guide would be implemented to minimize pollutants entering waterbodies.

FIGURE 6. SECTION 303(D) STREAMS



2.4 Floodplains

2.4.1 Regulatory

Floodplains are the lands on either side of a waterway that are inundated when a channel exceeds its capacity. The following regulatory requirements apply to floodplains:

- **Executive Order (EO) 11988, Floodplain Management (1977**), directs federal agencies to "provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This EO assists in furthering the NEPA, the National Flood Insurance Act of 1968 (amended), and the Flood Disaster Protection Act of 1973.
- **Code of Federal Regulations (CFR), Title 23 –** Highways, prescribes the policies and procedures that FHWA is directed to implement in the location and hydraulic design of highway encroachments on floodplains.
- **CFR, Title 44 – Emergency Management and Assistance**, contains the basic Federal Emergency Management Agency (FEMA) policies and procedures to regulate floodplain management and to analyze, identify, and map floodplains for flood insurance purposes.

2.4.2 Methodology

The 100-year floodplains and floodways were identified using FEMA digital GIS data. For projects within the floodplains, local jurisdictions typically require floodplain development permits.

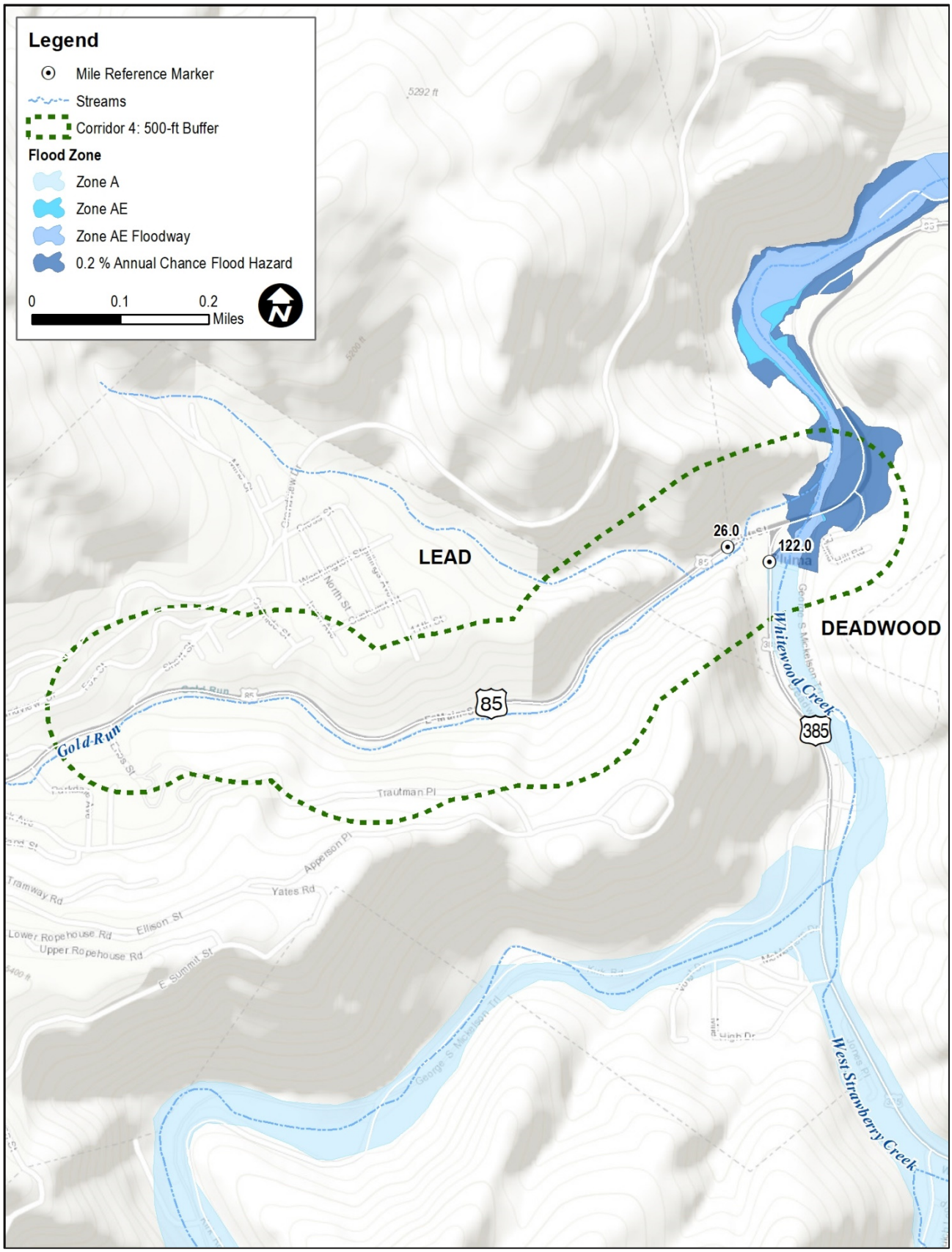
2.4.3 Existing Conditions

The main floodways and floodplains within the study area are those associated with Whitewood Creek. Floodplains within the environmental study area have been classified as "Flood Zone A" and "Flood Zone AE Floodway", which is the areas covered by a 100-year flood, and as "0.2% Annual Chance Flood Hazard", which is the area covered by a 500-year flood (see **Figure 7**) on Flood Insurance Rate Map (FIRM) Panel 4600946081C. No floodplains were identified for Gold Run Creek or its tributaries (see **Figure 7**).

2.4.4 Next Steps

This project requires that a floodplain analysis be completed to determine whether potential floodway impacts are associated with the project elements. If impacts are found, the level of these impacts will be identified, as well as measures to mitigate or eliminate these impacts. The floodplain analysis uses modeling to assess significant changes. These areas would require a Conditional Letter of Map Revision (CLOMR) from FEMA. For projects within the floodplains, local jurisdictions typically require floodplain development permits.

FIGURE 7. FLOODPLAINS



2.5 Wetlands and Waterways

2.5.1 Regulatory

Wetlands and Waters of the United States (WOUS) are protected under Section 404 of the CWA, as amended (33 USC 1344), and EO 11990 of 1977 (Protection of Wetlands). Discharge of fill into wetlands and WOUS requires a Section 404 permit from the United States Army Corps of Engineers (USACE). Additionally, SDDENR reviews and issues certification for Section 401 of the CWA, which requires states to review federal projects for water quality certification.

2.5.2 Methodology

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328). Wetlands and riparian areas are important because they provide habitat for various plant, fish, and wildlife species; serve as groundwater recharge areas; provide storage areas for storm and flood waters; serve as natural water filtration areas; and provide protection from wave action, erosion, and storm damage.

Potential wetlands were mapped within the study area, based on field observations and aerial photography.

2.5.3 Existing Conditions

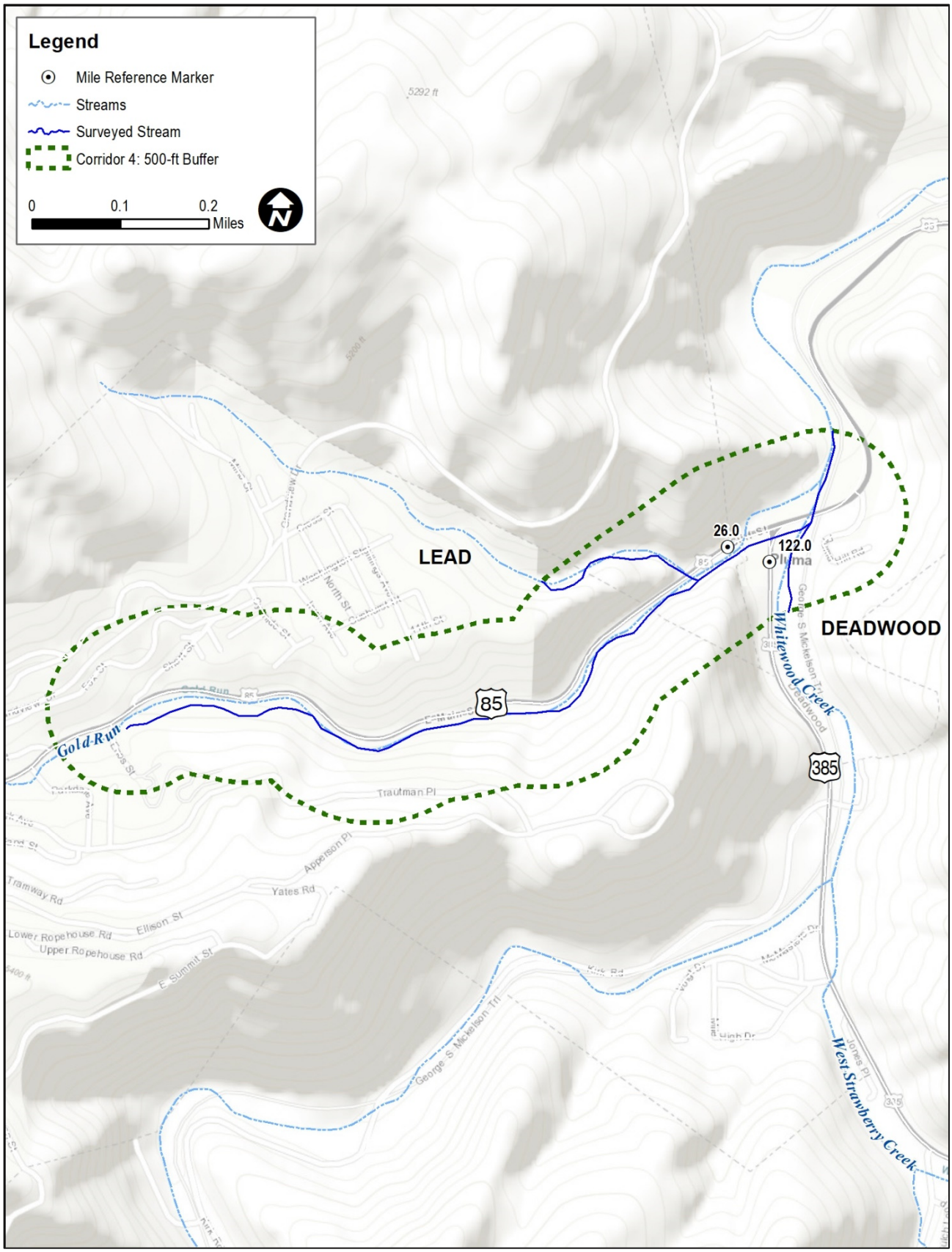
Initial inventories of streams and wetlands adjacent to or crossing the US 85 corridor west of Pluma within **Corridor 4** are summarized by MRM in **Table 1**, and on the Environmental Resources Map Book in **Appendix A**.

