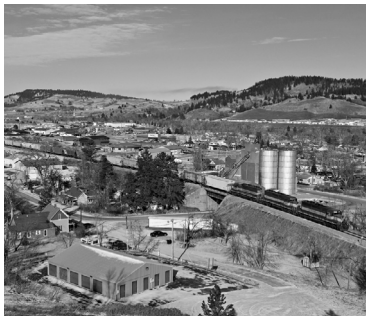


I-90 Exit 32 - 40
CORRIDOR REPORT

November 2020

Stantec

South Dakota DOT
Connecting South Dakota and the Nation

I-90 Exit 32-40
Corridor Report

November 2020

Prepared for:

South Dakota Department of Transportation (SDDOT)

Prepared by:

Stantec Consulting Services Inc.

Acknowledgments

The I-90 Exit 32-40 Corridor Study would not have been possible without the collaboration of SDDOT, Meade County, Federal Highway Administration, local agencies and tribal organizations, study advisory team members, consultant staff, and the general public. A special thanks to these team members for the dedication and effort they gave to make this study a success.

Table of Contents

List of Figures

List of Tables

List of Acronyms

ADT	Average Daily Traffic
AGR	Annual Growth Rate
ATIS	Advanced Traveler Information System
ATMS	Advanced Transportation Management System
AVI	Automatic Vehicle Identification
BHNC	Black Hills National Cemetery
BLM	Bureau of Land Management
CCTV	Closed Circuit Television
DMS	Dynamic Message Sign
DSRC	Dedicated Short-Range Communication
FHWA	Federal Highway Administration
GIS	Geographic Information System
GPS	Global Positioning System
HCM	Highway Capacity Manual
IMJR	Interchange Modification Justification Reports
iROC	Intelligent Roadside Operations Computer
ITS	Intelligent Transportation Systems
LOS	Level of Service
MASH	Manual for Assessing Safety Hardware
MRM	Mileage Reference Marker
NHD	National Hydrography Data
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OBU	On-board Unit
OHWM	Ordinary High-water Mark
PIP	Public Involvement Program
RCPE	Rapid City, Pierre, Eastern Railroad
RWIS	Roadway Weather Information System
SAT	Study Advisory Team
SCI	Surface Condition Index
SDDOT	South Dakota Department of Transportation
SDHP	South Dakota Highway Patrol
SLC	Single Load Cell
TMC	Traffic Management Center
TPOE	Tilford Port of Entry
TSMO	Transportation System Management & Operations
USACE	US Army Corps of Engineers
USFW	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VSL	Variable Speed Limit
WIM	Weigh-in-Motion

Executive Summary

Background

The South Dakota Department of Transportation (SDDOT), in cooperation with Meade County and the Federal Highway Administration, is working to preserve the Interstate 90 (I-90) corridor between Exit 32 and 40. This section of I-90 serves as the primary connection between Sturgis and Rapid City and is heavily travelled during summer months as tourists visit the Black Hills and area attractions.

The SDDOT has determined the pavement in the eastbound lanes of I-90 between Exit 32 and 40 will require replacement within the next 6 years. Deficiencies such as deteriorating drainage structures, substandard roadway geometrics, and limited interchange capacities have also been identified throughout the corridor. As a result, the SDDOT has undertaken a comprehensive study to evaluate requirements along this segment of I-90 and develop feasible solutions to meet those needs.

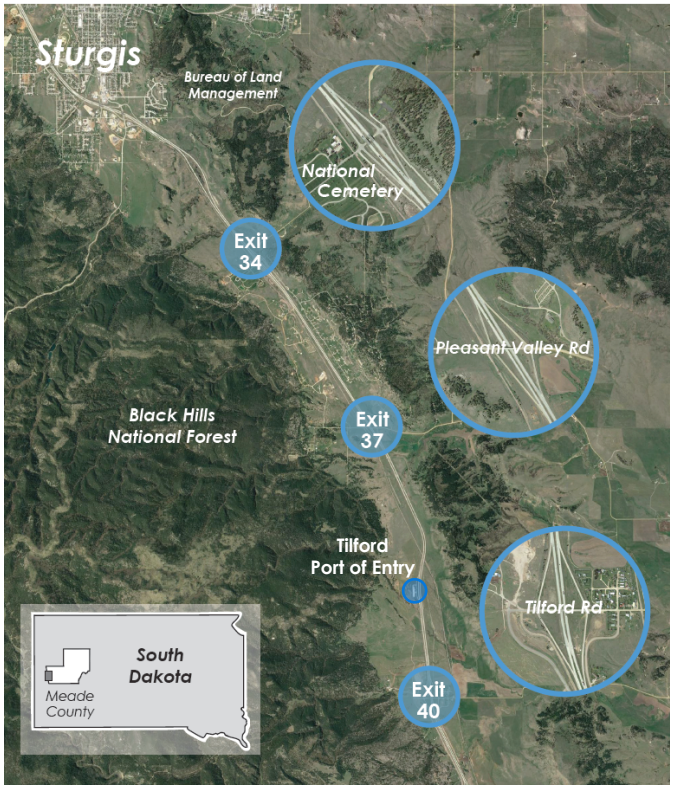
This study is a first step in addressing the existing roadway issues and planning for future needs within the corridor. The outcome of the study includes a comprehensive review of existing conditions, well-defined project needs, recommendations for phased construction projects within the study area, and a clearly outlined project process. Subsequent steps in the project development process will include interchange analysis and justifications, environmental documentation, and design plans. The study will also serve to initiate the FHWA Interchange Modification Justification process, which is required when access on the interstate system is added or modified.

Study Area

The study area consists of the Interstate 90 corridor from Exit 32 in Sturgis to Tilford and includes the following interchanges/exits:

- Exit 34 at Black Hills National Cemetery
- Exit 37 at Pleasant Valley Road
- Exit 40 at Tilford Road
- Tilford Port of Entry (located along I-90 between Exit 37 and 40)

Local roads and cross streets surrounding the three interchanges listed above are also included in the study.



+ Executive Summary
I-90 Exit 32-40: Corridor Report

Study Organization
This report is divided into five sections: Introduction, Existing Conditions, Environmental Overview, Year 2050 Traffic Conditions, and Solutions. The Existing Conditions section reviews current traffic operations, roadway geometry and infrastructure, bike and pedestrian travel, safety, and Intelligent Transportation Systems (ITS). This section provides a basis for defining the project need by defining the current conditions along the corridor.

The Environmental Overview provides a summary of the area resources and helps to define constraints that will shape development of alternatives. The Year 2050 Traffic Conditions section provides traffic forecasts for the opening year (2023) and design year (2050) that are used in developing solutions that will provide long-term benefits along the corridor. The last section, Solutions, outlines the study approach, alternatives development, and alternatives screening process. This section also includes a summary of the proposed design recommendations for the study corridor.

Recommendations
Recommendations for corridor improvements are provided at the end of the study which include the following design aspects:

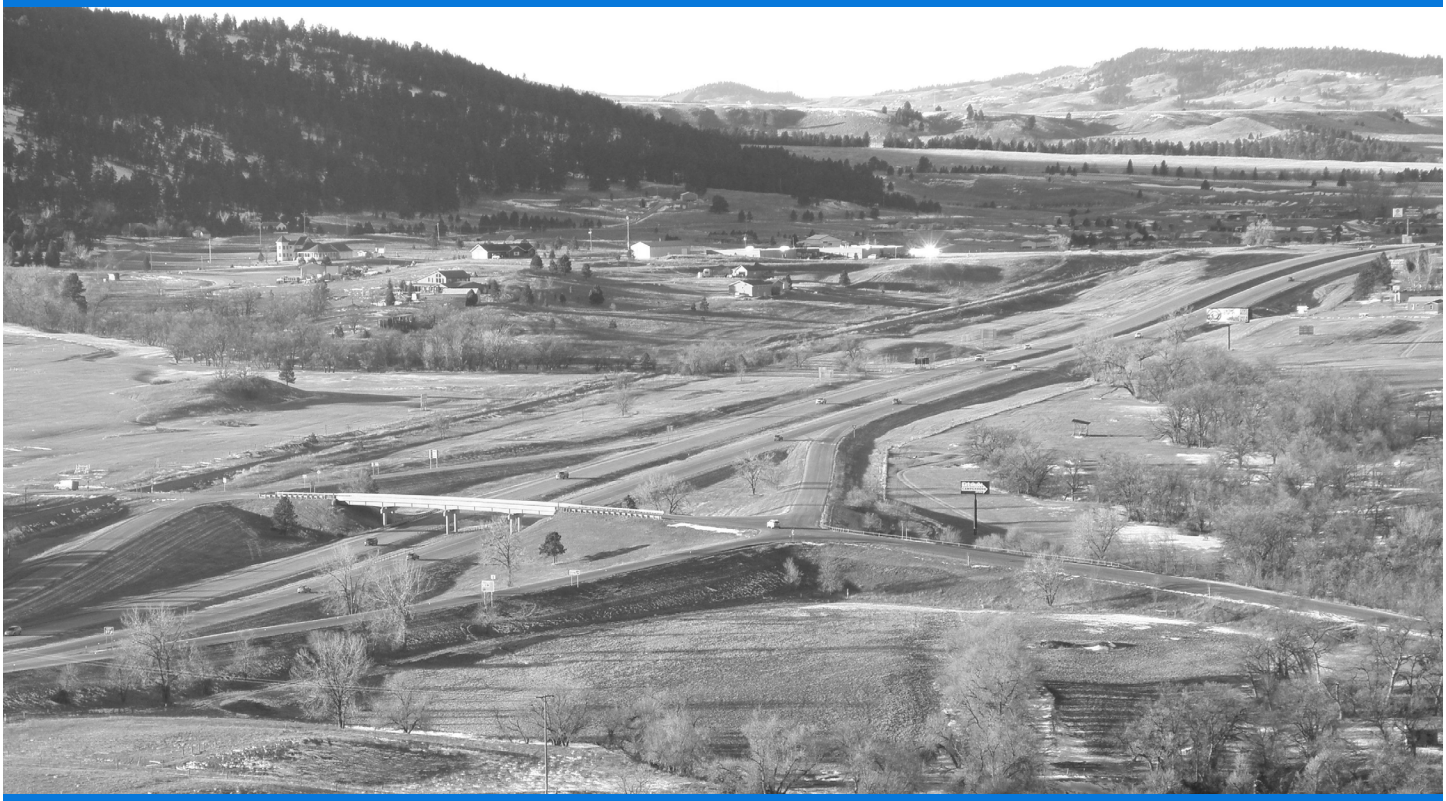
- Determine the need of a future six lane facility
- Design alternatives for interchanges
- Traffic analysis for interchanges in compliance with the FHWA Interstate Access Policy
- Intelligent Transportation System (ITS) element recommendations

Through the cooperative screening process described in the Solutions section of this study, the SDDOT identified a series of phased construction projects aimed at meeting current and future corridor requirements within the constraints of the corridor.

Recommended improvements and suggested construction timing include:

- Exit 37 interchange reconstruction and Exit 40 ramp improvements - 2022
- Reconstruction of I-90 eastbound lanes from Exit 37 to the Tilford Port of Entry (TPOE), including the TPOE ramps and facility - 2023
- Exit 34 interchange reconstruction and local road connections – 2024
- Reconstruction of I-90 eastbound lanes between Exit 32 to Exit 37 - 2025
- ITS system installation - coordinated to occur with roadway construction

+ INTRODUCTION



Study Purpose and Background

The purpose of this corridor study is to examine current operations, identify existing deficiencies, determine future needs, and develop/analyze a range of solutions that meet the project requirements. The primary need along this corridor is the aging pavement in the eastbound segment of I-90 from Exit 32 to Exit 40 as identified by the SDDOT pavement management system. However, before rehabilitating or reconstructing I-90 mainline pavement, it is important to identify a typical section that will accommodate the anticipated traffic volume for the duration of the roadway's new service life. Previous studies undertaken by the SDDOT have indicated this segment of I-90 may require capacity improvements. Existing interchanges within the corridor do not meet current standards. Therefore, it is critical to identify future improvements for bridges and interchanges along the corridor so those needs can be accommodated. Knowing these requirements when the mainline pavement is replaced, will ensure that any planned improvements will accommodate anticipated future needs.

This planning and design process will include the following tasks:

1. Corridor Study: Determine the future traffic demand of the corridor, structure needs, and geometric deficiencies and provide conceptual improvements for the corridor and the interchanges within it to accommodate the projected traffic demand. A traffic evaluation analysis comparison will help to determine the recommended option.
2. Determination of Construction Projects: A construction feasibility review will determine assist in the selection of a recommended option and will provide a logical construction schedule sequence. Funding is available for the first project to be let in FY 2022.
3. Interchange Modification Justification Reports (IMJRs): IMJRs will be developed as needed for the proposed construction projects.
4. Environmental Study: The environmental review process will be followed for each of the proposed construction projects and documents will be developed as needed.
5. Construction Plans Development: Roadway design plans will be developed for the proposed projects for use in securing ROW and finalized for construction.

The SDDOT has retained the services of Stantec Consulting Services, Inc. (Stantec) to undertake the Corridor Study for I-90 Exit 32 to 40.

Study Area

The project area for this study includes the I-90 corridor from the crossover east of Exit 32 (MRM 32.99 + 0.039) to the on-ramp junction of the TPOE (MRM 39.32) — approximately 7.0 miles from Sturgis to the town of Tilford. A map of the study area is shown in Figure 1. Within the study area, the following sections will be evaluated for existing deficiencies and future needs:

- Mainline I-90 between Exit 32 and 40
- Exit 32 at Junction Avenue
- Exit 34 at Black Hills National Cemetery (Old Stone Road)
- Exit 37 at Pleasant Valley Road (County Highway 8)
- Exit 40 at Tilford Road
- Tilford Port of Entry on Eastbound I-90

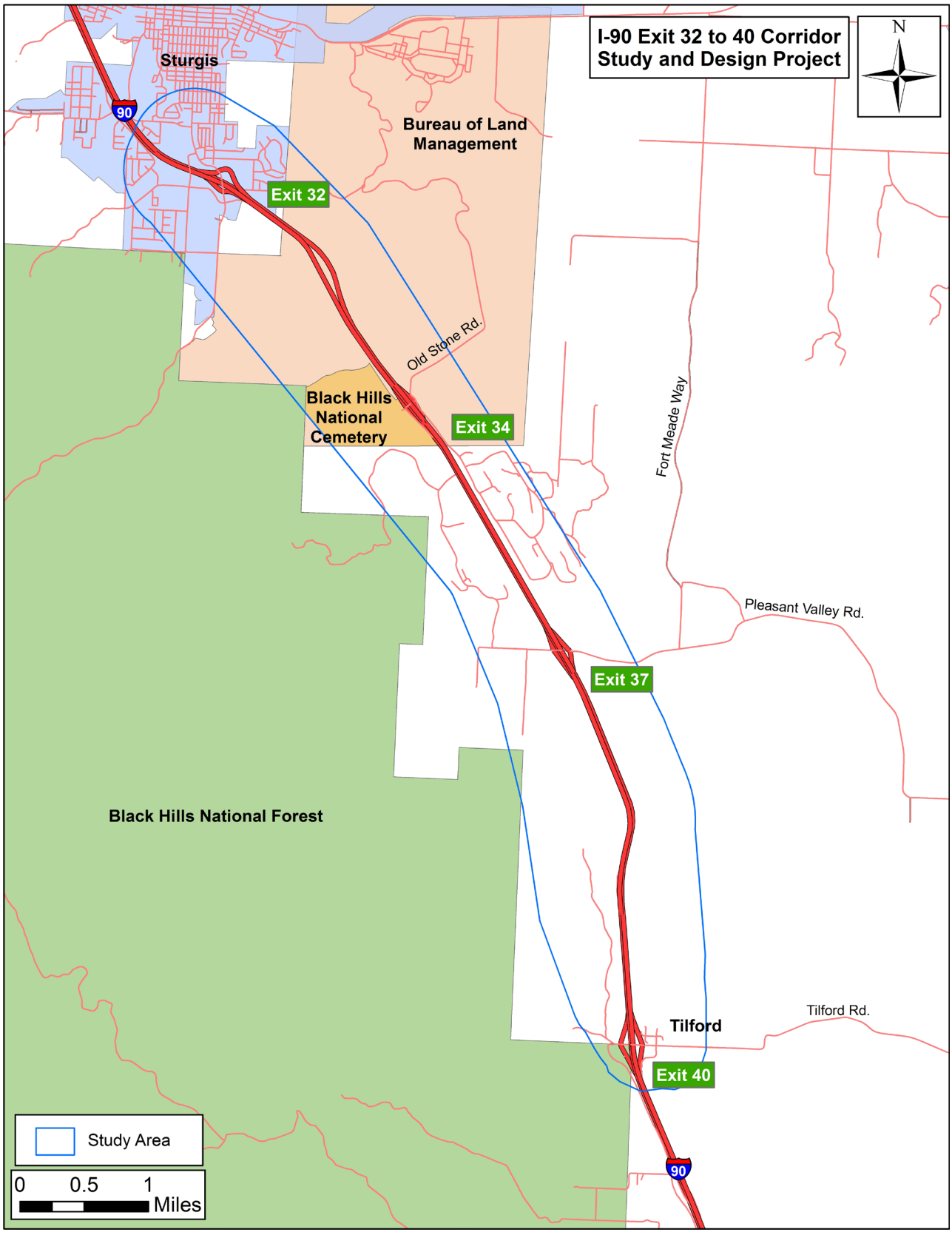


Figure 1: Study Area

Study Process

Public Involvement

A key goal throughout this project development process is to allow the SDDOT to make informed decisions that are in the public's best overall interest based on balanced consideration of the project purpose and need. A Public Involvement Program was developed to ensure that the public and agencies recognize what the SDDOT is working to accomplish with this study, and what the standards, procedures, and constraints are that SDDOT needs to consider while developing the proposed solutions. Keeping stakeholders informed is only one aspect of the Public Involvement Program. The SDDOT is also interested in gathering input and understanding concerns and issues that could affect the decision-making process and selection of feasible alternatives.

Stakeholders

I-90 Exits 32 to 40 Corridor Study and Design project includes the following public and private agency stakeholders:

- South Dakota Department of Transportation (SDDOT)
- Sturgis Emergency Services
- Meade County
- Landowners and business owners
- Federal Highway Administration (FHWA)
- Rapid City, Pierre, Eastern Railroad (RCPE)
- US Army Corps of Engineers (USACE)
- Lower Brule Sioux Tribe
- Bureau of Land Management (BML)
- Sisseton - Wahpeton Oyate
- Black Hills National Cemetery (BHNC)
- Standing Rock Sioux Tribe
- City of Sturgis
- Yankton Sioux Tribe
- Sturgis Chamber of Commerce
- Cheyenne River Sioux Tribe
- Sturgis Economic Development Corporation
- Oglala Sioux Tribe
- Meade School District
- Three Affiliated Tribes of ND
- Prairie Hills Transit
- Northern Arapaho Tribe of WY
- South Dakota Highway Patrol - Motor Carrier

Public Involvement Program
A Public Involvement Program (PIP) was developed to outline and help guide the process by which the SDDOT will communicate information and solicit and consider input from the public during the project development process. The PIP for the I-90 Exit 32 to 40 project consist of the following elements:

- Coordination with a Study Advisory Team
- A planned series of Public Meetings held at key points during project development
- Developing and maintaining a project website
- Document sharing using Listserv
- Public notification and contact using:
    - Direct mailings
    - Twitter
    - Facebook Live
    - Other social media platforms

Study Advisory Team
The SDDOT developed a Study Advisory Team (SAT) to provide direction and counsel throughout project development. The SAT will oversee the identification of transportation needs and the development of solutions. Two key responsibilities of the SAT members are: 1) to represent their respective functional groups or agencies, and 2) to promote community awareness of the project. SAT members will provide oversight and direction in developing a comprehensive and orderly means of involving local interests in the project. By representing many different interests and leveraging their experience, the SAT can help avoid conflicts between competing interests, and help resolve any conflicts that may arise.

The objectives of the SAT are to:

- Identify transportation deficiencies and needs
- Strengthen public understanding of the study process and its regulatory framework
- Discuss progress, work efforts, and activities
- Build consensus toward a preferred course of action
- Ensure that information is understandable to the public
- Provide clear and concise information to interested parties

Project Website
The project website launched in November 2017 (prior to the first public meeting), and will be maintained by Stantec throughout the project. The information on the website is organized to inform the public on the status of the study and provide public meeting announcements, presentations, and meeting summaries. The website will remain active for six months following the completion of the study to allow public access to the final report.

Public and Stakeholder Meetings
To collect comments and concerns related to the potential corridor improvements, a series of public and stakeholder meetings will be held throughout the project.

Public Information Meeting #1
The SDDOT hosted an open-house style public information meeting at the Sturgis High School on December 20, 2017. A formal presentation was given by Dale Grove. Informational boards available for viewing included a Welcome to the Project, Schedule + Study Process, Study Area Map, Crash History, Next Steps and Variable Speed Limit. Two identical roll plots were displayed highlighting known issues including sensitive land uses, geometric deficiencies, and snow build-up concerns. Approximately 50 people attended the meeting and were invited to provide comments. Written and oral comments were collected and noted.

Public Information Meeting #2
The SDDOT hosted a public information meeting on December 10, 2018 at Brown High School in Sturgis to share the project alternatives developed for the Corridor Study and gather input from the public. Approximately 60 people attended the meeting, including local, state and federal agency representatives, Meade County residents, landowners, and other stakeholders. Displays were provided for the public to review the alternatives, and SDDOT project team members were available to discuss issues and answer questions. Stantec employees Dale Grove and Theresa Maahs gave presentations highlighting project progress. Stakeholders were encouraged to submit written or oral comments, including website-based comments.

Stakeholder Meetings
The SDDOT held individual meetings with project stakeholders to discuss the I-90 improvement project, answer questions, collect data on known issues, and identify additional issues or concerns within the study corridor. The meetings were held at SDDOT offices on January 25 - 26, 2018. The meetings consisted of a review of the project description, schedule, purpose and need for the project, and existing conditions. Open conversation of the issues followed, allowing stakeholders to share their concerns.

SDDOT and the consultant team held a second round of stakeholder meetings on November 15-16, 2018 at the SDDOT's Rapid City Regional Offices. Individual meetings with eight stakeholders were held to discuss the project, review preliminary concepts, gather feedback, and answer questions. The meetings were informal to encourage open conversation. Each meeting began with introductions, followed by a project update. Participants reviewed early project concepts and were updated on the project schedule. Meetings then moved to an open conversation, allowing the stakeholders to share their concerns.

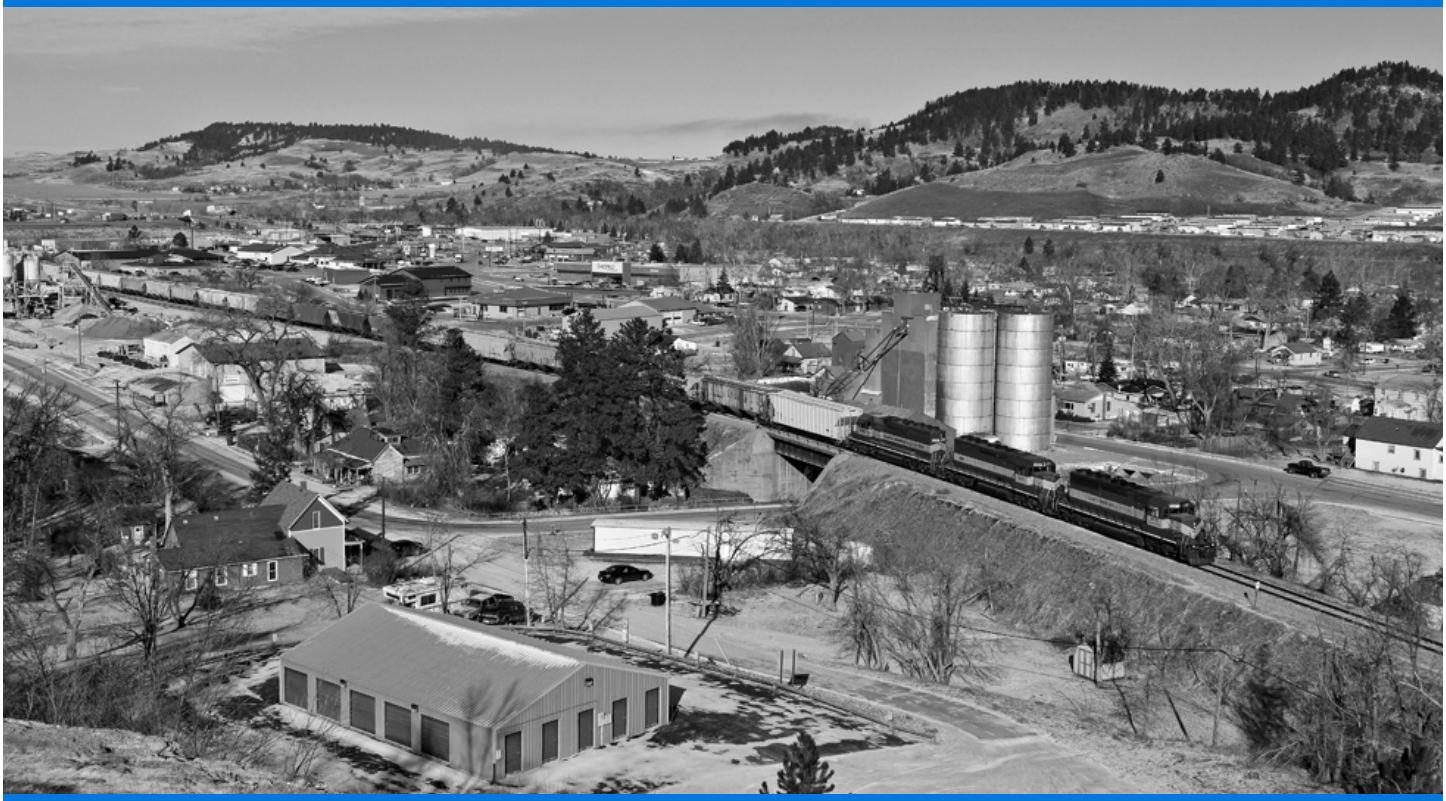
Environmental Analysis
Once a list of feasible build alternatives are selected, the project team will begin the environmental review process. The review process includes the detailed study of the physical, social, cultural, and economic impacts on the natural and human environment for the proposed projects under consideration. Analysis areas include environmental justice, wetlands and waterways, cultural resources, noise, floodplains and flood-prone areas, parks, wildlife and habitat, and regulated materials. Initial environmental research is included in later sections of this study. Once project concepts are developed, an evaluation process will provide an objective, quantifiable, and comprehensive approach to determining feasible build scenarios for the study corridor. Alternatives that are screened out will be supported by documentation in the form of reasoned arguments and matrices.

Planning Context and Prior Studies

The SDDOT has a history of studying the I-90 corridor. Several studies have previously been completed within or adjacent to the I-90 Exit 32 to 40 study area. These reports have been reviewed and information collected has been utilized as a starting point for this corridor study. The following are known previous or ongoing studies that are relevant to this study:

- I-90, Exit 32, Junction Avenue, Sturgis (**http://sddot.com/transportation/highways/planning/specialstudies/docs/I90Exit32justification.pdf**)
- I-90, Exit 44, Bethlehem Road, Meade County (**http://sddot.com/transportation/highways/planning/specialstudies/docs/I90Exit44IMJRFINAL.pdf**)
- 2000 Interstate Corridor Study (Phase 1 report available at **http://www.sddot.com/transportation/highways/planning/specialstudies/docs/Phase_I_Final_%20Report12_18.pdf**).
- 2010 Decennial Interstate Corridor Study (Phase I report available at **http://www.sddot.com/transportation/highways/planning/specialstudies/docs/09-104Phase1reportFINAL.pdf**).
- Interstate 90 Black Hawk to Sturgis Corridor Preservation Study (report available at **http://www.sddot.com/transportation/highways/planning/specialstudies/docs/03-241CorridorPreservReportfinal.pdf**)
- EA for I-90 From Exit 40 to Exit 51 (Available at **http://www.sddot.com/business/environmental/assessments/docs/MasterFinalEAandFONSISeptember292008.pdf**)
- Meade County Master Transportation Plan (report available at **http://www.sddot.com/transportation/highways/planning/specialstudies/docs/MeadeCountyTransportationPlanFinal.pdf**)
- Black Hills National Forest Travel Management Plan (report available at **http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/41877_FSPLT1_026126.pdf**)

+ EXISTING CONDITIONS



Roadway Network

The study area includes the following interchanges:

- Exit 32 at Junction Avenue (SD 79)
- Exit 34 at Pleasant Valley Drive/Blucksberg Drive/Old Stone Road
- Exit 37 at Pleasant Valley Road
- Exit 40 at 214th Street/Sturgis Road in Tilford
- The Port of Entry facility located along I-90 eastbound between Exit 37 and 40

A map of the study area roadway network and functional classification is shown in Figure 2. Interstate 90 is the only Principal Arterial through the study area. At Exit 32, Junction Avenue is functionally classified as a Minor Arterial through the interchange, then transitions to a Major Collector south of I-90 as it becomes Vanocker Canyon Road. Pleasant Valley Road (Exit 37) and Tilford Road (Exit 40) are Minor Collectors, and Pleasant Valley Drive (Exit 34) is a Local Road. All four interchanges are standard diamond service interchanges. The ramp terminals are unsignalized with STOP-control only on the exit ramp approaches. Temporary signals are installed at the Exit 32 ramp terminals during the annual Sturgis Motorcycle Rally.

Pavement Conditions

The SDDOT has established targets for overall pavement condition based the Surface Condition Index (SCI). The SCI is a value that takes into account roughness, rutting, faulting, and distress using a scale of 0 to 5. According to the SDDOT's 2018 Asset Management Plan, the ten-year target goal and minimum value for the statewide highway network are 3.90 and 3.55, respectively.

The SDDOT conducted a pavement condition survey for the section of I-90 from Exit 32 to Exit 40 in 2017. The SCI for was calculated. Figure 3 shows the average SCI for each pavement segment within the study area grouped by age. Approximately 55% of the pavement in the I-90 study corridor has been replaced in the last 15 years. These segments received a SCI greater than 4.00, which is considered to be in good condition and does not require replacement or resurfacing. The eastbound section of I-90 between the Tilford Port of Entry and the Exit 32 interchange roadway surface is about 35 years old and has an average SCI of 3.13, which is below the minimum value for a statewide highway.

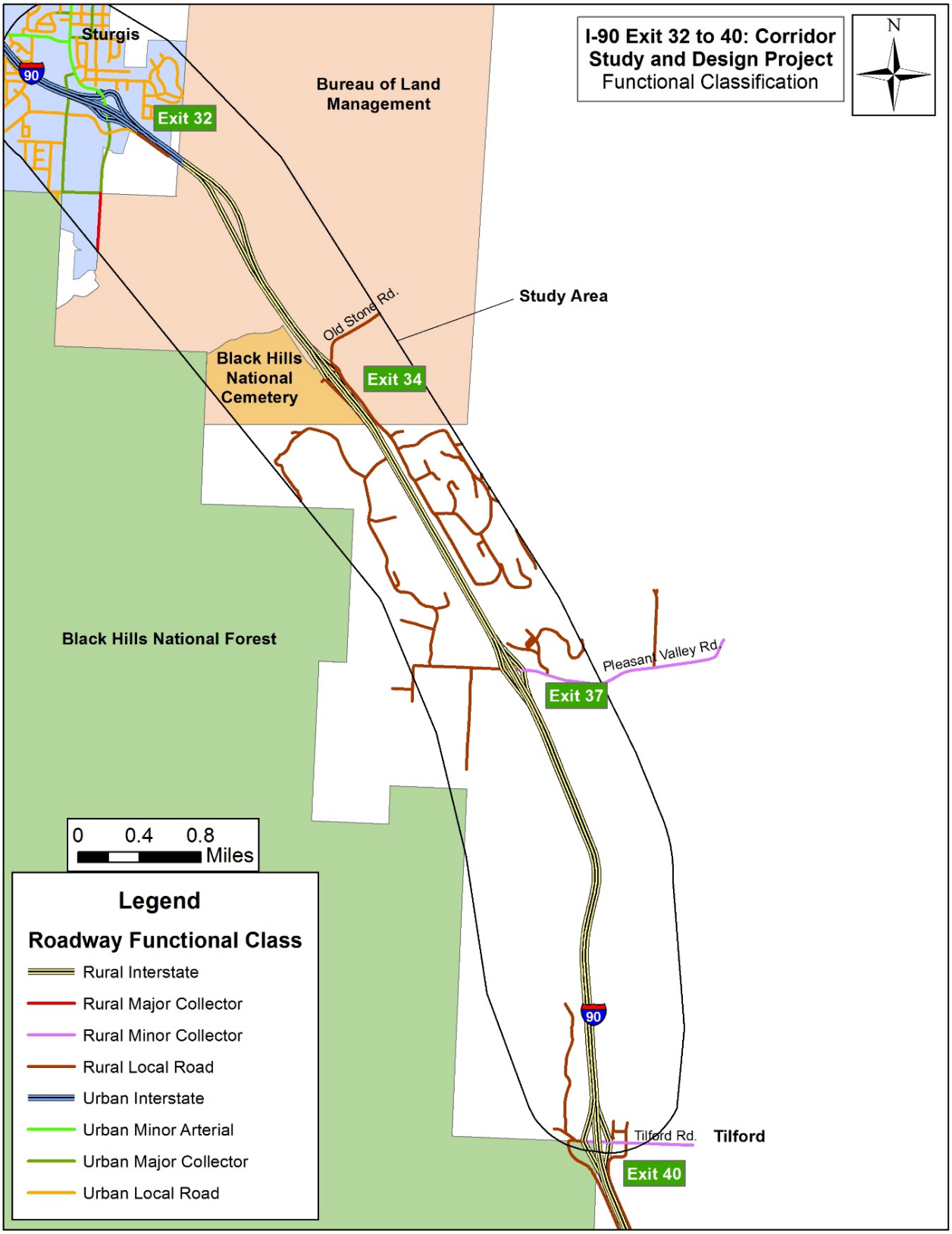


Figure 2: Study Area Roadway Network and Functional Classification

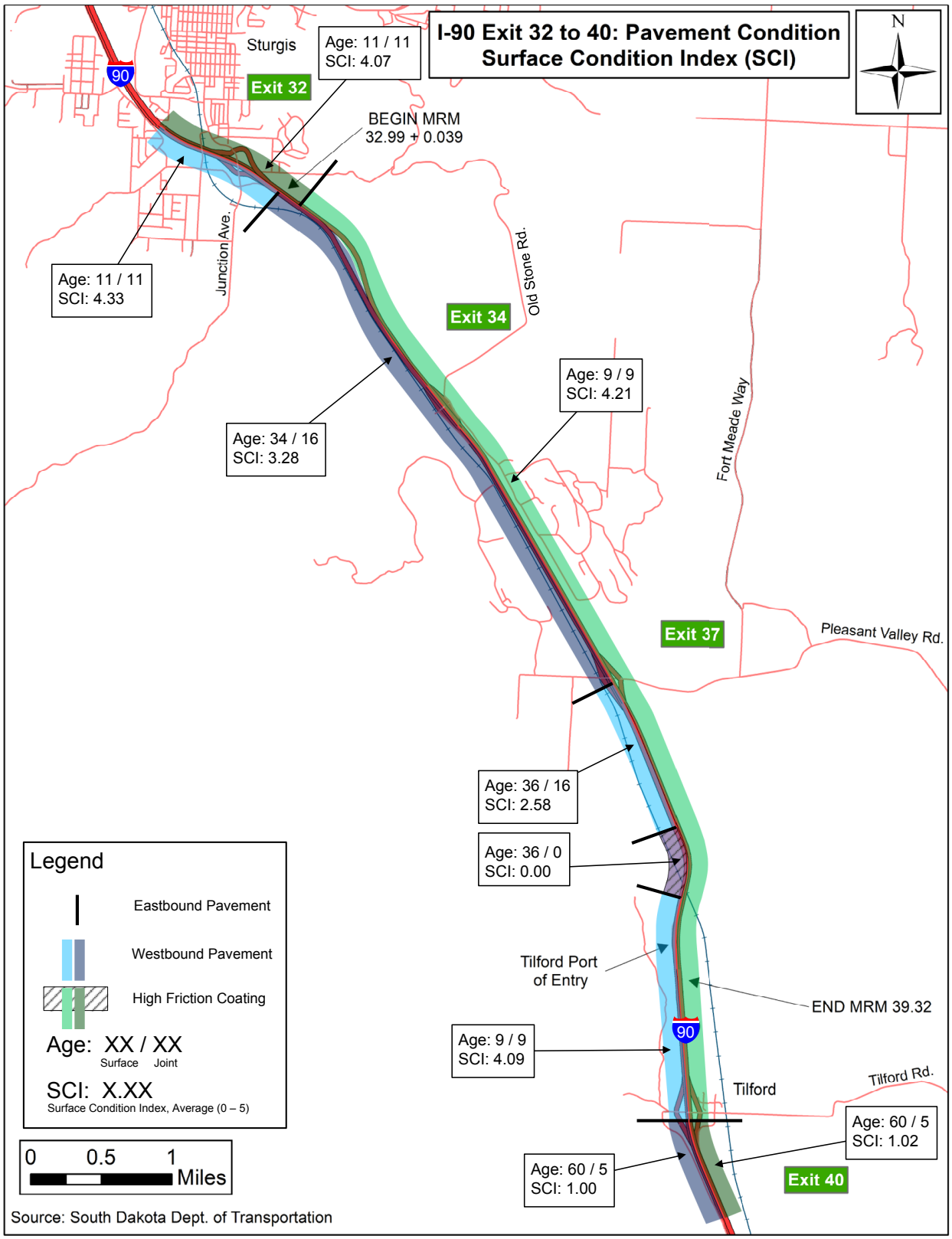


Figure 3: Pavement Conditions

Existing Guardrail Conditions

Traffic barrier is present along the I-90 project corridor between Exit 32 and 40. On the north end of the project corridor, barrier is predominantly used for slope protection as traffic on I-90 negotiates the initial curve south of Sturgis (between MRM 33 and MRM 34). Barrier systems protecting bridge ends and structure openings within the 30-foot clear zone are located intermittently throughout the corridor. Several types of traffic barrier systems are present:

- CASS 3 Cable (high tension)
- 3 Cable Guardrail (low tension)
- Thrie Beam
- W Beam

Currently, only highway safety hardware must comply with the Manual for Assessing Safety Hardware (MASH) for new permanent installations. After the year 2020, full replacement will be required. Existing guardrail within the I-90 study corridor will need to be updated to comply with the MASH TL-3 crash test standard.

Traffic Volumes

Year 2017 traffic volumes were obtained from two sources:

1. 24-hour directional volumes were collected for the Interstate 90 mainline at permanent Automatic Traffic Recorder (ATR) stations. Traffic counts were obtained for the week of September 11-14, 2017 and included vehicle classification data.
2. The consultant team collected hourly intersection turning movement counts on two occasions: August 8-9, 2017 during the Sturgis Motorcycle Rally, and again on September 12, 2017. The counts collected during the rally (between 9:00 a.m. and 9:00 p.m.) were collected for reference purposes only and were provided to SDDOT to supplement turning movement counts collected during the rally from previous years. The counts obtained on September 12, 2017 were collected from 6:30 a.m. to 7:00 p.m. and were used as inputs to the intersection analyses. Both sets of counts included vehicle classification data.

The I-90 directional counts were corrected for daily and seasonal variation based on factors developed by the SDDOT from data collected at the weigh-in-motion station within the corridor (“WIM 901”). These are scaling factors that equate traffic counts by month of the year for which they are collected to an annual average daily traffic volume. Year 2017 average daily traffic volumes (ADT) for I-90 mainline study segments are shown in Figure 4.

Peak hour a.m. and p.m. intersection turning movements for study area intersections during the motorcycle rally are shown in Figure 5. Likewise, peak hour a.m. and p.m. intersection turning movements collected in September and used in the analyses are shown in Figure 6.

Geotechnical Conditions

During the geotechnical review of the Exit 32 to 40 project, held in the summer of 2020, the hillside along west bound I-90 was identified as a significant landslide risk. An emergency slope correction project was completed in 1996 following a landslide along the present WB off ramp. To stabilize the hillside, a berm was placed adjacent the I-90 hillside and Blucksberg Drive constructed over top the berm. Due to the instability of the hillside, SDDOT’s Geotechnical Department strongly recommended no excavation occur along the westbound lanes of I-90. If excavation is not avoidable the entire hillside would need to be excavated from the top down to eliminate the possibility of adverse affects to I-90 and preserve traffic on Blucksberg Drive, the Blucksberg Mountain development’s sole ingress/egress.

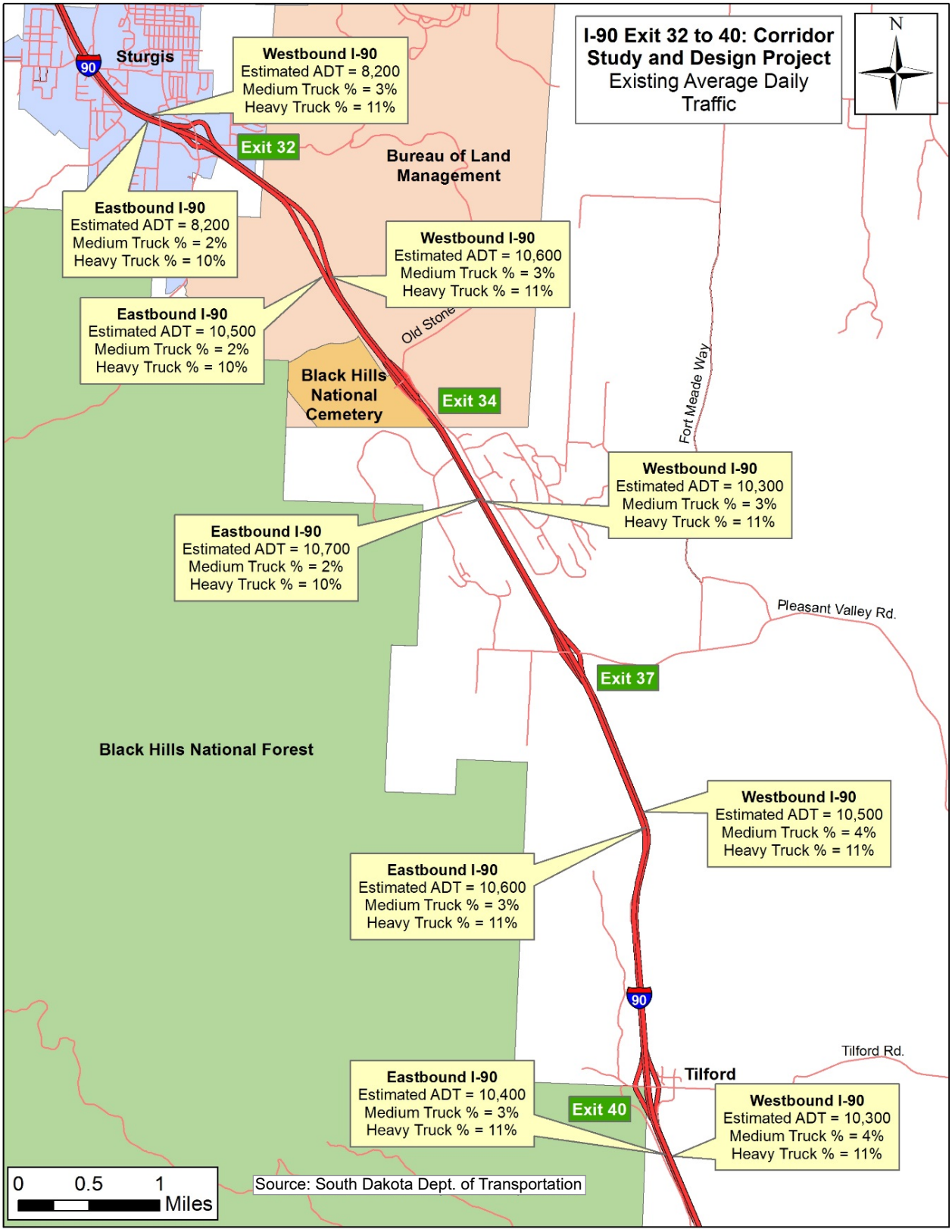


Figure 4: Existing Average Daily Traffic and Truck Percentages

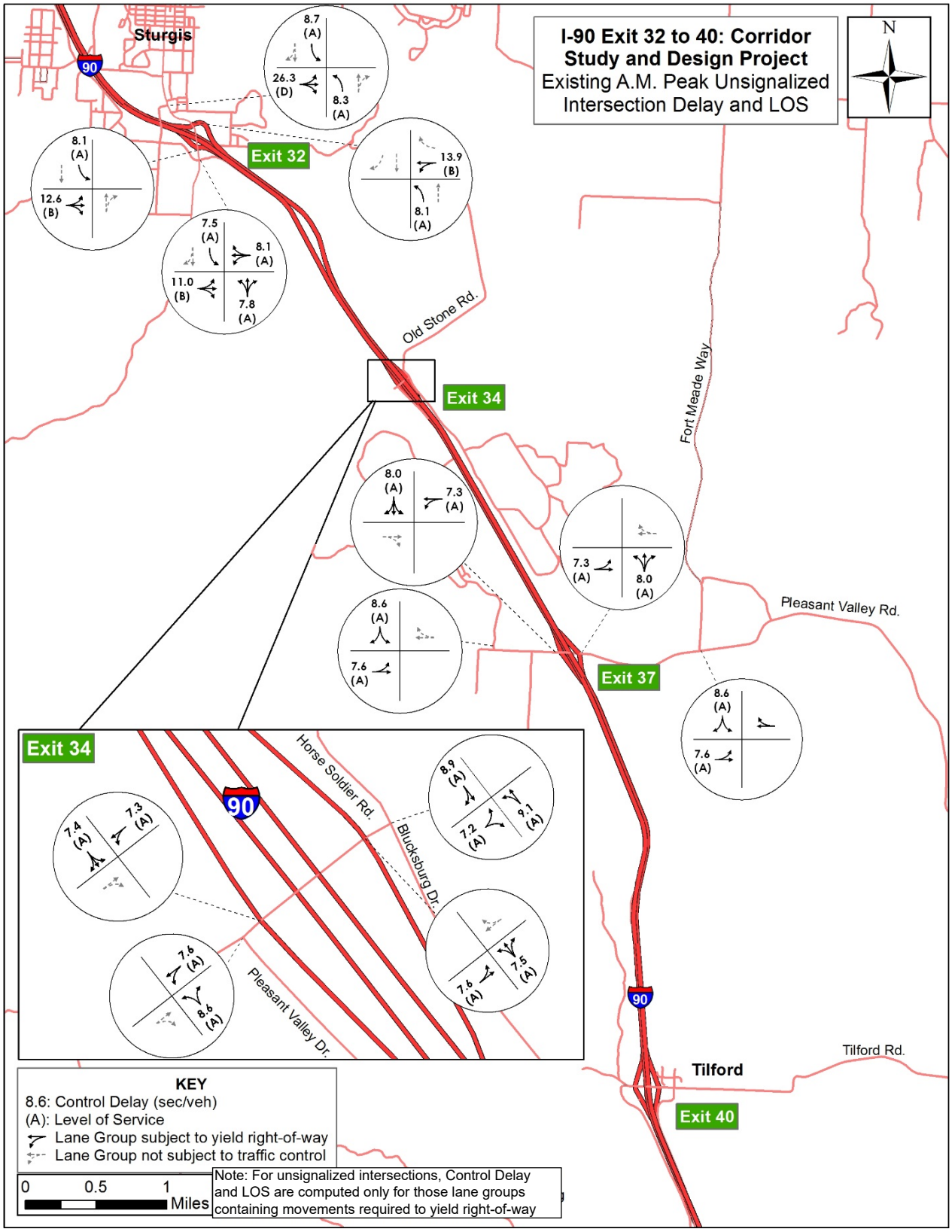


Figure 5: Existing Unsignalized Intersection Traffic Operations – A.M. Peak

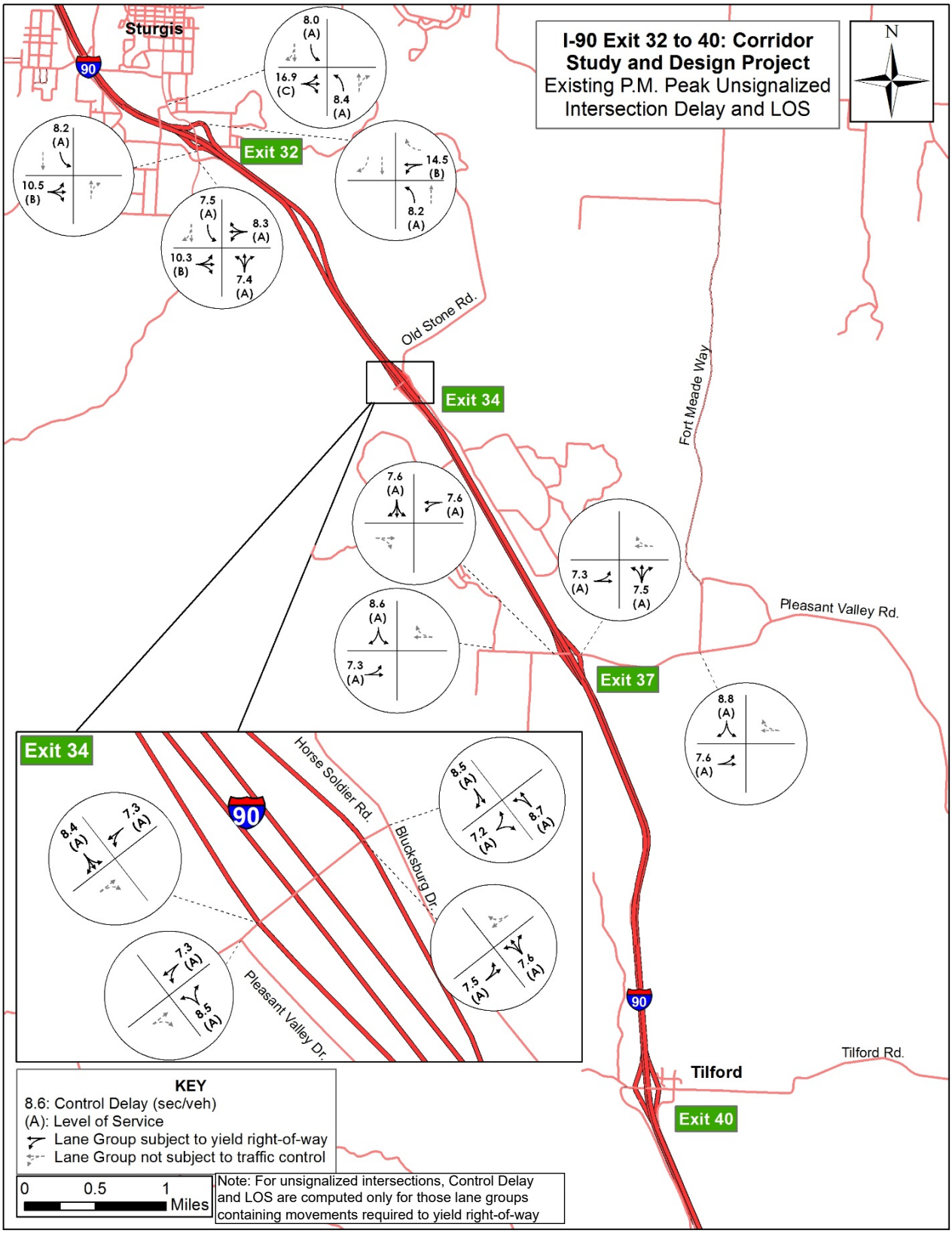


Figure 6: Existing Unsignalized Intersection Traffic Operations – P.M. Peak

Traffic Operations

I-90 is the only primary north-south roadway serving Sturgis between Exit 32 and 40. With only one highway and no service or frontage road, there are no alternate routes to relieve congestion on I-90. The consultant team conducted an analysis of existing traffic operations to determine the functionality of intersections and freeway along the I-90 corridor. The analysis found no existing capacity deficiencies for the mainline, the interchange ramps, or the crossroads.

Exit 34

The entrance to the Black Hills National Cemetery (BHNC) is located adjacent to the Exit 34 interchange. During large services and frequently on patriotic holidays, queues form while waiting to enter the cemetery causing vehicles to back up onto the ramp and even the interstate, disrupting I-90 traffic. BHNC staff indicated traffic rarely backs onto the interstate, but more frequently queues can back up onto the railroad corridor creating a hazardous rail-vehicle conflict.

Exit 37

Residents are concerned about the high volume of truck traffic that travels on Fort Meade Way. This road is used as an alternate route to Sturgis, SD Highway 34, and SD Highway 79. The road is unpaved and is not designed to handle large trucks. Residents are not opposed to the truck traffic, but they would like to see upgrades to the road to accommodate heavy vehicles. A sign currently in place on the eastbound entrance to County Highway 8 reads “local trucks only.”

Tilford Port of Entry on Eastbound I-90

Trucks preparing to exit I-90 for the TPOE typically need to reduce speed relative to through traffic, sometimes causing slowdowns on I-90. There is no deceleration lane to allow trucks to clear the I-90 mainline. The off-ramp to the TPOE is short and does not have the capacity to contain the queue of trucks during weigh times. Queues often spill into the main lanes or occupy the shoulder. Adjustments to the TPOE ramps could affect traffic flow and function within the site, prompting a review of the existing facility.

Level of Service

The ‘Freeway Facilities’ traffic analysis is a method that provides a level of service (LOS) analysis for freeway facilities. The Freeway Facilities method is a directional analysis which produces performance measures for individual segments. Freeway Facilities analyses of existing conditions along the corridor were performed for the a.m. peak period (7:00 a.m. – 8:30 a.m.) and for the p.m. peak period (4:00 p.m. – 5:30 p.m.), as determined from the traffic counts. The following performance measures are reported: average travel speed (mph), density (pc/mi/ln), LOS, and demand-to-capacity ratio (D/C). According to the Highway Capacity Manual (HCM), studies on LOS perception by rural travelers indicate the presence of lower-density thresholds in comparison to urban freeway travelers. The majority of the I-90 study section is located outside Sturgis city limits, thus the entire corridor was evaluated as a rural facility.

The results indicate, both at the segment level and at the facility level, the study section of I-90 operates at an acceptable level of service during typical weekday a.m. and p.m. peak hours. For this analysis, “typical” means no inclement weather, incidents, work zone activities, or special events. Overall facility results are presented in Table 1.

Table 1: Level of Service - Overall Facility Results

Analysis Direction	Mean Speed (mph)	Average Travel Time	Density (pc/mi/ln)	LOS
A.M. Peak				
Eastbound	70.1	9.3 minutes	1.4	A
Westbound	71.3	9.4 minutes	1.4	A
P.M. Peak				
Eastbound	70.0	9.4 minutes	1.7	A
Westbound	71.0	9.4 minutes	1.6	A

Existing Roadway Needs

Currently, no capacity deficiencies exist for the I-90 mainline or the crossroads that form its service interchanges within the study area. For typical weekday a.m. and p.m. peak periods, all facilities (with one exception) operated at a LOS B or better. The one exception was the STOP-controlled minor street approach of eastbound Vanocker Canyon Road at Junction Avenue. This intersection operates at LOS D during the a.m. peak and LOS C during the p.m. peak.

Existing Pedestrian and Bicycle Facilities

The consultant team reviewed resources provided by federal and state agencies, Meade County, and the City of Sturgis to gain a thorough understanding of the existing pedestrian and bicycle facilities within the project corridor.

City of Sturgis Trails

The City of Sturgis has five designated non-motorized trails within the City limits. The closest one to the project limits is a North/South trail called Deadman Trail, approximately one-half mile north of Exit 32. Other bike paths within the City are Ball Park Drive Trail, Centennial Bike Path, Connector, and Moose Drive Bike Path.

Centennial Trail

Centennial Trail is a 111-mile-long hiking, horseback riding, mountain biking, and intermittent automotive trail. It starts near Bear Butte State Park and continues through the Black Hills until it reaches Wind Cave National Park near Hot Springs. The trail is managed through a partnership between the US Forest Service, the Bureau of Land Management (BLM), the National Park Service, and the South Dakota Department of Game, Fish, and Parks. The trail crosses the project area just north of Exit 34 and continues to the Alkali Creek Trailhead approximately one-half mile east of the Exit 34 interchange. The section of Centennial Trail starting at the Alkali Creek Trailhead up to Highway 34 in Sturgis is designated as a National Backcountry Byway. Vehicle travel is allowed on the five-mile segment of gravel road.

Safety

Crash Summary

Historical crash data were collected along the study area for the five-year period between 2012 and 2016 which constitutes the “Analysis Period” for this report. A total of 423 crashes occurred over the Analysis Period within study area. Two of the crashes resulted in fatalities, 21 resulted in incapacitating injuries, and 46 resulted in non-incapacitating injuries. 131 crashes were designated as ‘wild animal hit’ crashes.

To better understand the corridor crash history, crash types were examined based on the ‘Manner of Collision’ field in the crash reports. Single vehicle crashes were the most common crash type (281 crashes, 66%) and are predominately run-off-the-road incidents. Animal collisions were the second most commonly reported crash type, however many of these collisions were coded as single vehicle crashes. As illustrated in Table 2, crashes were evenly distributed along the segments of I-90 included in the study. However, several 0.3-mile “hot-spots” with a high concentration of crashes also exist. The spot with the highest number of crashes (43) is located between Exit 32 and Exit 34 (MP 33.0 + 0.000-33.3). The next highest crash location (34) is found between Exit 34 and Exit 37 (MP 36.0-36.3).

Table 2: Crash Summary (2012-2016)

Segment	Route	Description	Begin MRM	End MRM	Length (mi.)	Number of Crashes (2012-2016)	ADT (veh./day)	Actual Crash Rate (Annual Crashes/ 100 million VMT)	Statewide Average Crash Rate (Annual Crashes/ 100 million VMT)	Facility Type
1	I-90	West of Exit 32	31.50	32.41	0.9104	39	15,800	149	302	Urban Interstate
2	I-90	Between Exits 32 & 34	32.41	34.81	2.400	79	20,300	89	302/129	Urban/Rural Interstate
3	I-90	Between Exits 34 & 37	34.81	37.01	2.200	83	20,200	102	129	Rural Interstate
4	I-90	Between Exits 37 & 40	37.01	40.20	3.190	95	20,200	81	129	Rural Interstate
5	I-90	East of Exit 40	40.20	41.00	0.8004	37	19,900	127	129	Rural Interstate

Safety Analysis

The consultant team conducted an analysis to identify safety issues, suggest contributing factors, and propose countermeasures to improve safety for a curved segment of I-90 between reference mile-points 38.0 and 38.7.

A horizontal curve on I-90 between reference mile-points 38.0 and 38.7 experienced 34 crashes between the years 2012-2017. The predominant crash type at this location was run-off-the-road (ROR) crashes (74%, 25 crashes). This area ranked first in terms of crash severity with two incapacitating injuries and five non-incapacitating injuries. When compared to other segments within the corridor of similar length, this location observes the highest proportion of single vehicle crashes.

Contributing factors to ROR crashes typically include inadequate lane width, slippery pavement, inadequate median width, poor delineation, and excessive speed. Of the 25 recorded ROR crashes, 18 cases involved excessive speeds. Weather related crashes accounted for 60% of ROR crashes along the curve segment. While most ROR crashes did not involve a collision with a fixed object, the crash data contained 10 incidents of overturning vehicles, resulting in severe injuries to occupants. Due to the consistency of ROR and overturning crashes along this segment, countermeasures to reduce crash frequency and severity are warranted.

Location-Specific Safety Concerns

Exit 34

This bridge at this location is considered ‘critical’ since it carries mainline interstate traffic. Bridge columns under I-90 mainline are very close to the cross-street lanes of travel and do not have protective barriers in place. If these columns are struck, the bridge could become structurally compromised. This happened in 2009 and the bridge columns received repairs that same year.

Exit 40

A high number of guardrail crashes occur during snowy or icy conditions around the interchange at Exit 40. In a previous study conducted for SDDOT eight of 32 crashes that occurred at the interchange between July 2006 and July 2009, were guardrail crashes. Six of eight guardrail crashes occured during snowy or icy conditions. Guardrails are in place on both sides of the overpass on Tilford Road, and under the overpass protecting the bridge columns on I-90. Of the more severe crashes, 75% occurred during snowy or icy conditions.

Tilford Point of Entry on Eastbound I-90

Lighting is provided to illuminate the port along the facility’s on and off ramps. According to the most recent maintenance inspection report, the lighting infrastructure is in good condition.

Existing Safety Needs

The consultant team analyzed crash data for the 5-year period from January 1, 2012 through December 31, 2016. All segments of I-90 between Exit 32 and 40 had annual average crash rates below the statewide average for similar facilities. However, five 0.3-mile spots were identified as candidates for further study of potential safety improvements. The most frequent types of crashes within the corridor were related to run-off-the-road occurrences and collisions with animals.

Figure 7: Dynamic Message Sign

Intelligent Transportation Systems (ITS) Infrastructure

The SDDOT does not currently have a Traffic Management Center (TMC), but is interested in building one should the Federal Highway Administration make operational funding available in the future, nor do they currently have a centralized Advanced Transportation Management System (ATMS) for managing the various ITS devices located around the state. The majority of the ITS equipment throughout the State is maintained by the SDDOT Office of Research with some routine items being handled by each of the four (4) regions in the state. Each ITS device or system is controlled by the manufacturer's proprietary software for doing routine tasks such as posting messages to a Dynamic Message Sign (DMS) or viewing a Closed-Circuit Television (CCTV) camera. Besides access from each of the regions, all of the devices that have a communications connection can be accessed from the DOT headquarters in Pierre, SD. The SDDOT does have an Advanced Traveler Information System (ATIS) located at **https://www.safetravelusa.com/sd/**,and the corresponding 511 System that provides existing roadway conditions and information to the traveling public. The existing ITS devices in the study corridor are described below.


Figure 8: Closed Circuit Television

Dynamic Message Signs (DMS)

There is one DMS within the project limits which is located on westbound I-90 at approximately mileage reference marker 35.04 + .5 as shown in Figure 7. This sign is used for posting warnings and traveler information to the public.

Closed Circuit Television (CCTV)

One CCTV camera with pan-tilt-zoom capabilities within the study corridor is used for monitoring roadway conditions. It is co-located on the DMS on westbound I-90 at reference mileage marker 35.04 + 0.5 as shown in Figure 8.

Road Closure Gates and Signs

SDDOT operates snow gates to close roadways during severe inclement weather conditions around the state. Within the project limits, gates are located at Exit 32 in Sturgis as shown

Figure 9: Road Closure Gate

in Figure 9. Advanced warning signs are also located at each of the closure points. There are also advance warning signs at each closure location, as shown in Figures 10 and 11. Both the gates and signs are currently activated manually. When South Dakota Highway Patrol and SDDOT agree on the Interstate closure time, a SDDOT employee is sent out to flip the advanced warning signs activation switch. After the signs are activated the gates are manually lowered to close the roadway via a handcrank. The handcrank can be seen in Figure 9 on the right-hand side of the pole just above the base.

If additional ITS functionality and communications backbone are added along this corridor, SDDOT would consider automating both of these functions. As a part of this automation, a CCTV camera or other form of positive verification would need to be installed to verify that the signs indeed were activated. Additional upstream signage with beacons need to be added (dynamic or static) to warn the oncoming motorists about the automatic freeway closure (fully automatic closure without the need of a police or maintenance vehicle with flashing lights blocking the roadway and closing the gates). Other proactive advanced warnings may include deploying a CB-Radio based traveler information and warning system and/or other emerging safety technologies such as Dedicated Short Range Communications (DSRC) equipment at these locations to alert the truck drivers and other motorists in advance preparing them for a smooth slow down and exit.

Electronic Screening & Traffic Monitoring

The SDDOT and SDHP operate an electronic screening system at the Tilford Port of Entry on eastbound I-90 at mileage reference marker 38. For westbound I-90, SDDOT only collects volume, speed, classification, and weight information from the in-pavement monitoring equipment. There is no physical weigh station for overweight vehicles in this direction. The in-pavement collection equipment for westbound I-90 is shown in Figure 12.

In the eastbound direction, SDDOT and SDHP operate a full Electronic Screening and Traffic Monitoring system for the Tilford Port of Entry that supports e-screening to allow trucks with in-cab transponders to by-pass the inspection station, reducing emissions associated with the truck's deceleration/ acceleration. This system also includes a license plate reader to identify vehicles that may not have a transponder but are pre-approved. It can be seen in Figure 13. The Electronic Screening and Traffic Monitoring system consists of a single load cell (SLC) weigh-in-motion (WIM) mainline sorter system with automatic vehicle identification (AVI), an over-height detector, piezoelectric tracking sensors, side-view camera, scale house operator electronics and an intelligent Roadside Operations Computer (iROC). The transponder readers, over-height detector, and side view camera can be seen in Figure 13.

Figure 10: Advance Road Closure Sign

Figure 11: Road Closure Sign at Closure Point


Figure 12: 1-90 Traffic Data Collection Loops & Scales


Figure 13: I-90 Weigh-in-Motion Equipment

Trucks that do not have in-cab transponders or legible license plates (or the ones that are randomly selected for a safety or log-book check) are required to enter the weigh station. Two message boards direct vehicles to enter the inspection station, as shown in Figure 14. SDDOT uses the Drivewyze commercial vehicle program to screen on credentials as well, but currently it does not have weight information. SDDOT is currently seeking a Federal Motor Carrier Safety Administration grant to integrate vehicle weight information into the system.

Similar to the WB I-90 direction, SDDOT uses this Electronic Screening and Traffic Monitoring station to collect speed, volume, classification and weight information. If the roadway is reconstructed and the WIM equipment is reinstalled, SDDOT would consider additional ITS related safety technologies at the Tilford Port of Entry.

ITS Needs

The SDDOT has considered installing several new ITS elements throughout the state, including this project study corridor. To enhance the functionality of the planned ITS elements, and to manage the existing capability, the SDDOT may consider a Traffic Management Room (TMR) at the Rapid City Region maintenance office or a portable virtual Traffic Management Center (TMC) utilizing various applications operating on a secure phone or tablet based upon number and location of the devices as well as the system architecture.

Future ITS improvements are discussed in the Year 2050 Traffic Conditions section of this report. The potential ITS systems/devices do not represent all the SDDOT's needs to enhance the corridor's level of service considering the extreme weather and heavy traffic volumes. Further identification and investigation of stakeholders' user needs will be developed in the ConOps workshop to be scheduled at a later date. Each strategy developed will be checked against the current SDDOT Transportation System Management & Operations plan to ensure that it is compatible with identified business processes and institutional capabilities. This step will help SDDOT lay the groundwork for future TSM&O Statewide ITS Deployment plan development.

Figure 14: I-90 Weigh Station Bypass Dynamic Signs

+ ENVIRONMENTAL OVERVIEW

Study Process

The environmental review process is undertaken to ensure the proposed project satisfies user needs while maintaining or improving existing area resources. The process also provides a mechanism for disclosing environmental impacts and gives the decision makers the appropriate information to make a sound choice among alternatives. Public and agency scoping has begun for the I-90 corridor project including agency coordination letters, tribal consultation letters, stakeholder meetings, and public information meetings.

The SDDOT's environmental process is in accordance with rules set by the National Environmental Policy Act (NEPA), as well as other related federal, state, and local requirements. Early in the NEPA process, SDDOT will determine which of the three basic "classes of action" is most appropriate for documenting the projects based on the location, extent, and potential for impact on the human environment. The class of action defines the level of environmental review required to make a determination. An independent utility and logical termini analysis will be completed to determine whether these projects are single, stand-alone projects and will not trigger other actions potentially requiring environmental review. The termini for these projects will be selected in accordance with FHWA Technical Guidelines for termini development.

Documenting the environmental review process will include the detailed study of the physical, social, cultural, and economic impacts on the natural and human environment for the proposed projects under consideration. This information guides alternative development that avoids or minimizes impacts. Where impacts cannot be avoided, comprehensive environmental review along with public involvement and agency coordination will help identify potential mitigations to be evaluated and integrated into the projects as appropriate.

Documentation also provides a report of the environmental process undertaken by the SDDOT, relates the results of the SDDOT's analysis to the public, and allows for an opportunity to provide input and comment. Once the appropriate document is selected, a draft report will be developed. If an Environmental Assessment (EA) is prepared, the document will be distributed for public comment. The EA provides sufficient environmental documentation to determine the need for an Environmental Impact Statement (EIS) or that a Finding of No Significant Impact (FONSI) is appropriate.

Environmental Overview

Floodplains

The current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) have been reviewed for this project (Map Numbers 46093C1167F, 46093C1188F and 46093C1525F in Meade County, South Dakota dated September 16, 2011). No part of the project is located within a base flood (100-year or Zone A) floodplain boundary.

Historic Resources

The consultant team studied historic and cultural resources throughout the project corridor to understand existing conditions and potential impacts. This process began with a Class I Literature Search. The objective of the literature search and windshield survey was to obtain information regarding archaeological surveys that had been completed in the project area, identify recorded archaeological sites and architectural resources within the project limits, and provide recommendations for additional cultural resource surveys.

Portions of the project area have been subject to Class III survey during the last 20 years. Thirty-four previously recorded archaeological sites are located within the project area and were identified during previous cultural resource survey efforts. Of these 34 sites, two are listed on the National Register of Historic Places (NRHP) and are 39MD0082 and 39MD3002. Three sites have been determined eligible for listing on the NRHP and are 39MD0572, 39MD0628 and 39MD2003. Two sites (39MD0760 and 39MD0872) have been recommended eligible by the surveyor but have not been formally determined eligible by the SHPO. Nine sites have been determined not eligible, and two additional sites have been recommended not eligible but do not have formal SHPO determinations. Fourteen sites have not been evaluated. One of the unevaluated sites, 39MD0136, has had additional testing conducted by the BLM and is noted as having significant intact deposits. One site (39MD0022) is documented as a Ute burial site.

The Black Hills National Cemetery and the Fort Meade Historic District are both listed on the NRHP. All of the other previously recorded historic structures or bridges within the project area have been determined Not Eligible for listing on the NRHP and no further work is recommended. Based on the windshield survey and historic maps review it appears that approximately 12 individual structures would need to be recorded as historic architectural resources. There are approximately eight structures along Dickinson Drive including three houses, two commercial buildings, and some metal sheds. One house along Vanocker Canyon Road and a house and outbuildings within the RV Parks would require recordation although most of the structures in the campground are more recent and do not meet the age criteria for recordation. The VFW Memorial Chapel is located at Exit 34 across from the Black Hills Cemetery. In addition to the individual resources noted during the windshield survey, the Town of Tilford may require recordation as a historic district.

Three eligible structures are located outside the project limits but within a mile of the project area and include the Beug House (MD50), the McMillan House (MD213), and the CNW Passenger Depot (MD348). All three of these resources are located within the town of Sturgis and do not have current visibility of the project area.

Hazardous Materials

Excavation for roadway widening or interchange configurations can provide a potential for exposure of contaminated soils and regulated materials. A Phase I ESA will be performed for the study area. If recommended in the Phase I ESA, a Phase II may be performed to determine the extent of suspected contamination.

Wetlands & Waters of the US

The consultant team conducted a wetland and waterway review to determine if any jurisdictional wetlands exist within the project corridor. This included a desktop analysis followed by a field delineation to verify the findings of the desktop analysis. The desktop delineation was completed in spring 2018 followed by the field work in summer 2018. The desktop and field reviews found the following resources along the corridor:

- Alkali Creek, a beneficial use stream for:
    - Domestic water supply waters
    - Coldwater marginal fish life propagation waters
    - Limited-contact recreation waters
- Bulldog Creek
- Forested (PFO) Wetlands
- Freshwater Emergent (PEM) Wetlands

Impacts to the above resources will require coordination with the U.S. Army Corps of Engineers (USACE). Impacts to USACE jurisdictional wetlands will require the analysis of the alternatives under consideration to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) as part of the permitting process as required by the 404(b)(1) guidelines. To be selected as the LEDPA, a project alternative must result in the least impact to aquatic resources while being practicable after taking into consideration cost, existing technology, and logistics—while also considering the overall project purpose. The methods used for wetland and waterway delineations are included in the following sections as well as the findings from those processes.

Methodology

Wetlands Methods

Wetland determinations were based on the criteria and methods outlined in the U.S. Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (1987) and subsequent guidance documents (USACE 1991, 1992), and the Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Great Plains Region Version 2.0, Technical Report ERDC/EL TR-10-1 (2010).

The wetland determination involved using available resources to assist in the assessment such as U.S. Geological Survey (USGS) topographic maps, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping, US Geological Survey National Hydrography Data (NHD), and recent and historic publicly available aerial photography.

The consultant team completed routine level 2 on-site wetland determinations using the three criteria (vegetation, soil, and hydrology) and technical approach defined in the USACE 1987 Manual and applicable Regional Supplement. According to procedures described in the 1987 manual and applicable regional supplement, areas that under normal circumstances reflect a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology (e.g., inundated or saturated soils) are considered wetlands.

Additionally, as climate plays an important role in the formation and identification of wetlands, the consultant team reviewed antecedent precipitation in the months leading up to the field investigations. The current year's precipitation data was compared to long-term (30-year) precipitation averages and standard deviation to determine if precipitation was normal, wet, or dry for the area using a WETS analysis as developed by the NRCS.

In areas where the wetlands were connected by a culvert under the roadway, a sample point transect was completed on only one side of the road assuming that the wetlands on either side of the roadway would exhibit the same criteria. If the wetland type was different, then a new set of transects was completed.

Sample points were placed in all areas identified as being an NWI-mapped wetland or a whole unit hydric soil. If sample points did not meet wetland criteria, data were recorded to document non-wetland conditions. In study areas where neither NWI or hydric soils were mapped and hydric vegetation or surface hydrology was not observed, photos were taken to document the lack of wetland or waterway criteria.