TABLE 1. CORRIDOR 4 INVENTORY OF STREAMS AND POTENTIAL WETLANDS

Streams and Wetlands	Location (MRM or MRM Range)
Stream Crossings / Adjacent Stream:	25.95
Gold Run Creek	26.1 - 25.4
Waterfall	25.8
Potential Wetlands	None identified

No potential wetlands were identified within the environmental study area during the field visit in September 2020. Gold Run is located adjacent to the roadway for most of the corridor. Whitewood Creek crosses US 85 on the eastern end of the study area at MRM 26.1 and an unnamed tributary crosses US 85 at MRM 25.95. The project has a potential to impact Waters of the U.S.

FIGURE 8. WATERS OF THE U.S.



2.5.4 Next Steps

A wetland delineation would be required during the NEPA phase of the project to ensure that the areas preliminarily identified within the study area contain all three requirements of a wetland. When wetland impacts cannot be avoided through design, adequate time must be built into the project schedule to allow for wetland permitting and mitigation.

2.6 Vegetation and Wildlife

This section describes the existing vegetation and wildlife that occurs within the environmental study area for Corridor 4.

2.6.1 Existing Conditions

Vegetation

The environmental study area is located in the Black Hills Core Highlands sub-ecoregion within the Middle Rockies Ecoregion (USEPA, 2006). The Middle Rockies ecoregion consists of individual mountain ranges of mixed geology intermingled with high elevation, grassy parkland. The Black Hills are an outlier of the Middle Rockies and share with them a montane climate, hydrography, and land use pattern. Land uses such as ranching and woodland grazing, logging, recreation, and mining are commonly found throughout this ecoregion. The Black Hills Core Highlands sub-ecoregion consists of higher elevations and cooler temperatures. Increased rainfall in this area fosters boreal species such as white spruce, aspen, and birch trees.

Table 2 provides a list of species observed within the Black Hills corridors.

TABLE 2. OBSERVED BLACK HILLS VEGETATION LIST

Common Name	Scientific Name
Tree	
Aspen	*Populus tremuloides*
Bur oak	*Quercus macrocarpa*
Paper birch	*Betula papyrifera*
Ponderosa pine	*Pinus ponderosa*
Rocky Mountain juniper	*Juniperus scopulorum*
White spruce	*Picea glauca*
Shrub	
Arroyo willow	*Salix lasiolepis*
Bebb willow	*Salix bebbiana*
Buffaloberry	*Shepherdio canadensis*

Common Name	Scientific Name
Chokecherry	*Prunus virginiana*
Common bearberry	*Arctostaphylos uva-ursi*
Common hackberry	*Celtis occidentalis*
Common snowberry	*Symphoricarpos albus*
Creeping Oregon grape	*Mahonia repens*
Ground juniper	*Juniperus communis*
Mountain ninebark	*Physocarpus monogynus*
Peachleaf willow	*Salix amygdaloides*
Prickly wild rose	*Rosa acicularis*
Sandbar willow	*Salix interior*
Saskatoon serviceberry	*Amelanchier alnifolia*
Wood's rose	*Rosa woodsii*
Herb	
Baltic rush	*Juncus balticus*
Bearded wheatgrass	*Elymus caninus*
Canada goldenrod	*Solidago canadensis*
Cattail	*Typha* sp.
Common cowparsnip	*Heracleum sphondylium*
Common dandelion	*Taraxacum officinale*
Common threesquare	*Schoenoplectus pungens*
Common Yarrow	*Achillea millefolium*
Curly dock	*Rumex crispus*
Indian ricegrass	*Oryzopsis hymenoides*
Kentucky bluegrass	*Poa pratensis*
Little bluestem	*Schizachyrium scoparium*
Nebraska sedge	*Carex nebrascensis*
Oxeye daisy	*Leucanthemum vulgare*
Prairie cordgrass	*Spartina pectinata*
Reed canarygrass	*Phalaris arundinacea*
Roughleaf ricegrass	*Oryzopsis asperifolia*
Sedge	*Carex* spp.
Smartweed	*Polygonum* sp.

Common Name	Scientific Name
Smooth brome	*Bromus inermis*
Softstem bulrush	*Schoenoplectus tabernaemontani*
True forget-me-not	*Myosotis scorpioides*

There are a few commercial properties on the eastern end of the study area and on the western end is the Town of Lead. However, in between these developed areas, much of the environmental study area is comprised of undeveloped forested land.

At the time of September 2020 field visit, no noxious weeds were observed within the study area, but they are still possible through the environmental study area. State-listed noxious weed species from the SDDANR (2021) include:

- Absinth wormwood (*Artemisia absinthium*)
- Leafy spurge (*Euphorbia esula*)
- Canada thistle (*Cirsium arvense*)
- Perennial sow thistle (*Sonchus arvensis*)
- Hoary cress (*Cardaria draba*)
- Purple loosestrife (*Lythrum salicaria*)
- Salt cedar (*Tamarix sp.*)

No purple loosestrife has been reported in Lawrence County, but the other six species have documented populations. Locally listed noxious weed species in Lawrence County include Canada thistle, common Tansy (*Tanacetum vulgare*), and common mullein (*Verbascum thapsus*) (Lawrence County, 2021).

Wildlife

The Fish and Wildlife Coordination Act of 1958, as amended, recognizes the vital contribution of wildlife resources to the Nation and requires equal consideration and coordination of wildlife conservation with water resources development programs.

This area is home to a variety of species due to the presence of streams, lakes, varied topography, and vegetation in the Black Hills National Forest. Ungulate species known to occur in or near the environmental study area include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), and pronghorn (*Antilocapra americana*).

Many carnivore species occur in the environmental study area, including raccoon (*Procyon lotor*), coyote (*Canus latrans*), red fox (*Vulpes vulpes*), and mountain lion (*Puma concolor*). Individuals of these species may use this area as a movement corridor, for hunting purposes, or for denning purposes.

Many rodent species may occur in the environmental study area. This group is very large, and species likely to be found in or near the environmental study area include the beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), yellow-bellied marmot (*Marmota flaviventris*), porcupine (*Erethizon dorsatum*), mountain cottontail (*Sylvilagus nuttallii*), least chipmunk (*Tamias minimus*), pine squirrel (*Tamiasciurus hudsonicus*). Various mice, voles, and woodrats (*Neotoma* sp.) could also use the environmental study area.

Several bat species have the potential to occur in the environmental study area. These species include the Long-eared Myotis (*Myotis evotis*), Northern Long-eared Bat (*Myotis septentrionalis*), and the Silver-haired Bat (*Lasionycteris noctivagans*).

Several reptile and amphibian species can be present in the environmental study area due to the presence of suitable habitat within the riparian area surrounding streams crossing the environmental study area. Species such as: bull frogs (*Lithobates catesbeianus*), snapping turtles (*Chelydra serpentina*), common garter snakes (*Thanmophis sirtalis*), bull snakes (*Pituophis catenifer sayi*), and prairie rattlesnakes (*Crotalus viridis*).

Migratory Birds and Raptors

The Migratory Bird Treaty Act (MBTA) of 1918 provides protection of birds classified as migratory birds by the U.S. Fish and Wildlife Service (USFWS). The Migratory Bird Permit memorandum issued in April 2003 stipulates there is no prohibition against destruction of inactive nests. Additionally, any disturbance to these nesting areas must follow the stipulations outlined in the MBTA. Specific protection for Bald and Golden Eagles is authorized under the Eagle Protection Act (16 United States Code 668), which provides additional protection to these species from intentional or unintentional harmful conduct.

Most birds found in South Dakota and their nests are protected under the MBTA. Species not included in the MBTA are nonnative species whose occurrences in the United States are solely the result of intentional or unintentional human-assisted introduction. Disturbance of active migratory bird nests is prohibited (USFWS, 2020a).

Bald eagles (*Haliaeetus leucocephalus*) require mature trees near large, open bodies of water for nesting and winter roosting. Golden eagles (*Aquila chrysaetos*) generally nest on cliffs or escarpments. The study area contains suitable habitat that may provide opportunities for forage, roosts, and nesting to migrating birds, such as raptors and passerines.

2.6.2 Next Steps

A field survey would be required to establish the presence or absence of noxious weeds, migratory bird and raptor nests, and species-specific wildlife habitat during the NEPA phase of the project.

Disturbance of soil due to project activities would have the potential to introduce or spread noxious weeds and other invasive plant species. Mitigation measures should include seeding disturbed areas

with mixtures that comply with South Dakota Seed Laws in order to reduce the potential for invasive plant infestations and to comply with South Dakota laws regarding weed and pest control (South Dakota Code, 2005).

2.7 Threatened and Endangered Species

2.7.1 Regulatory

The Endangered Species Act (ESA), administered by the United States Fish and Wildlife Service (USFWS), provides protection to imperiled species and their habitats. Section 7 of the ESA requires federal agencies to consult with USFWS for federally funded or federally permitted projects that may affect a species listed under the ESA. South Dakota State Law (SDCL 34A-8), administered by South Dakota Department of Game Fish and Parks (SDGFP), protects state listed threatened and endangered species.

2.7.2 Methodology

Felsburg Holt & Ullevig (FHU) used the USFWS Information, Planning, and Conservation System (IPaC) website to identify the latest information on threatened and endangered species that may occur in the study area (USFWS, 2021). SDGFP county lists were also reviewed for threatened, endangered, proposed, and candidate species (SDGFP, 2021). Habitat was evaluated in the project area for species listed as potentially present in Lawrence County.

2.7.3 Existing Conditions

Table 3 identifies federal and state listed species potentially located in the Corridor 4 area.

TABLE 3. THREATENED AND ENDANGERED SPECIES LIST

Common Name	Status	Habitat	Comments
Mammals			
Northern long-eared bat (*Myotis septentrionalis*)	FT	Northern long-eared bats are typically found near water and dense forest conditions. Roost sites consist of shedding bark and tree cavities, open buildings, and caves or mines. Winter hibernacula are frequently caves and mines.	Potential summer roosting habitat for the northern long-eared bat exists along Gold Run and other drainages that cross the environmental study area.
Birds			
Osprey (*Pandion haliaetus*)	ST	Lakes, rivers, and coastal bays are primary habitat. Builds nests at the tops of large living or dead trees, utility poles, cellphone towers, and other tall structures.	No suitable habitat is found within the study area. Gold Run is a narrow creek that does not provide suitable habitat for Osprey's. No nests were observed during the field survey.