Waterways Methods

The ordinary high-water mark for waterways was determined and surveyed along with culverts, and/or other connections to off-site wetland or aquatic features that may be under federal or state authority using a Global Positioning System (GPS) and mapped using Geographic Information System (GIS) software. Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an ordinary high-water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank, shelving, changes in soil characteristics, destruction of terrestrial vegetation, the presence of litter and debris, and watermarks on structures that are inundated during normal high-water conditions. Streams were classified as perennial, intermittent, or ephemeral based on field observations and review of depth to water table and flood frequency data available from the USDA NRCS. The OHWM typically represents the potential limits of the USACE jurisdiction. The USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

Existing Conditions Findings

Wetlands

Nine wetlands were delineated within the study area, and descriptions of each wetland are summarized in Table 3. All culvert locations were located with a GPS capable of sub-meter accuracy.

Table 3: Summary of Wetlands Delineated within the Study Area

Wetland ID	Approximate MRM	Latitude	Longitude	Side of Road	Cowardin Class	Preliminary Assessment Jurisdictional Status	Acres
WL-1	33.34	44.38934060	-103.4890465	East	PEMB	Jurisdictional	0.182
WL-2	33.48	44.38704636	-103.4879032	Median	PEMC	Jurisdictional	0.186
WL-3	35.00	44.37139846	-103.4719110	East	PEMB	Not Jurisdictional	0.030
WL-4	35.04	44.36902897	-103.4720416	West	PEMC	Not Jurisdictional	0.029
WL-5	35.40	44.36722760	-103.4695841	West	PEMC	Jurisdictional	3.800
WL-6	37.28	44.34272419	-103.4477676	West	PEMA	Jurisdictional	0.145
WL-7	37.80	44.33423489	-103.4408175	Both	PEMA/PEMC	Jurisdictional	2.508
WL-8	38.00	44.33210527	-103.4378368	East	PEMA	Jurisdictional	0.217
WL-9	36.14	44.35537925	-103.4569543	East	PEMC	Not Jurisdictional	0.089
WL-10	40.20	44.30111694	-103.4357746	West	PSS	Not Jurisdictional	0.297
WL-11	35.50	44.36309917	-103.4657118	West	PEMA/PEMC	Jurisdictional	0.853
						Total	**8.336**

Upland

Upland within the study area consisted of road ditch, hay land, and pasture. Common species seen at sample points within the study area included: smooth brome (Bromus inermis), Kentucky bluegrass (Poa pratensis), western wheatgrass (Pascopyrum smithii), western snowberry (Symphoricarpos occidentalis), prairie rose (Rosa arkansana), common dandelion (Taraxacum officinale), and prairie sage (Artemisia ludoviciana). Typically, the slope of the upland areas eliminated the possibility of ponding, which subsequently effectively eliminated any potential for wetland conditions to exist within the upland areas. No whole unit hydric soils were mapped by the NRCS within the study area according to the Meade County Soil Survey.

Waterways
Eleven waterways were identified within the study area. The waterways are described below and summarized in Table 4. All culvert locations were located with a GPS capable of sub-meter accuracy.

Table 4: Summary of Waterways Delineated within the Study Area

Waterway ID	Name	Latitude	Longitude	Type	Preliminary Jurisdictional Status	Length	Acres
ST-1	Vanocker Creek	44.39626181	-103.5034393	Intermittent	Jurisdictional	274’	0.165
ST-2	Unnamed tributary	44.38897817	-103.4921817	Ephemeral	Jurisdictional	160’	0.004
ST-3	Unnamed tributary	44.38801114	-103.4870749	Intermittent	Jurisdictional	523’	0.027
ST-4	Unnamed tributary	44.34505285	-103.4522841	Intermittent	Jurisdictional	75’	0.097
ST-5	Alkali Creek	44.37568297	-103.4830099	Intermittent	Jurisdictional	5192’	1.365
ST-6	Unnamed tributary	44.37132197	-103.4715165	Intermittent	Jurisdictional	358’	0.021
ST-7	Unnamed tributary	44.34843135	-103.4522904	Intermittent	Jurisdictional	874’	0.206
ST-8	Unnamed tributary	44.34862695	-103.4503317	Ephemeral	Jurisdictional	172’	0.004
ST-9	Unnamed tributary	44.34895397	-103.4506180	Ephemeral	Jurisdictional	40’	0.001
ST-10	Pleasant Valley Creek	44.33955227	-103.4428329	Intermittent	Jurisdictional	436’	0.020
ST-11	Unnamed tributary	44.31411599	-103.4366898	Intermittent	Jurisdictional	788’	0.455
ST-12	Unnamed tributary	44.31099118	-103.4346002	Intermittent	Jurisdictional	427’	0.093
ST-13	Unnamed tributary	44.34574093	-103.4466259	Ephemeral	Jurisdictional	103’	0.014
ST-14	Unnamed tributary	44.34461091	-103.4446858	Intermittent	Jurisdictional	2123’	0.271
					Total	**13,161’**	**3.002**

Wildlife/Threatened & Endangered Species

The consultant team reviewed available USFWS and SDGFP Database Information (NatureServe) to determine the existence of wildlife, threatened and endangered species, and related habitat. The following species were determined to exist within the study area:

- Least tern
- Red knot
- Whooping crane
- Northern long eared bat

No designated critical habitat was found, however possible effects to fish, wildlife, plant communities, and known threatened and endangered species include possible acoustic and habitat impacts from construction and clearing. Interchange construction will include tree clearing of terrestrial habitat that could result in direct and permanent impacts to the northern long eared bat habitat. Tree removal areas will require coordination with the US Fish and Wildlife Service to determine if impacts are anticipated, and to work through mitigation if needed. Impacts to rare species, rare native plant communities, trees, shrubs, or other notable vegetation are not anticipated, however, typical erosion control and native reseeding practices should be implemented.

Section 4(f)

After the effective date of the Federal-Aid Highway Act of 1968, the Secretary shall not approve any program or project (other than any project for a Federal lands transportation facility) that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use.

The consultant team reviewed the corridor for Section 4(f) properties within one mile of the project and the following resources were identified:

- No designated Wild and Scenic Rivers within Meade County
- No FWS National Wildlife Refuges or easements
- No FWS Waterfowl Production Areas or easements
- No FWS Wetland Management Districts
- Nearest state park is Bear Butte over one mile away
- Fort Meade Historic District: Area of Critical Environmental Concern (ACEC)
- The U.S. Forest Service has jurisdiction over Centennial Trail that runs through BLM property and alongside Alkali Creek. The trail may be realigned if necessary, but must be approved by the BLM and the U.S. Forest Service.

Additional resources include the Historic and Archaeological properties located along the project corridor, which would also be subject to Section 4(f). Coordination will be required with the official with jurisdiction over the affected property. Impacts will be minimized where possible and if found to be unavoidable, the 4(f) process will be undertaken. 4(f) can be a lengthy coordination process, but there are several programmatic options for processing, dependent upon the impact and the resource that will be evaluated if needed.

Section 6(f)

The project has been reviewed for potential Section 6(f) involvement. The project will not cause the conversion of any land acquired, planned, or developed with funds from the Land, and Water Conservation Fund (LAWCON). Therefore, there will not likely be Section 6(f) involvement as part of the corridor improvements. However, the SDGFP will be contacted as part of the environmental documentation process to confirm the proposed project(s) would not impact Section 6(f) properties.

Noise

Anticipated sensitive land uses encountered in the study—as categorized by FHWA Noise Abatement Criteria (NAC)—include: residences, churches, schools, parks, places of worship, cemeteries (particularly the Black Hills National Cemetery, which is planned for expansion), and recreation areas/campgrounds. Several campground sites occur between Exit 34 and 37.

Identified resources include:

- Black Hills National Cemetery
- No Name RV Park
- Katmandu RV Park
- Vanocker Campground
- Kickstand Campground
- Rush No More RV Resort and Campground

Per SDDOT guidance, existing sound levels will be established by performing field measurements within all noise sensitive areas in the project area. The consultant team will prepare a noise analysis report that identifies noise impacts based on FHWA Noise Abatement Criteria (NAC). If impacts are identified, study limits may need to be expanded to determine extent of impact, and further TNM 2.5 analysis will be conducted to investigate additional impacts and/or evaluate potential structural noise abatement options (berms/barriers).

Cultural Resources

A Phase I study included a records review, windshield survey, and additional information provided by the Bureau of Land Management (BLM). The Phase I identified portions of the project area of potential effect (APE) having the potential to contain intact archaeological resources. The following resources were identified:

- Ute burial ground avoidance area and scatter sites
- BLM archaeological features
- Recommended eligible sites
- National Register listed sites
- Railroad (segments are historic)
- BHNC gates
- BHNC property
- Fort Meade Historic District
- Fort Meade Archaeological site

Avoidance areas were identified as initial concepts were developed. As the project moves through the environmental documentation phase, a Phase II cultural resources investigation involving shovel testing will be used to assess the potential for buried archaeological resources within the APE.

Environmental Justice

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations," dated February 1, 1994, requires that environmental justice be addressed in all federal planning and programming activities. The purpose of EO 12898 is to identify, address, and avoid disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority populations and low-income populations. The proposed project has a potential for federal permit requirements and will utilize federal funding. As such, it is considered a federal project for the purpose of compliance with this Executive Order. EO 12898 requires that the proposed actions be reviewed to determine if there are "disproportionately" high or adverse impacts on minority or low-income populations. "Disproportionate" is defined in two ways: the impact is "predominantly borne" by the minority or low-income population group, or the impact is "more severe" than that experienced by non-minority or non-low-income populations.

The steps for defining environmental justice impacts include the following:

- Step 1: Determine if an identifiable low income and/or minority population exists in the project area
- Step 2: Determine if there are potentially high and adverse environmental impacts disproportionately borne and appreciably greater for the low-income and/or minority populations
- Step 3: If the determination in Step 2 is 'Yes," then determine if further mitigation is possible to avoid or reduce the adverse effect to the population; or are other alternatives to avoid or reduce impacts practicable

The consultant team will review proposed actions along the corridor to determine whether the improvements will introduce high levels of adverse impacts that would have disproportionately high and adverse human health or environmental effects to any minority population or low-income population.

Cumulative Impacts

Cumulative impacts are defined as "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or persons undertakes such actions." The geographic areas considered are those areas directly adjacent to and near the I-90 Exit 32 to Exit 40 corridor. The project impacts defined during the environmental documentation for the I-90 project may include impacts to wetlands, floodplains, cultural resources and increased stormwater runoff.

Past actions in the project vicinity include decades of agricultural, residential and commercial development and transportation infrastructure improvements. All these have resulted in the current built environment surrounding the I-90 corridor, which is generally rural development. The Black Hills National Cemetery is expected to expand in the next decade. An EA is being completed for the expansion and impacts will be discussed as part of the environmental documents for the I-90 project. Based on conversations with property owners, further future development may occur at the Exit 40 interchange, however no plans are in place. No future development opportunities in the surrounding area have been identified.

Planning documents will be used to identify applicable projects including South Dakota's final 2016-2019 State Transportation Improvement Plan (STIP), and existing city and county comprehensive plans and capital improvement plans.

+ YEAR 2050 TRAFFIC CONDITIONS

Future Roadway Needs: Travel Growth Projections

Approach

The consultant team developed average daily traffic forecasts for the opening year (2023 for Exit 37-40 and 2025 for Exit 32-37) and design year (2050). These forecasts are needed to establish appropriate design criteria for potential geometric improvements and as an input for pavement design. Future year a.m. and p.m. peak hour traffic forecasts were developed for:

- I-90 mainline directional segments (for use in the HCM Freeway Facilities analysis)
- Intersection turning movements (for use in HCM Unsignalized Intersection analysis)

Seasonal Adjustments

Seasonal adjustment factors provided by the SDDOT for Weigh-in-Motion (WIM) Station 901 (MRM 38.185) were applied to directional counts collected on Tuesday, September 12th and Wednesday, September 13th in 2017. The adjustment factor for Tuesdays (1.043) and Wednesdays (1.036) in September were averaged (1.039) and this value was applied to the two-day average of the mainline counts. The seasonally adjusted average daily traffic (ADT) volumes were the basis for developing future year traffic forecasts. These factors were also applied to intersection turning movement counts conducted during that same time frame.

Growth Factors

Growth factors developed by the SDDOT Inventory Management Office were the primary basis for developing future year traffic forecasts. These growth factors, shown in Table 5, are broken down into 20-, 25-, 30-, and 35-year values for both rural and urban interstates. The opening year forecasts were developed by computing an average annual growth rate (agr) from the 20-year growth factors, then projecting that agr for six years (2017 to 2023) for Exit 37 to Exit 40 and eight years (2017 to 2025) for Exit 32 to Exit 37. The growth factors used in developing the opening year and design year forecasts are summarized in Table 6.

Table 5: SDDOT Growth Factors

Area/Facility Type	20-year	25-year	30-year	35-year
Rural Interstate	1.267	1.325	1.390	1.455
Rural Arterials/Collectors/Locals	1.339	1.425	1.510	1.595
Urban Interstate	1.407	1.500	1.600	1.700
Urban Arterials/Collectors/Locals	1.235	1.300	1.360	1.420

Table 6: Summary of Growth Factors

Area/Facility Type	Annual Growth Rate	Year 2023 Growth Factor*	Year 2025 Growth Factor*	Year 2050 Growth Factor*
Rural Interstate	1.19%	1.074	1.100	1.429
Rural Arterials/Collectors/Locals	1.47%	1.092	1.124	1.561
Urban Interstate	1.72%	1.108	1.146	1.660
Urban Arterials/Collectors/Locals	1.06%	1.065	1.088	1.396

* Applied to 2017 traffic volumes adjusted for day of week and month

Projected Traffic Conditions

Corridor Traffic Forecasts

Mainline Forecasts

Mainline average daily traffic forecasts were developed by applying the 2023, 2025 and 2050 growth factors to existing traffic volumes adjusted for day of week and month. These forecast volumes are shown in Table 7 and in Table 8 and also are presented in Figure 15, Figure 16 and Figure 17.

Table 7: Opening Year 2023 and 2025 Average Daily Traffic Forecasts

Location	Type	Direction	2017 Adjusted ADT	2023			2025		
				ADT	Medium Truck %	Heavy Truck %	ADT	Medium Truck %	Heavy Truck %
West of Exit 32	Urban Interstate	Eastbound	8,200	9,100	2%	10%	9,400	2%	10%
		Westbound	8,200	9,100	3%	11%	9,400	3%	11%
Between Exit 32 & 34	Rural Interstate	Eastbound	10,500	11,300	2%	10%	11,600	2%	10%
		Westbound	10,600	11,400	3%	11%	11,700	3%	11%
Between Exit 34 & 37	Rural Interstate	Eastbound	10,700	11,500	2%	10%	11,800	2%	10%
		Westbound	10,300	11,100	3%	11%	11,300	3%	11%
Between Exit 37 & 40	Rural Interstate	Eastbound	10,600	11,400	3%	11%	11,700	3%	11%
		Westbound	10,500	11,300	4%	11%	11,600	4%	11%
East of Exit 40	Rural Interstate	Eastbound	10,400	11,200	3%	11%	11,400	3%	11%
		Westbound	10,300	11,100	4%	11%	11,300	4%	11%

Table 8: Design Year 2050 Average Daily Traffic Forecasts

Location	Type	Direction	2017 Adjusted ADT	2050		
				ADT	Medium Truck %	Heavy Truck %
West of Exit 32	Urban Interstate	Eastbound	8,200	13,600	2%	10%
		Westbound	8,200	13,600	3%	11%
Between Exit 32 & 34	Rural Interstate	Eastbound	10,500	15,000	2%	10%
		Westbound	10,600	15,100	3%	11%
Between Exit 34 & 37	Rural Interstate	Eastbound	10,700	15,300	2%	10%
		Westbound	10,300	14,700	3%	11%
Between Exit 37 & 40	Rural Interstate	Eastbound	10,600	15,100	3%	11%
		Westbound	10,500	15,000	4%	11%
East of Exit 40	Rural Interstate	Eastbound	10,400	14,900	3%	11%
		Westbound	10,300	14,700	4%	11%

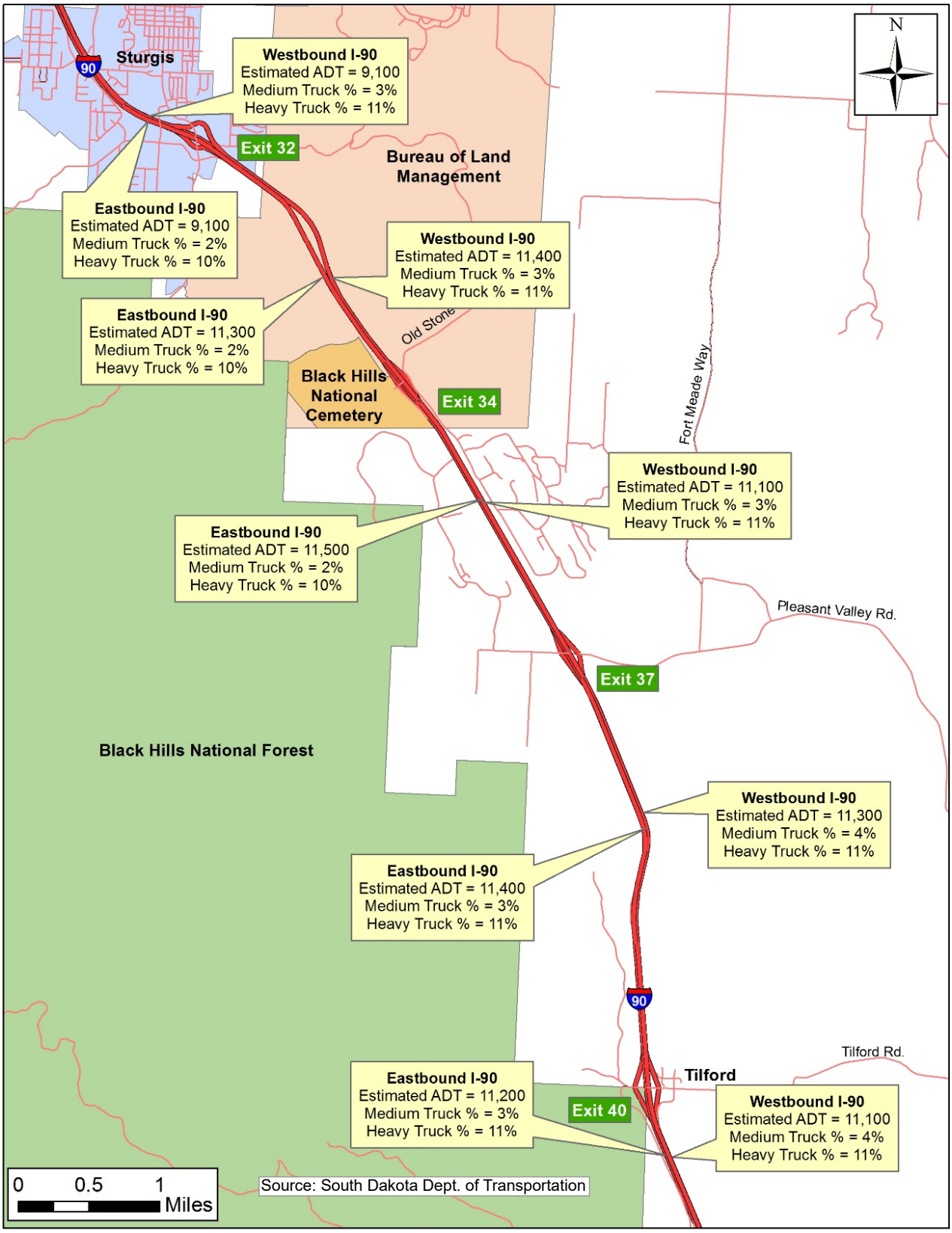


Figure 15: Opening Year Exit 37 to Exit 40 - 2023 Average Daily Traffic Forecasts

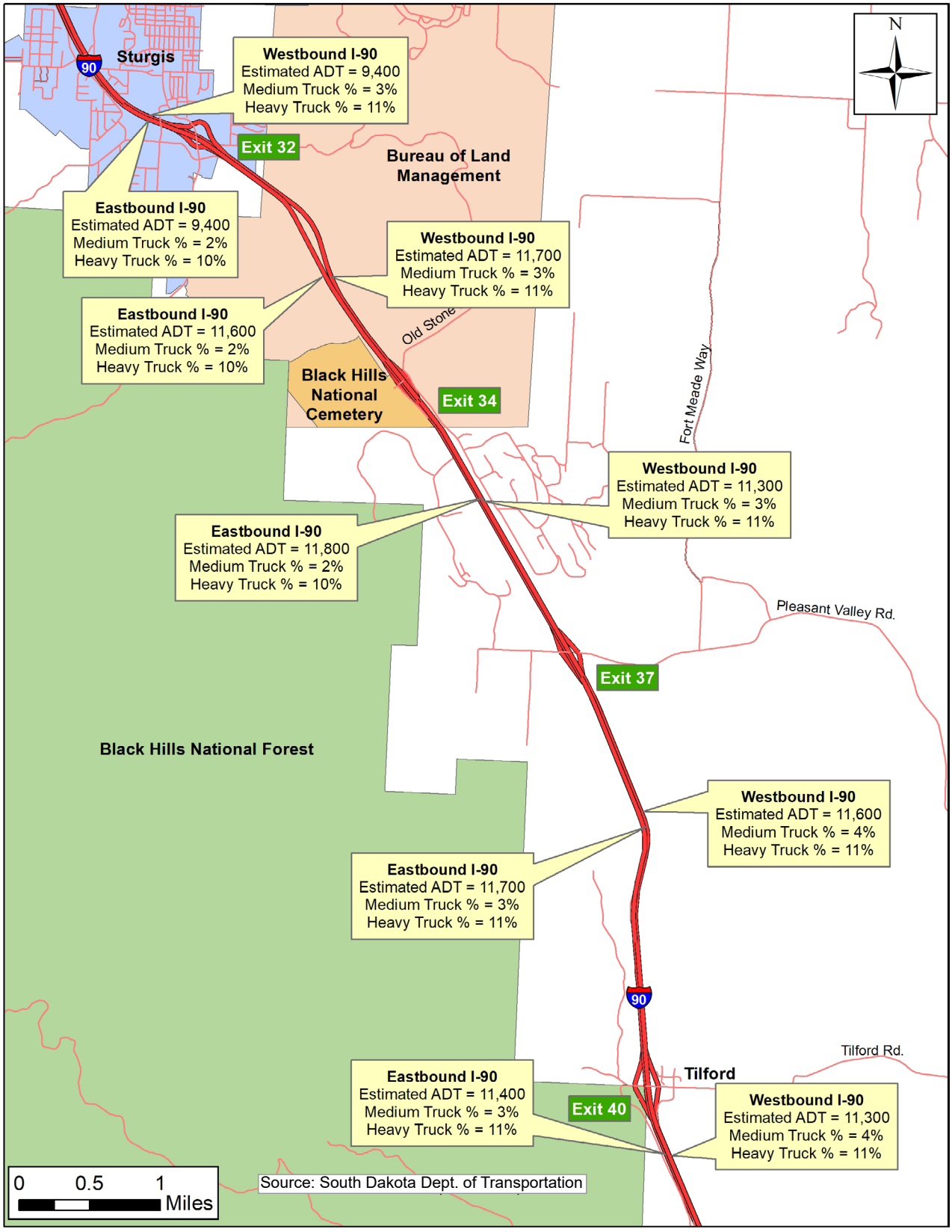


Figure 16: Opening Year Exit 32 to Exit 37 - 2025 Average Daily Traffic Forecasts

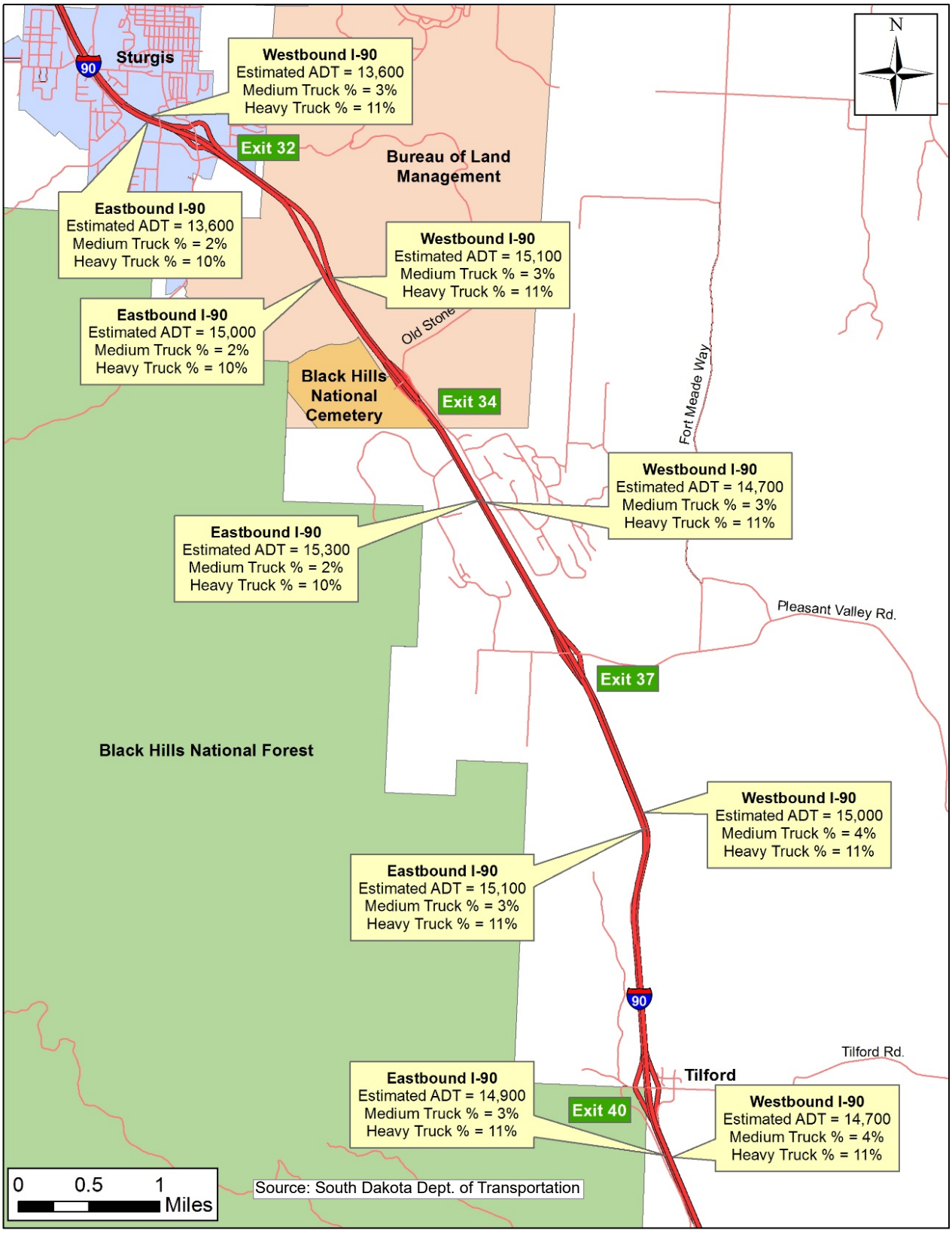


Figure 17: Design Year - 2050 Average Daily Traffic Forecasts

Peak Hour Forecasts
Year 2023, 2025 and Year 2050 a.m. and p.m. peak hour traffic forecasts were developed for:

- I-90 mainline directional segments
- Intersection turning movements

In both cases, existing (September 2017) traffic counts were adjusted for day of week and month based on 2017 seasonal adjustment factors developed by SDDOT for WIM Station 901. These adjusted volumes then were multiplied by the corresponding growth factors shown previously. For turning movements at I-90 ramp intersections with cross streets, the application of different growth factors to different approaches (interstate ramp vs. arterial or collector) resulted in "unbalanced" intersection volumes (i.e. entering and departing traffic volumes were not in agreement). Forecasts are included in Tables 9 and 10 below.

Table 9: Opening Year 2023 and 2025 I-90 Facility Results

Analysis Direction	Mean Speed (mph)		Average Travel Time		Density (pc/mi/ln)		LOS	
	2023	2025	2023	2025	2023	2025	2023	2025
A.M. Peak								
Eastbound	70.1	69.9	9.3 minutes	9.4 minutes	7.2	7.4	B	B
Westbound	71.2	70.9	9.4 minutes	9.4 minutes	7.2	7.4	B	B
P.M. Peak								
Eastbound	69.1	69.0	9.5 minutes	9.4 minutes	7.9	7.9	B	B
Westbound	71.2	70.9	9.4 minutes	9.4 minutes	8.3	8.5	B	B

Table 10: Design Year 2050 I-90 Facility Results

Analysis Direction	Mean Speed (mph)	Average Travel Time	Density (pc/mi/ln)	LOS
A.M. Peak				
Eastbound	70.1	9.4 minutes	9.6	B
Westbound	71.2	9.4 minutes	9.5	B
P.M. Peak				
Eastbound	69.0	9.5 minutes	10.5	B
Westbound	70.9	9.4 minutes	10.2	B

Future Pedestrian and Bicycle Network

Meade County has identified a list of non-motorized projects in its 2040 Transportation Plan. Three of these projects are within the project area, and two specifically deal with pedestrian and bicycle improvements. The first is a 11.9-mile bicycle wayfinding route, including bike route signing and pavement markings on Vanocker Canyon Road from Pineview Drive to the County Line. The second is an improved trail head at Pleasant Valley Road and BLM Road (Exit 34). Improvements include parking, facilities signage, and wayfinding for access to the FMRA. The final improvement listed is for a Park-n-Ride facility at Tilford Road (Exit 40) for future use by Prairie Hills Transit. With funding for non-motorized projects limited, Meade County suggests improvements to the non-motorized network be integrated into roadway projects where applicable.

Future Intelligent Transportation System (ITS) Improvements

As noted earlier in this report, the SDDOT has planned to install several new ITS elements throughout the state, including within this project study corridor. These new ITS elements are described in the following sub-sections.

Variable Speed Limits (VSL)

The SDDOT plans to pursue legislation in the 2020 Legislative session to allow a Variable Speed Limit (VSL) system along the I-90 corridor within the project limits. This stretch of I-90 has intense and quickly changing winter weather conditions that produce icy roadways with blowing and drifting snow, causing crashes, fatalities, and road closures. The primary intent of the VSL is to improve roadway safety and reduce the need for winter road closures by harmonizing the traffic speed to adverse weather and surface conditions. The VSL implementation could also help SDDOT lower speed limits during hazardous traffic conditions resulting from a major incident or congestion.

The VSL system will require the installation of a Roadway Weather Information System (see Section 3.1.2) along the corridor which feeds both meteorological and roadway conditions (traffic volumes, speed and headway) into the VSL algorithms for speed limit recommendations. This recommended speed limit could be manually changed based on other real time field observations from maintenance crews and images from additional CCTV cameras along the corridor. VSL signs will have to be installed at each on-ramp interchange to advise motorists of the roadway speed limit, to comply with the Manual of Uniform Traffic Control Devices.

Dynamic Messages signs or static roadway signs may have to be installed near the beginning and ending of VSL corridors to inform travelers of an activated corridor. Additional messages could be sent to the travelers via DSRC communications to reinforce and remind the driver of the recommended speed limits as well as when the limits have returned to normal. This information should also be posted on the SDDOT 511 Traveler Information Service, **www.safetravelusa.com/sd/**, mobile applications, social media, and conventional media outlets for periods of extreme weather.

Environmental Sensor Stations (ESS)

SDDOT currently deploys environmental sensor stations (ESS) throughout the state. None are currently installed along this section of I-90 between Sturgis and Tilford. As part of the VSL implementation, several ESS installations would be needed to provide information on temperature, humidity, wind speed and direction, precipitation, visibility, and presence of moisture, snow, or ice, to help determine whether the speed limits should be lowered. Traffic sensors would also be required to support speed limit recommendations as the current speed limit algorithms that are based on speed levels and dispersion.

Tire Anomaly and Thermal Brake Inspection System

As part of the SDDOT and SDHP Commercial Vehicle Safety Enhancement program, SDDOT may install an automated tire anomaly and thermal brake inspection system along with the Electronic Screening and Traffic Monitoring systems at the various Ports of Entry in South Dakota. If I-90 is reconstructed at the Tilford Port of Entry, this enhanced safety system could be installed with the reconstructed Electronic Screening and Traffic Monitoring equipment. These two new systems will interface with the e-screening system at the Tilford Port of Entry's Electronic Screening and Traffic Monitoring station.

For tire anomaly detection, additional sensors would be installed in the mainline to detect flat and underinflated tires. If a problem is detected, an alarm is generated, and the truck is directed into the weigh station for further inspection (bypass is denied).

An Automated Thermal Brake Inspection system (Figure 14) has permanently mounted thermal cameras on each side of the entrance lane to the weigh station. High resolution thermal images are captured for each axle's wheel set (both left and right). The system automatically processes the captured images to detect thermal anomalies such as inoperative or locked brakes, overheated brakes, failed bearings, underinflated or damaged tires. This information and associated images are shown on the system display. This system expedites safety inspection and can reduce queuing on the inbound ramp to the weigh station.

For the commercial vehicles that may be flagged for additional inspection, it would be extremely beneficial to the SDHP to have a physical inspection building to be provided at the Tilford Port of Entry in order to carry out these additional enhanced safety inspections.

Snow Gates and Warning Sign Activation for Closures

As part of the ITS corridor improvements, the SDDOT may be interested in automation of the advanced road closure signs' warning beacons and the snow gate (lowering and raising). To automate the gate movement, a CCTV camera or traffic sensors would be needed to ensure that no vehicle is present during the downward movement. Additional advance warning signs (static with beacons or dynamic signs) and possibly Highway Advisory Radio (HAR), CB-Radio based notification system, or the utilization of DSRC systems could also be considered to alert motorist to roadway conditions ahead. The HAR and CB-Radio based notifications have been widely used in the past, but those technologies have limited reach and effectiveness.

Deer/Elk/Animal Intrusion Alerts

Two identified locations have a high number of animal / vehicle crashes along this stretch of I-90. SDDOT is interested in exploring possibilities for a wildlife detection system that warns the approaching motorists of animals entering the roadway. Some systems combine thermal imaging with radar to detect encroachment into a defined area and activate beacons on static roadside signs. With the increasing presence of connected vehicles on the roadways, an alert could be sent directly to the driver's onboard unit (OBU) via DSRC.

High Wind Advisory Alerts

SDDOT is deploying a high wind warning system on US18 at the Ft. Randall Dam. This location has geographic characteristics similar to the I-90 corridor between Sturgis and Tilford project limits. The roadway is often hit with high wind gusts blowing from southwest to northeast or northeast to southwest, depending on the season. It would be helpful to have a system that detects gusty wind conditions and activates static road sign beacons to warn road users who are towing camping trailers, empty tractor trailers, or any other high-profile vehicle vulnerable to a strong crosswind. As with the animal intrusion system mentioned above, the warning can be transmitted, to connected vehicles/trucks with DSRC equipped OBUs.

Additional Dynamic Message Signs

With enhanced ITS communications along this corridor additional DMS signs can be installed to support the traffic management, safety, and variable speed limit system along the corridor. The additional DMS(s) will increase the amount of traveler information to be disseminated to motorists using the corridor.

Additional CCTV Corridor Coverage

With enhanced ITS communications along this corridor additional pan-tilt-zoom CCTV cameras can be installed. These additional CCTVs will increase the visual coverage of the corridor in addition to current CCTV installed on the westbound DMSs. The spacing and placement of these additional CCTV should provide visual coverage of corridor critical locations, at a minimum, such as known vehicle hot spots, locations with high animal strikes etc.

Queue Warning System

With enhanced ITS communications along this corridor additional vehicle detection stations can be installed at the exit ramps where it is known that traffic may spill back onto the I-90 mainlanes, such as an event at the National Cemetery or the exit to Sturgis during the annual motorcycle rally, to send safety messages upstream to approaching traffic about slowing or stopped traffic. These messages could be posted to the additional corridor DMS or sent out via HAR or DSRC to approaching vehicles warning of the conditions ahead. This information could also be sent to the Congestion / Event Management System described below to recommend suggested traffic responsive actions for SDDOT to implement.

Congestion/Event Management

With enhanced ITS communications along this corridor and additional CCTV coverage, vehicle detectors could be installed in addition to the ones required for the VSL system to support advanced decision making and congestion / event management algorithms. These congestion / event management algorithms would support enhanced safety operation of the corridor and manage the congestion during events such as the annual Sturgis motorcycle rally, national cemetery events, and other emergencies and occasions. These congestion / event management strategies suggested from the algorithms could then be broadcast via the DSRC technologies to traveling public to support any messages placed on the DMSs.

Dedicated Short Range Communications (DSRC)

With the increasing number of connected vehicles and commercial trucks in the traffic stream, the SDDOT is interested in adding DSRC radios to future ITS deployments to advance to a connected transportation network. For this project study corridor, DSRC radios can provide several important safety alerts to the public travelers. This information would be beyond the Basic Safety Messages (BSM) and could include VSL operation, icy roadway, and animal intrusion warnings.

This technology, along with the newly deployed ITS devices and systems, could help SDDOT significantly improve the study corridor's safety and mobility and be applied to other SDDOT corridors around the state.

Communications Backbone

SDDOT is interested in including conduit with optical fiber along the study corridor to serve existing ITS equipment and planned devices and systems. This would move away from the current leased fiber connection and provide SDDOT with timely control and management of a future VSL system.

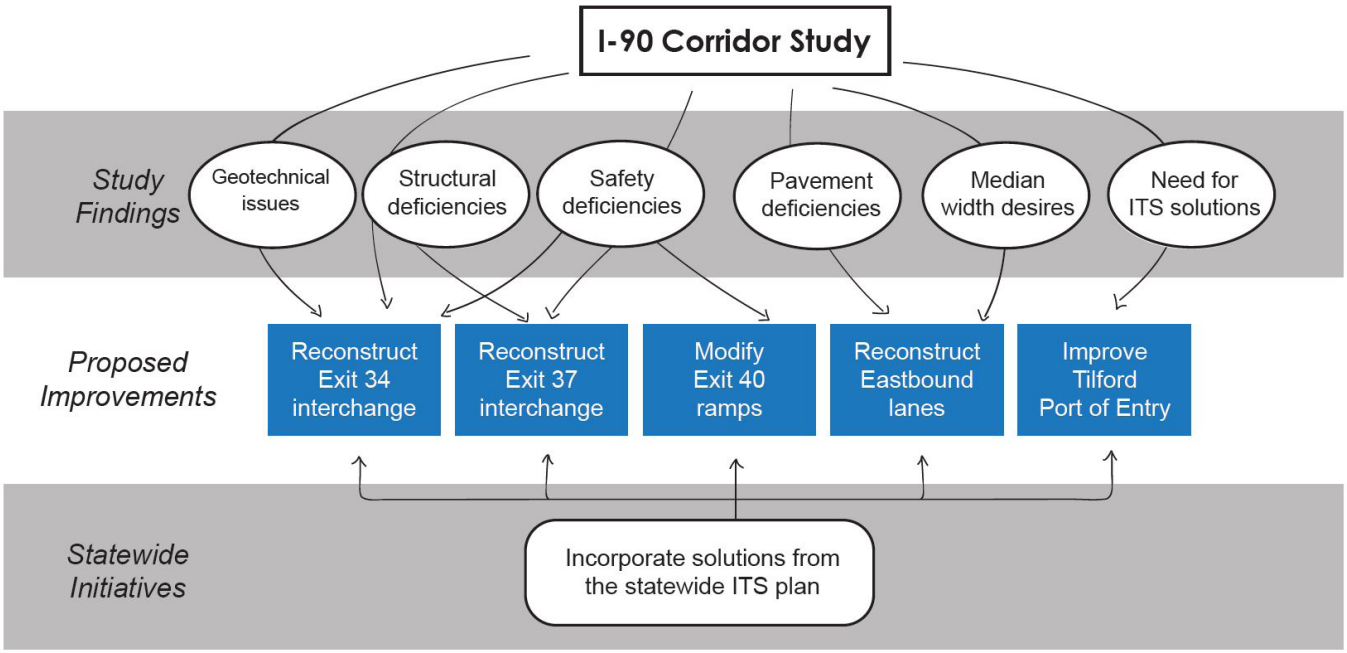
+ SOLUTIONS

Alternatives Analysis

Alternative concepts were developed for potential improvements at Exit 34 and Exit 37, modifications to Exit 40, and alignment and profile modifications to I-90 from Exit 32 to Exit 40. These concepts were evaluated through a collaborative decision-making process with the SAT. The alternative analysis process used weighted screening criteria to review and evaluate the project alternatives. This chapter describes the study approach, alternatives development, and alternatives screening process.

The findings developed in the corridor study were used to identify and document key issues to be considered in development and analysis of the proposed improvements. Statewide initiatives, such as planned ITS improvements also contribute to development of the full solution.

The following flow chart explains the triggers and solutions for each of the proposed improvements.



Project Scoping

The SAT conducted a project brainstorming session as an initial step in the alternatives development process. Building on previous planning efforts (such as the Interstate 90 Black Hawk-Sturgis Corridor Preservation Study) and existing and future traffic conditions, the brainstorming session focused on a variety of issues along the corridor. In this half- day brainstorming session, the SAT expressed interest in review/evaluation of the following needs within the corridor and the surrounding area.

- Bringing the I-90 corridor and associated interchanges and local road connections to current design standards
- Determine what upgrades are needed at the Tilford Port of Entry
- Evaluate Exit 34 to determine the preferred location and interchange configuration
- Evaluate Exit 37 to determine the preferred interchange configuration
- Review the need to upgrade eastbound exit and westbound entrance ramps at Exit 40 to match improvements made on the south side of the interchange
- Determine the need and, if necessary, provide appropriate accommodations for a future six-lane facility
- Evaluate ITS solutions and determine what specific solutions to implement

Screening Criteria

The SAT used project goals and prioritized criteria to evaluate each of the alternatives along the corridor. The consultant team established a list of evaluation criteria that fell into one of the categories listed in Table 9 below. The criteria were developed to address key issues documented during the existing conditions stage of this study. Although it is important to consider the suitability of an alternative in terms of each criterion, it is also useful to establish an overall composite score by determining appropriate weighting (relative importance) among the criteria. Each evaluation criterion was assigned a weight by the SAT to represent its relative importance to the other criteria. A ranking of 1 to 5 was provided for each criterion with 5 being the most important and 1 being the least important. These criteria and weightings were used to develop the overall project Alternatives Evaluation Matrix. The criteria and its application to each of the corridor improvements is summarized in Table 11 below.

Table 11: Alternatives Evaluation Criteria

Criteria	Application	Rank
Traffic and Level of Service	Does the alternative provide for an acceptable level of service for the design year?	3.9
Geometric Needs	Do the improvements meet the current design standards for the interstate and local roads?	4.5
Environmental Impacts	What are the impacts to known environmental receptors including floodplains, wetlands, historic and archaeological sites, noise, environmental justice, regulated materials and animal migration?	4.4
Right of Way Impacts	How does each alternative impact the need for permanent and temporary right of way?	3.3
Safety Improvements	How does each alternative reduce crashes along the corridor?	4.7
Utility Impacts	How does each alternative impact existing private and public utilities?	1.9
Bicycle Facility Enhancements	Do the improvements provide access for bicycles and connections to existing facilities?	2.0
Impact to existing land use or new development including access	Do the improvements accommodate access to the existing businesses along the corridor or known future development?	3.4
Cost	What are the costs for each of the alternatives?	4.0
Constructability	What is the complexity of construction for each alternative? Can the construction be staged efficiently and provide continuous access during construction?	3.8
Flexibility to accomodate future improvements or land use changes	Do the improvements accomodate future development and are future local road improvements accommodated?	3.2
Geotechnical Application	Is the alternative feasible to construct given available soil stability techniques?	4.2

Alternative Development and Screening

Initial Alternative Development and Screening

Once the brainstorming workshop was complete, the SAT developed a set of initial alternatives along the corridor based on the detailed summary of comments compiled from the workshop. Concepts were developed specifically related to Exits 34, 37, and 40. Although comments were received related to the TPOE, discussions following the meeting led to the reconstruction of the ramps and the port of entry facility.

The initial alternatives and screening process considered a wide range of alternatives utilizing thick line sketches over aerial photos to easily assess the impacts of each alternative to the surrounding area. In total, nine interchange alternatives and three local road connections were prepared for Exit 34; three interchange alternatives were prepared for Exit 37; and one interchange ramp modification alternative was developed for Exit 40. These alternatives are described in Table 12 and an image of each alternative is provided in Appendix A: Alternatives Screening.

A SAT meeting was held to provide an initial review of these alternatives. Due to the nature of the area along this segment of I-90, project area constraints would prevent some of these alternatives from moving forward in the selection process. The SAT's comments related to each of the alternatives are summarized in Table 12.

Table 12: Initial Alternatives and Concept Screening

Interchange	Alternative	Possible Improvement	SAT Comments
34	34-1	Offset Single Point Diamond Interchange	The three bridges and realignment of I-90 make this an expensive option. The previous I-90 Black Hawk-Sturgis Corridor Preservation Study recommended a single point urban interchange. The alternative was dismissed during the environmental documentation process because the traffic volumes did not warrant signalization. The SAT recommended developing a compressed diamond interchange option with roundabouts at each ramp terminal. The two roundabouts would be approximately 400 feet apart and could operate as two roundabouts or as one peanut shaped roundabout. **A new option will be developed using the SAT's recommendations.**
	34-2	Standard Folded Diamond Interchange	Due to the large footprint required for this interchange a substantial cut into the hillside on the east side of I-90 will be required which makes this too costly and unfeasible. This option will be removed from consideration.
	34-3	Modified Folded Diamond Interchange	This option appears to fit within the physical constraints of the surrounding area. This option would require a new multi-plate railroad pipe which is not recommended by the SDDOT Bridge Office due to the cost and maintenance issues they have had with similar structures. The Rapid City Regional Office likes the concept and would like to carry this forward. **This option will be carried forward.**
	34-4	Shifted Standard Diamond Interchange	Due to the large footprint required for this interchange, a substantial cut into the hillside on the east side of I-90 would be required, making this option too costly and unfeasible. This option will be removed from consideration.
	34-5	Westbound Button-Hook Interchange	The SDDOT has had problems with a similar button hook interchange located in Sioux Falls. The Sioux Falls interchange will be removed in the future and the SDDOT does not intend to install any button hook interchanges in the future. This option will be removed from consideration. Note: A new option will be created that removes the button hook and provides a partial folded diamond.
	34-6	Trumpet Interchange	The SDDOT Bridge Office does not want horizontal curves on bridges. This is also a costly option with the curved bridge and realignment of I-90. This option will be removed from consideration.
	34-7	Partial Roundabout Interchange	The SAT likes this concept. **This option will be carried forward.**
37	37-1	Standard Diamond Upgrade	This option helps to move the existing west ramp intersection further away from the existing at-grade railroad crossing. It also provides further separation between the two ramp terminal intersections. **This option will be carried forward.**
	37-2	Bridge Skew Upgrade	This option removes the existing skew of Pleasant Valley Road and shortens the bridge over I-90, which requires replacement. **This option will be carried forward.** Note: A third option will be developed for Exit 37 that will realign I-90 further east providing greater separation from the railroad.
40	40-1	Standard Diamond Upgrade	This option matches what has already been constructed on the southeast side of the interchange. **This option will be carried forward.**
Options A, B, C (Local Roads)	N/A	Local road connection north-west of Alkali Creek to the existing local road southeast of the Black Hills National Cemetery.	Provides for a local road connection northwest of Alkali Creek to the existing local road southeast of the Black Hills National Cemetery. These options are required for Interchange options 34-1 to 34-6. **These options will be carried forward.**

Note: In addition to the recommendations presented in Table 12, the frontage road on the east side of I-90 at Exit 34 will include an alternative that parallels I-90. This will require a box culvert for the crossing of Alkali Creek.

Exit 34 Refinement of Alternatives

Additional analysis and concepts were developed for Exit 34 throughout this process to further clarify options moving forward. Once the three concepts highlighted in Table 12 were selected, each option was developed to a level with sufficient detail to complete a decision matrix. The matrix used project goals and prioritized criteria to score the alternatives and was used to assist decision makers in making a fully informed choice for the preferred alternate. An example of the decision matrix can be seen in Figure 18. The results of the ranking were presented to the public at an open house, and comments received were largely in favor of shifting the interchange south of the existing (Alternative 34-7) rather that to the north (Alternative 34-1B or Alternative 34-3). A tentative decision was made to select Alternative 34-7 as the preferred alternative to move forward with environmental documentation.

As the selected preferred alternative to be carried forward for refinement and additional study, Alternative 34-7 was reviewed by the SDDOT functional groups and management to determine feasibility. During this review process, two items were noted; concerns were raised regarding the use of a roundabout at the ramp terminals and an issue was noted with the Control of Access (COA) provided between the interchange ramp terminal and the connection to the local frontage road in the previously reviewed alternatives. Per the SDDOT Design Manual, a minimum of 660 feet between interchange ramps and local roads is recommended. The SDDOT determined that further refinement of the preferred alternative would be needed. A total of sixteen options were developed and reviewed. The new alternatives at the preferred interchange location south of existing were reviewed against the same criteria used in the previous analysis. These new alternatives are included as Appendix B - Refined Interchange Alternatives & Alternative Evalution Matrix. Again, each of the 16 options carried into the alternatives analysis were developed to a level with sufficient detail to complete a decision matrix and a qualitative assessment was conducted by tabulating the advantages and disadvantages of each alternative based upon the scale of potential impacts. The refined alternative evaluation matrix for these sixteen alternatives is included as Appendix C - Refined Interchange Alternatives & Evaluation Matrix . Three concepts (Alternative 34-3, 34-10B, and 34-19) were selected as desirable by the SAT. Following further development of the preferred alternative 34-10B, the geotechnical review identified slopes along side the westbound lanes near Exit 34 as being susceptible to landslides. All alternatives previously developed were analyzed for refinements that would avoid excavation of the hillside. It was determined that refinements could made to two Alternatives, 34-19 and 34-10B to avoid the hillside. One refinement was made to 34-19 (known as 34-19B) and four alternatives refinements spurred from Alternative 34-10B. Three of those four alternatives (34-20, 34-21, and 34-22) impacted residential homes and for that reason were unfeasible. The fourth refinement of Alternative 34-10B, named 34-23 was selected to further develop and analyze with Alternative 34-19B. These options are described below and shown in the decision matrix in Figure 18 and Preliminary Alternatives in Figure 19.

Alternative 34-19B: Alternative 34-19B constructs a new interchange at the same location, providing lengthened interchange ramps to meet standards. In this alternative, mainline I-90 is raised to avoid excavation of the hillside adjacent the west bound lanes and provide an 108 foot standard median width. Blucksberg drive is no longer improved. Pleasant Valley Drive is reconstructed to minimize impacts to the existing wetlands. The local connecting road crosses under the raised lanes of I-90 and results in an at-grade crossing of the railroad.

Alternative 34-23: This alternative is a modification of 34-10B which avoids all excavation of the hillside. The cross road bridge spans I-90 and the railroad on a skew to avoid impact to adjacent homes. Blucksberg Drive from Old Stone Road to the proposed cross road is removed and the frontage road along the east bound lanes provides access to Old Stone Road via an at-grade crossing which connects into the proposed cross road.

Alternatives Evaluation

After this initial screening, the new options as noted in Table 12 were developed and included in the next round of screening. For this screening process an Alternatives Evaluation Matrix (Figure 18) was developed which included refined screening criteria and weighting. This evaluation matrix was presented and updated cooperatively by the SAT at the Concept Review and Project Identification Workshop. As noted above, this decision matrix process was conducted three times for Exit 34, with the resulting two desirable concepts.

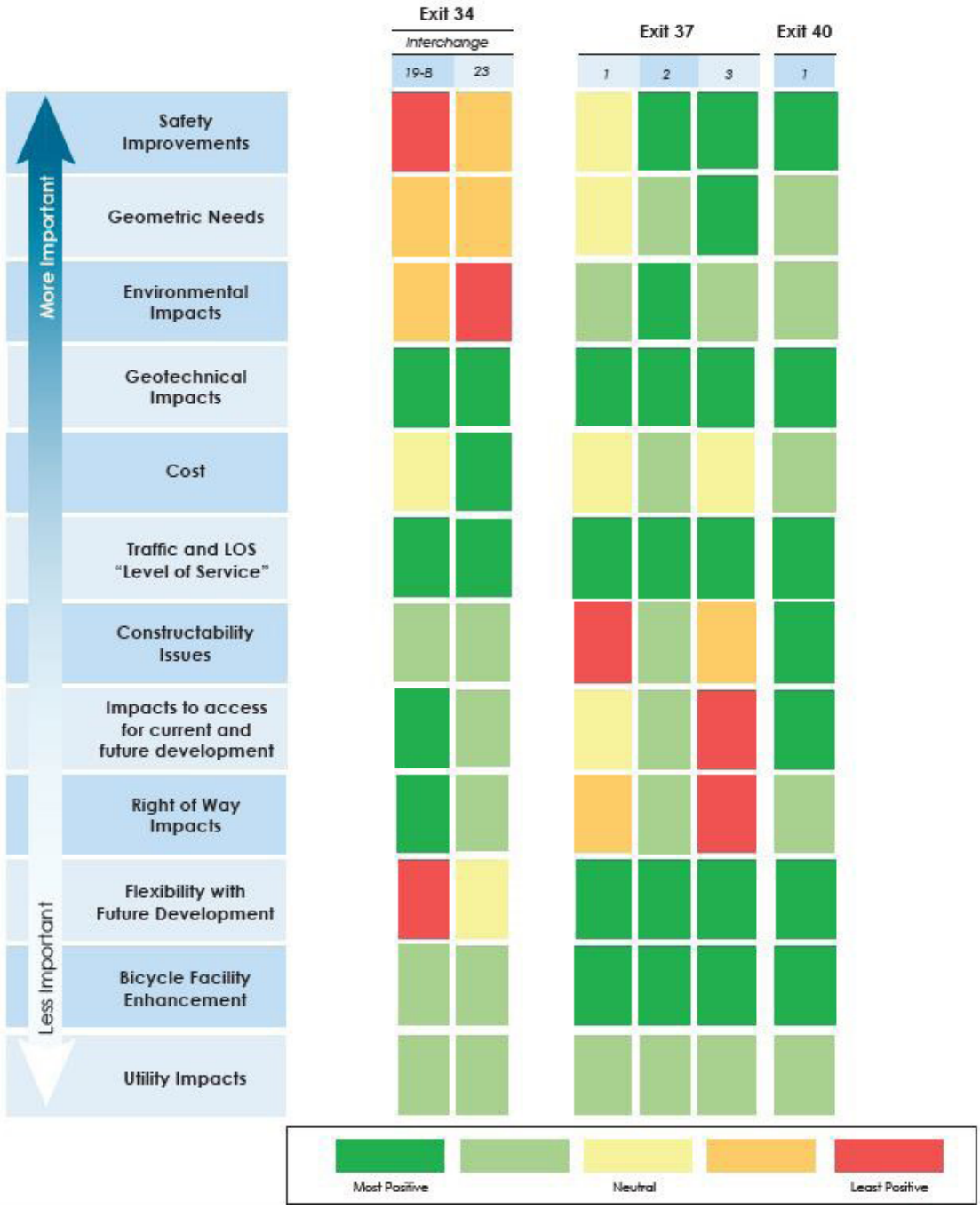


Figure 18: Alternatives Evaluation Matrix and Scoring

The results of the screening are shown in the Alternatives Evaluation Matrix on the following page.

Evaluation Findings: Exit 34
Option 34-10B scored the highest (Figure 19 on pages 55 and 56) at Exit 34. Key criteria include:

- Low geotechnical impact
- Low impact to existing land use
- Low environmental impact
- Low Right of Way impacts
- Low construction cost

Of the Local Road Connection alternatives at Exit 34, option B scored the highest (Figure 20 on page 56). However, if alternative 34-10B or 34-19 move forward as the preferred option, the local road connection is removed from the consideration as it is not needed for those alternatives.

Evaluation Findings: Exit 37
At Exit 37, option 37-2 scored the highest (Figure 21 on page 57). Key criteria include:

- Safety is improved with the removal of the skew on Pleasant Valley Road
- Fewer wetland impacts
- Less permanent right-of-way required, reducing right-of-way costs
- Fewer constructibility issues; new bridge can be constructed while existing interchange is being used
- Less impact to existing land use

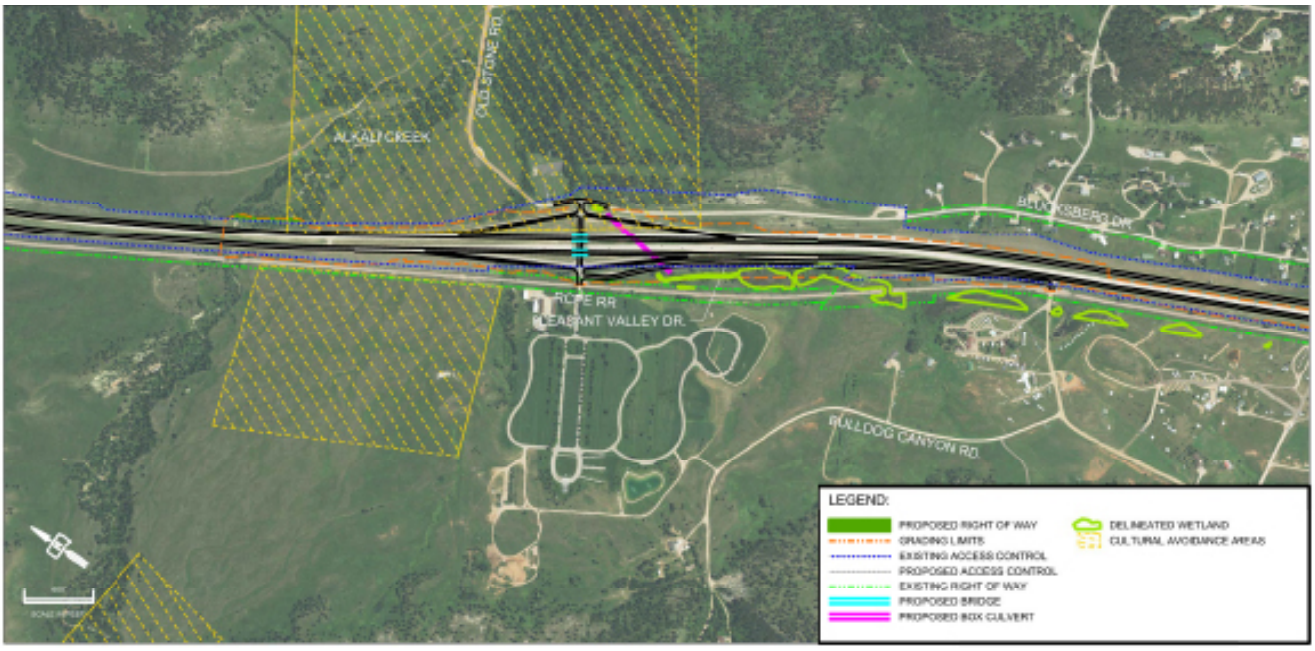
Evaluation Findings: Exit 40
Only one alternative was evaluated for Exit 40, shown in Figure 22 on page 58.

Corridor Solutions

In addition to the need to develop alternatives for the interchanges along I-90, future I-90 widening options were considered. The SDDOT plans to reconstruct the eastbound mainline pavement from Exit 32 to Exit 40, with the exception of MRM 38.67 + 0.068 to MRM 40.31 + 0.010, which was recently reconstructed. The westbound pavement will remain in place. Where the eastbound I-90 lanes are reconstructed, the project will provide for a median width meeting the current design standard.

As other segments of I-90 have been reconstructed, the SDDOT has been grading for a six-lane freeway to provide for future widening. This study reviewed the need to continue this wider grading section along this segment from Exit 32 to Exit 40. The study provided an analysis of the existing traffic, 20-year design traffic, and 50-year projections. Based on the traffic analysis and LOS, a six-lane freeway will not be needed along this segment of I-90 for over 50 years. Therefore, the SDDOT has determined that the segment will accommodate for a six-lane section however it is not necessary to provide grading for the six-lane section.

Alternative 34-19B: Refined Lengthened Interchange



Alternative 34-23: Relocated Frontage Road

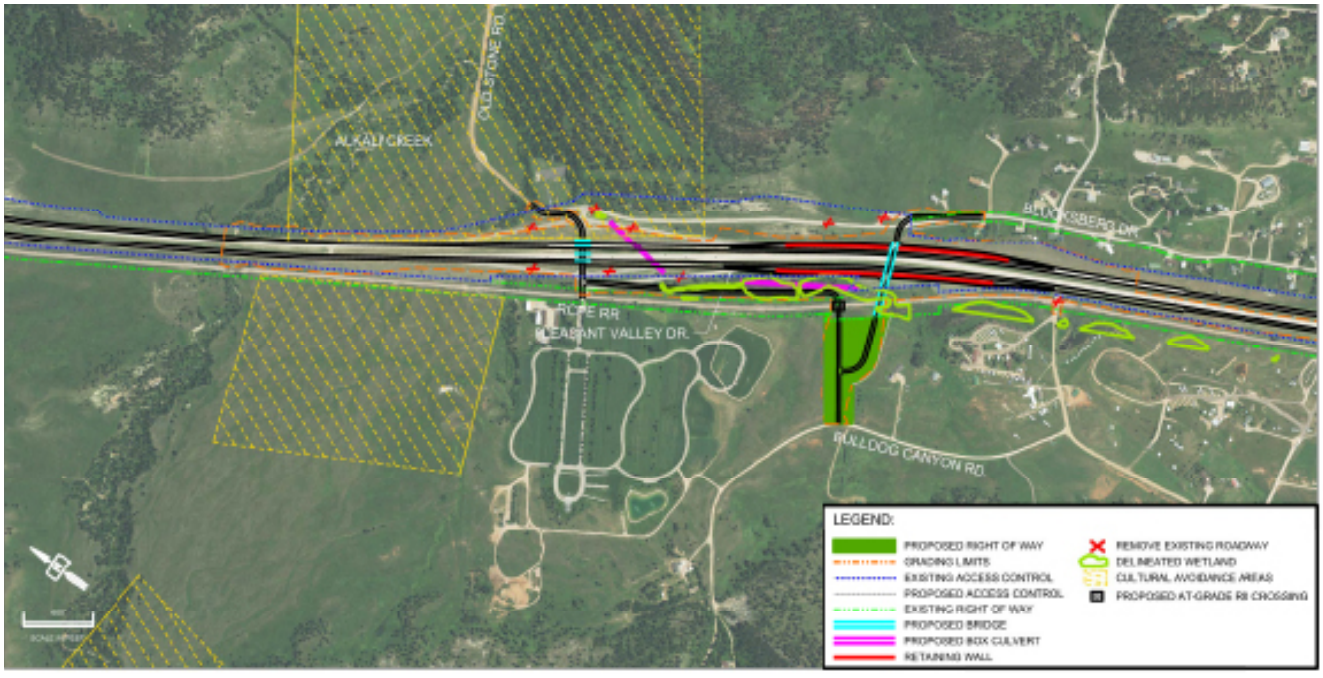
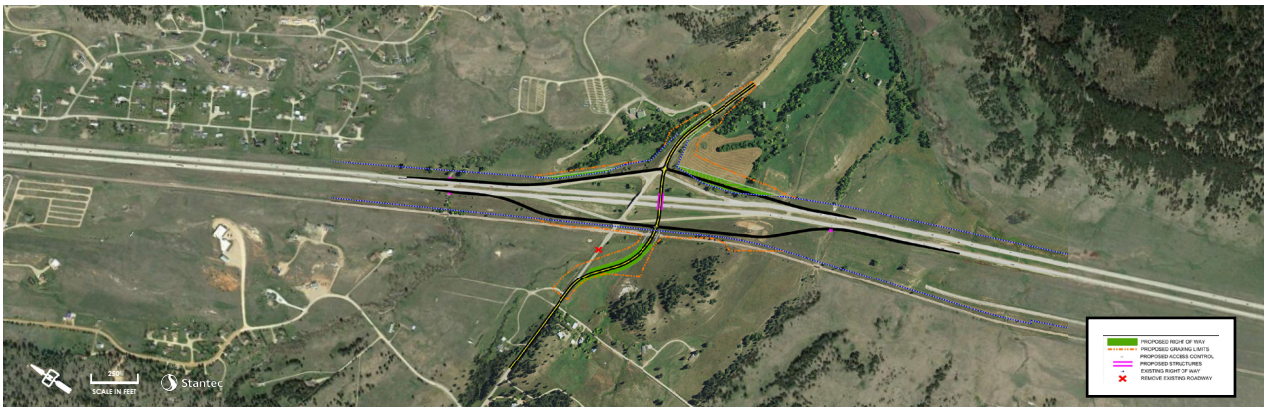


Figure 19: Exit 34 Preliminary Alternatives

Alternative 37-1: Ramp Upgrade

Alternative 37-2: Squared Up Structure



Alternative 37-3: I-90 Realignment

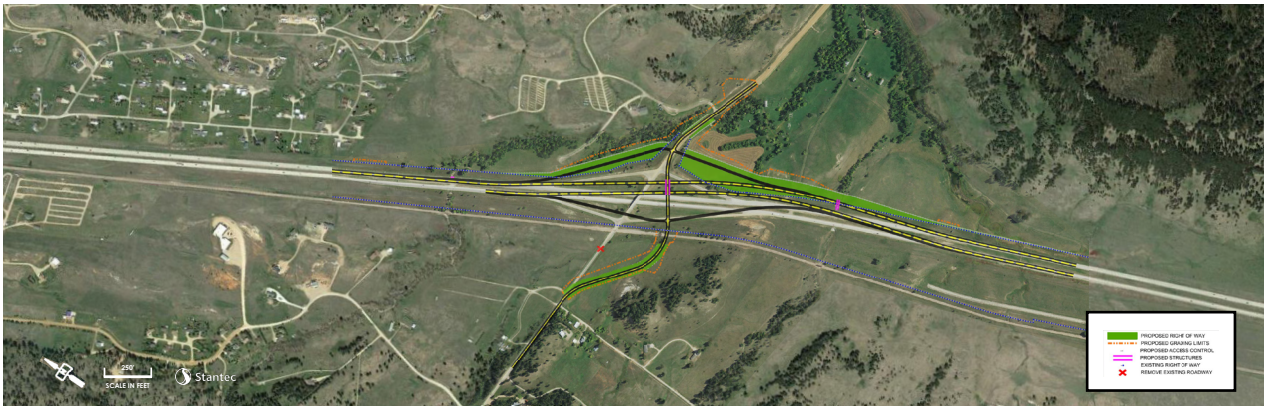


Figure 20: Exit 37 Preliminary Alternatives

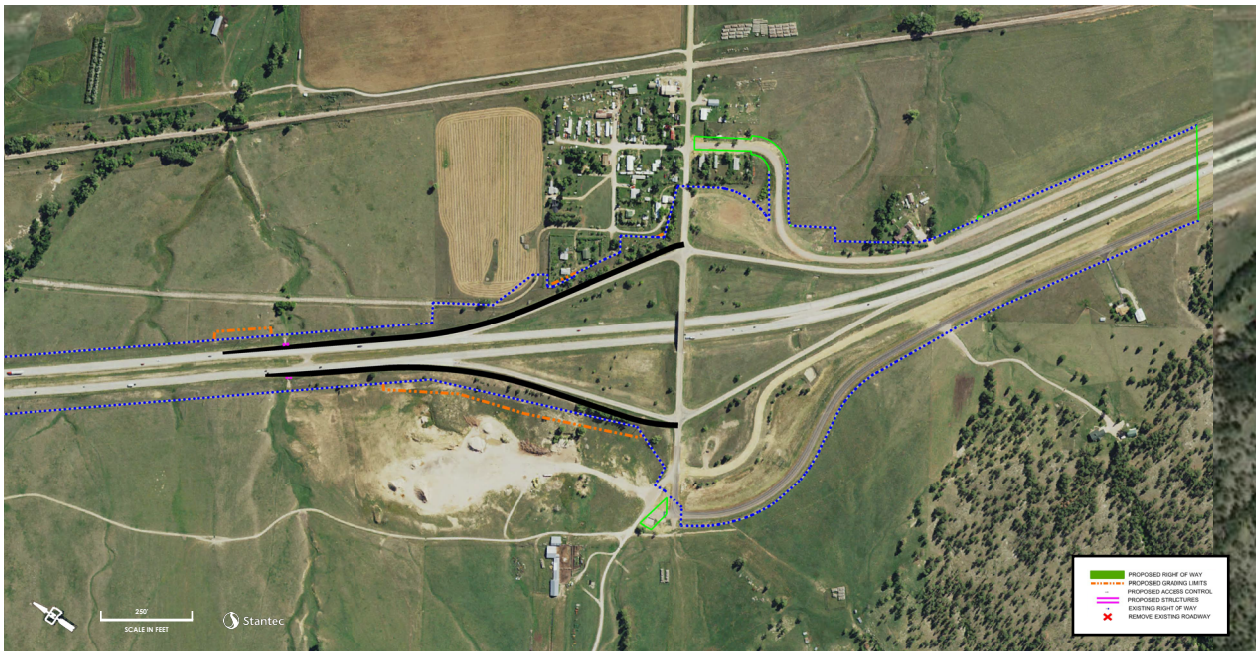
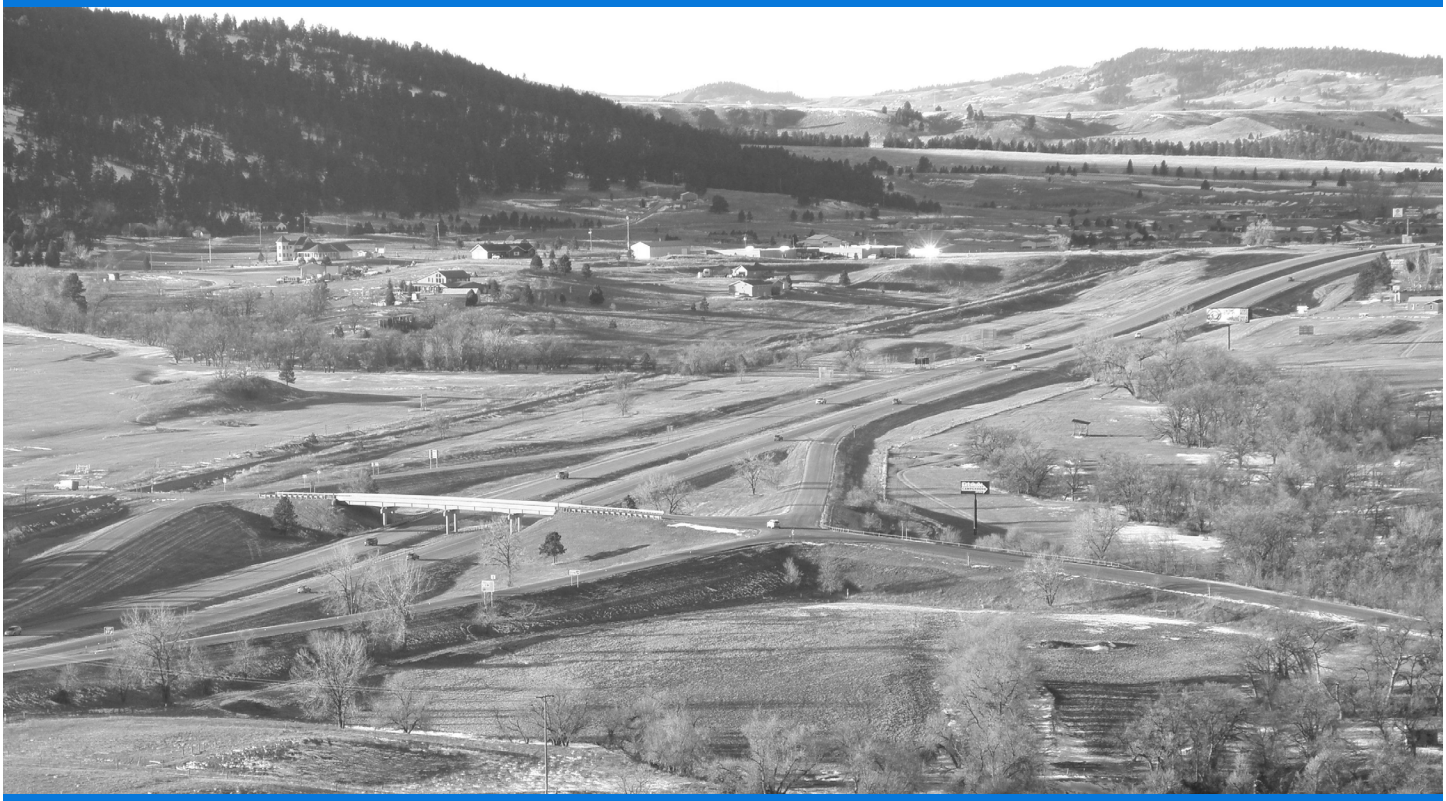


Figure 21: Exit 40 Preliminary Alternative

+ APPENDIX



APPENDIX A – ALTERNATIVES SCREENING

1) *December 2017 Public Information Meeting #1 Summary*
2) *January 2018 Stakeholder Meeting Summary*
3) *November 2018 Stakeholder Meeting Summary*
4) *December 2018 Public Information Meeting #2 Summary*

Stantec

Public Information Meeting #1 - Summary

To:	Steve Gramm	From:	Dale Grove
	SDDOT		Rochester MN Office
File:	MEAD_IM 0901(195)32N_IM 0901(198)32N_I-90 Exit 32-40	Date:	January 11, 2018

I-90, Exit 32 to Exit 40 Corridor Study Public Information Meeting #1
December 20, 2017, 4:30 pm to 7:00 pm MST

Overview

The South Dakota Department of Transportation hosted a public information meeting to discuss issues that have been identified within the Interstate 90 (I-90) Corridor Study from Exit 32 to Exit 40 and receive input from the public. The public information meeting was held on Wednesday December 20, 2017, at Brown High School in Sturgis, SD (12930 SD-34, Sturgis, SD 57785) from 4:30 pm to 7:00 pm MST.

Approximately 50 people attended (Sign-In sheet is attached) the meeting to learn about the project and provide input. Attendees ranged from Meade County residents and landowners to various key stakeholders.

The meeting was advertised through the following methods:

- Notification in Rapid City Journal – December 6th & 9th, 2017
- Public Service Announcements
- Direct mailings
- Flyers placed in community buildings

Displays were set up for the public to review, discuss and provide comments.