Common Name	Status	Habitat	Comments
Red Knot (*Calidris canutus rufa*)	FT	Red knots breed in dry tundra areas and winter at intertidal marine habitats near coastal inlets, estuaries, and bays.	Project lacks dry tundra areas and suitable intertidal marine habitats.
American Dipper (*Cinclus mexicanus*)	ST	Rocky, unpolluted streams. Streams with cliffs, ledges, or bridges nearby are important nesting habitats.	No suitable habitat is located within the study area.
Peregrine Falcon (*Falco peregrinus*)	SE	Habitat consists of tall cliffs for nesting with open landscapes for foraging. Nests are often established on cliffs at heights ranging from 50 to 200 meters.	Currently the peregrine is a rare summer resident of the Black Hills. No suitable habitat is located within the study area.
Whooping Crane (*Grus americana*)	FE/SE	Whooping Cranes migration habitat includes freshwater marshes, wet prairies, shallow portions of rivers and reservoirs, grain stubble fields and submerged sandbars in rivers with good horizontal visibility for feeding and resting.	Although individuals can be found during migration anywhere in South Dakota, they are most commonly found along and adjacent to the Missouri River.
Fish			
Finescale dace (*Chrosomus neogaeus*)	SE	Cool spring-fed bogs, lakes and creeks; small, weedy, sluggish streams and small lakes. Sometimes associated with beaver ponds.	Potential habitat is located within the environmental study area along Whitewood Creek and Gold Run.
Longnose sucker (*Catostomus catostomus*)	ST	Habitat for longnose sucker may be lentic or lotic. They prefer cool, clear, spring-fed streams and lakes.	The species is known to exist in very few locations. No recent populations are found on National Forest System lands.

FE = Federally Endangered
FT = Federally Threatened
ST = State Threatened
SE = State Endangered
References: SDGFP – Accessed July 2021
USFWS Species Profiles – ECOS, IPaC July 2021

In Lawrence County, three federally listed species were identified through the USFWS IPaC. Potential northern long-eared bat summer foraging habitat is present at wooded habitats along Gold Run and Whitewood Creek, and other drainages, which also includes adjacent non-forested habitats such as open fields. There are also several bridges within the study area that could also be considered potential summer habitat.

The SDGFP identified six state listed species as having potential to occur in Lawrence County, South Dakota, including one species that is also federally listed. In general, habitat is lacking for state listed species within the environmental study area. While some species use stream habitat, channels present within the study area lack suitable habitat. There is potentially suitable habitat along Gold Run and Whitewood Creek for the finescale dace.

2.7.4 Next Steps

A field survey would be required to establish the presence or absence of federal or state listed threatened and endangered species habitat during the NEPA phase of the project.

The following measures should be implemented during planning and construction of the project:

- Disturbance to riparian and wetland areas should be kept to an absolute minimum.
- If riparian vegetation is lost it should be quantified and replaced onsite. Seeding of indigenous species should be accomplished immediately after construction to reduce sediment and erosion.
- A site-specific sediment and erosion control plan should be part of the project.
- A post construction erosion control plan should be implemented to provide interim control before reestablishing permanent vegetative cover on the disturbed site.

As the project moves into the NEPA phase, USFWS and SDGFP should be coordinated with for concurrence on effects to the listed species and to identify necessary mitigation commitments.

2.8 Environmental Justice

2.8.1 Regulatory

Under Executive Order 12898 (1994), Federal Actions to Address Environmental Justice in Minority Populations, projects are required to identify and address disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities on minority populations and low-income populations in the United States. In accordance with Council on Environmental Quality (CEQ) guidance, EJ populations occur where either:

- The minority or low-income population of the affected area exceeds 50%.
- The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Title VI of the Civil Rights Act of 1964 (Title VI) ensures that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance based on race, color, or national origin (42 United States Code [USC] 2000d et seq.). Executive Order 12898 on environmental justice directs that programs, policies, and activities not have a disproportionately high and adverse human health or environmental effect on minority and low-income populations (59 FR 7629).

When federal funding or a federal action is involved, the lead federal agency procedures for identifying EJ populations should be followed. The potential for disproportionately high or adverse

impacts to be borne by EJ populations when compared to the non-EJ populations will need to be determined. Additionally, the opportunity for EJ populations to participate fully in the decision-making process must be provided. The denial, reduction, or delay of receipt of benefits by minority and low-income populations cannot occur.

2.8.2 Methodology

To be consistent with the requirements of Title VI and Executive Order 12898, demographic characteristics of the environmental study area were examined to determine whether a low-income and/or minority population occurs within the study area. The demographic and economic character of the environmental study area was compared with that of the State of South Dakota using data from EJSCREEN, USEPA's Environmental Justice Screening and Mapping Tool (Version 2020) (USEPA, 2020).

2.8.3 Existing Conditions

The study area lies within Census Tract 9666, Block Group 4. A block group is an area defined by the U.S. Census Bureau that usually has in the range of 600-3,000 people living in it. Low-income populations are defined by USEPA as: "*The percent of a block group's population in households where the household income is less than or equal to twice the federal poverty level*." Minority populations are defined by the U.S. Census Bureau as: "*A population of people who are not single-race white and not Hispanic. Populations of individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic*."

EPA's EJSCREEN tool was used and reports approximately 2,755 habitants within one mile of the proposed project corridor. The minority population is approximately 11 percent, while that of the State of South Dakota is 18 percent. The low-income population is approximately 36 percent, while that of the State of South Dakota 31 percent. The demographic index is 23 percent, while that of the State of South Dakota is 24 percent. The demographic index in EJSCREEN is a combination of percent low-income and percent minority. State Percentiles are a way to see how local residents compare to the rest of the State of South Dakota. Instead of just showing numbers out of context, EJSCREEN compares a community to the rest of the state, by using percentiles. The State percentile tells you what percent of the State population an equal or lower value has, meaning less potential for exposure/ risk/ proximity to certain facilities, or a lower percent minority (USEPA, 2020).

Based on the EJSCREEN the project does not lie within a minority population, however, the low-income population percentage was slightly higher than that of the State.

2.8.4 Next Steps

A more detailed EJ analysis should be completed during the NEPA process to verify the proposed project does not have a potential for disproportionately high or adverse impacts on EJ populations and identify ways to avoid and mitigate for any impacts.

2.9 Historic and Cultural Resources

2.9.1 Regulatory Guidance

Historic resources are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible to the National Register of Historic Places (NRHP). Cultural resources are defined as man-made features and physical remains of past human activity, generally at least 45 years old (properties constructed in 1975 or earlier). Cultural resources include historic buildings, bridges, railroads, roads, other structures, and archeological sites. Section 106 of the National Historic Preservation Act of 1966 requires evaluation of project effects on historic properties that are on, or eligible for, the National Register of Historic Places (NRHP). Criteria for determinations of eligibility are set forth in 36 Code of Federal Regulations (CFR) Part 60.4 (70) and are described in National Register Bulletin How to Apply the National Register Criteria for Evaluation (NPS 1995).

2.9.2 Methodology

An initial inventory and analysis of historic and cultural resources was conducted for Corridor 4 by a historian with FHU. This process involved the following steps:

- Initiating a record search request to the South Dakota Archaeological Research Center (SDARC), for previously recorded historic and archaeological resources within a 1-mile buffer of US 85, within the study limits of Corridor 4 (see Section 1.4.1 Logical Termini).
- Mapping of previously recorded resources within 500 ft of US 85.
- Reviewing all previously recorded sites within the 500 ft buffer and identifying NRHP Listed NRHP Eligible sites that may potentially be affected by Corridor 4 improvements.

Results of the Corridor 4 historic and cultural resources inventory and analysis are documented in **Table 4**.

2.9.3 Existing Conditions

A total of 21 previously recorded resources listed in **Table 4** were identified within the 500 ft buffer for Corridor 4, including 2 properties that are listed on the NRHP and 2-NRHP eligible properties.

TABLE 4. CORRIDOR 4 – PREVIOUSLY RECORDED RESOURCES ADJACENT TO US HWY 85

Resource ID / Site ID	Resource Type	Location	Description	Most Recent National Register Eligibility Determination
74001892	Misc.	T5N, R3E NE ¼ of NE ¼ of Section 33	Lead Historic District	***National Register Listed***
23088 / **LA00000203**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Dwelling (b.1966)	*NRHP Not Eligible (Lead Historic District)*
23095 / **LA00000220**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Henry Sweatman House (b.1905)	*NRHP Not Eligible (Lead Historic District)*
23094 / **LA00000221**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Richarson's Ice Cream and Bottling Company (b.N/A)	***NRHP Eligible*** *(Lead Historic District)*
23092 / **LA00000223**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	W.M. Quimby House (b.1898)	***NRHP Eligible*** *(Lead Historic District)*
23091 / **LA00000224**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	A.D. Ferguson House (b.1902)	***NRHP Eligible*** *(Lead Historic District)*
23090 / **LA00000225**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Joseph Corrigan House (b.1905)	***NRHP Eligible*** *(Lead Historic District)*
23089 / **LA00000226**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Joseph Corrigan House (b.1890)	*NRHP Not Eligible (Lead Historic District)*
32296 / **LA00001049**	Structure	T5N, R3E NE ¼ of NE ¼ of Section 33	Manhole (ca.1900)	*NRHP Not Eligible (Lead Historic District)*
23103 / **LA00100070**	Structure	T5N, R3E NE ¼ of NW ¼ of Section 34	The Headmaster (b.1947)	***NRHP Eligible***
23144 / **LA00100085**	Structure	T5N, R3E SE ¼ of SW ¼ of Section 27	Shamrock Drive-Inn (b.1963)	*NRHP Not Eligible*
23141 / **LA00100088**	Structure	T5N, R3E SE ¼ of SW ¼ of Section 27	Consolidated P&L Gas Regulator Building (b.1930)	***NRHP Eligible***
23121 / **LA00100089**	Structure	T5N, R3E SW ¼ of SE ¼ of Section 27	BHP Building, Substation (b.1983)	*NRHP Not Eligible*