A formal presentation was planned for 5:45 pm including an introduction to the project by Dale Grove of Stantec and a discussion of the planned variable speed limit concept by David Huft of SDDOT. Many early attendees stated they would not be able to stay for the scheduled presentation, so to accommodate these individuals an additional presentation was started at 4:50 pm.

Formal Presentation

Dale Grove of Stantec kicked off the presentation by welcoming the public. He introduced the project, provided a safety moment on winter driving, and gave an overview of the *Project History and Background*. Dale then discussed the *Need and Goals of the Project*, reviewed *Project Stakeholders*, *Project Data, Project Next Steps,* and *How to Get Involved*.

Following Dale's presentation, David Huft gave a presentation on SDDOT's Variable Speed Limit concept. David presented on the *Problem*, *Goals*, and *Process*. He provided an *Overview of the Variable Speed Limit System* and *Storm Data from Wyoming I-80* showing histograms of traffic speeds at clear and dry times, as a storm begins, as the variable signs

are put into effect during a weather event, and as speeds are restored to posted speed. David concluded the presentation with *Project Deployment and Approach.*

PDF copies of both presentation are included as attachments to this summary.

Displays

Meeting attendees could view boards and a plot identifying the existing conditions/issues with information related to the corridor study project and variable speed limit. The boards included *Welcome to the Project*, *Schedule + Study Process*, *Study Area Map*, *Crash History*, *Next Steps* and *Variable Speed Limit*. Two identical roll plots were displayed highlighting known issues including sensitive land uses, geometric deficiencies, and snow build-up concerns.

Stantec representatives were on hand to facilitate discussion and write down thoughts and ideas from the public. The displays from the public information meeting can be found in the supporting documentation section of this meeting summary.

Comments

Attendees had the option of giving oral or written comments at the meeting. Three (3) written comment forms were submitted at the meeting along with 11 notes added to the existing issues map roll plot.

Comment forms were available for attendees to take home and submit after the meeting. The public was given until January 5th to submit comments by mail, email, phone, or by using the interactive map on project webpage. One additional comment was submitted by mail.

STANTEC CONSULTING SERVICES INC.

Dale Grove
Principal

Phone: (507) 529-6039
Fax: (507) 282-3100
Dale.Grove@stantec.com

Attachment: Meeting Sign In Sheet
Meeting Advertisements
Meeting Presentations
Meeting Displays
Comments Received

c. Aaron Cook, file

Stantec

I-90, Exit 32 to Exit 40 Corridor Study Public Information Meeting #1
December 20, 2017, 4:30 pm to 7:00 pm MST

ATTACHMENTS:

Sign In Sheet
Corridor Study Presentation
Variable Speed Limit Concept Presentation
Meeting Boards
Comment Sheets

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION
I-90 EXIT 32 - 40 | PUBLIC INFORMATIONAL MEETING #1 | DECEMBER 20, 2017

	NAME	EMAIL	ORGANIZATION
1)	Ken Sabers		Self
2)	Marion Barber		FHWA
3)	Sam Gilkerson		SD DOT
4)	Steve Gramm		SDDOT
5)	Robin Shuake		Business
6)	Peggy Harter		Stantec
7)	Mary Freeman		Self
8)	Mike Carlson		SDDOT
9)	Todd Seaman		"
10)	Chuck Buell		Butte Electric
11)	Jim Allison		SEI
12)	Steve Palmer		SDDOT
13)	Jim Walczak		Buffalo Chip
14)	Mike Kintigh		SDGFP
15&16)	Dana + Cathi Legner		Self
17)	Carla Evans		self
18&19)	Connie + Pat Vandenbosch		Self
20)	Calvin Cutler		KNBN
21)	Tim Matthews		Hotmail.com
22,23,24)	Linda Lou / Ethan Ch		Self/Family
25)	Mark Hoines		FHWA
26)	Mike Schmeltzer		Home Owner
27)	Bill Melrose		Home Owner
28)	Dale Remington		Landowner

	NAME	EMAIL	ORGANIZATION
29)	Nancy Remington		Landowner
30)	TOM HORAN		SD DOT
31)	Jordan Brown		SD DOT
32)	Dale Grove		Stantec
33)	Aaron Cook		Stantec
34)	Ed Byers		landowner
35)	Rick Finn		landowner
36)	Rod Schad		
37)	Darwin Lessman		home owner
38)	Distin Hamilton		HDR
39	Yvonne A Willner		
40	Larry D Willner		
41	D. D. ChenHOLM		LAND OWNER
	Mitch Iverson		Bureau of Land Mgmt
	Bill Blomberg		
	Richard Morkert		RETIRED.
	Ken Snyder		Landowner
	Ervel Nurse		
			Landowner
	DALE NORDHERE		Landowner
	William Carpenter		Landowner
	Jane Murphy		Landowner

I-90 Exit 32 to 40

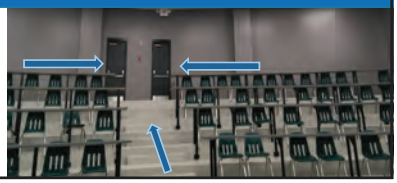
Corridor Study + Design

Public Meeting #1
December 20, 2017
Brown High School

Agenda

1 Introductions & Housekeeping
2 History & Background
3 Project Need & Goals
4 Project Stakeholders
5 Project Data
6 Next Steps & How to Get Involved

Housekeeping exit locations



History & Background

This section of I-90:

- Previously designated as US 14 and SD 79
- Became part of the US Interstate system in 1958 (longest route in US)

Construction History		
	Eastbound	Westbound
1958	Sturgis to Tilford Port of Entry (Reinforced Concrete)	
1962	Tilford Port of Entry to Tilford (Concrete)	
1981	Sturgis to Tilford Port of Entry (PCCP)	Exit 37 to Tilford Port of Entry (PCCP)
1982	Tilford Port of Entry	
1986	Tilford Port of Entry Modifications	
2004	Exit 32 Interchange Reconstruction	
2007	Tilford Port of Enty to Tilford (PCCP)	Exit 32 to Tilford (PCCP)
2011	WIM	

History & Background

Previous Completed Studies

- Interstate Corridor Study (2000)
- I-90 Black Hawk to Sturgis Corridor Preservation Study (2004)
- Decennial Interstate Corridor Study (2010)
- Meade County Master Transportation Plan (2016)

Project Need & Goals

- Replace eastbound lanes
- Drainage structures nearing end of useful life
- Interchanges do not meet current standards
- Address queuing issues at Tilford

Project Need & Goals

- Determine traffic demand, structure needs, and geometric deficiencies of the I-90 corridor
- Identify and analyze conceptual improvements (corridor and interchanges)
- Develop feasible construction projects within the corridor
- Design and implement improvements

Project Stakeholders

South Dakota DOT – Connecting South Dakota and the Nation

FHWA

Welcome to Meade County – Rich Past, Rich Future

Project Stakeholders

1. US Army Corps of Engineers (USACE)
2. Bureau of Land Management (BLM)
3. Black Hills National Cemetery
4. Sturgis Chamber of Commerce
5. Sturgis Economic Development Corporation
6. Meade School District
7. Prairie Hills Transit
8. South Dakota Highway Patrol – Motor Carrier
9. Sturgis Emergency Services
10. Landowners and business owners
11. Rapid City, Pierre, Eastern Railroad (RCPE)
12. Lower Brule Sioux Tribe
13. Sisseton - Wahpeton Oyate
14. Standing Rock Sioux Tribe
15. Yankton Sioux Tribe
16. Cheyenne River Sioux Tribe
17. Oglala Sioux Tribe
18. Three Affiliated Tribes of ND
19. Northern Arapaho Tribe of WY
20. South Dakota GFP

Project Data

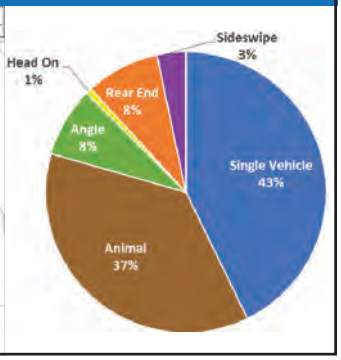
Crash Analysis

Total Crashes

Year	Number of Crashes
2012	87
2013	91
2014	87
2015	81
2016	77

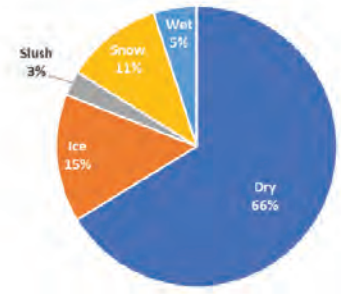
Project Data

Crash Analysis - *Crash Type*



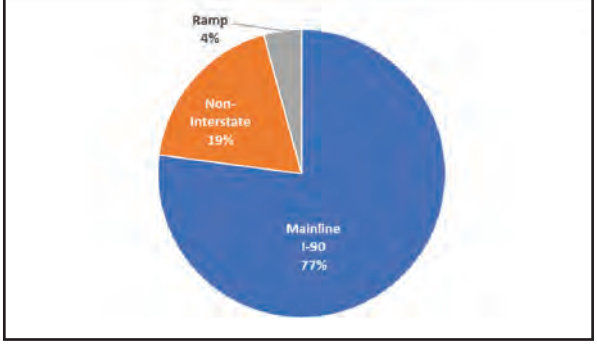
Project Data

Crash Analysis - *Road Condition*



Project Data

Crash Analysis - *Location*



Project Data

Crash Analysis - *Severity*

2 - Fatal

100 – Injury

190 – Non-Injury

131- Animal Hit

Project Data

Bridge Review

Structure Inventory and Appraisal Reports (SIA)

National Bridge Inventory (NBI)

Maintenance History

Inspection Reports

Project Data

Bridge Review - *Age and Sufficiency*

Bridge No.	Mileage Reference Marker	Feature Crossed	Type	Age	Sufficiency Rating
Mainline Structure over Local Roads					
47-048-462	34.81	I-90 EB over National Cemetery Rd	Conc. Slab Bridge	54	82.0
47-048-461	34.81	I-90 WB over National Cemetery Rd	Conc. Slab Bridge	54	82.0
Local Road Structures over Mainline					
47-061-480	37.01	Pleasant Valley Rd over I-90	Steel Beam Bridge	54	96.7
47-069-510	40.20	Tilford Road over I-90	Steel Beam Bridge	53	86.0
Culverts					
47-045-458	34.32	I-90 over Alkali Creek	Conc. Box Culvert	70	81.9
47-064-484	37.40	I-90 over Pleasant Valley Creek	Conc. Box Culvert	61	82.0
47-068-501	39.32	I-90 over Creek	Conc. Box Culvert	61	82.0
47-068-503	39.45	I-90 over North Br Morris Creek	Conc. Box Culvert	61	82.0
Railroad Tunnel					
47-068-495	38.67	I-90 over CP/DM&E RR	Train Tunnel	36	82.0

Project Data

Bridge Review

Less than Desirable Clearance Over Local Roads

Substandard Lateral Clearance

Nonstandard Bridge Barriers

Project Data

Existing Corridor Issues

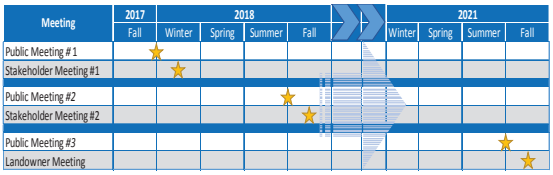
- Stopping Distance
- Intersection Proximity to Interchange
- Curve Sharpness
- Snow Drifting Critical Areas
- Capacity at Tilford Port of Entry
- Slope Standards
- Adjacent Land Use
  - National Cemetery
  - Bureau of Land Management

Project Data

Schedule

1. Corridor Study
2. Determination of Construction Project(s)
3. Interchange Modification Justification Report(s) (IMJR)
4. Environmental Studies
5. Construction Plans

Upcoming Meetings



Next Steps

Corridor Study:
June 2017 - February 2018
stakeholder meetings in January

Environmental Studies:
January 2018 - September 2019

Construction Plan Development:
January 2018 - September 2021

How to Get Involved

Leave a Comment Related to this Meeting:

Tonight

- Written (place in comment box) or Oral

After Tonight (Comments accepted until January 5, 2018)

- Written (Take a comment card with you)
- Website (www.i90exit32to40.com)
- Contact Me (phone, email, letter)

Enter the Photo Contest – Opens in January!

Attend an Upcoming Public Meeting

Project Staff are available to answer questions

How to Get Involved

It's the end of the presentation but the night isn't over.

Review the Existing Issues Map.

Do you have an issue that should be included?
Let us know.

sign up for the State's listserve to receive email updates:
https://listserv.sd.gov/scripts/ wa.exe?A0=I90EXIT34TO37

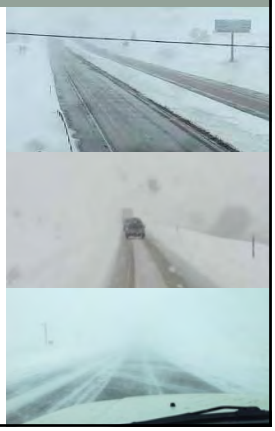
Visit us on our webpage: www.i90exit32to40.com

VARIABLE SPEED LIMIT CONCEPT

David Huft
Transportation Systems Operations & Management Manager
South Dakota Department of Transportation
December 20, 2017

The Problem

- Winter Storms
- Snow
- Blowing Snow
- Drifting
- Icy Roads
- Excessive Speed
- Fast/Slow Traffic Mix
- Crashes
- Fatalities
- Closures



Variable Speed Limit Goals

Goals

- Reduce speed when conditions warrant
- Reduce speed variability of traffic stream
- Reduce crashes
- Reduce fatalities
- Reduce road closures
- Economic benefit

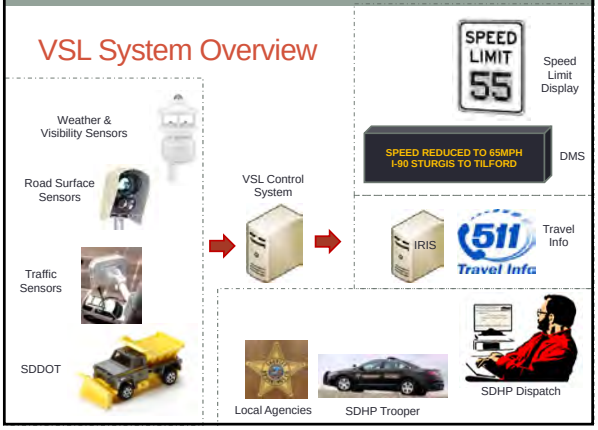
Expectation

- Average speed drops ~70-80% of posted reduction
- Range and standard deviation decrease markedly
- Reduced ~1/2 in WY
- Reduced ~1/2 in WY
- Reduced ~1/3 in WY
- User savings ≫ cost

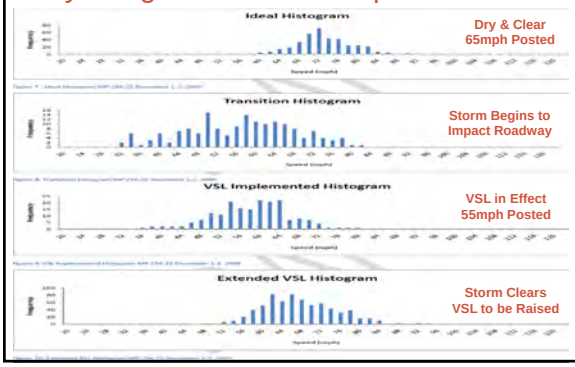
Variable Speed Process

- Assess conditions
  - weather
  - road surface
  - visibility
  - traffic speed & headway
- Determine appropriate speed (down & back up)
- Post & publish speed limit
- Measure & evaluate results

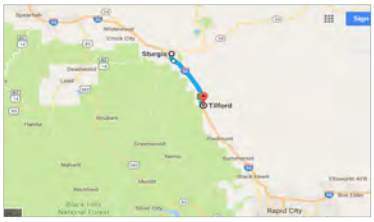
VSL System Overview

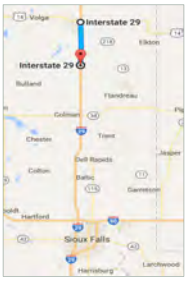


Wyoming I-80 Storm Example



Accelerated Innovation Deployment Project





- 2018 Enabling Legislation
- 2018 Deployment
- Accelerated Innovation Grant

VSL Project Approach

- Build on other states' experience
- Assess feasibility (done)
- Systems engineering (underway)
  - Concept of Operations
  - Requirements
  - Design
  - Testing & Validation Plan
- Contract award, installation
- Formal evaluation (operation, effectiveness)
- Possible future expansion to other Interstate segments

Questions?

Contact

David Huft

SDDOT Transportation Systems Operations & Management Manager

605.773.3358

dave.huft@state.sd.us

WELCOME TO THE PROJECT

About the Project

The South Dakota Department of Transportation (SDDOT), in cooperation with Meade County, is working to preserve the Interstate 90 (I-90) corridor between Exits 32 and 40. This section of I-90 serves as the primary connection between Sturgis and Rapid City, South Dakota.

The SDDOT has determined the pavement in the eastbound lanes of I-90 between Exits 32 and 40 will require replacement within the next eight years. The pavement condition, combined with deteriorating drainage structures, substandard designs, and interchange capacity limits, has led the SDDOT to develop a comprehensive project to address all issues within the corridor. The project will include a corridor study, interchange analysis and justification, environmental documentation, and design plans. The project will culminate with the construction of the selected alternatives studied. Although more than one project may be required to implement all the necessary improvements, construction of the first project is planned for 2022.

Study Area

The study area encompasses Interstate 90 from Exit 32 in Sturgis to Exit 40 at Tilford. The study area includes the following interchanges:

- Exit 32 at Junction Avenue
- Exit 34 at Pleasant Valley Drive/Blucksberg Drive/ Old Stone Road
- Exit 37 at Pleasant Valley Road
- Exit 40 at 214th Street/Sturgis Road in Tilford

The study section also includes the Port of Entry facility located along I-90 eastbound between Exits 37 and 40.

Need for Study

This study will be the first step in the process to identify deficiencies and needed improvements to I-90 and its service interchanges between Exits 32 and 40. The study will initiate the FHWA Interchange Modification Justification process for addressing the Interstate Access Modification Policy Points.

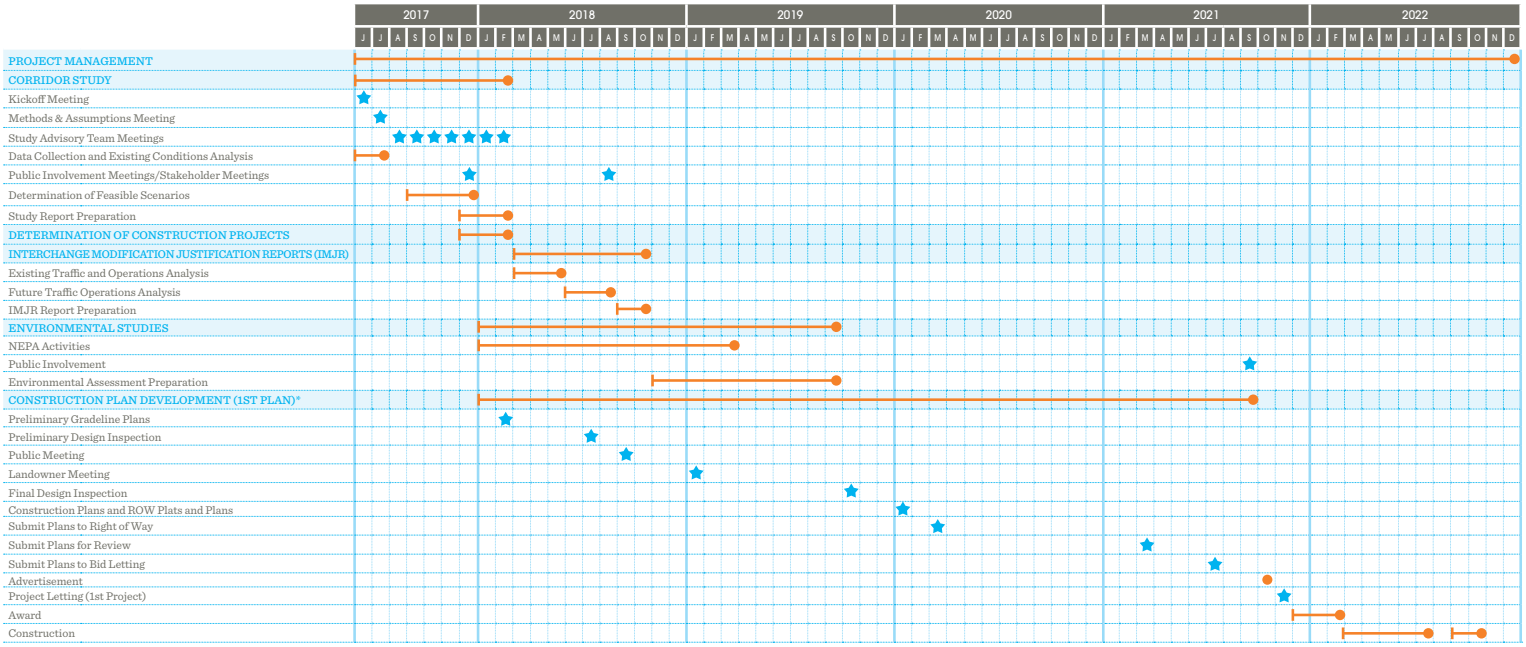
SCHEDULE + STUDY PROCESS

Project Schedule

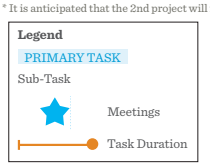
The I-90 Design and Study will follow a five phase plan between 2017 and 2022

1. Corridor Study: June 2017 - February 2018
2. Determination of Construction Projects: December 2017 - February 2018
3. Interchange Modification Justification Reports: February - October 2018
4. Environmental Studies: January 2018 - September 2019
5. Construction Plan Development: January 2018 - September 2021

Project Schedule — I-90 Exit 32 to Exit 40 Corridor Study & Design



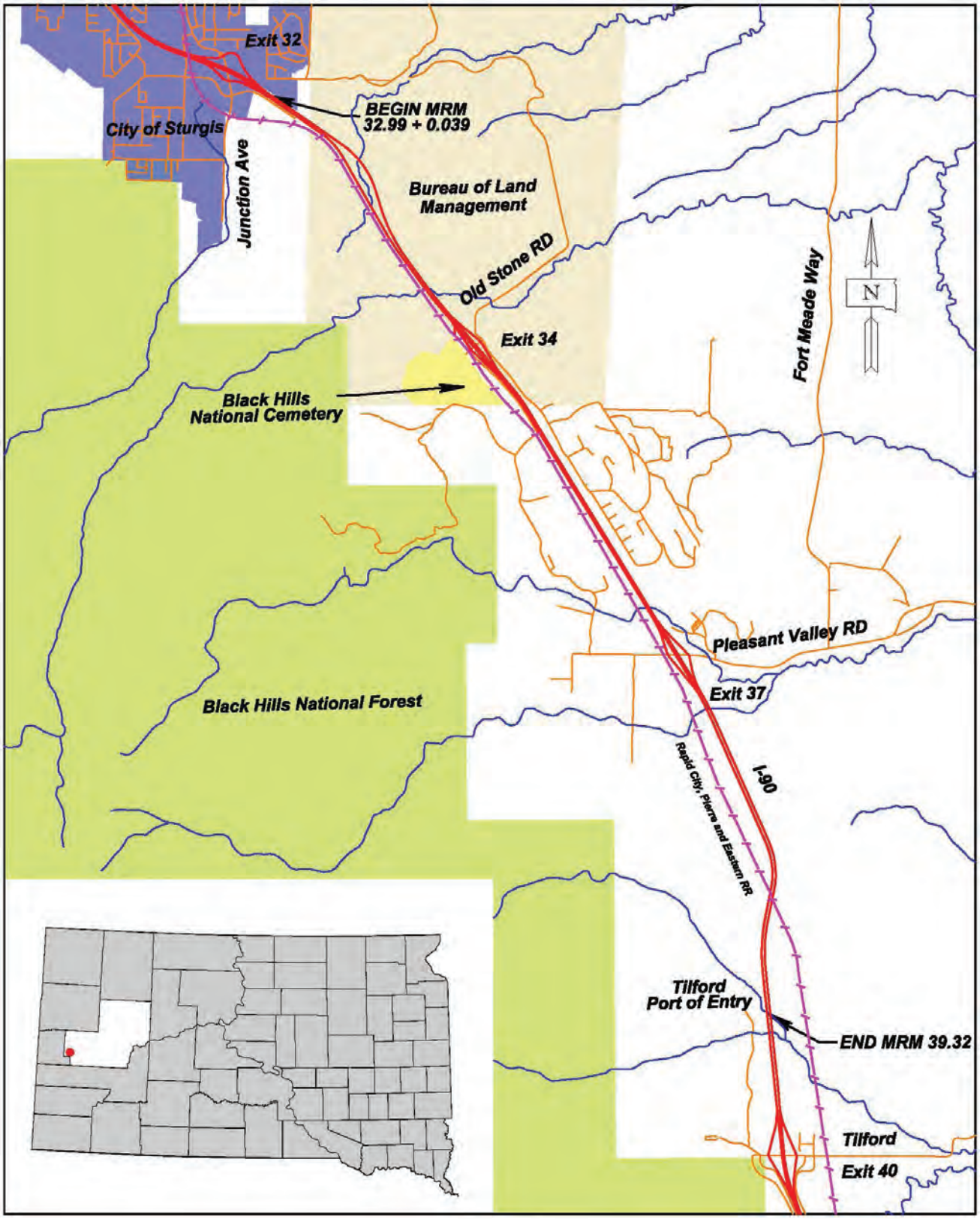
* It is anticipated that the 2nd project will follow the same schedule as the 1st project but all activities will occur 1 year later.



STUDY AREA MAP

Project Location

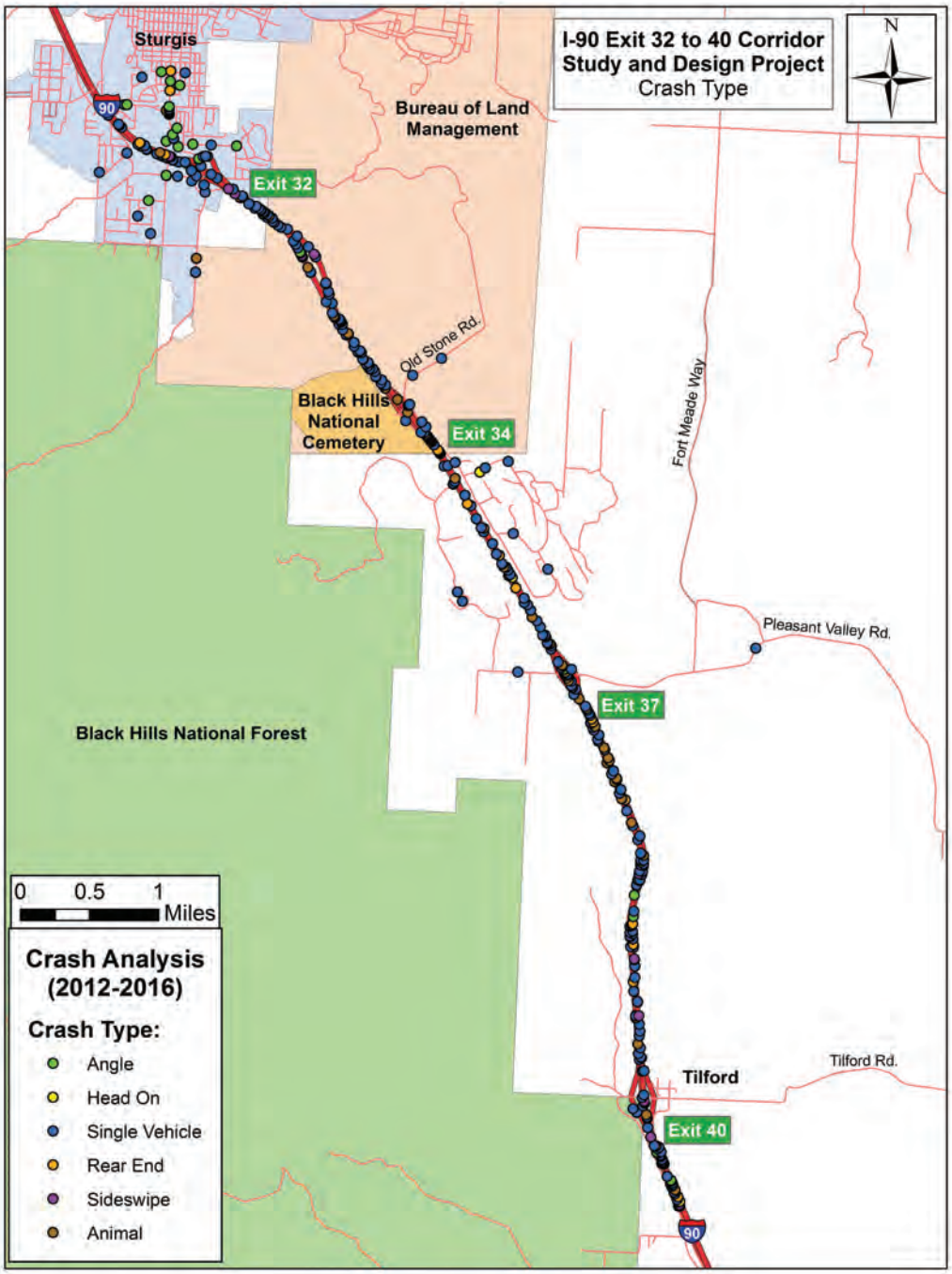
The I-90 Study and Design is located along the interstate between Tilford and Sturgis



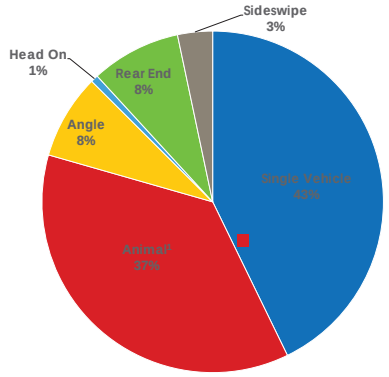
CRASH HISTORY

Segment	Route	Description	Beginning MRM[1]	Ending MRM[1]	Length (mi.)	Number of Crashes (2012-2016)	ADT[2] (veh./day)	Actual Crash Rate (Annual Crashes/100 million VMT[4])	Statewide Average Crash Rate[3] (Annual Crashes/100 million VMT[4])	Road Type
1	I-90	West of Exit 32	31.50	32.41	0.910[5]	39	14,132	166	302	Urban Interstate
2	I-90	Between Exits 32 & 34	32.41	34.81	2.400	79	18,546	97	302/129	Urban/Rural[6] Interstate
3	I-90	Between Exits 34 & 37	34.81	37.01	2.200	83	18,090	114	129	Rural Interstate
4	I-90	Between Exits 37 & 40	37.01	40.20	3.190	95	17,570	93	129	Rural Interstate
5	I-90	East of Exit 40	40.20	41.00	0.800[5]	37	17,528	145	129	Rural Interstate

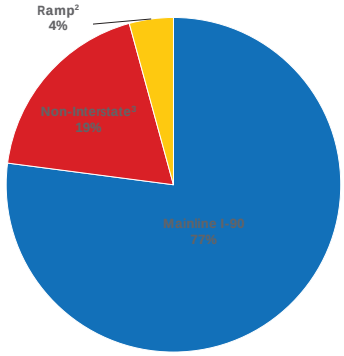
[1] Mileage Reference Marker
[2] 5-year annual average (2012 - 2016)
[3] Source: South Dakota Accident Records
[4] Vehicle Miles Traveled
[5] Segment length for end sections are arbitrary, based on locations of reported crashes within the functional area of interchanges at Exits 32 and 40. Computed crash rates are for informational purposes only and are not indicative of crash rates for those entire sections.
[6] Sturgis city limit lies at eastern terminus of Exit 32



Crash Type

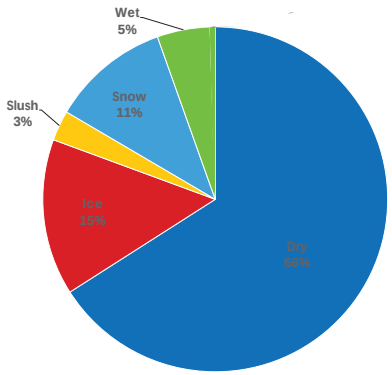


Crash Location



2: Includes ramp terminal intersections with cross streets
3: All other streets/roads in the study area

Road Condition



I-90 Exit 32-40 Study and Design

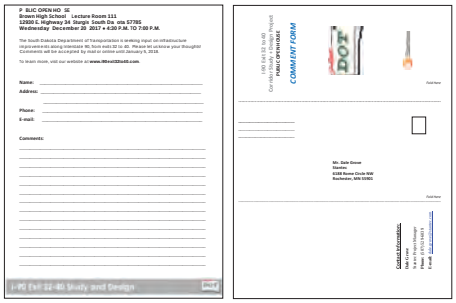
NEXT STEPS

Stay Involved!

Thank you for taking the time to participate in our public meeting. We'd love to stay in touch and hear your feedback throughout the project.

Leave a Comment

Please let us know your thoughts by submitting a written comment on the forms provided or by participating in the guided activities at the meeting. We want to know what you see as the biggest issues and opportunities in the I-90 corridor and hear your ideas for improving it!



Visit the Project Website

Follow the project and stay up-to-date on meetings, next steps, and opportunities by participating through the project website. You can check it out here:

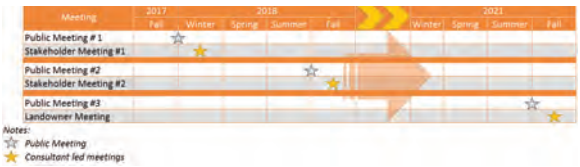
www.i90exit32to40.com

Enter the Photo Contest

You know your community better than anyone including the best vantage points, the places in need of the most repairs, unique sites, and parks along the way. Starting in January 2018, we're hosting a photo contest where you can submit your views of the I-90 corridor between Tilford and Sturgis. Your photo will be published on the website and may appear in final planning documents!

Attend a Future Public Meeting

Please plan to join us at future public and stakeholder meetings. We will be advertising these meetings online and at venues throughout the community. Can't make it? You can view past meeting materials on our project website.



Join the Listserv

Sign up to receive updates through the State's listserve:
https://listserv.sd.gov/scripts/wa.exe?A0=I90EXIT34TO37

VARIABLE SPEED LIMIT CONCEPT

THE PROBLEM

- Winter Storms
- Snow
- Blowing Snow
- Drifting
- Icy Roads
- Excessive Speed
- Fast/Slow Traffic Mix
- Crashes
- Fatalities
- Closures

GOALS

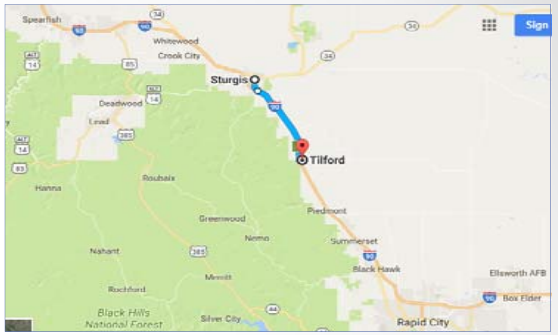
- Reduce speed during poor conditions
- Reduce traffic speed variability
- Reduce crashes & fatalities
- Reduce road closures
- Save user costs

EXPECTATIONS

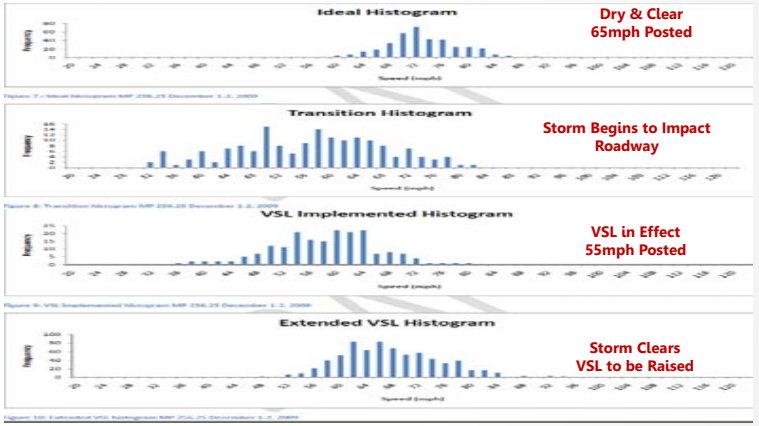
- Average speed drops ~70-80% of posted reduction
- Speed range and variation reduced significantly
- Crashes reduced ~1/2 in WY
- Fatalities reduced 1/2 in WY
- Closures reduced ~1/3 in WY
- Road user savings ≫ cost

ACTIONS

- Enabling legislation 2018
- Installation for 2018-2019 winter



Wyoming I-80 Storm Example Reduction of Average Speed & Variability



VSL System Overview

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Mike Kintigh, Regional Supervisor - SD GFP
Address: 4130 Adventure Trail
Rapid City SD 57702
Phone: 605-394-6837
E-mail: mike.kintigh@state.sd.us

Comments:

#1 - SD DOT does an outstanding job - Thanks.