Resource ID / Site ID	Resource Type	Location	Description	Most Recent National Register Eligibility Determination
23120 / **LA00100090**	Structure	T5N, R3E SW ¼ of SE ¼ of Section 27	Treber Artificial Ice Company (b.1910)	*Non-Extant*
22839 / **LA00100092**	Structure	T5N, R3E SW ¼ of SE ¼ of Section 27	Pluma Sinclair (b.1945)	***National Register Listed***
12223 / **LA3001**	Structure	T5N, R3E NE ¼ of NE ¼ of Sec 33	Lead Townsite	***National Register Listed***
619 / **LA00000035**	Bridge	T5N, R3E NE ¼ of NW ¼ of Sec 34	Bridge 41-156-169 (b.1929)	*Recommended Not Eligible*
3374 / **LA00001981**	Bridge	T5N, R3E NE ¼ of NW ¼ of Section 34	Bridge (b.1931)	*Recommended NRHP Eligible*
13552 / **39LA1542**	Site	T5N, R3E SW ¼ of SE ¼ of Section 27	foundation; euroamerican artifact scatter	*Recommended Not Eligible*
13553 / **39LA1556**	Site	T5N, R3E SW ¼ of SE ¼ of Section 27	foundation; euroamerican artifact scatter	*Recommended Not Eligible*
13554 / **39LA2009**	Site	T5N, R3E SW ¼ of SE ¼ of Section 27	Railroad	***NRHP Eligible***
	Previously recorded National Register listed or eligible resources			
	Eligibility determination: not eligible/SHPO concurrence, unevaluated, or *unknown*			

2.9.4 Next Steps

Next steps would be for the responsible agency to initiate a cultural resources survey to determine whether the undertaking (project) could affect these previously recoded historic and cultural resources that are National Register listed or eligible. If so, the agency proceeds to define the Area of Potential Effects (APE), which is the area that an undertaking may directly or indirectly cause changes in the character of use of historic resources. Once the APE has been defined, a cultural resources survey would be conducted, and the agency would consult with the appropriate State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO) on effects to historic or potentially historic resources located within the APE.

2.10 Federal and Tribal Lands

2.10.1 Regulatory

Tribal consultation is conducted for all transportation projects that may be of interest to a Tribe in South Dakota and with Tribes with aboriginal ties to lands in in South Dakota, particular the Black Hills. For projects involving federal funding, SDDOT coordinates with FHWA to conduct regular and meaningful consultation with Tribes, in accordance with Executive Order 13175 on Tribal Consultation.

2.10.2 Methodology

Tribes with interests in lands within Lawrence County were identified based on FHWA's list of *Counties of Interest for Tribes in and near South Dakota* (Environmental Procedures Manual, Table 2.5-1, SDDOT. 2019)

2.10.3 Tribal Consultation

Tribal consultation through coordination with FHWA, the Bureau of Indian Affairs and Lawrence County would involve the following tribes in South Dakota: Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, Oglala Sioux Tribe, Sisseton-Wahpeton Oyate, Standing Rock Sioux Tribe, Yankton Sioux Tribe, Three Affiliated Tribes (Mandan Hidatsa Arikara Nation), Ponca Tribe of Nebraska, Northern Arapaho Tribe, and the Chippewa Cree Tribe.

2.10.4 Next Steps

An initial step in the NEPA scoping process will be to prepare a letter to each designated tribal representative, including a description of the proposed project, a map, and an invitation to become a consulting party. Under Section 106 regulations, tribes are offered the opportunity to identify concerns about cultural resources, and comment on how the project might affect them. Tribes that that elect to become consulting parties for the undertaking will be notified of the results of any necessary historic property surveys, and they will be asked to comment on eligibility and effects determinations.

2.11 Traffic Noise

Traffic noise can be an important and contentious environmental consideration for highway projects. The locations most often of concern for traffic noise are exterior areas of frequent human use.

2.11.1 Regulatory

At the federal level, highway traffic noise is addressed under 23 CFR 772. The *Noise Analysis and Abatement Guidance* is South Dakota DOT's compliance with 23 CFR 772 and guides highway noise analyses in South Dakota. These regulations apply to projects that receive federal funding or are otherwise subject to FHWA approval. State-only actions do not require a noise analysis.

Some, but not all, federal-aid or federal-approval highway improvement projects will require a traffic noise analysis. Type I projects require a noise analysis; South Dakota does not participate in Type II projects; Type III projects are exempt. No new through lanes are currently planned, so the most likely reasons an improvement may be Type I is from a substantial vertical shift in the road surface near a receptor or a shift in the road alignment that halves the distance between the road and a receptor. In most other cases, the project is likely to be Type III.

If the project is determined to be Type I, a traffic noise impact analysis will be undertaken through computer modeling using prescribed software. The analysis will focus on the presence or absence of noise impacts in the study corridor. Noise abatement, typically in the form of noise barriers, will be evaluated for any noise impacts identified. Noise abatement actions found to be feasible and reasonable, if any, must be included in the final project.

2.11.2 Existing Conditions

US 85 in this corridor is an existing two-lane highway through a mixed rural/developed setting. There are residences and other developed sites within 300 feet of the highway, so nominally there will be noise receptors to consider. Substantial changes to the elevation and alignment of the road are not expected due to the cost and difficulty that would entail but some changes are expected (e.g., curve flattening). There are no existing SDDOT noise abatement measures present.

2.11.3 Next Steps

The specific improvements proposed at the NEPA phase will need to be reviewed to determine the noise type status and what noise analysis may be required. As envisioned by the recommendations from Phases 1 and 2, the conceptual improvements for the corridor suggest a Type III noise project is likely, which will not require a traffic noise analysis. If future decisions on corridor improvements result in a Type I project, a noise analysis may be needed during the NEPA phase where noise impacts and abatement actions are evaluated in accordance with *Noise Analysis and Abatement Guidance*.

2.12 Section 4(f) and Section 6(f) Resources

Section 4(f) properties include publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites as defined in the US Department of Transportation (DOT) Act of 1966. FHWA and other DOT agencies cannot approve use of these properties for transportation projects unless certain conditions apply.

Section 6(f) properties include recreational resources developed with federal funding through the Land and Water Conservation Fund (LWCF). Section 6(f) of the LWCF Act prohibits the conversion of these properties to anything other than public outdoor recreation uses.

2.12.1 Regulatory

Section 4(f) stipulates that FHWA and other United States Department of Transportation (DOT) agencies cannot approve the use of land from publicly owned parks, recreational facilities, wildlife and waterfowl refuges, or historic sites unless there is no feasible and prudent alternative to the use of the land and unless the action includes all possible planning to minimize harm to the property resulting from use. Historic sites that are on or eligible for the NRHP qualify for protection under Section 4(f).

Section 6(f) of the Land and Water Conservation Act requires that the conversion of lands or facilities acquired with LWCF Act funds be coordinated with the Department of Interior. Usually, replacement in kind is required. Evaluation of Section 6(f) properties is completed for the following reasons:

- To preserve the intended use of public funds for land and water conservation
- To comply with several legal mandates that pertain to the LWCF and Section 6(f)

Section 6(f) of the Act assures that once an area has been funded with LWCF assistance, it is continually maintained for public recreation use unless the NPS approves a substitute property of reasonably equivalent usefulness and location and of at least equal fair market value.

2.12.2 Methodology

Section 4(f): Preliminary inventory included a review of available GIS data for parks, recreational facilities, wildlife and waterfowl refuges for non-historic Section 4(f) resources. For historic Section 4(f) resources, the information provided in Section 2.9 was used to determine the presence of historic Section 4(f) resources.

Section 6(f): Information from The Land and Water Conservation Fund (LWCF) was referenced to identify Section 6(f) properties potentially located near the study area.

2.12.3 Existing Conditions

Section 4(f): Non-Historic Section 4(f) properties located within the within the 500 ft study area for Corridor 4 include:

- George S. Michelson Trail

There are 2 historic Section 4(f) properties that are listed on the NRHP and 2-NRHP eligible properties within the 500 ft study area for Corridor 4, including:

- Property # 22839 /LA00100092: Pluma Sinclair—National Register Listed
- Property #12223/LA3001: Lead Townsite—National Register Listed
- Property # 23141 /LA00100088: Consolidated P&L Gas Regulator Building—NRHP eligible

- Property # 13554 /39LA2009: Railroad—NRHP eligible

Section 6(f): No Section 6(f) resources were identified within or near the environmental study area.

2.12.4 Next Steps

Section 4(f): If, during the project development processes, parks, trails, or open space are impacted, the next steps of the Section 4(f) process require evaluations of publicly owned parks, trails, and open space lands to be conducted to determine if there are any properties that qualify for protection under Section 4(f). The law says that FHWA (and other DOT agencies) cannot approve the use of land from publicly owned parks, recreation areas, wildlife refuges, or historic sites unless there is no feasible and prudent alternative to the use and the action includes all possible planning to minimize harm to the property. The substantive provisions of Section 4(f) apply only to agencies within the USDOT. A Section 4(f) evaluation would be required for the conversion of any publicly owned parks, trails, or open space lands for transportation improvements.

Section 6(f): During the NEPA process, the absence of any Section 6(f) resource will be verified and determine if there will be any impacts to Section 6(f) properties. For Section 6(f) properties located in the areas of the improvements, alternatives should be designed to avoid a conversion of these properties. If a conversion of land cannot be avoided, efforts will be made to mitigate effects to these properties. SDDOT, in cooperation with the local government landowner, must identify replacement land of equal value, location, and usefulness before a transfer of property under Section 6(f) can occur.

2.13 Visual Resources

2.13.1 Regulatory

The VIA scoping process applied to Corridor 4 follows guidance from FHWA's Guidelines for the Visual Impact Assessment of Highway Projects (FHWA, 2015) for assessing impacts on visual resources in context to NEPA (See Appendix C, Visual Resource Scoping - Corridor 4).

2.13.2 VIA Scoping

A visual resource scoping process was conducted for Corridor 4, to identify issues related to the transportation improvement concepts planned for **US 85: West of Pluma**, and to establish Visual Impact Assessment (VIA) requirements for the NEPA phase.

Context and Landscape Character

The curvilinear US 85 corridor is located within a narrow and densely vegetated canyon between Lead and Pluma, where the alignment parallels West Strawberry Creek to the south, with steep rock outcroppings and dense vegetation. The influence of development and mining is screened by steep slopes and roadside vegetation in the central section of the corridor between Lead (Short Street) and Pluma.