#2 - My primary interest/concern with this project is consideration for the high number of wildlife strikes on I-90. Actually - From Rapid City to the WY line, we see high numbers of collisions with wildlife. GFP is not concerned with the wildlife loss - but we are interested in reducing personal injuries & property loss. Many new developments in mitigating wildlife crossings & GFP is willing to work with DOT in exploring feasible ways of mitigating these strikes

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Michael Kefferel

Address: 13122 Tilford Rd Piedmont SD

Phone: 605 490 7734

E-mail:

Comments:

off Ramp at weight Station should Be longer, third Lane for truck to slow Down.

on Ramp could Be Longer or third Lane

Service Road corner to sharp at the Snyder Driveway

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Nancy Remington
Address: 13189 Pleasant Valley Rd
Sturgis, SD 57785
Phone: 605-347-4254
E-mail: ngremington@gmail.com

Comments:

I represent 2 entities near exit 37 (+ south) on east side of I90

- VB (Viola Blair) Trust
- George + Viola Blair Family LLP (8 siblings)

Concerns - drainage at Exit 37 (wetland/springs) currently has small culvert
- what land will be taken / how will it be assessed (at what value?)

RECEIVED JAN 0 5 2018

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com.**

Name: DANA + CATHY LEGNER
Address: 21070 FT. MEADE WAY
STURGIS, S.D. 57785
Phone: (605) 490-1317
E-mail: dclegner@gmail.com

Comments:

IS THERE ANY CHANCE THAT THE S.D.D.O.T. WILL GET INVOLVED WITH THE UPGRADING OF THE FORT MEADE WAY BYPASS SINCE IT HOOKS UP WITH HIGHWAYS 79 + 34. IT IS USED ~~BY~~ QUITE HEAVILY BY TRUCKS AND IS NOT DESIGNED FOR THE WEIGHT OF ~~MUCH~~ MANY OF THE VEHICLES THAT USE IT. WE BELIEVE THAT SINCE IT IS PRIMARILY USED AS A BYPASS THAT IT SHOULD BE BUILT TO HANDLE THE TRAFFIC THAT USES IT. WE WOULD APPRECIATE A RESPONSE TO THIS QUESTION.

THANK YOU,
Dana A Legner

Contact Information:

Dale Grove

Stantec Project Manager

Phone: (507) 529-6039

E-mail: dale.grove@stantec.com

Fold Here

Mr. Dale Grove
Stantec
6188 Rome Circle NW
Rochester, MN 55901

I-90 Exit 32 to 40
Corridor Study + Design Project
PUBLIC OPEN HOUSE

COMMENT FORM

South Dakota DOT
Connecting South Dakota and the Nation

Stantec

Fold Here

SDDOT Public Meeting Survey

The South Dakota Department of Transportation (SDDOT) invites you to share your opinion about this public meeting and tell us how we can improve our meeting process. Thank you for taking just a few minutes to complete this survey.

You may either mark this survey and turn it in as you leave this meeting or complete it later online at https://www.surveymonkey.com/r/SDDOT-Public-Meeting-Survey

1. In what city was this SDDOT meeting held?

- ○ Aberdeen
- ○ Belle Fourche
- ○ Custer
- ○ Huron
- ○ Mitchell
- ○ Mobridge
- ○ Pierre/Ft. Pierre
- ○ Rapid City
- ○ Sioux Falls
- ○ Watertown
- ○ Winner
- ○ Yankton
- ○ Web Meeting
- ● Other (please specify) STURGIS

2. When did you attend this meeting?

Please enter the meeting date (month/day/year)

Month Day Year: 12 / 20 / 2017

3. How did you learn about this meeting? (please check all that apply)

- ☐ Letter from SDDOT
- ☒ SDDOT Web Site
- ☐ Newspaper
- ☐ Radio
- ☐ Television
- ☐ Facebook
- ☐ Twitter
- ☐ Friend or Acquaintance
- ☐ Electronic Message Board
- ☐ Other (please specify)

4. Why were you interested in attending this meeting? (please check all that apply)

- ☒ I own property that may be affected SDDOT activity
- ☒ I live or work adjacent to a road that may be affected by SDDOT activity
- ☒ I travel on roads or streets that may be affected by SDDOT activity
- ☐ I am a public official in the area
- ☐ My business may be affected by SDDOT activity
- ☒ I have general interest
- ☐ Other (please specify)

5. Please indicate your agreement or disagreement with the following statements:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Does Not Apply
The purpose of the meeting was clearly explained	○	○	●	○	○
Information was presented clearly at the meeting	○	○	●	○	○
I felt free to comment and ask questions during the meeting	○	○	●	○	○
Questions were answered clearly and completely	○	○	●	○	○

Please explain any of your answers

6. How could SDDOT improve the quality and value of this public meeting?

7. If you would like to be contacted about your responses, please provide your name and contact information (this is entirely optional).

Name:

Email:

Phone:

Thank you for taking time to complete this survey. You may either mark this survey and turn it in as you leave this meeting or complete it later online at **https://www.surveymonkey.com/r/SDDOT-Public-Meeting-Survey**

Stantec

Hello, Ms. Musilek,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> *"First: Why is this study being done by a company in Minnesota. I am sure that somewhere in SD there is a company that can and should be preparing for this project. Second: will this be closing 8 miles of Interstate for the complete project or will it be closed in shorter portions. The safety factor of closing long portions of interstate is tremendous. I am referring to the safety of both workers and travelers. It is not necessary to close long portions of road to facilitate renovations. Look at how more populous states handle this."*

Stantec is a company with more than 22,000 employees in offices throughout the United States and Canada, including employees who live and work in South Dakota. We are careful to devote the appropriate resources to every project to give our clients the best services possible. On this project some of the staff, including the Project Manager, happen to be based in Minnesota.

No decisions have been made about roadway closures or construction plans. We are in the process of working closely with the SDDOT staff to identify projects that are the most economically efficient while providing workers and the traveling public the safety they require. Our process will include examining multiple traffic phasing and staging scenarios to select appropriately the one that will work best for the required improvements.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

Stantec

Hello Ms. Morris,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> "*Would be nice to have a service road between Blucksberg and Sturgis. I think it is the only stretch that does not have a service road in this area off I-90.*"

Your comment is timely because we are currently in the process of reviewing all the issues and deficiencies in the project area. We will be meeting the SDDOT staff soon to present our findings and begin developing ideas about what types of projects will be necessary address all the needs in the corridor. We will make sure that your comment is heard by SDDOT staff and included in our discussions.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

Stantec

Hello Mr. Ismay,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> *"I would be interested in visiting with you about waste dirt disposal involved in the construction if needed."*

We are currently in a discovery and data collection mode as we identify the issues and deficiencies in the corridor. We will be meeting with SDDOT staff soon to discuss what we've found and begin discussions on the projects necessary to address those needs. Once we have projects identified, we will begin planning for construction, including a search for any required borrow materials or waste disposal areas. We will keep your contact information, but I encourage you to contact us again later this year after construction concepts are developed.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

Stantec

Hello, Mr. Mitchell,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> *"Coming onto I-90 from Pleasant Valley is dangerous. when it is dark you can't see eastbound traffic because the bridge is in the way. Every day I drive Ft. Meade Way to I-90 and in the winter it is dark. I can't see if an eastbounder on I-90 is in the right or left lane. I've had a couple of close calls where eastbound traffic couldn't see me for the same reason I couldn't see them. So when I pull off of Pleasant Valley Way, onto the on ramp I just put on my blinkers and try to ramp up to interstate speed and get ready for what could be a disaster."*

We are currently reviewing the existing alignment and sight distances at the Pleasant Valley interchange as part of our assessment of the geometrics in the I-90 corridor between Exits 32 and 40. We are also reviewing the need for roadway lighting base on existing and projected traffic volumes. As we develop improvements in the corridor we will certainly keep your concerns in mind as improving motorist safety is a top priority for us.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

Stantec

Hello Ms. Martel,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> *"Are there actual changes being made to direction of road? Would like more details if so. Thank you, Katherine Martel Davenport Family Real Estate"*

The Interstate 90 alignment will remain essentially unchanged. If needed, small changes to the alignment may be made to improve safety. Roads crossing the interstate may be re-aligned to allow the ramps connecting to the interstate to be brought up to current standards.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

Stantec

Hello, Ms. Kunz,

Thank you for taking the time to follow the progress of the I-90 Corridor Study and Design Project and visit our website. We appreciate your feedback and participation in the process. Through the online submission form, we received your comment:

> *"How can you relocated exit 34? What about all the residents in blucksberg? There is only one way in blucksberg so I'm curious how you would relocated our only entrance and exit."*

No decisions have been made, but there is a possibility that Exit 34 will be reconstructed or relocated to address sub-standard design and address other issues in the vicinity of the interchange. During any construction on I-90 near Blucksberg, we will work to maintain access for residents throughout the project and minimize any inconvenience related to construction activities.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Thank you again,

Dale Grove

City of Sturgis
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street
January 25, 2018 4:00 pm - 5:00 pm MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Mike Carlson	SDDOT	605-394-2248	mike.carlson@state.sd.us
	Daniel Ainslie	City of Sturgis	605-347-4422	dainslie@sturgisgov.com

Action Item: N/A

1. Welcome & Introductions – All
2. Project Description and Schedule
3. Purpose and Need
4. Existing Conditions
5. City of Sturgis Considerations

   Traffic flow throughout the community is generally good. The city is experiencing is a need for permanent signal systems. Especially, with the city expanding in the SE direction. There is a need for the signal located at the east bound exit to be operating for a longer period of time if not permanently.

   The intersection of Anna/Junction needs signalization and reorientation due to increased traffic flows from the interstate and development in the area. People have been using the right turn lane from the interstate exit ramp have been using it as through lane

   A general public meeting is being held by the city. The Administrator will ask if people have additional comments on the project.

   Wildlife throughout the corridor has been a problem.

   Safety is important and SDDOT maintenance is very good. The curve north of the Tilford port of entry is a problem area – in particular for commuters to/from Sturgis and Rapid City and for tourists. Wider shoulders through the curve and at the bridge (pointed to bridge 47-068-495) could help.

   Lack of a frontage road is of interest as the detour routes are quite extensive when issues occur on the interstate. Of the interstate segments in the study, Exit 32 to Exit 34 would be of highest priority for us to access so that our emergency services can get to and from the Blucksberg development.

   Adding capacity for the national cemetery so cars do not back up on to the interstate.

The City of Sturgis cannot extend into the BLM land. Sturgis has been working with Catherine Martel, a property owner in the SE portion of Sturgis, to develop high density and low-density areas. Projections are showing an increase of 400 permits. The last six years the city is averaging 50 building permits a year. This past year the city was at 40. In 2019 the city anticipates 85 new housing permits and 60 each year is likely thereafter. More and more land owners are starting to become open to development and the city foresees growth continuing to increase. A connection through BLM land from Vanocker Canyon Rd to exit 34 would be a benefit.

Sturgis has a far larger amount of people that commute to Sturgis than residents leaving to places like Rapid City. There are more jobs available in Sturgis than available housing.

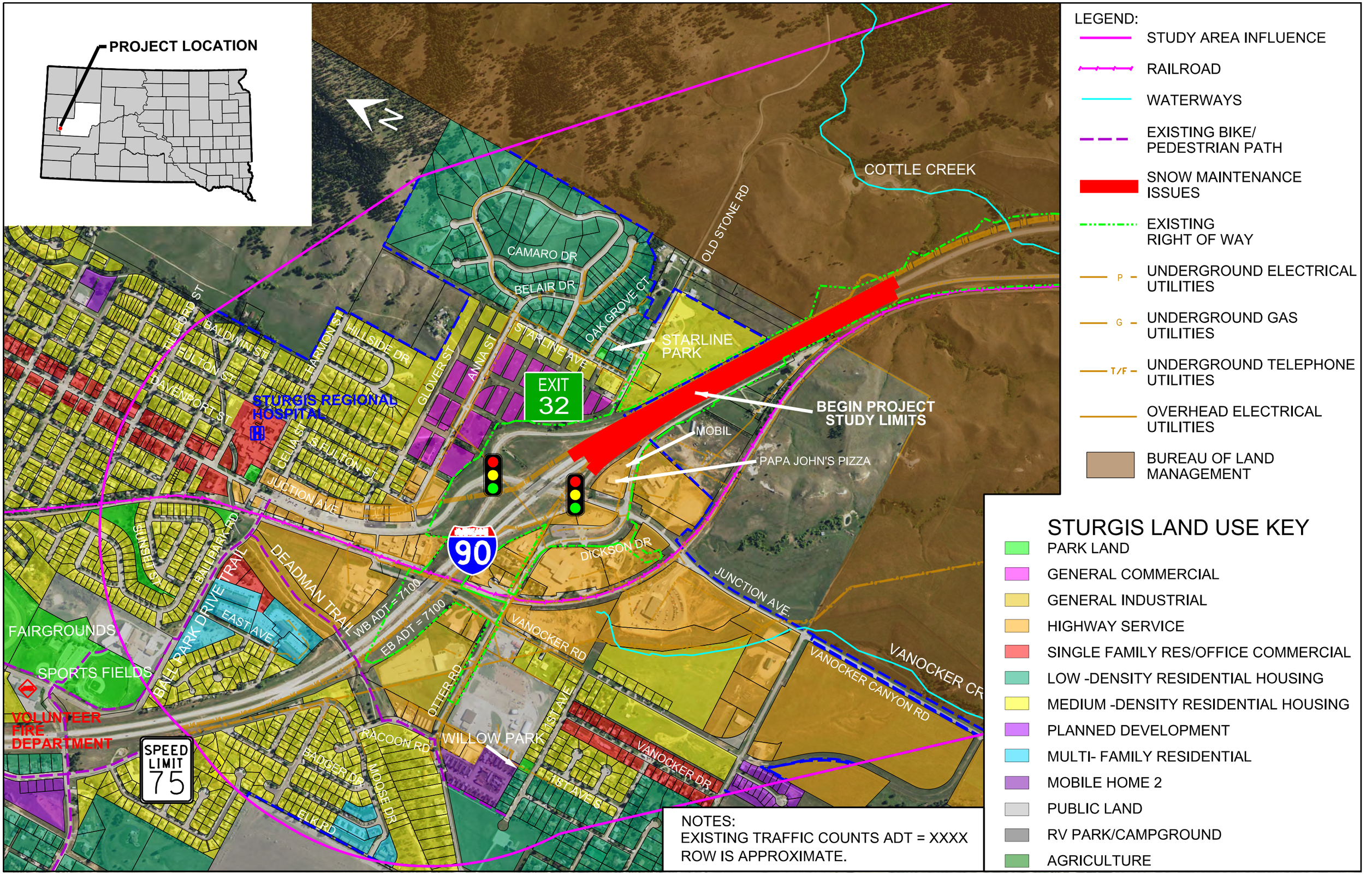
There is a greater lifestyle and desire for bike riding, so a frontage road would help get those users off the interstate. The City is working with the SD School of Mines to update the comprehensive plan to improve the planned trail connections.

Are there known low-income or minority populations in the area? No. There are no segregated populations within the City, the minority populations that do exist are dispersed throughout the community.

There are no city park developments planned within the city. The city owns about 400 acres south of Sturgis and are working with SD GFP to transfer land for a State Recreational Area. There are four dams there, but the city has since then gone to a deep well system in the early 70's so it has not been used. Several of the area trails connect in this area.

6. General Discussion / Next Steps

    - Right now, in data collection mode
    - Later this year we will have another public meeting that will contain concepts.
    - In 2019 following the completion of the Environmental Assessment there will be another public meeting.



LEGEND:

- STUDY AREA INFLUENCE
- RAILROAD
- WATERWAYS
- EXISTING BIKE/ PEDESTRIAN PATH
- SNOW MAINTENANCE ISSUES
- EXISTING RIGHT OF WAY
- P – UNDERGROUND ELECTRICAL UTILITIES
- G – UNDERGROUND GAS UTILITIES
- T/F – UNDERGROUND TELEPHONE UTILITIES
- OVERHEAD ELECTRICAL UTILITIES
- BUREAU OF LAND MANAGEMENT

STURGIS LAND USE KEY

- PARK LAND
- GENERAL COMMERCIAL
- GENERAL INDUSTRIAL
- HIGHWAY SERVICE
- SINGLE FAMILY RES/OFFICE COMMERCIAL
- LOW -DENSITY RESIDENTIAL HOUSING
- MEDIUM -DENSITY RESIDENTIAL HOUSING
- PLANNED DEVELOPMENT
- MULTI- FAMILY RESIDENTIAL
- MOBILE HOME 2
- PUBLIC LAND
- RV PARK/CAMPGROUND
- AGRICULTURE

NOTES:
EXISTING TRAFFIC COUNTS ADT = XXXX
ROW IS APPROXIMATE.

Stakeholder Meetings #2 - Summary

To:	Steve Gramm	From:	Dale Grove
	SDDOT		Rochester MN Office
File:	MEAD_IM 0901(195)32N_IM 0901(198)32N_I-90 Exit 32-40	Date:	January 15, 2019

I-90, Exit 32 to Exit 40 Corridor Study Stakeholder Meetings #2
November 15, 2018, 9:00 am to 11:00 am MST
November 16, 2018, 9:00 am to 3:00 pm MST
SDDOT Rapid City Regional Office
2300 Eglin St. Rapid City, SD 57703

Overview

In November 2018, Stantec and South Dakota Department of Transportation staff held individual meetings with project stakeholders to discuss the project, review concepts developed, gather feedback, and answer questions. The stakeholder meetings were held at Rapid City Regional Office.

Meetings with eight stakeholders were held over a two-day period. Project team members Dale Grove, Aaron Cook, and Theresa Maahs (Stantec) attended all meetings. Either Mike Carlson or Tom Horan from the Regional office attended the meetings and Steve Gramm and Alice Whitebird (SDDOT) participated from Pierre by Video Conference as shown below.

Jan. 25th, All times in MST (SDDOT representative)

- 9:00 am – Danny Dalton; GWRR (Tom Horan)
- 10:00 am – Jeff Breckenridge; USACE (Tom Horan)
- 11:00 am – Dan Ainslie and Rick Bush; City of Sturgis (Mike Carlson)

Jan 26th, CST (SDDOT representatives)

- 9:00am – Ryan Larson, Brenda Shierts and Daniel Velder; BLM (Mike Carlson; Steve Gramm and Alice Whitebird by video conference)
- 10:00 am – Terry Corkins and Dav VanDenheede; Black Hills National Cemetery (Mike Carlson; Steve Gramm and Alice Whitebird by video conference)
- 11:00am – Trenton Haffley; South Dakota GFP (Tom Horan)
- 1:00 pm – Annie Apodaca and John Kelly; US Forest Service (Tom Horan)
- 2:00 pm – RJ Ludwick; No Name City Luxury Cabins & RV, Dick Morkert; Property Owner and Michael Russell; Katmandu on the phone (Mike Carlson)

To spur conversations and help accurately identify concerns of each stakeholder a packet was developed that included the following:

- Interchange Stick concepts (11x 17)
- Alternative maps (30x40)
    - 3- Alternatives at Exit 34
    - Local road connections around the cemetery

Reference: I-90 (Exit 32 to Exit 40) Corridor Study Public Information Meeting #1

  - 3- Alternatives at Exit 37
  - Exit 40
- Environmental Maps
- Alternative evaluation matrix (8.5x11) with supporting rating criteria for each alternative.

The meetings were informal to encourage an open conversation. Each meeting began with introductions, followed by a *Project Update.* The *Alternative Concepts and Matrix* were reviewed along with the current *Schedule* for the project. Meetings then moved to an open conversation allowing the stakeholders to share their concerns.

A summary of each of the eight meetings is attached to this Memo. The data collected in these meetings will be carried into project identification and design phase of the project.

STANTEC CONSULTING SERVICES INC.

Dale Grove
Principal

Phone: (507) 529-6039
Fax: (507) 282-3100
Dale.Grove@stantec.com

Attachment: Meeting Minutes
Stick line Interchange Layouts
Interchange Concepts
Environmental Maps
Alternative Evaluation Matrix
Sign-in Sheet

c. Aaron Cook, file

Genesee & Wyoming
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street
November 15, 2018 9:00 am - 10:00 am MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Tom Horan	SDDOT	605-394-2244	tom.horan@state.us
	Danny Dalton	GWRR	307-660-4208	ddalton@gwrr.com

Action Items:

59	Genesee & Wyoming Railroad will send Stantec the vertical and horizontal clearance requirements	Danny Dalton 11/15/2018	

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. Genesee & Wyoming Railroad Considerations:
    - There are no plans to modify the existing rail alignment or profile.
    - The rugged terrain adjacent the railroad would make realignment costly.
    - The railroad would be open to fill being placed inside railroad right of way as long as drainage is maintained.
    - It was understood that due to limited separation between I-90 and the railroad, retaining wall encroachments may be required. If necessary, 25 feet is the minimum offset a wall would be allowed to be placed from the centerline of railroad tracks, although 50 feet is preferable.
    - Currently, the railroad is operating six days a week. There is a 60% chance of the rail traffic increasing from one route per day per day to two routes per day between Belle Fouche and Rapid City. Typically, this happens when the bentonite production picks up.
    - The alternatives at both Exit 34 and Exit 37 remove an existing at-grade crossing at one location and add a new at-grade crossing at a different location. The railroad wants a gated warning system installed at each proposed at-grade crossing.

- If improvements within the railroad right of way are required, the railroad's engineers would determine feasibility and costs. The engineering department in Jacksonville, FL would review all proposed modifications.

5. General Discussion / Next Steps

    - If railroad right of way encroachments are necessary, railroad staff will need to review layouts with toe of slope and drainage impacts as well as any retaining wall locations.

    - **Danny will send Stantec the vertical and horizontal clearance requirements.**

U.S. Army Corps of Engineers
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 15, 2018 10:00 am - 11:00 am MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Tom Horan	SDDOT	605-394-2244	tom.horan@state.us
	Jeff Breckenridge	USACE	605-341-3169 ext. 3621	jeff.l.breckenridge@usace.army.mil

Action Items:

60	USACE will send current wetland rules dealing with forested wetlands	Jeff Breckenridge 11/15/2018	Completed 11/30/2018

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. U.S. Army Corp of Engineer (USACE) Considerations:
    - Exit 37 has both forested wetlands and freshwater emergent wetlands present, which may have different mitigation requirements. **USACE will send current wetland rules dealing with forested wetlands** following the meeting.
    - If mitigation is required for project impacts, an enhancement activity could include correcting nearby degraded wetland areas (i.e. - reworking a silted wetland).
        - Degraded wetlands are not tracked, so finding an available site for correction will require additional coordination with the USACE. No updates have occurred for western South Dakota wetland banking. Banking is still not available in this area.
    - Permit impact threshold acreages:
        - Nationwide Permit <0.5 acre
        - Individual Permit >0.5 acre
    - USACE would like to see a structure installed in the local road for Alternative 34-7, footing would reduce impacts to the wetlands.
    - Diverting flows for box culvert construction would be considered.

- Temporary work impacts will need to be identified in the permit, including borrow sites.

5. General Discussion / Next Steps

   - The USACE will use the FHWA's determinations on Section 7 T&E and SHPO Section 106 determinations that will be part of the roadway project NEPA process. The NEPA/EA, a 404(b)(1) analysis should be integrated into the alternative evaluations to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) regarding impacts to aquatic resources. Once the LEDPA is identified, the USACE would like to see a specified compensatory mitigation plan within the EA for unavoidable impacts to aquatic resources for the selected alternative.

   - USACE would like to be involved in reviewing drafts of the EA to ensure that the 404(b)(1) analysis is properly integrated into the alternative evaluation.

City of Sturgis
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street
November 15, 2018 11:00 am - 12:00 pm MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Mike Carlson	SDDOT	605-394-2248	mike.carlson@state.sd.us
	Daniel Ainslie	City of Sturgis	605-347-4422	dainslie@sturgisgov.com
	Rick Bush	City of Sturgis	605-347-1832	rbush@sturgisgov.com

Action Items: N/A

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. City of Sturgis Considerations:
    - The city estimates 300-400 residents live in Blucksberg development. Maintaining access to the Blucksberg development should be an important consideration in design and throughout construction.
5. General Discussion / Next Steps
    - Lack of service roads along this corridor are a concern for the City of Sturgis as the Blucksberg development could be annexed to the city in the future and access better than what exists today would be necessary.

Bureau of Land Management
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 16, 2018 9:00 am - 10:00 am MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Mike Carlson	SDDOT	605-394-2248	mike.carlson@state.sd.us
	Ryan Larson	BLM	605-892-7000	rlarson@blm.gov
	Brenda Shierts	BLM	605-723-8712	bshierts@blm.gov
	Daniel Velder	BLM	605-892-7000	dvelder@blm.gov

Action Items:

61	The BLM will survey locate the rock culverts and send to Stantec.	Brenda Shierts 11/16/2018	

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. Bureau of Land Management (BLM) Considerations:
    - The local road connections included in alternative 34-1B and 34-3 are undesirable as they would land-lock portions of BLM land.
    - The BLM is concerned with having cattle crossing over roads. Box culverts need to be large enough to allow the passage of cattle. The height of the existing Alkali creek box culvert should be used for new local road box culverts.
    - Rock culverts exist at the location of the old highway east of existing I-90 that are likely historic. **The BLM will survey locate the rock culverts and send the information to Stantec.**
    - A sleeve for a small waterline will be needed if I-90 culverts are relocated or reconstructed at Alkali creek.
    - Alternatives 34-1B and 34-3 would cut off portions of BLM land with local road connections.
    - The BLM will need to do their own NEPA process and would be open to being a Cooperating Agency on our EA to reduce duplicative work.

5. General Discussion / Next Steps

    - Once an alternative is selected for Exit 34, Stantec's Archeologist will contact Brenda Shierts to perform a Class I Survey so the BLM can be present during the field work.

Black Hills National Cemetery
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 16, 2018 10:00 am - 11:00 am MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Mike Carlson	SDDOT	605-394-2248	mike.carlson@state.sd.us
	Terry Corkins	BHNC	605-347-3830	terry.corkins@va.gov
	Dav VanDenheede	BHNC	605-390-4389	dav.vandenheede@va.gov

Action Items:

62	Black Hills National Cemetery Management will provide thoughts on relocating Exit 34 interchange between Alkali Creek and present Exit 34 interchange	Terry Corkins 11/16/2018	
63	Black Hills National Cemetery will provide property corner information to SDDOT and Stantec	Terry Corkins 11/16/2018	

Welcome & Introductions – All

1. Project Update
2. Review Alternative Concepts and Matrix
3. Black Hills National Cemetery (BHNC) Considerations:
    - Terry indicated that the both the north and south concepts appear to have a similar impact on the cemetery. He would like to discuss the concepts further with BHNC management.
    - Terry Corkins would be interested in revisiting the concept that places the new Exit 34 interchange between Alkali Creek and the present Exit 34 interchange. He feels it could provide the cemetery with a better access point. Terry was thought that a local road through the cemetery would benefit both the cemetery and area residents. **Terry will discuss this option with BHNC management and provide the SDDOT with their thoughts.**
    - The BHNC is finishing the environmental report for the new property and will have a draft early 2019.
    - **The BHNC has survey information available on the property corners and will provide that to the SDDOT and Stantec**.
4. General Discussion / Next Steps
    - N/A

South Dakota Game, Fish, and Parks
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 16, 2018 11:00 am - 12:00 pm MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Tom Horan	SDDOT	605-394-2244	tom.horan@state.us
	Trenton Haffly	SDGFP	605-347-3830	terry.corkins@state.sd.us

Action Items: N/A

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. SD Game Fish and Parks (SD GFP) Considerations:
    - Discussed elk herd locations and hunting pressures in the area along with the animal collision memo that Stantec developed. SD GFP reviewed the memo prior to the meeting and thought the mitigations outlined in the document made sense since the movement habits of the elk herds in this area are not migratory.
    - Both sides of the interstate have suitable habitat for elk.
    - Two hunting units (Unit BHE-H7A and Unit PRE-09A) are located along the corridor.
    - The South Dakota Game Fish and Parks has not deployed any escape ramps along fence runs to allow animals trapped on the highway side of the fence an escape.
        - Coordination with the South Dakota Game Fish and Parks will be needed to determine the best locations for the fencing.
    - CHAP land is not bound by the SDGFP. Any impacts to CHAP land would be dealt with through discussions with the private landowner.
    - Hilary Meyer is a Biologist in the Pierre office. She may have interest in the environmental review of the project area and could provide insight or data.
5. General Discussion / Next Steps

US Forest Service
Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 16, 2018 1:00 pm - 2:00 pm MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Tom Horan	SDDOT	605-394-2244	tom.horan@state.us
	Annie Apodaca	USFS	605-673-9239	aapodaca@fs.fed.us
	John Kelley	USFS	605-443-3074	john.kelley@usda.gov

Action Items: N/A

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. US Forest Service Considerations:
    - The Forest Service has heritage sites located in or near the foothills west of the Black Hills National Cemetery. The Option 3, for local road connections around the cemetery impacts these sites as it impacts the corner of National Forest land.
    - Local road connection Option C would clip the Black hills National Forest Service boundary.
    - The Black Hills National Forest Service was concerned that local road connections proposed for Alternative 34-1B and 34-3 would create an inadvertent trailhead for the Centennial Trail. History has shown if a public road is in close proximity with a trail, the public will use the road to access the trail rather than using the designated trailhead.
    - The USFWS gave an example of previous experience in a similar situation - Signs and guardrail have not helped to deter the public from parking along US 14 in the Spearfish Canyon to access the Devils Bathtub hiking destination.
    - The Forest Service prefers not to relocate the Centennial Trail's entry point on Forest Service land. However, if this is needed coordination between the Forest Service, Bureau of Land Management, Black Hills National Cemetery, and South Dakota Department of Transportation will take place to determine what options are available.
    - The Centennial Trail experiences heavy equestrian use and we will need to consider horse trailer parking.

5. General Discussion / Next Steps

    - Consideration should be made in development of the local road connection. Visual and acoustic barriers to public land recreational land so to not disturb the Black Hills National Cemetery.

RV Park Owners Meeting Minutes

Stantec WO: PD-03-17, I-90 Exit 32-40

Rapid City Regional Office, 2300 Eglin Street

November 16, 2018 2:00 pm - 3:00 pm MST

Attendees	Name	Organization	Phone	E-Mail
	Dale Grove	Stantec	507-529-6039	dale.grove@stantec.com
	Aaron Cook	Stantec	701-989-7087	aaron.cook@stantec.com
	Theresa Maahs	Stantec	651-604-4786	theresa.maahs@stantec.com
	Mike Carlson	SDDOT	605-394-2248	mike.carlson@state.sd.us
	RJ Ludwik	RV Owner	605-490-8909	camping@nonamecity.com
	Dick Morkert	Neighbor	605-347-5573	- - -
	Michael Russell	RV Owner	605-347-2451	russell.michael1@me.com

Action Items: N/A

1. Welcome & Introductions – All
2. Project Update
3. Review Alternative Concepts and Matrix
4. RV Park Owners Considerations:
    - The RV Park owners expressed concerns that alternatives were mainly focused north of the cemetery and this location was not ideal for their business.
    - The RV Park owners expressed an interest in leaving the frontage road where it is currently located. It was explained that the facilities (I-90 mainline, I-90 ramps, frontage road, and railroad) are all too close together and do not meet current spacing design requirements. For this reason, the frontage road could not remain as it is today.
    - The RV Park owners indicated that the location of the Alternative 34-7 would be ideal for residents of Blucksberg. Mr. Ludwick thought that it would help improve local road conditions of Blucksberg drive as he considers the current local road geometry dangerous. While Mr. Ludwick was disappointed that more options were not shown south of the cemetery, he agreed that it was a reasonable alternative.
    - Bulldog Road is currently privately owned and maintained. Ownership of the road would need to be reviewed if it were to become a through road.
5. General Discussion / Next Steps
    - The local road connection to Bull Dog Canyon Rd is currently shown cutting through the center of the Morkert parcel. Mr. Morkert would like to see the road shifted to avoid splitting his property. If Alternative 34-7 is selected, the design will be refined in final design, and Stantec will look at reducing impacts to the Morkert parcel by moving to north west side of the parcel.

ALTERNATIVE 34-1

OFFSET SINGLE POINT

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

FILENAME: P:\...\InterchangeAlternatives2018-09-26.dgn

2500' RADIUS
75 MPH DS

833' RADIUS
50 MPH DS

833' RADIUS
50 MPH DS

340' RADIUS
35 MPH DS

81' RADIUS
20 MPH DS

250' RADIUS

833' RADIUS

833' RADIUS
50 MPH DS

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

766' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

ALKALI CREEK

833' RADIUS
50 MPH DS

PROPOSED BOX CULVERT

2500' RADIUS
75 MPH DS

PROPOSED BRIDGE

PROPOSED BRIDGE

PROPOSED BRIDGE

I-90 REALIGNMENT ~210' O/S
MEDIAN TO MEDIAN

485' RADIUS
40 MPH DS

833' RADIUS
50 MPH DS

2500' RADIUS
75 MPH DS

PROPOSED AT-GRADE
CROSSING

ALTERNATIVE 34-1
THIS ALTERNATIVE FEATURES AN OFFSET SINGLE POINT INTERCHANGE.
AVOIDS THE RAILROAD WHILE IMPACTING THE HILLSIDE
TO THE EAST. FOR THIS ALTERNATIVE THREE BRIDGES WILL BE NEEDED.
TRAFFIC SIGNAL IS REQUIRED AT INTERSECTION WITH RAMPS.
BOX CULVERTS OPTIONS OVER ALKALI CREEK IN PLACE OF BRIDGES.
THE LOCAL ROAD CONNECTION WILL NCLUDE AN AT GRADE RAILROAD
CROSSING.

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 34-1B

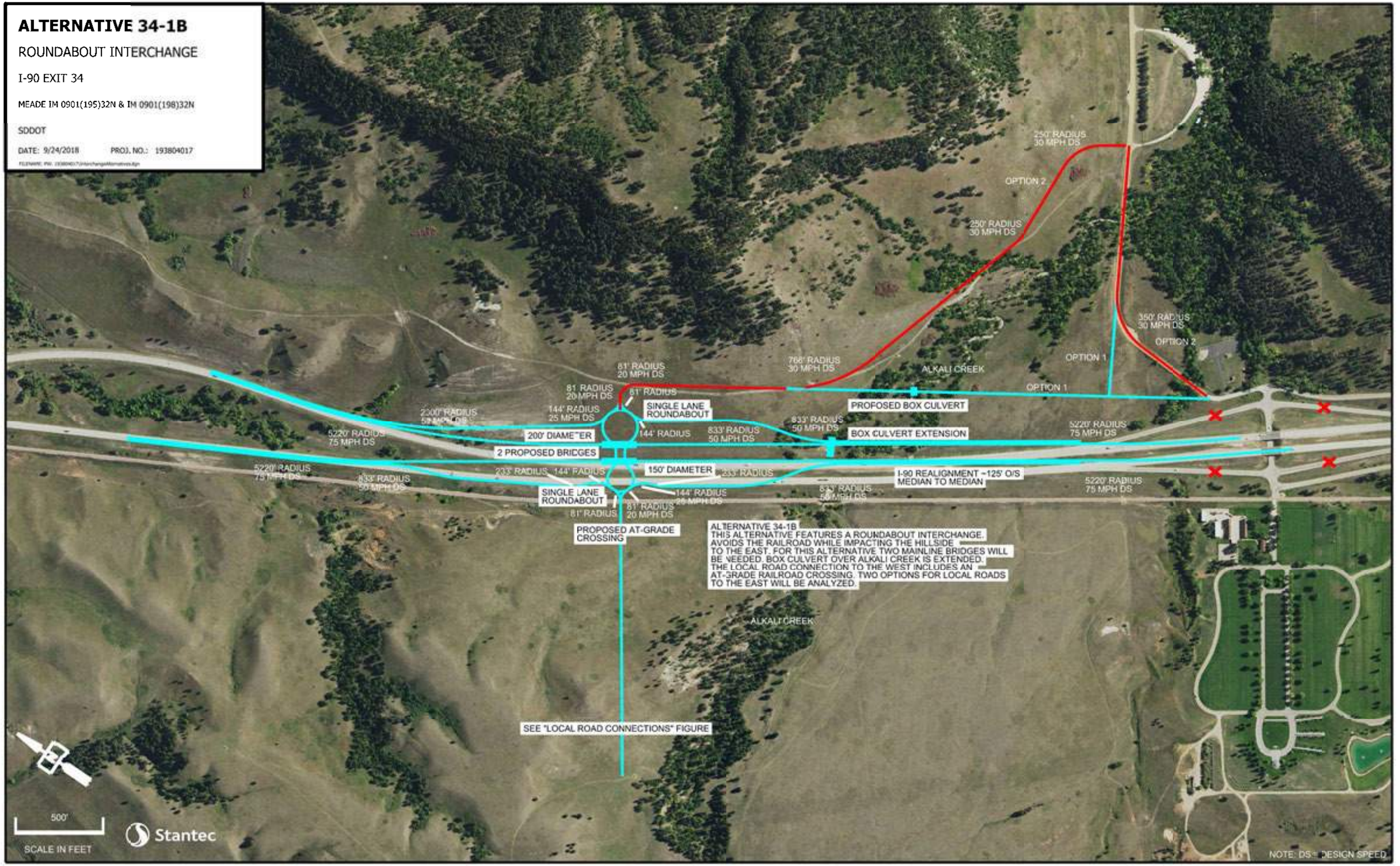
ROUNDABOUT INTERCHANGE

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



ALTERNATIVE 34-2

FOLDED DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

250' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

833' RADIUS
50 MPH DS

833' RADIUS
30 MPH DS

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

833' RADIUS
50 MPH DS

2500' RADIUS
75 MPH DS

ALKALI CREEK

PROPOSED BRIDGE

PROPOSED BOX CULVERT

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

I-90 REALIGNMENT ~485' O/S
MEDIAN TO MEDIAN

2500' RADIUS
75 MPH DS

ALTERNATIVE 34-2
THIS ALTERNATIVE FEATURES A FOLDED DIAMOND INTERCHANGE. AVOIDS THE RAILROAD WHILE GREATLY IMPACTING THE HILLSIDE TO THE EAST. TERRAIN SIGNIFICANTLY STEEPENS 50' PAST DIRT ROAD. FOR THIS INTERCHANGE ONE CROSSROAD BRIDGE OVER MAINLINE WILL BE NEEDED. BOX CULVERTS OPTIONS OVER ALKALI CREEK IN PLACE OF BRIDGES THE INTERCHANGE IS FOLDED AWAY FROM CREEK TO REDUCE IMPACTS. THE LOCAL ROAD CONNECTION WILL INCLUDE AN AT GRADE RAILROAD CROSSING.