2.13.3 Next Steps

The VIA Scoping process resulted in a score ranging from **16 to 17 points**, indicating that an *Abbreviated VIA* would briefly describe project features, impacts and mitigation requirements. Visual simulations would be optional.

2.14 Hazardous Materials

2.14.1 Regulatory

Hazardous materials are regulated by various state and federal regulations. NEPA, as amended (42 US Code (USC) 4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the US that are contaminated with hazardous substances (as specifically designated in the CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 321 et seq.), which establishes a framework for the management of both solid and hazardous waste. The federal Hazardous and Solid Waste Amendments of 1984 established a new comprehensive regulatory program for underground storage tanks containing petroleum products and hazardous chemicals regulated under CERCLA. In 2016, the EPA retired the CERCLA Information System database, and replaced it with a more modern system called the Superfund Enterprise Management System.

2.14.2 Existing Conditions

A desktop review of the study area revealed facilities that may utilize hazardous materials daily such as the following:

- Twin Cities Construction (518 Cliff Street)

In addition to the facility listed above, there may other properties that were previously located within the study area that may have affected groundwater and subsurface soils but have since been occupied by another business. Finally, there could be facilities located near the study area that may be undergoing active groundwater remediation.

2.14.3 Next Steps

Prior to final design, an environmental database records search of federal and state environmental resources should be obtained and reviewed for the study area. The environmental database records would be evaluated with respect to the status of the facility listing and its location within the study area boundaries. The facilities identified in the environmental database would be ranked as having either a high, medium, or low potential to impact based on the location of these facilities and known releases.

In addition to the environmental database review, an on-site visual inspection of the study area and surrounding areas should be completed. The site visit should be completed by a qualified environmental professional, skilled and experienced in identifying hazardous materials and waste issues, to identify and evaluate present conditions.

Finally, a review of historical site information such as Sanborn fire insurance maps, US Geological Survey topographic maps, and readily available historical aerial photographs should be completed. This review of historical sources should include all obvious uses from the study area's first obvious developed use or 1940, whichever is earlier, to the present time.

If findings from the historical and/or database reviews indicate that subsurface contamination may be present, a limited subsurface investigation to collect soil and/or groundwater samples may be warranted. Based on the information gathered during the subsurface investigation, a Materials Management Plan (MMP) may be recommended to detail the Standard Operating Procedures for handling potentially contaminated media, specifically soil and/or groundwater. The MMP will be designed to minimize worker exposure to potentially contaminated material, prevent releases to the environment, and ensure proper disposal.

2.15 Summary

This environmental review was prepared to evaluate issues and the potential for conflicts with human and natural environment from highlighted key resources within each corridor with a likelihood of potential effects depending on the proposed action and project design development.

Next steps would follow SDDOT NEPA process in coordination with FHWA. The scan report is intended to provide a starting point for the NEPA process.

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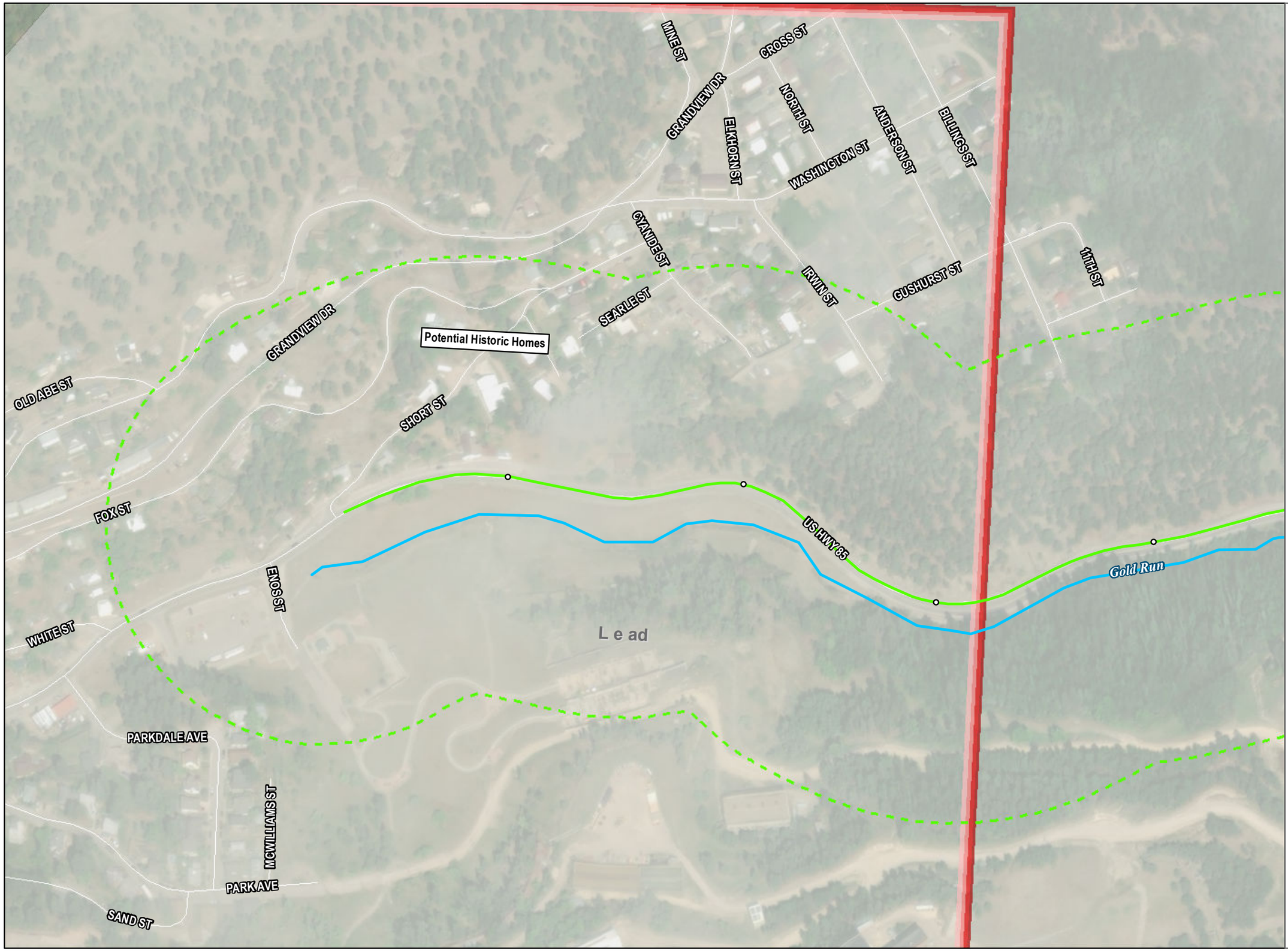
Appendix A. Environmental Resources Map Book

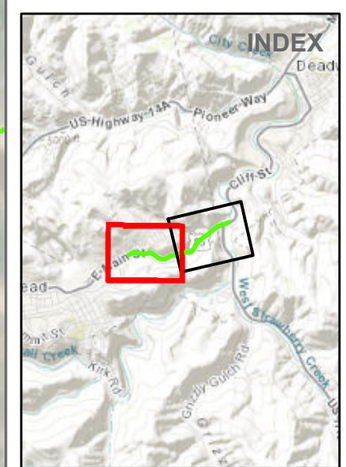


Black Hills Phase III Corridors
Corridor 4: Sheet 1 of 2

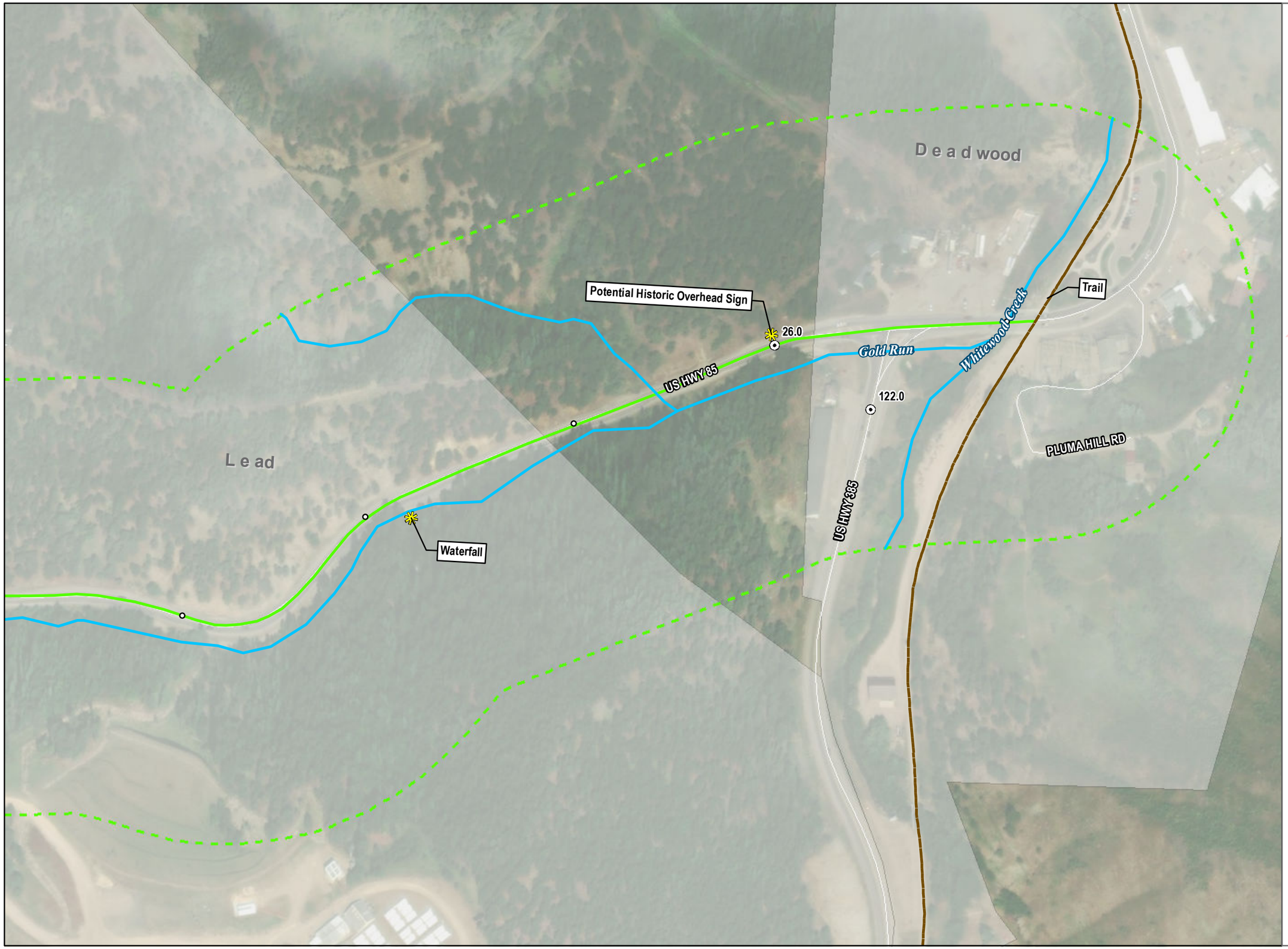
Legend

- Other Environmental Resource
- Tenth Mile Marker
- Mile Reference Marker
- Snowmobile Trail
- Streams
- Corridor 4: Existing Alignment
- Potential Wetland
- Waterbodies
- SD Parks and Recreation Area
- Corridor 4: 500 ft Buffer
- City Boundary
- Historic District