PROPOSED AT-GRADE
CROSSING

500' RADIUS
30 MPH DS

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 34-3

MODIFIED FOLDED DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

FILENAME: P:\...\Interchange Alternatives.dgn

2800' RADIUS
75 MPH DS

2300' RADIUS
50 MPH DS

2300' RADIUS
50 MPH DS

5300' RADIUS
75 MPH DS

231' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

766' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

OPTION 2

766' RADIUS
30 MPH DS

ALKALI CREEK

OPTION 1

PROPOSED BOX CULVERT

350' RADIUS
30 MPH DS

OPTION 1

OPTION 2

7500' RADIUS
75 MPH DS

7500' RADIUS
75 MPH DS

PROPOSED BRIDGE

PROPOSED RAILROAD TUNNEL

231' RADIUS
30 MPH DS

231' RADIUS
30 MPH DS

231' RADIUS
30 MPH DS

7500' RADIUS
75 MPH DS

ALTERNATIVE 34-3
THIS ALTERNATIVE FEATURES A FOLDED DIAMOND INTERCHANGE. IT USES EXISTING I-90 MAINLINE TO LOWER IMPACTS TO EASTERN HILLSIDE. THE RAILROAD WILL BE AFFECTED WITH THIS ALTERNATIVE. A RAILROAD TUNNEL WILL UTILIZE LOWER TERRAIN ALLOWING FOR TWO RAMPS TO PASSOVER. MAINLINE WILL NEED TO BE RAISED TO ALLOW RAMPS TO CLEAR RAILROAD. AN EXTENDED BRIDGE WILL BE NEEDED OVER MAINLINE AND RAILROAD.

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 34-4

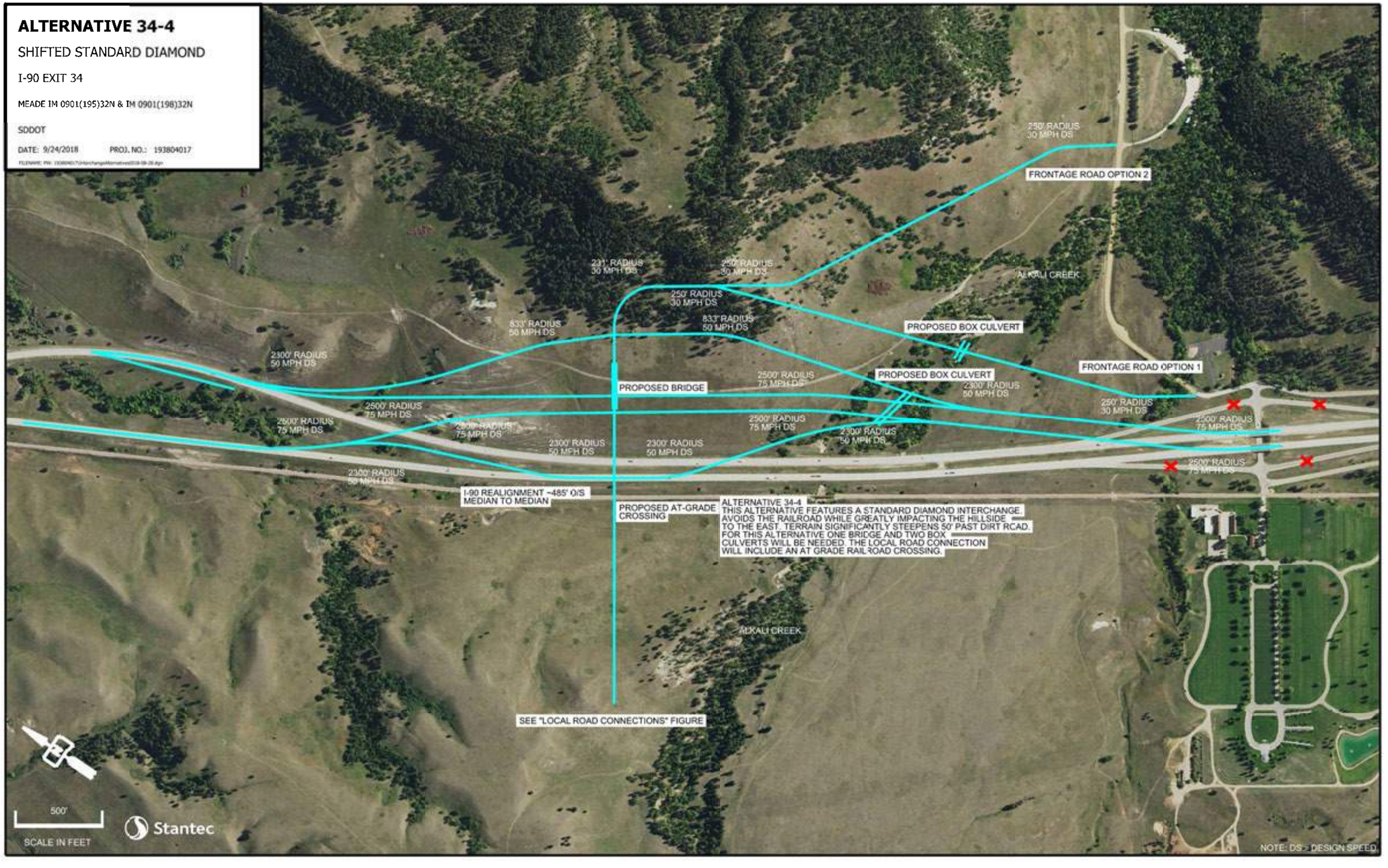
SHIFTED STANDARD DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



ALTERNATIVE 34-5

WESTBOUND BUTTON-HOOK

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

250' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

81' RADIUS
20 MPH DS

1500' RADIUS
30 MPH DS

ALKALI CREEK

2500' RADIUS
75 MPH DS

231' RADIUS
30 MPH DS

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

PROPOSED BOX CULVERT

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

PROPOSED BRIDGE

2500' RADIUS
75 MPH DS

I-90 REALIGNMENT ~220' O/S
MEDIAN TO MEDIAN

2300' RADIUS
50 MPH DS

2300' RADIUS
50 MPH DS

2300' RADIUS
50 MPH DS

2500' RADIUS
75 MPH DS

PROPOSED AT-GRADE
CROSSING

500' RADIUS
30 MPH DS

ALTERNATIVE 34-5
THIS ALTERNATIVE FEATURES A WESTBOUND BUTTON-HOOK INTERCHANGE. AVOIDS THE RAILROAD WHILE IMPACTING THE HILLSIDE TO THE EAST. FOR THIS ALTERNATIVE ONE BRIDGE AND ONE BOX CULVERT IN ALKALI CREEK WILL BE NEEDED. THE LOCAL ROAD CONNECTION WILL INCLUDE AN AT-GRADE CROSSING.

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 34-5B

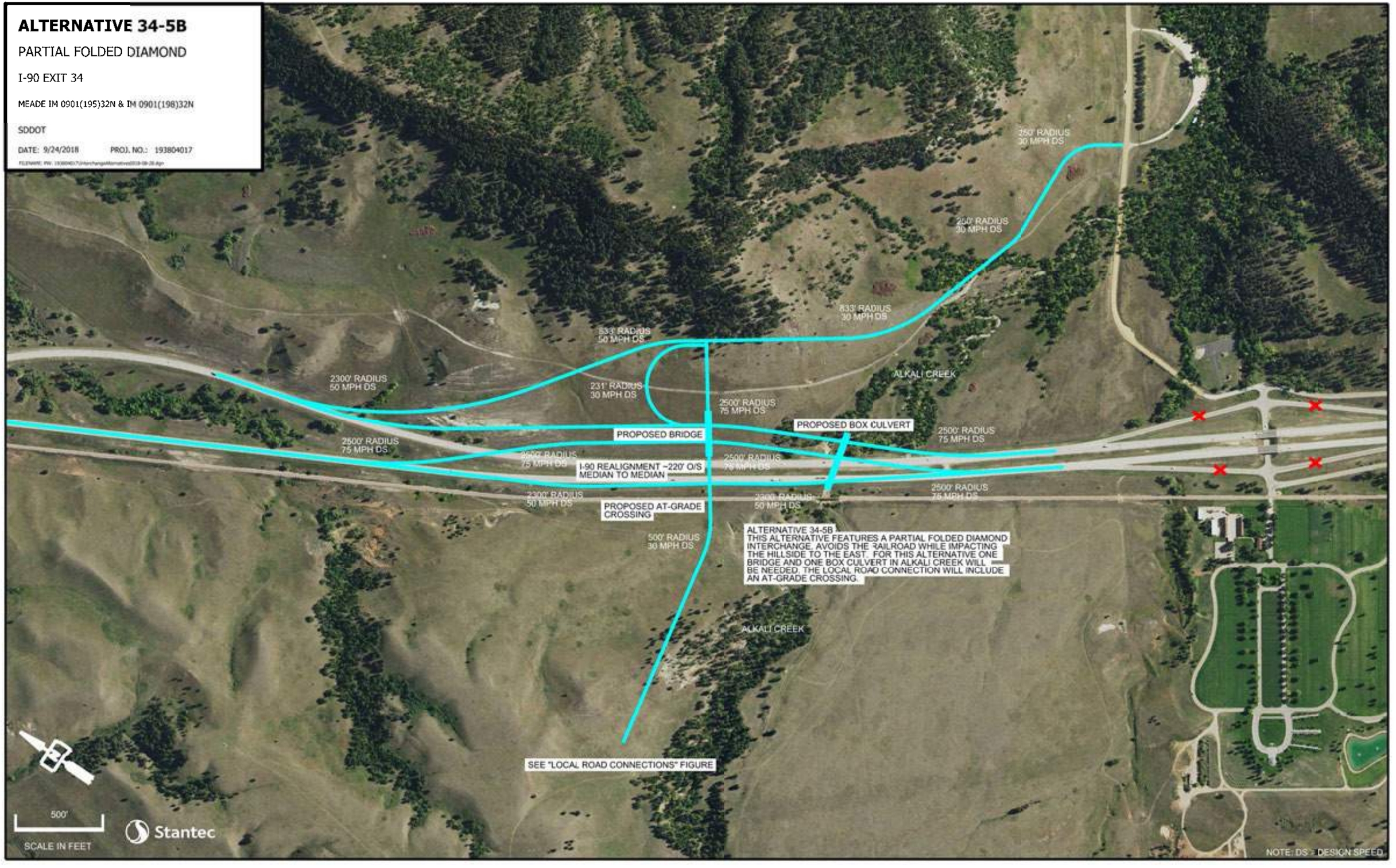
PARTIAL FOLDED DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



ALTERNATIVE 34-6

TRUMPET

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

250' RADIUS
30 MPH DS

250' RADIUS
30 MPH DS

2300' RADIUS
50 MPH DS

2300' RADIUS
50 MPH DS

833' RADIUS
50 MPH DS

2300' RADIUS
50 MPH DS

500' RADIUS
30 MPH DS

ALKALI CREEK

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

PROPOSED BRIDGE

PROPOSED BRIDGE

PROPOSED BOX CULVERT

231' RADIUS
30 MPH DS

2500' RADIUS
75 MPH DS

2500' RADIUS
75 MPH DS

2300' RADIUS
50 MPH DS

I-90 REALIGNMENT ~220' O/S
MEDIAN TO MEDIAN

PROPOSED AT-GRADE
CROSSING

500' RADIUS
30 MPH DS

2300' RADIUS
50 MPH DS

2500' RADIUS
75 MPH DS

ALTERNATIVE 34-6
THIS ALTERNATIVE FEATURES A TRUMPET INTERCHANGE. AVOIDS THE RAILROAD WHILE IMPACTING THE HILLSIDE TO THE EAST. FOR THIS ALTERNATIVE TWO BRIDGES AND ONE BOX CULVERT OVER ALKALI CREEK WILL BE NEEDED. THE LOCAL ROAD CONNECTION WILL INCLUDE AN AT-GRADE RAILROAD CROSSING.

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 34-7

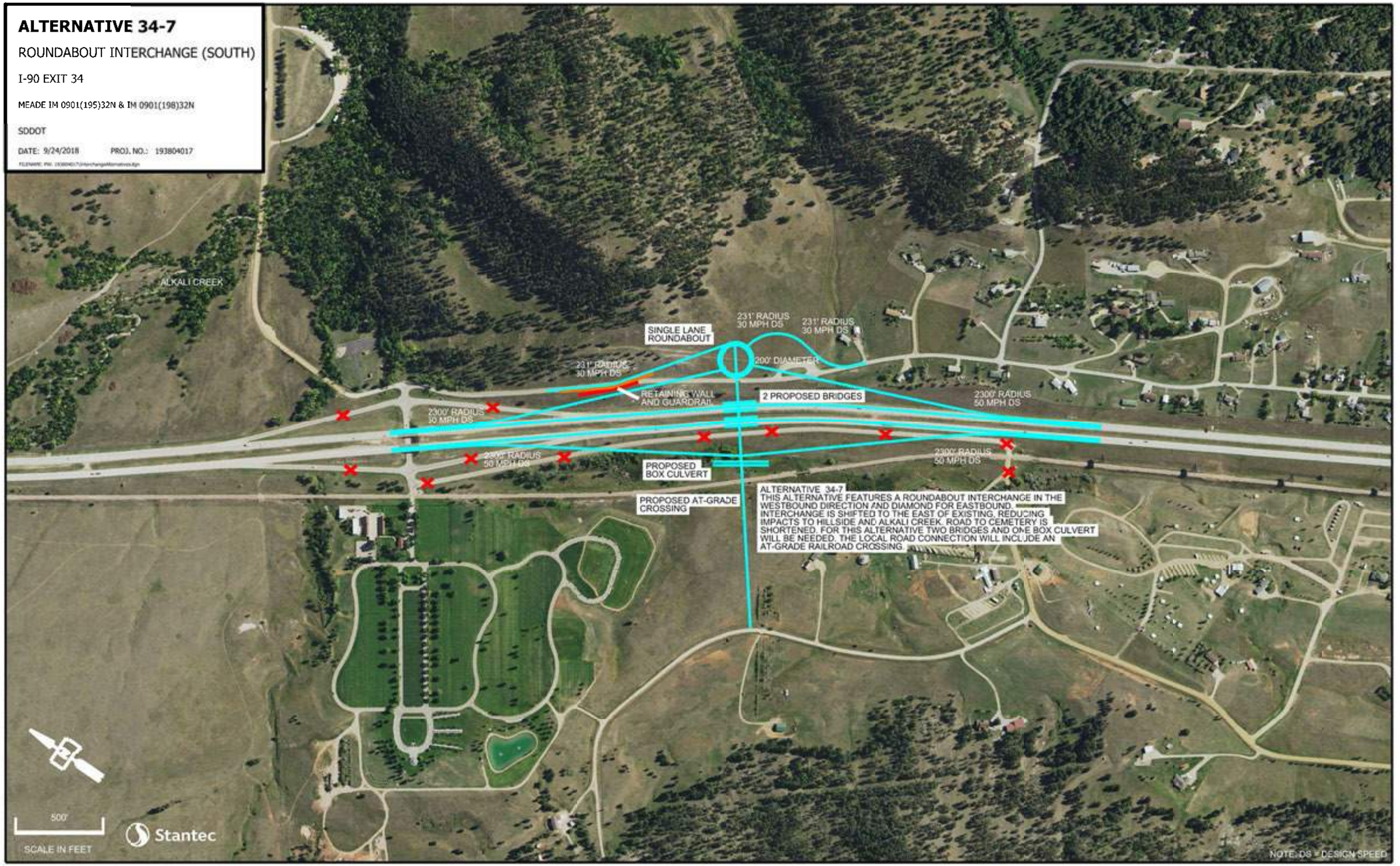
ROUNDABOUT INTERCHANGE (SOUTH)

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



OPTION A, B, C

LOCAL ROAD CONNECTIONS

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

FILENAME: P:\...\InterchangeAlternatives.dgn

OPTION A
THIS OPTION TAKES THE SHORTEST ROUTE ACRCSS ALKALI CREEK WHILE LOCAL ROAD CONNECTION IMPACTS CEMETERY EXPANSION PROPERTY. AVOIDS STEEP TERRAIN TO THE WEST. TIES BACK INTO BULLDOG CANYON ROAD. CENTENNIAL TRAIL FOLLOWS ALKALI CREEK THROUGH BOX CULVERT.

OPTION B
THIS OPTION TAKES THE LEAST IMPACTFUL ROUTE ACROSS ALKALI CREEK THEN FOLLOWS THE TREE LINE UNTIL TIEING BACK INTO BULLDOG CANYON ROAD. AVOIDS MOST OF THE BUILDABLE AREAS OF THE EXPANSION CEMETERY PROPERTY. CENTENNIAL TRAIL FOLLOWS ALKALI CREEK THROUGH BOX CULVERT.

OPTION C
THIS OPTION TAKES THE LONGEST THROUGH SIGNIFICANT TERRAIN ROUTE ACROSS ALKALI CREEK THEN FOLLOWS THE TREE LINE UNTIL TIEING BACK INTO BULLDOG CANYON ROAD. AVOIDS THE BUILDABLE CEMETERY PROPERTY. CENTENNIAL TRAIL FOLLOWS ALKALI CREEK THROUGH BOX CULVERT.

OPTION A

OPTION B

OPTION C

PROPOSED BOX CULVERT

PROPOSED BOX CULVERT

PROPOSED BOX CULVERT

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

500' RADIUS 30 MPH DS

250' RADIUS 30 MPH DS

500'

SCALE IN FEET

Stantec

NOTE: DS = DESIGN SPEED

ALTERNATIVE 37-1

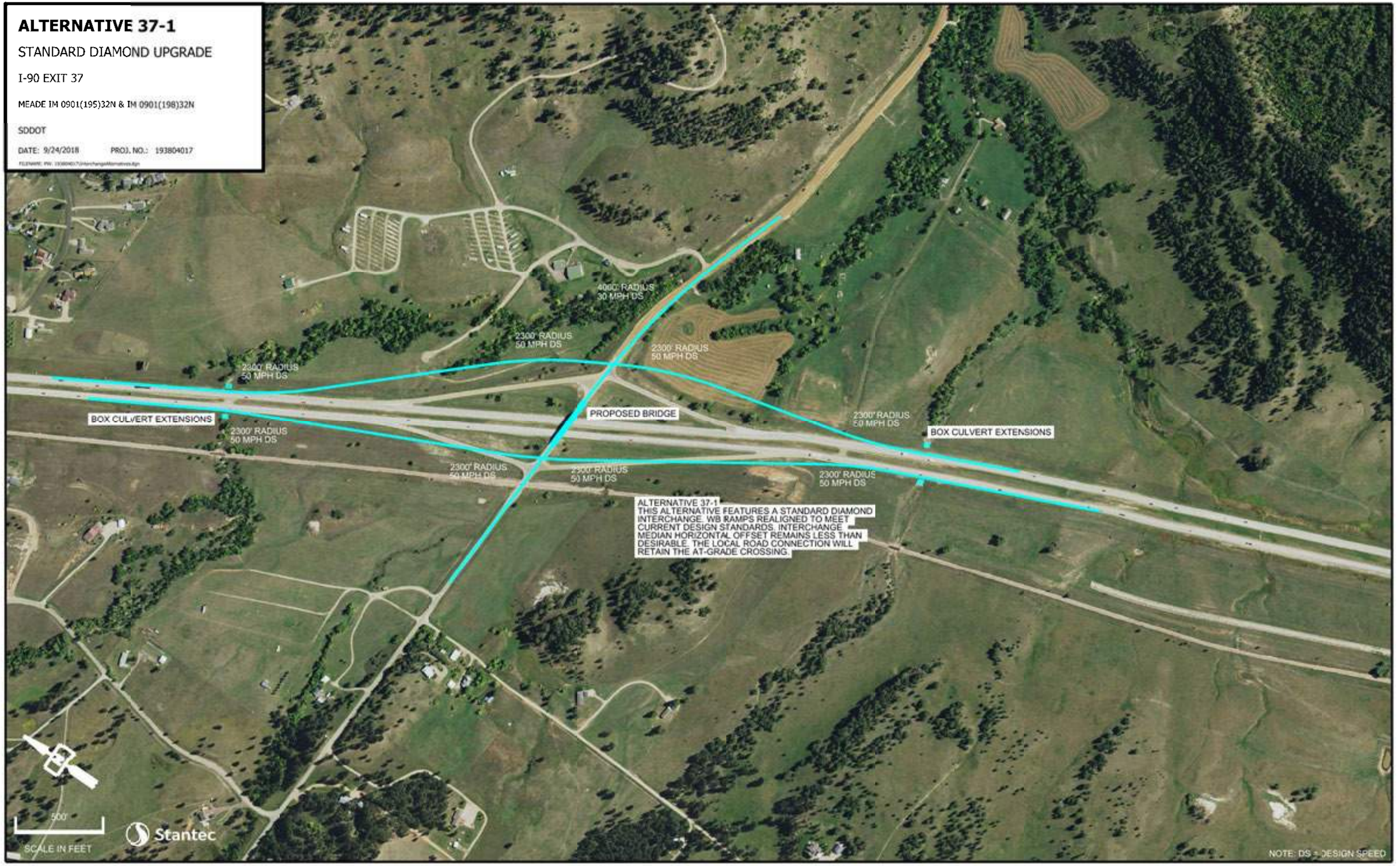
STANDARD DIAMOND UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



ALTERNATIVE 37-2

BRIDGE SKEW UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017

ALTERNATIVE 37-3

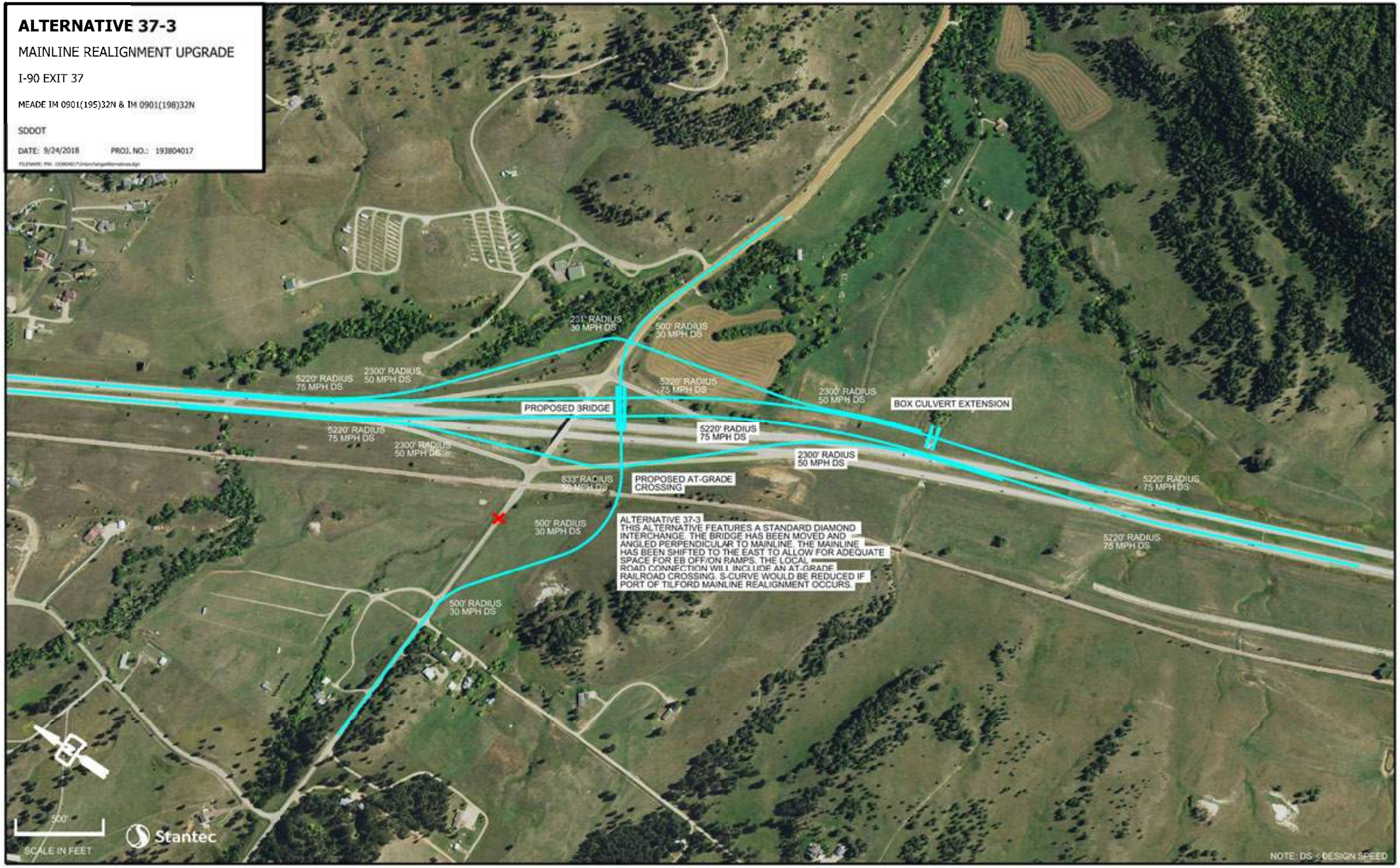
MAINLINE REALIGNMENT UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



ALTERNATIVE 40-1

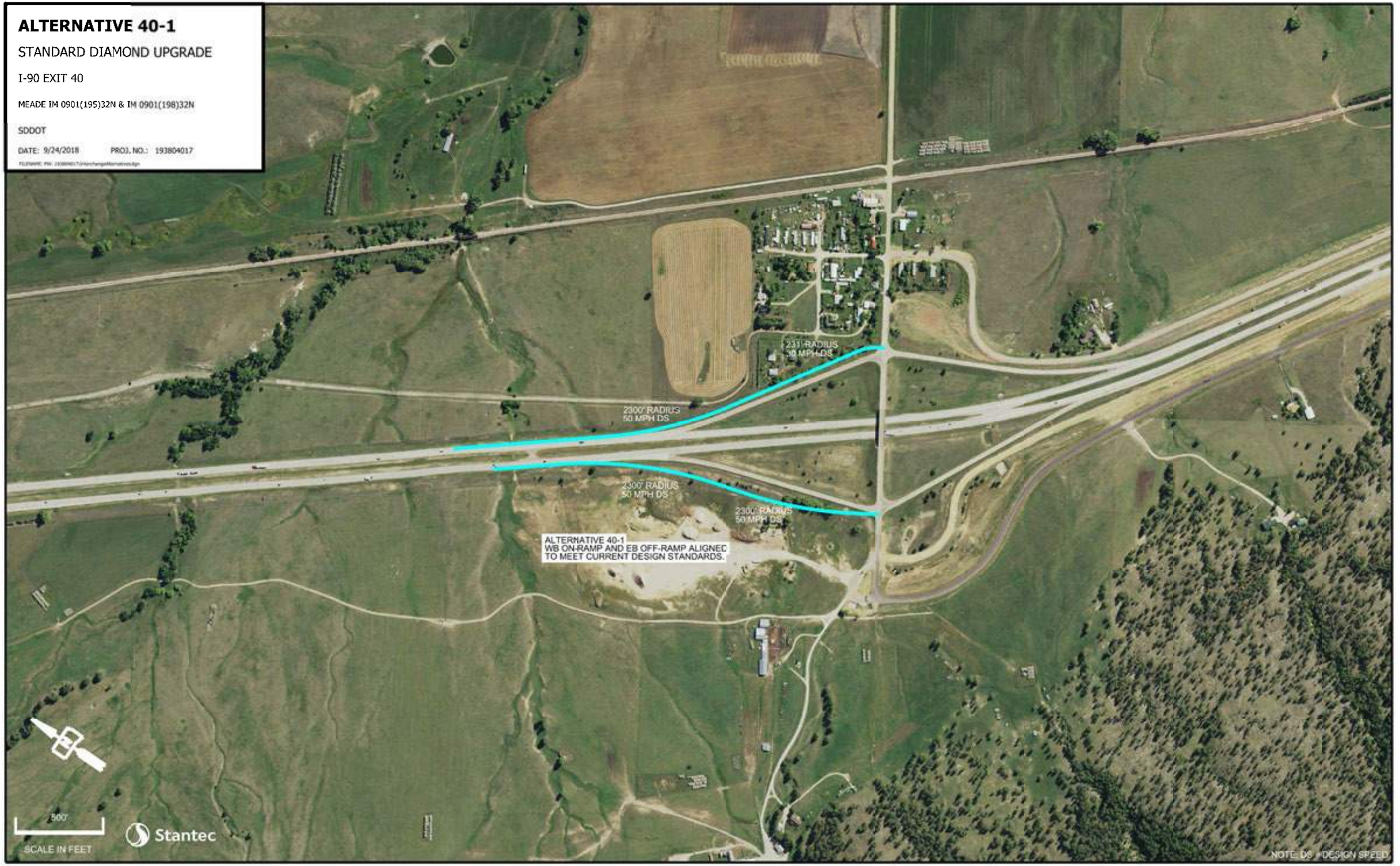
STANDARD DIAMOND UPGRADE

I-90 EXIT 40

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: 9/24/2018 PROJ. NO.: 193804017



RIGHT OF WAY EXHIBIT

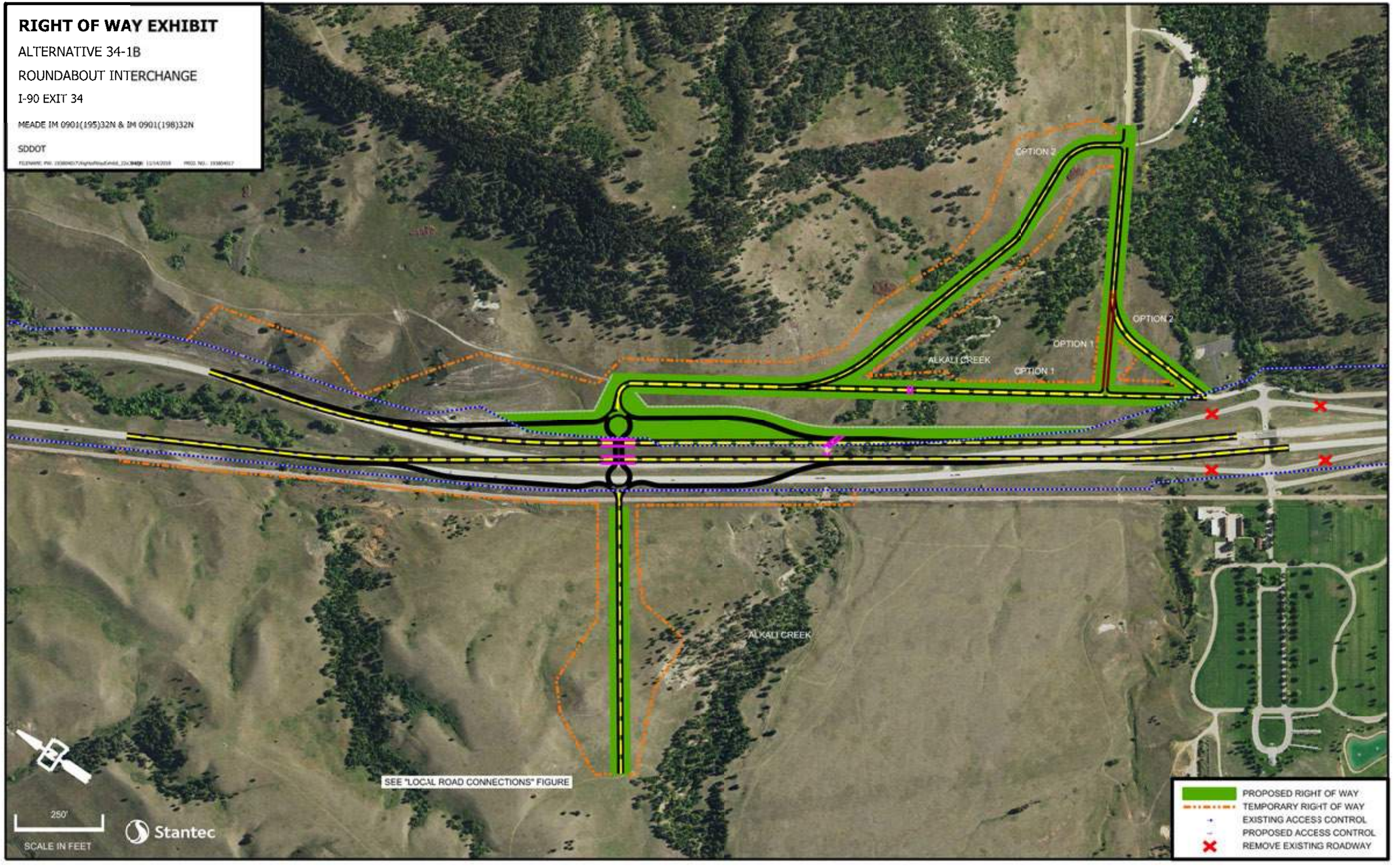
ALTERNATIVE 34-1B

ROUNDABOUT INTERCHANGE

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

ALTERNATIVE 34-3

MODIFIED FOLDED DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

OPTION 2

OPTION 3

OPTION 1

ALKALI CREEK

OPTION 1

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

250'

SCALE IN FEET

Stantec

PROPOSED RIGHT OF WAY

TEMPORARY RIGHT OF WAY

EXISTING ACCESS CONTROL

PROPOSED ACCESS CONTROL

REMOVE EXISTING ROADWAY

RIGHT OF WAY EXHIBIT

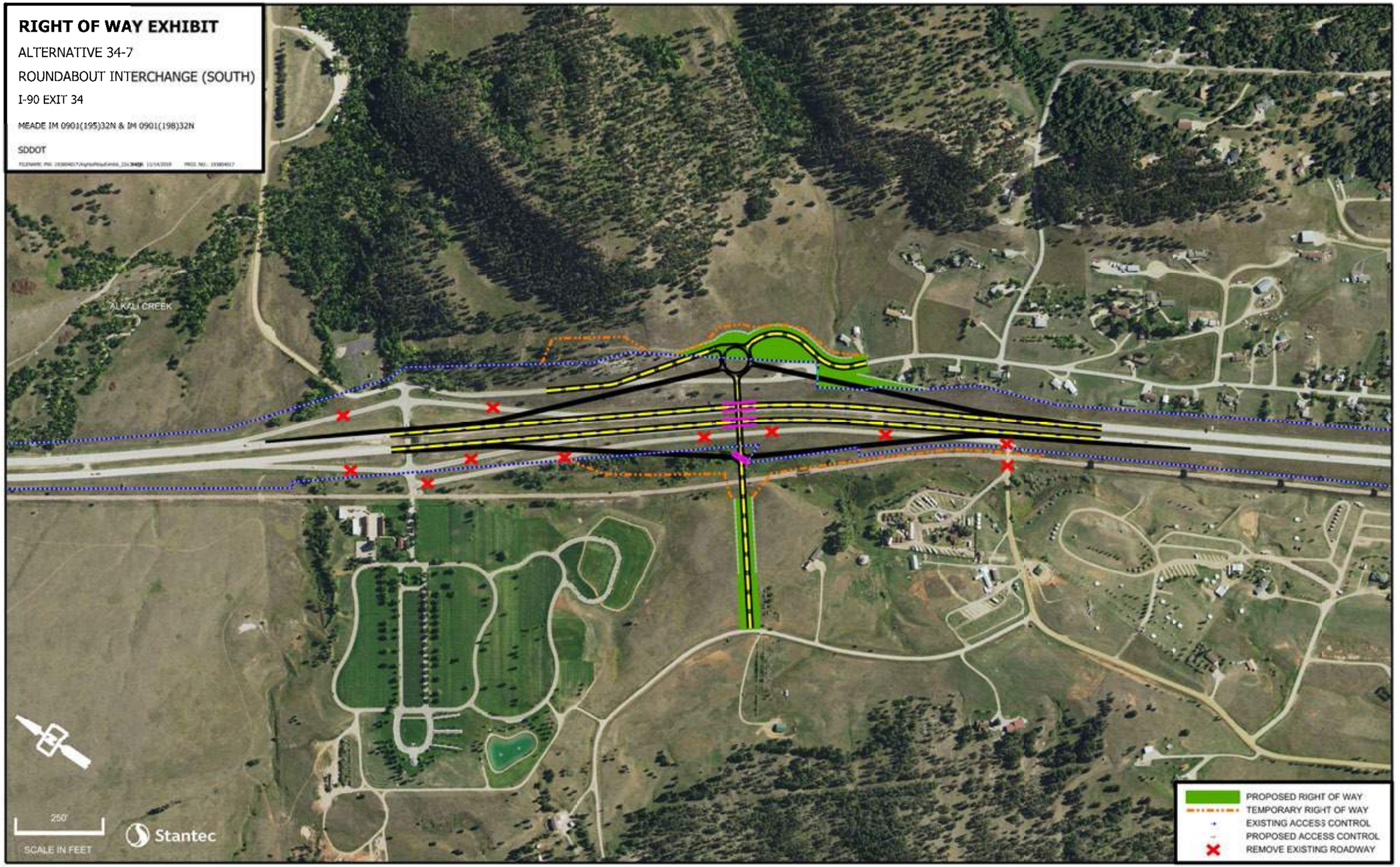
ALTERNATIVE 34-7

ROUNDABOUT INTERCHANGE (SOUTH)