0 100 200 300 Feet



Black Hills Phase III Corridors
Corridor 4: Sheet 2 of 2



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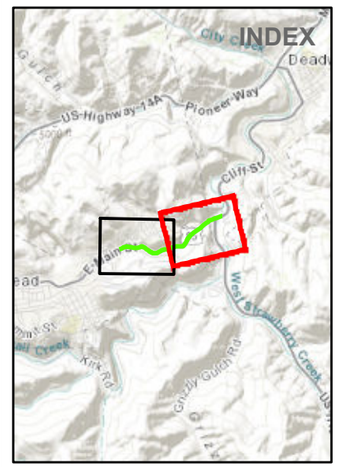


Appendix B. Visual Impact Analysis Scoping

2.15 Appendix B. Corridor 4 Visual Impact Assessment Scoping

2.15.1 Introduction

This visual impact assessment (VIA) scoping for Corridor 4 identifies issues related to the transportation improvement concepts recommended for US 85: West of Pluma and anticipates the visual resource requirements for the National Environmental Policy Act (NEPA) phase. The VIA scoping process applied to Corridor 4 follows guidance from FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA, 2015) for assessing impacts on visual resources in context to NEPA.

These FHWA Guidelines include a scoping questionnaire, to be applied early in project planning, as a tool to determine the appropriate level of effort for assessing the visual impacts that may result from a proposed highway project. The questionnaire consists of 10 questions, including 5 questions covering *environmental compatibility* and 5 questions covering *viewer sensitivity,* with a scoring system to help determine if a VIA would be required, and if so, the appropriate level of VIA for NEPA documentation: Expanded, Standard, Abbreviated, or Memorandum. This initial scoping process was based primarily on the Corridor 4 concept planning and design, corridor videos, and the Lawrence County *2030 Comprehensive Plan* (Lawrence County, 2020).

The following sections include the Corridor 4 VIA Scoping Questionnaire responses, with assumptions, supporting information, and next steps to consider for NEPA.

2.15.2 VIA Scoping

Corridor 4 Scoping Questionnaire

Environmental Compatibility

The five questions about *environmental compatibility* in the VIA Scoping Questionnaire are:

1. ***Will the project result in a noticeable change in the physical characteristics of the existing environment?***

   Consider all project components and construction impacts, both permanent and temporary, including landform changes, structures, noise barriers, vegetation removal, railing, signage, and contractor activities.

   - High level of permanent change (3)
   - **Moderate level of permanent change (2)**
   - Low level of permanent or temporary change (1)
   - No Noticeable Change (0)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-1, following the questionnaire.

2. ***Will the project complement or contrast with the visual character desired by the community?***

   Evaluate the scale and extent of the project features compared to the surrounding scale of the community. Is the project likely to give an urban appearance to an existing rural or suburban community? Do you anticipate that the change will be viewed by the public as positive or negative? Research planning documents or talk with local planners and community representatives to understand the type of visual environment residents envision for their community.

   - Low Compatibility (3)
   - **Moderate Compatibility (2)**
   - **High compatibility (1)**

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-2, following the questionnaire.

3. ***What types of project features and construction impacts are proposed? Are there particular concerns related to bridge structures, large excavations, sound barriers, vegetation removal, or other features of the proposed project that will raise concerns?***

   Certain project improvements can be of special interest to local citizens, causing a heightened level of public concern and requiring a more focused visual analysis.

   - High concern (3)
   - **Moderate concern (2)**
   - Low concern (1)
   - Negligible Project Features (0)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-3, following the questionnaire

4. ***Will the project changes likely be mitigated by normal means such as landscaping and architectural enhancements, or will avoidance or more extensive compensation measures be necessary to minimize adverse change?***

   - Extensive Non-Conventional Mitigation Likely (3)
   - **Some non-conventional Mitigation Likely (2)**
   - Only Conventional Mitigation Likely (1)
   - No Mitigation Likely (0)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-4, following the questionnaire

5. ***Will this project, when seen collectively with other projects, result in cumulative adverse impacts to visual resources or their visual character?***

   Identify any projects [both state and local] in the area that have been constructed in recent years and those currently planned for future construction. The window of time and the extent of area applicable to possible cumulative impacts should be based on a reasonable anticipation of the viewing public's perception.

   - Cumulative Impacts likely: 0– years (3)
   - Cumulative Impacts likely: 6–10 years (2)
   - **Cumulative Impacts unlikely (1)**

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question EC-5, following the questionnaire.

Viewer Sensitivity

The five questions about *viewer sensitivity* in the VIA Scoping Questionnaire are:

1. ***What is the potential that the project proposal may be controversial within the community, or opposed by any organized group?***

   This can be researched initially by talking with the state DOT and local agency management and staff familiar with the affected community's sentiments as evidenced by past projects and/or current information.

   - High Potential (3)
   - Moderate Potential (2)
   - **Low Potential (1)**
   - No Potential (0)

Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-1, following the questionnaire.

2. ***How sensitive are potential viewer-groups likely to be regarding visible changes proposed by the project?***

   Consider among other factors the number of viewers within the group, probable viewer expectations, activities, viewing duration, and orientation. The expected viewer sensitivity level may be scoped by applying professional judgment and by soliciting information from other DOT staff, local agencies, and community representatives familiar with the affected community's sentiments and demonstrated concerns.

   - High Sensitivity (3)
   - **Moderate Sensitivity (2)**
   - Low Sensitivity (1)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-2, following the questionnaire.

3. ***To what degree does the project appear to be consistent with applicable laws, ordinances, regulations, policies, or standards regarding visual preferences?***

   - Low Compatibility (3)
   - Moderate Compatibility (2)
   - **High compatibility (1)**

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-3, following the questionnaire.

4. ***Are any permits going to be required by outside regulatory agencies (i.e., Federal, State, or local) that will necessitate a particular level of Visual Impact Assessment?***

   Permit requirements can have an unintended consequence on the visual environment. Anticipated permits, as well as specific permit requirements – which are defined by the permitter, may be determined by talking with the project environmental planner and project engineer. Note: Coordinate with the state DOT representative responsible for obtaining the permit before communicating directly with any permitting agency. Permits that may benefit from additional analysis include permits that may result in visible built features, such as infiltration basins or devices under a stormwater permit or a retaining wall for wetland avoidance or permits for work in sensitive areas such as coastal development permits or on Federal lands, such as impacts to Wild and Scenic Rivers.

   - Yes (3)
   - Maybe (2)
   - **No (1)**

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-4, following the questionnaire.

5. ***Will decision-makers (including the project designers) or the public benefit from a more detailed visual analysis in order to help reach consensus on a course of action?***

   Consider the proposed project features, possible visual impacts, and probable mitigation recommendations.

   - **Yes (3)**
   - Maybe (2)
   - No (1)

   Assumptions: See **Section 2.15.3**, **Supporting Information and Assumptions**, for Question VS-5, following the questionnaire.

Summary of VIA Scoping Results

This represents an initial VIA scoping effort to get the process started based on a preliminary review of the Corridor 4: US 85: West of Pluma context-sensitive planning and design documentation and the Black Hills National Forest Plan. **With a score ranging from 16 to 17 points, an Abbreviated VIA is appropriate (see below).**

Determining the Level of Visual Impact Assessment

Total scores of the answers to all 10 questions on the Visual Impact Assessment Scoping Questionnaire indicate the appropriate level of VIA to perform for the project. If there remains doubt about whether a VIA needs to be completed, it may be prudent to conduct an Abbreviated VIA. If there remains doubt about the level of the VIA, begin with the simpler VIA process. If visual impacts emerge as a more substantial concern than anticipated, the level of VIA documentation can always be increased.

The level of the VIA can initially be based on the following ranges of total scores:

☐ ***Score 25–30*** An *Expanded VIA* is probably necessary. It is recommended that it should be proceeded by a formal visual scoping study prior to beginning the VIA to alert the project team to potential highly adverse impacts and to develop new project alternatives to avoid those impacts. These technical studies will likely receive statewide, even national, public review. Extensive use of visual simulations and a comprehensive public involvement program would be typical.

☐ ***Score 20–24*** A *Standard VIA* is recommended. This technical study will likely receive extensive local, perhaps statewide, public review. It would typically include several visual simulations. It would also include a thorough examination of public planning and policy documents supplemented with a direct public engagement processes to determine visual preferences.

X ***Score 15–19*** An *Abbreviated VIA* would briefly describe project features, impacts and mitigation requirements. Visual simulations would be optional. An Abbreviated VIA would receive little direct public interest beyond a summary of its findings in the project's environmental documents. Visual preferences would be based on observation and review of planning and policy documents by local jurisdictions.

☐ ***Score 10–14*** A *VIA Memorandum* addressing minor visual issues that indicates the nature of the limited impacts and any necessary mitigation strategies that should be implemented would likely be sufficient along with an explanation of why no formal analysis is required.

☐ ***Score 6–9*** No noticeable physical changes to the environment are proposed and no further analysis is required. Print out a copy of this completed questionnaire for your project file to document that there is no effect. A *VIA Memorandum* may be used to document that there is no effect and to explain the approach used for the determination.

2.15.3 Supporting Information and Assumptions

Environmental Compatibility

The following provides supporting documentation and assumptions related to scores assigned to Environmental Compatibility (EC) Questions 1–5.

Question EC-1: Assumptions

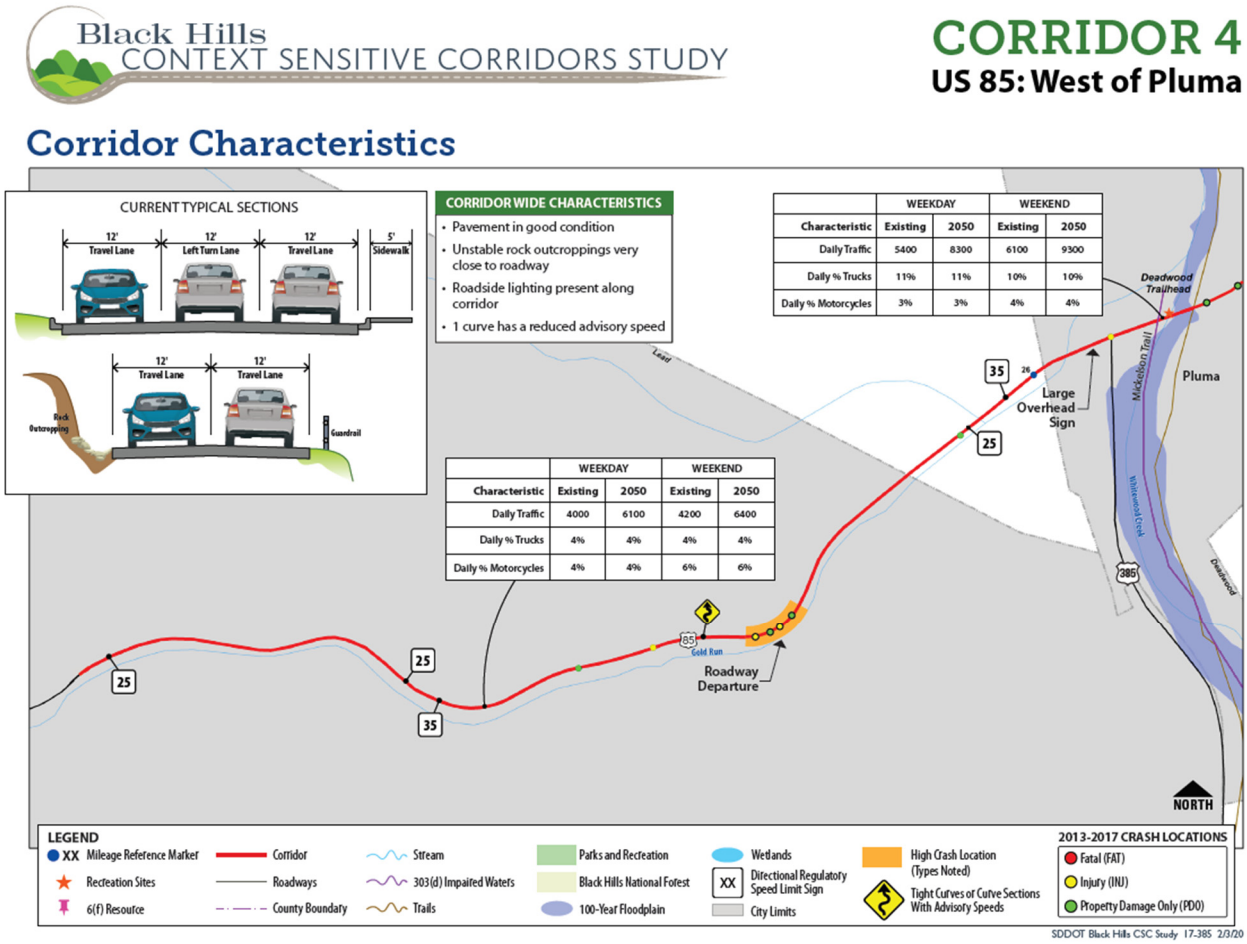
Context and Landscape Character

The curvilinear US 85 corridor is located within a narrow and densely vegetated canyon between Lead and Pluma, where the alignment parallels West Strawberry Creek to the south, with steep rock outcroppings and dense vegetation. The influence of development and mining is screened by steep slopes and roadside vegetation in the central section of the corridor between Lead (Short Street) and Pluma (US 85).

Roadway Characteristics and Deficiencies (see **Attachment A**)

- **Current Typical Roadway Section**: US 85 is a 2-lane roadway with 12-ft lanes and minimal shoulders, with a posted speed limit of 35 mph through the narrow canyon slopes between Lead and Pluma.
- **Roadway Deficiencies**: This urbanized corridor needs improved non-motorized connectivity and updated roadway section, including:
  - Pedestrian linkage along the corridor
  - Additional lane/shoulder width through the corridor
  - Guardrail/roadside safety improvements
  - Improved aesthetics for transition between two communities
  - Modification to section to optimize shoulder and lane widths with improved bike/ped facilities.
  - Roadside safety improvements

Attachment A. Corridor 4 Corridor Characteristics



Transportation Improvements and Visual Change (see **Attachment B**)

Rock wall and side slopes highly constrain this narrow corridor. Improvements that could result in low to moderate levels of visual contrast and noticeable visual change due to possible vegetation removal and rock cuts include:

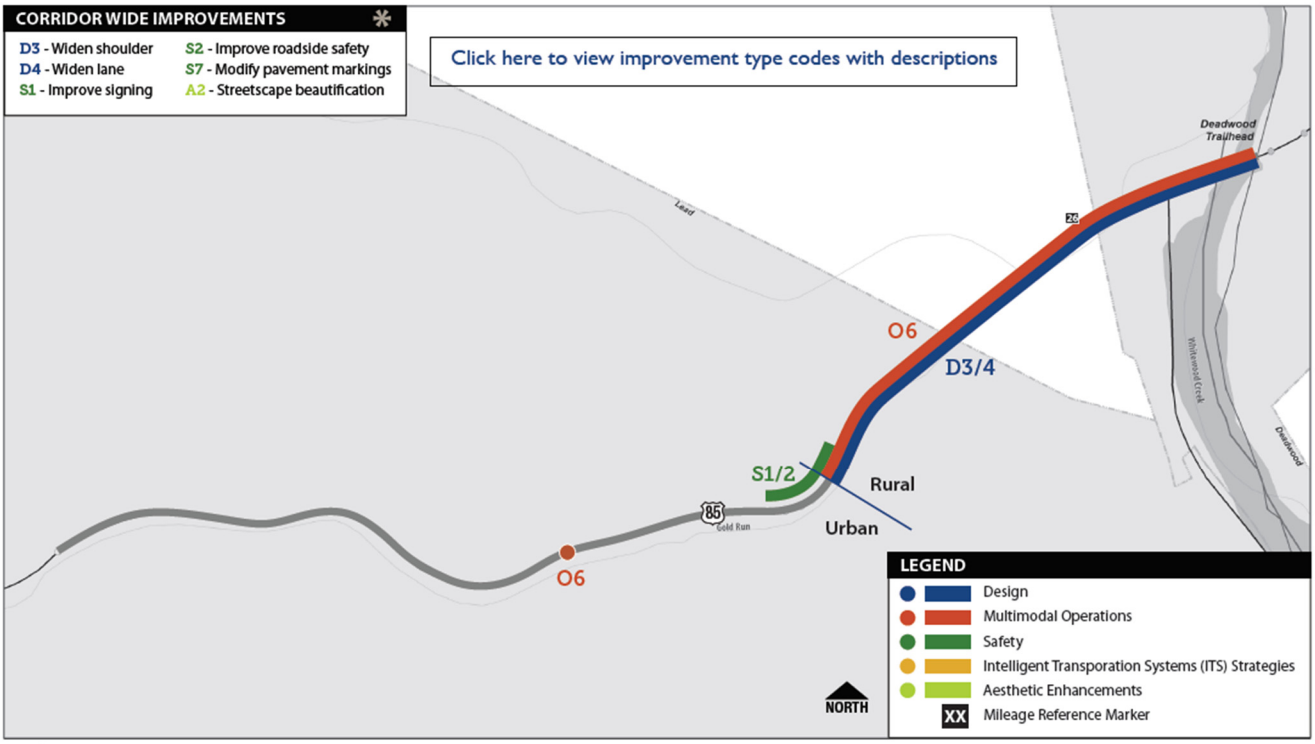
- Retaining the current 12-foot travel lanes in each direction.
- Adding five-foot shoulders on either side of the travelway to accommodate pedestrians and bicyclists and to assist in establishing the desired clear zone. **Attachment C** illustrates the concept of using the hillside shoulder adjacent to rock face slopes for pedestrian use, and the Creekside shoulder for bike use.
- Maintaining the south curb line as the southern limits of the project, which results in widening to the north. The north widening will require cutting into the rock face to provide the added width for shoulders and clear zone on either side.
- Remove guardrail where possible to improve landscape character

Attachment B. Corridor 4 Improvements to Support Vision

PURPOSE:
Commuter/Commercial Route

CORRIDOR 4
US 85: West of Pluma

Improvements to Support Vision

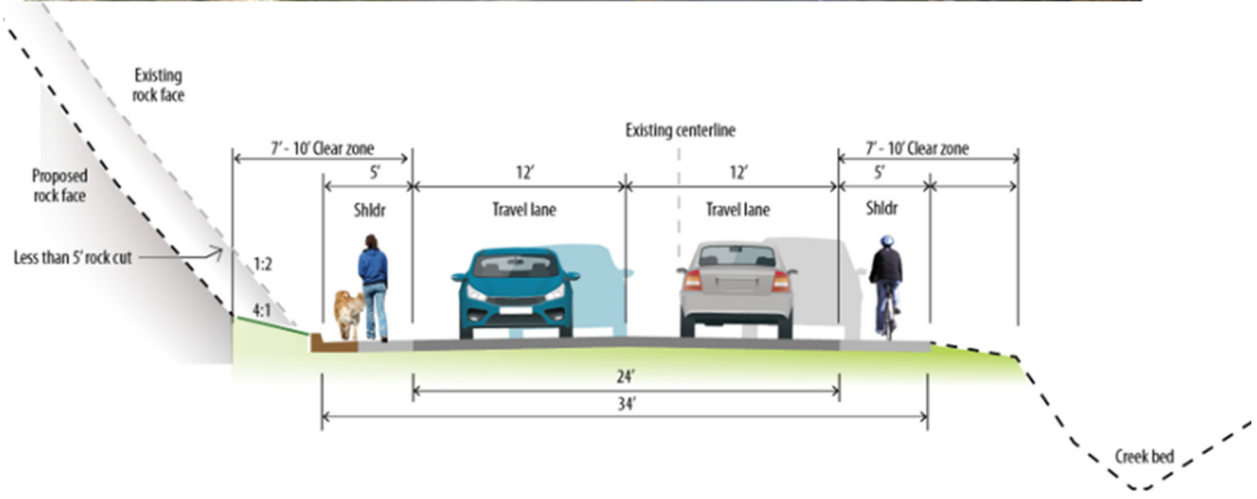


See Corridor Visioning - Potential Improvement Types Table for Specific Element Defintions

Attachment C. Multiuse Shoulders

MRM 25.9 – MRM 26: Shoulder widening & bike/ped facilities

MRM 25.9: View toward Pluma



Question EC-2: Assumptions

US 85 is serving commuter, local commercial goods traffic between Deadwood and Lead, along with some recreational and tourist travel. The proposed safety and bike/ped improvements would likely be moderate to highly compatible with Corridor 4.

Question EC-3: Assumptions

The proposed improvement concepts for multiuse shoulders and a pedestrian path would result in varying vegetation removal, cut slopes, and possible rock cuts.

Question EC-4: Assumptions

Fitting the proposed shoulders and bike/ped improvements within the constraints of the US 85 corridor between Lead and Pluma would likely require some non-conventional mitigation strategies due to the proximity to Strawberry Creek and adjacent rock outcropping.

Question EC-5: Assumptions

The landscape character of the US 85 corridor West of Pluma is visually diverse, with a range of large-scale visually dominant mining-related landforms.

Viewer Sensitivity

The following provides supporting documentation and assumptions related to scores assigned to Viewer Sensitivity (VS) Questions 1–5.

Question VS-1: Assumptions

Corridor 4 will connect the urban centers of Lead and Pluma, where there is a need for the proposed local improvements. Ongoing public, agency, and stakeholder involvement in the planning and design process will create a positive collaborative approach.

Question VS-2: Assumptions

US 85 serves commuter, local commercial goods traffic between Deadwood and Lead, with some recreational travel. The sensitivity to proposed safety and bike/ped improvements is considered low to moderate.

Question VS-3: Assumptions

The Lawrence County *Highway 85 Land Use Study* (Lawrence Commission, 2009) includes guidelines for addressing future access needs to and from Highway 85 and for determining suitable locations for future development and open space. No direct access would be allowed to Highway 85 within a 660-foot mixed use corridor. The Lawrence County *2030 Comprehensive Plan* (Lawrence County, 2020) provides a framework to address the balance between growth and preserving local character and community values. The corridor vision for the US 85 corridor is supportive of these planning goals.

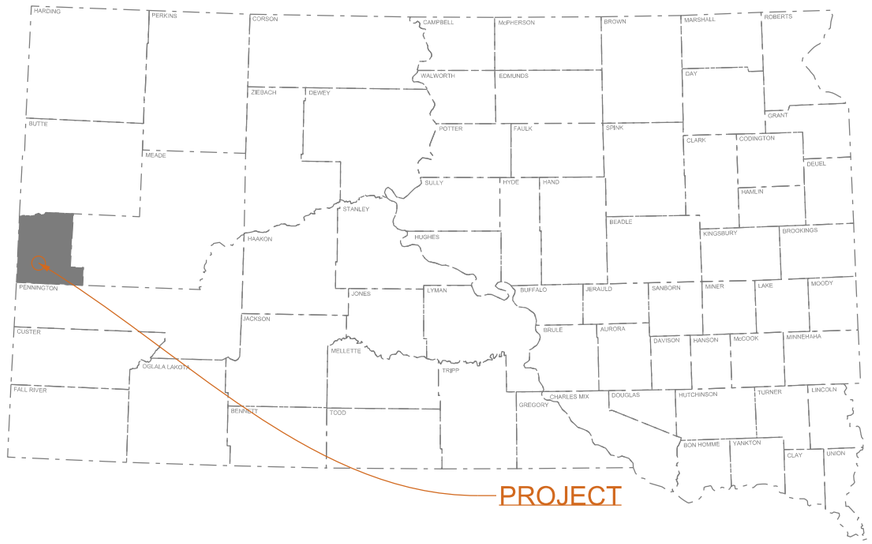
Question VS-4: Assumptions

Local permitting within the study corridor area is generally associated with extractive industry, water and wastewater systems, and buildings. The Highway 85 corridor is under the jurisdiction of Lawrence County and the transportation vision for US 85: West of Pluma (between Deadwood and Lead).

Question VS-5: Assumptions

This urbanized corridor is highly constrained by rock walls and side slopes, with improved non-motorized connectivity needs, an updated roadway section to address safety, and improved aesthetics for the transition between communities.

APPENDIX C. CORRIDOR DESIGN INFORMATION



STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

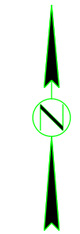
PROJECT NH 0085 (104) 0, PCN 0786
US HIGHWAY 85
LAWRENCE COUNTY

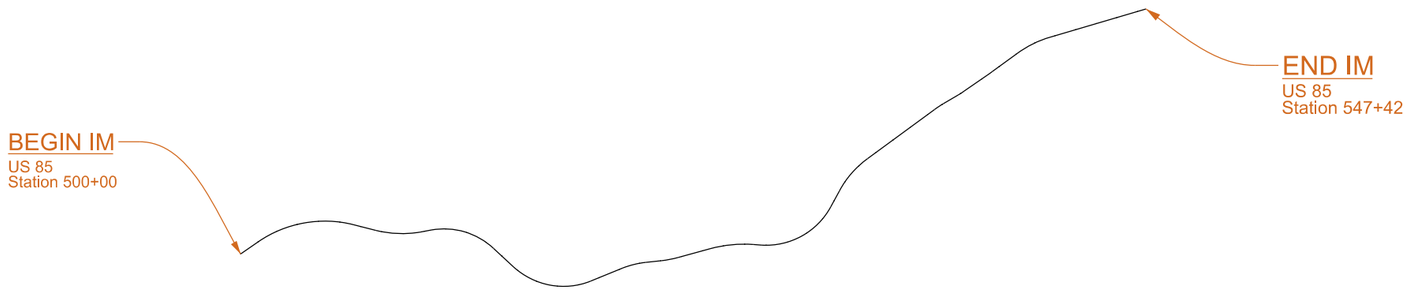
TYPICAL SECTIONS AND CONCEPTUAL PLAN SHEETS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	NH 0085(104) 0 N, PCN 0786	1	8

Plotting Date: 01-28-2021

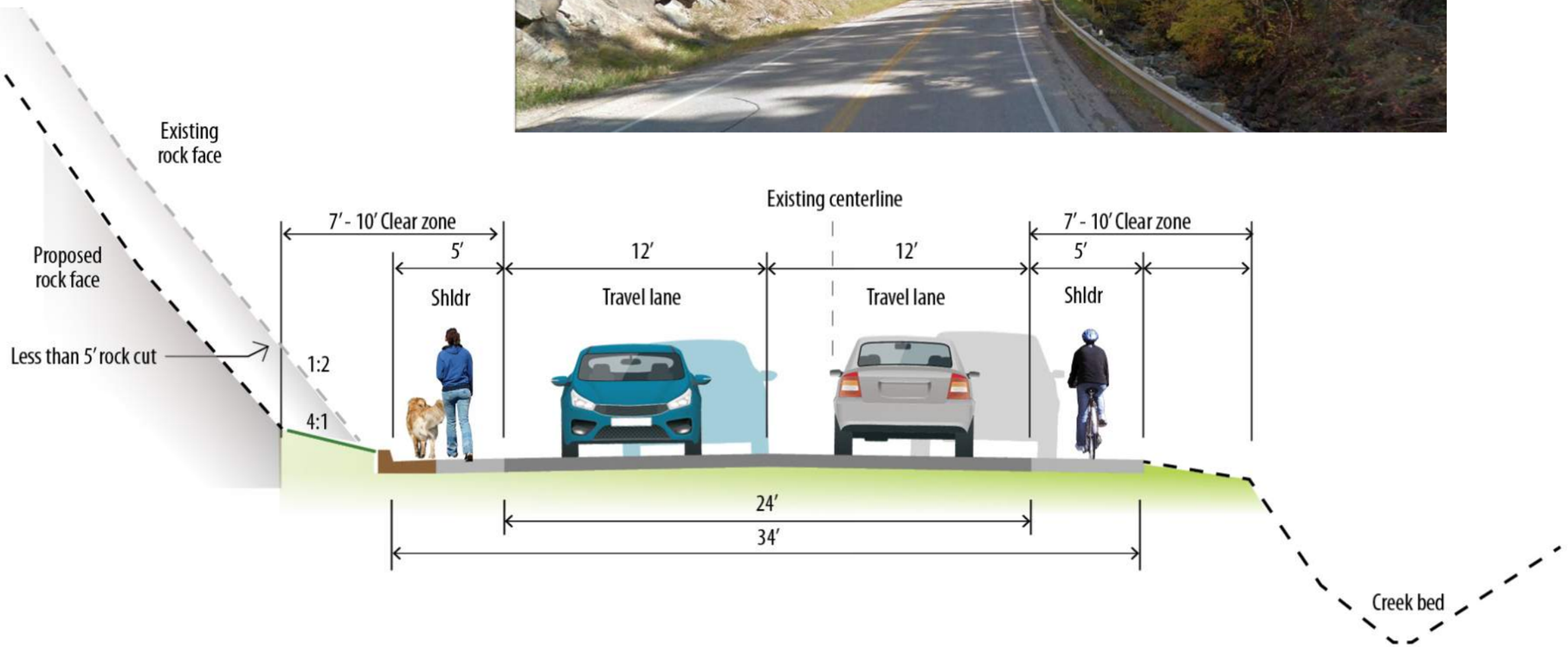
INDEX OF SHEETS





US 85 (MRM 25.6) **Improvement: Widen Shoulders**

US 85 Typical Section MRM 25.6 +/- (Option 1)



Black Hills
CONTEXT SENSITIVE CORRIDORS STUDY

SRF JACOBS FELSBURG HOLT & ULLEVIG

Corridor 4 (US 85: West of Pluma)

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