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

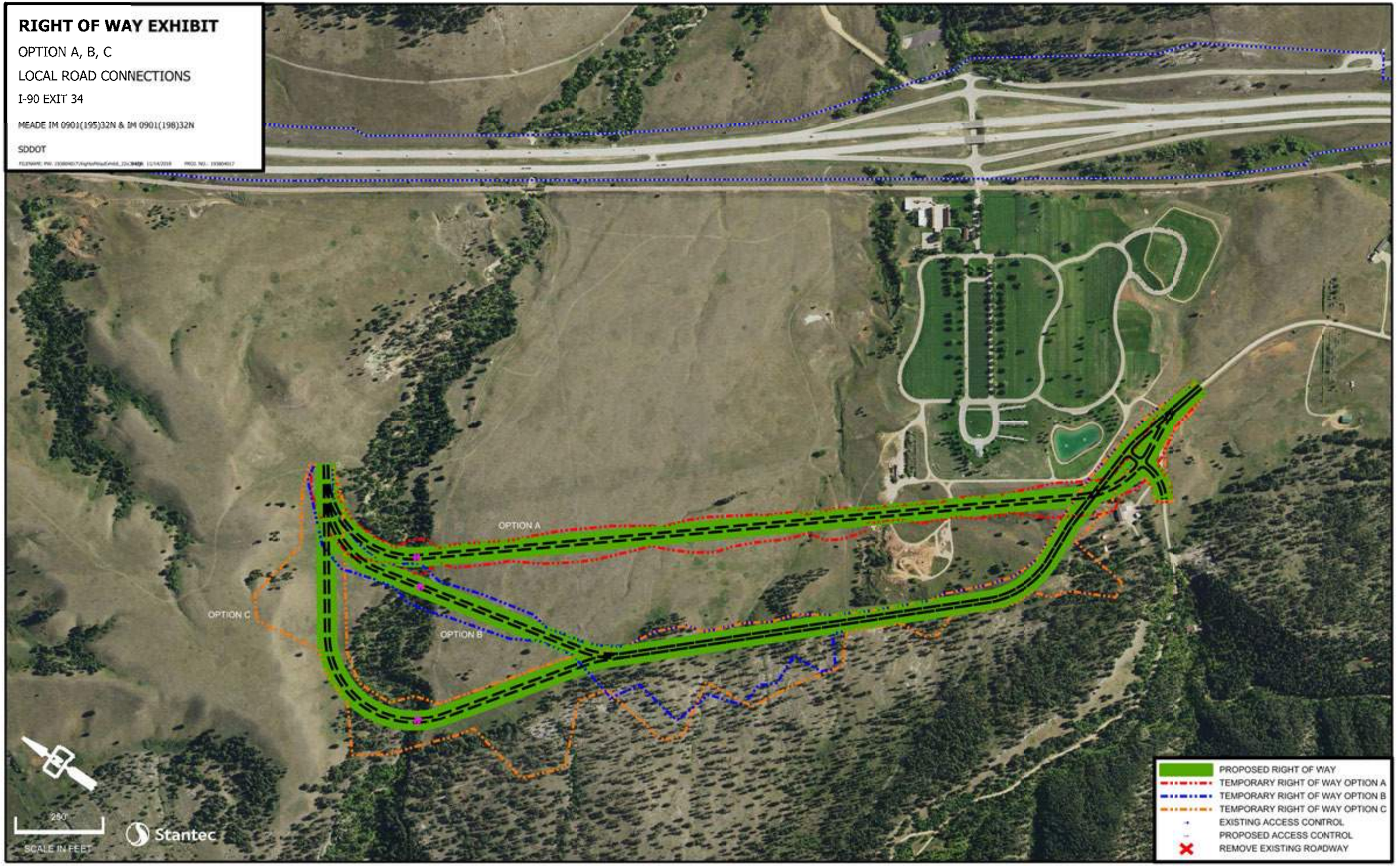
OPTION A, B, C

LOCAL ROAD CONNECTIONS

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

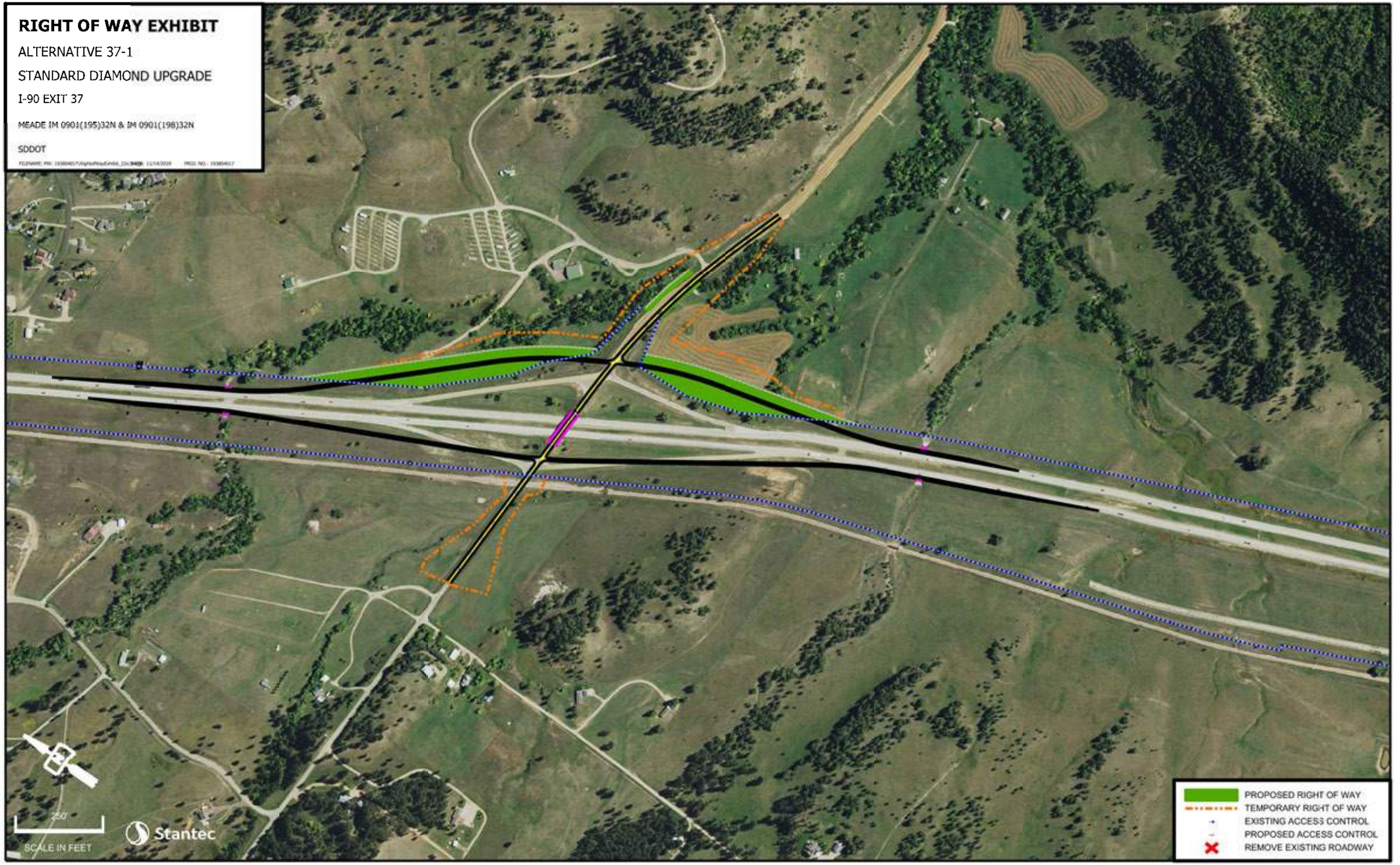
ALTERNATIVE 37-1

STANDARD DIAMOND UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

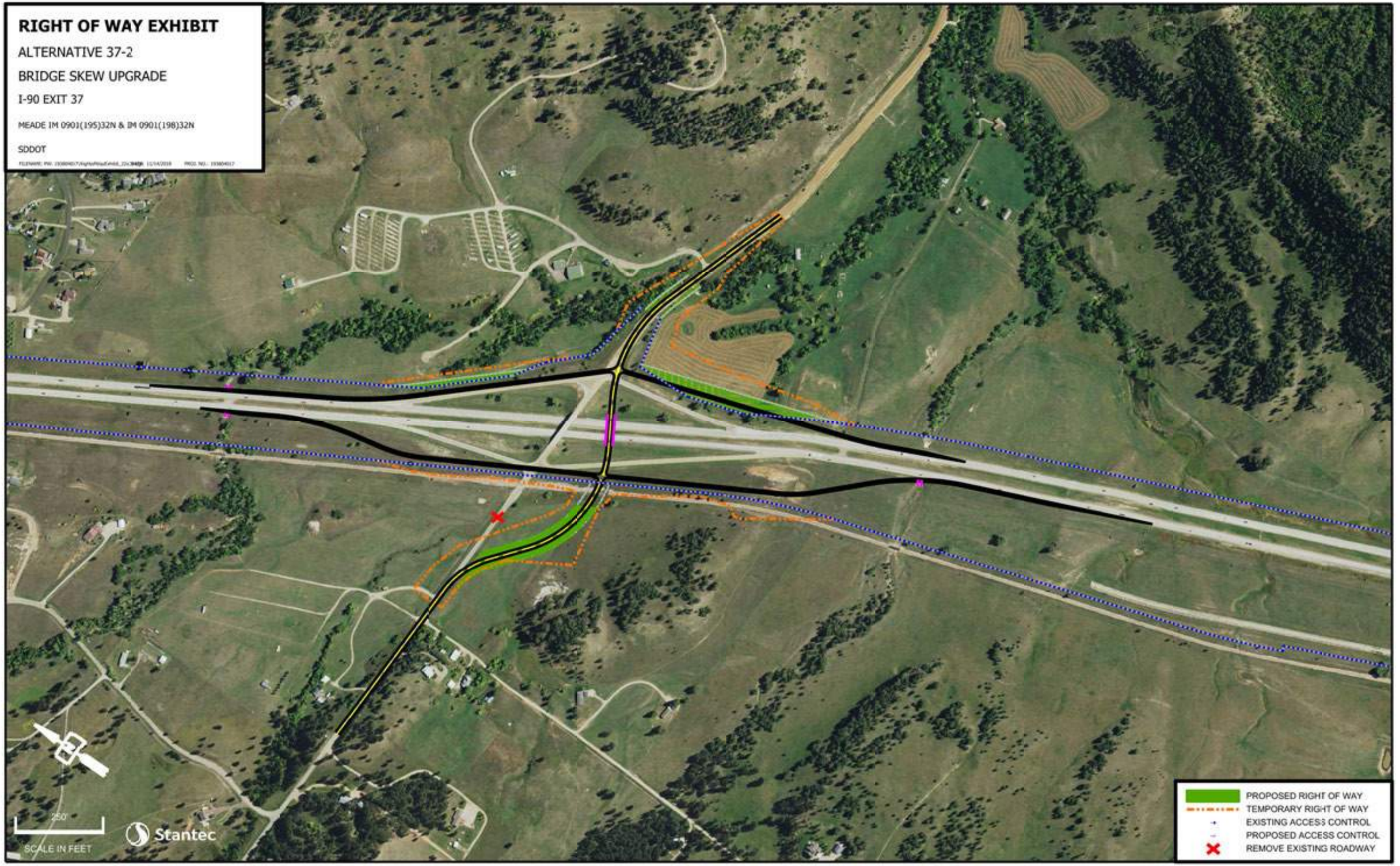
ALTERNATIVE 37-2

BRIDGE SKEW UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

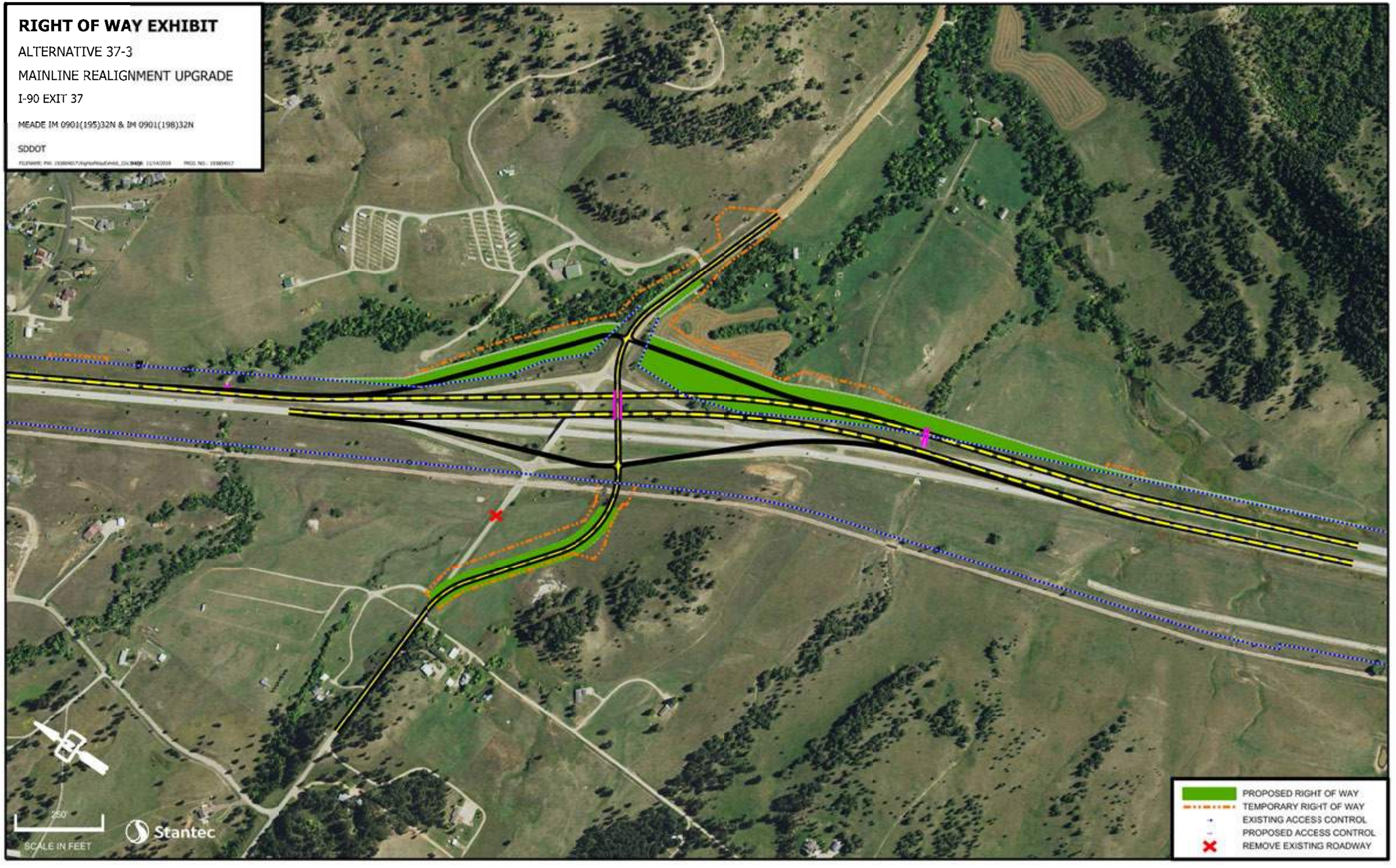
ALTERNATIVE 37-3

MAINLINE REALIGNMENT UPGRADE

I-90 EXIT 37

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT



RIGHT OF WAY EXHIBIT

ALTERNATIVE 40-1

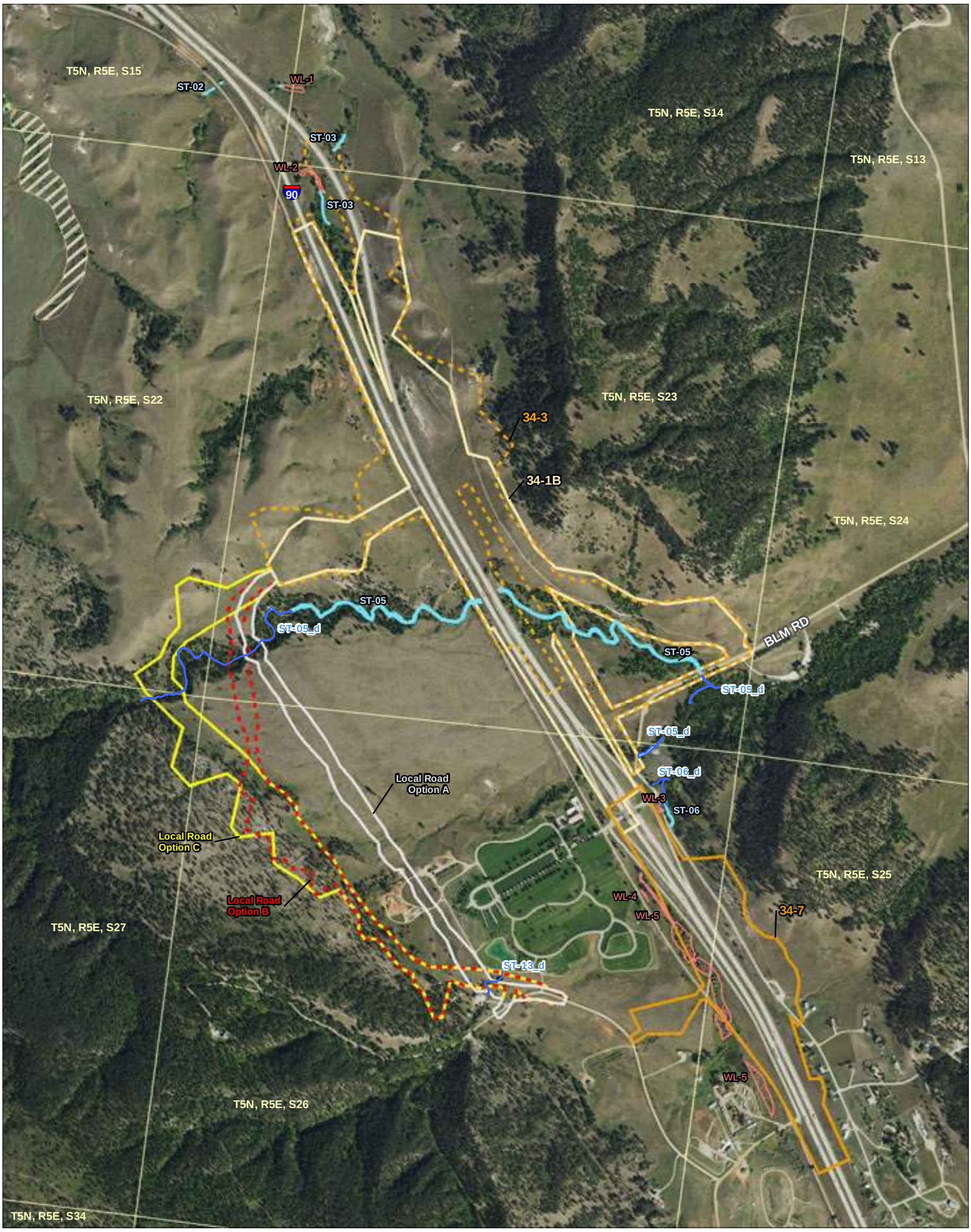
STANDARD DIAMCND UPGRADE

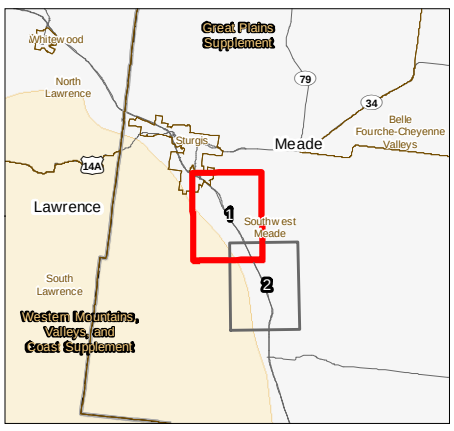
I-90 EXIT 40

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

V:\1938\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig1_fcd_fema_193804017.mxd Revised: 2018-09-27 By: safoster





Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, FEMA
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

- Field Delineated Wetland
- Field Delineated Waterway
- Field Delineated Waterway Area
- Desktop Delineated Wetland
- Desktop Delineated Waterway

FEMA Flood Zone
- 100-year Flood Zone
- 100-year Floodway
- 500-year Flood Zone

Figure No.
1

DRAFT

Title
Field and Desktop Delineated Wetlands and Waterbodies and FEMA Floodplains

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-27

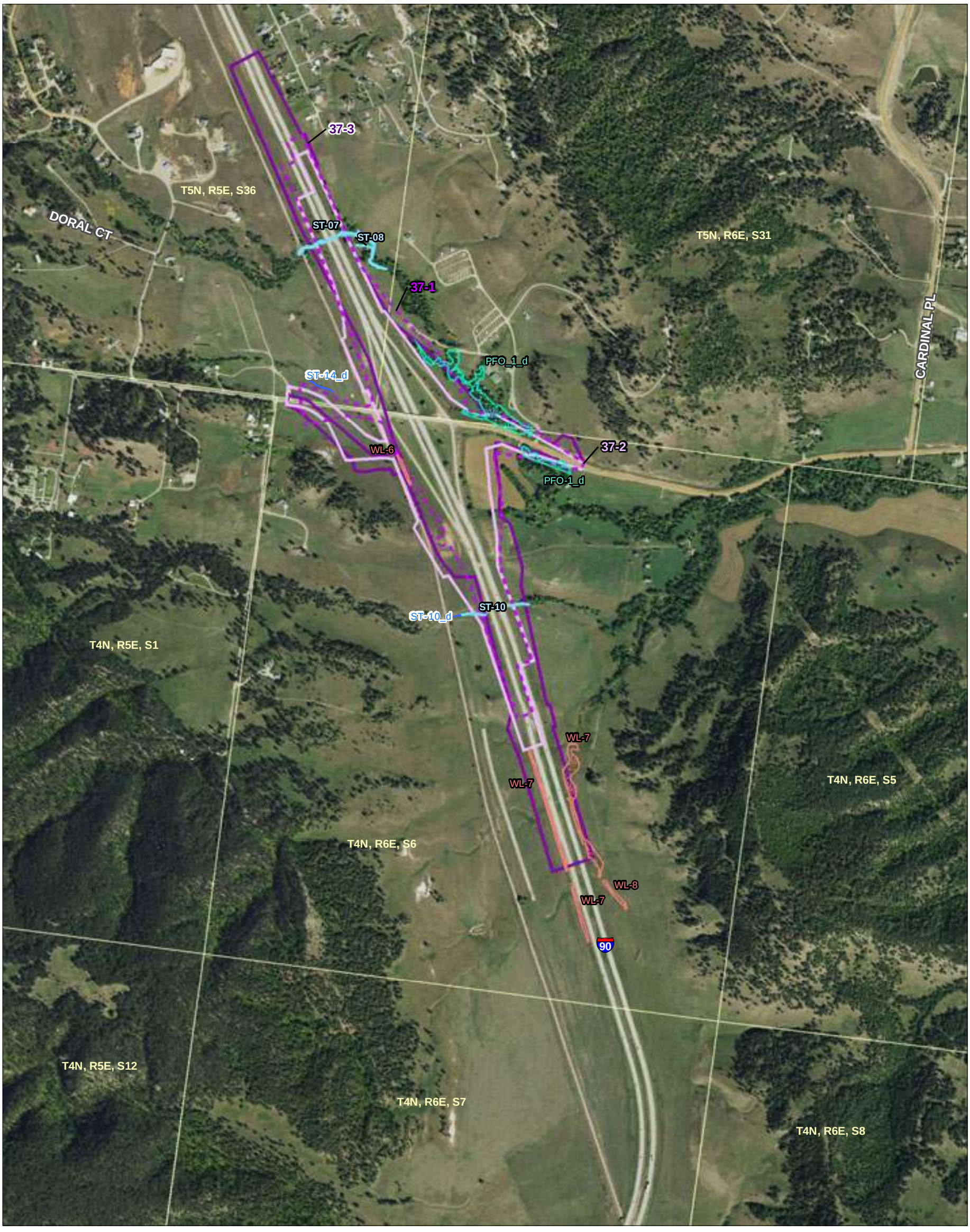
0 500 1,000 Feet

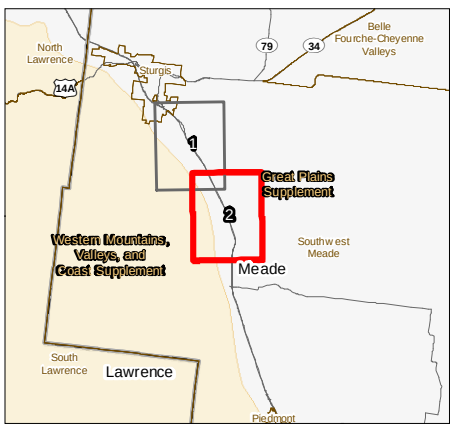
1:12,000 (At Original document size of 11x17)

N

Stantec

V:\1938\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig1_fcd_fema_193804017.mxd Revised: 2018-09-27 By: safoster





Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, FEMA
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

- Field Delineated Wetland
- Field Delineated Waterway
- Field Delineated Waterway Area
- Desktop Delineated Wetland
- Desktop Delineated Waterway

FEMA Flood Zone
- 100-year Flood Zone
- 100-year Floodway
- 500-year Flood Zone

Figure No.
1

DRAFT

Title
Field and Desktop Delineated Wetlands and Waterbodies and FEMA Floodplains

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-27

0 500 1,000 Feet

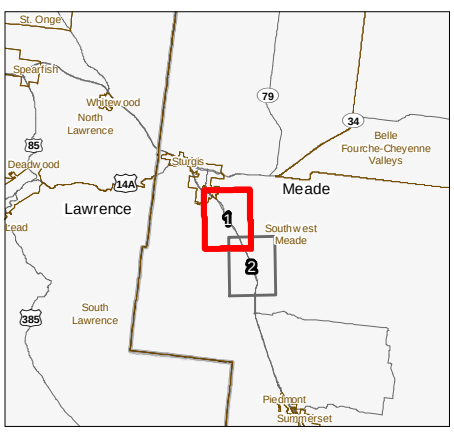
1:12,000 (At Original document size of 11x17)

N

Stantec

V:\19381\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig2_section4_6_193804017.mxd Revised: 2018-09-26 By: safoster

Centennial Trail Ft. Meade Trailhead
Starline Park
DICKSON RD
JUNCTION AVE
T5N, R5E, S16
T5N, R5E, S15
T5N, R5E, S15
T5N, R5E, S14
T5N, R5E, S14
T5N, R5E, S13
Vanocker Campground
T5N, R5E, S15
T5N, R5E, S22
90
T5N, R5E, S14
T5N, R5E, S23
Bureau of Land Management
T5N, R5E, S13
T5N, R5E, S24
Fort Meade Recreation Area
34-3
34-1B
T5N, R5E, S22
T5N, R5E, S23
T5N, R5E, S23
T5N, R5E, S24
BLM RD
T5N, R5E, S22
T5N, R5E, S27
Local Road Option C
T5N, R5E, S23
T5N, R5E, S26
Alkali Creek Centennial Trailhead
T5N, R5E, S24
T5N, R5E, S25
Local Road Option A
Local Road Option B
Black Hills National Cemetery
34-7
T5N, R5E, S27
T5N, R5E, S26
Black Hills National Forest
BLUCKSBERG MT RD
No Name RV Park
T5N, R5E, S27
T5N, R5E, S34
T5N, R5E, S26
T5N, R5E, S35
T5N, R5E, S26
T5N, R5E, S25
PLEASANT VALLEY DR
Katmandu RV Park
T5N, R5E, S25
T5N, R5E, S36
T5N, R5E, S34
T5N, R5E, S35
T5N, R5E, S35
T5N, R5E, S36
T5N, R5E, S36
T5N, R6E, S31
37-3



Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, PADUS
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 37-1
- 37-2
- 37-3
- 34-1B
- 34-3
- 34-7

Approximate Recreational Trail

Private Lands Hunting Access
- CHAP

Federal Lands
- Black Hills National Forest
- Bureau of Land Management
- National Park Service

Figure No.
2

DRAFT

Title
Section 4(f) and 6(f) Lands

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-26

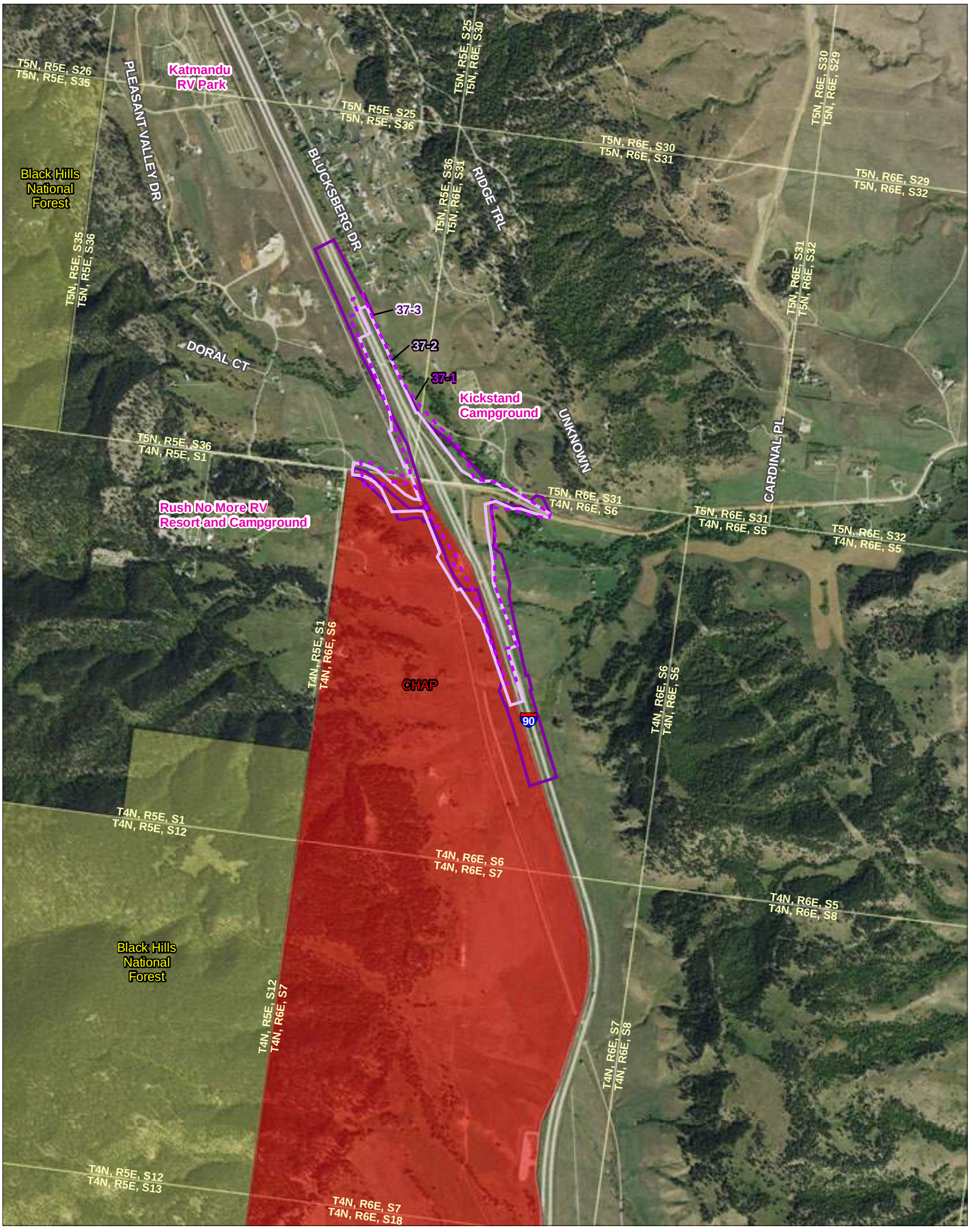
0 750 1,500 Feet

1:18,000 (At Original document size of 11x17)

N

Stantec

V:\19381\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig2_section4_6_193804017.mxd Revised: 2018-09-26 By: safoster



Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, PADUS
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 37-1
- 37-2
- 37-3
- 34-1B
- 34-3
- 34-7

Approximate Recreational Trail

Private Lands Hunting Access
- CHAP

Federal Lands
- Black Hills National Forest
- Bureau of Land Management
- National Park Service

Figure No.
2

DRAFT

Title
Section 4(f) and 6(f) Lands

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-26

0 750 1,500 Feet

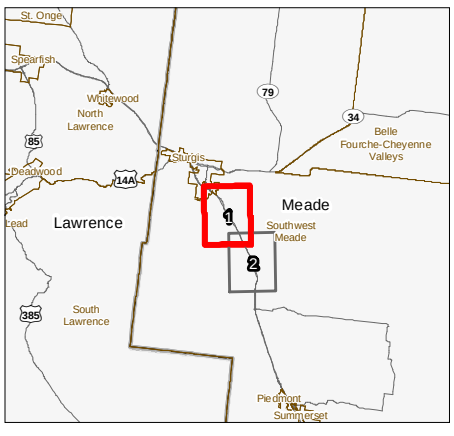
1:18,000 (At Original document size of 11x17)

N

Stantec

V:\1938\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\public_meeting\fig3_cultural_resources_193804017.mxd Revised: 2018-12-03 By: safoster

T5N, R5E, S12
T5N, R5E, S15
T5N, R5E, S14
T5N, R5E, S13
90
T5N, R5E, S22
34-3
34-1B
T5N, R5E, S23
T5N, R5E, S24
34-7
T5N, R5E, S27
T5N, R5E, S26
T5N, R5E, S25
T5N, R5E, S34
T5N, R5E, S35
T5N, R5E, S36
37-3



Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 37-1
- 37-2
- 37-3
- 34-1B
- 34-3
- 34-7

- Fort Meade Historic District
- Fort Meade Archaeological Site
- Cultural Area
- Railroad (No SHPO determination - may be eligible)

Figure No.
3

DRAFT

Title
Cultural Resources

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by AC on 2018-12-03

0 750 1,500 Feet

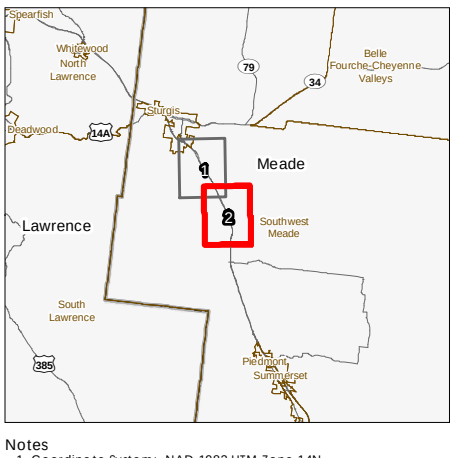
1:18,000 (At Original document size of 11x17)

N

Stantec

V:\1938\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\public_meeting\fig3_cultural_resources_193804017.mxd Revised: 2018-12-03 By: safoster

T5N, R5E, S26
T5N, R5E, S25
T5N, R6E, S30
T5N, R6E, S29
T5N, R5E, S35
T5N, R5E, S36
37-3
37-2
37-1
T5N, R6E, S31
T5N, R6E, S32
T4N, R5E, S1
T4N, R6E, S6
90
T4N, R6E, S5
T4N, R5E, S12
T4N, R6E, S7
T4N, R6E, S8
T4N, R5E, S13
T4N, R6E, S18



Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS
3. Orthophotography: 2016 NAIP

Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 37-1
- 37-2
- 37-3
- 34-1B
- 34-3
- 34-7

- Fort Meade Historic District
- Fort Meade Archaeological Site
- Cultural Area
- Railroad (No SHPO determination - may be eligible)

Figure No.
3

DRAFT

Title
Cultural Resources

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by AC on 2018-12-03

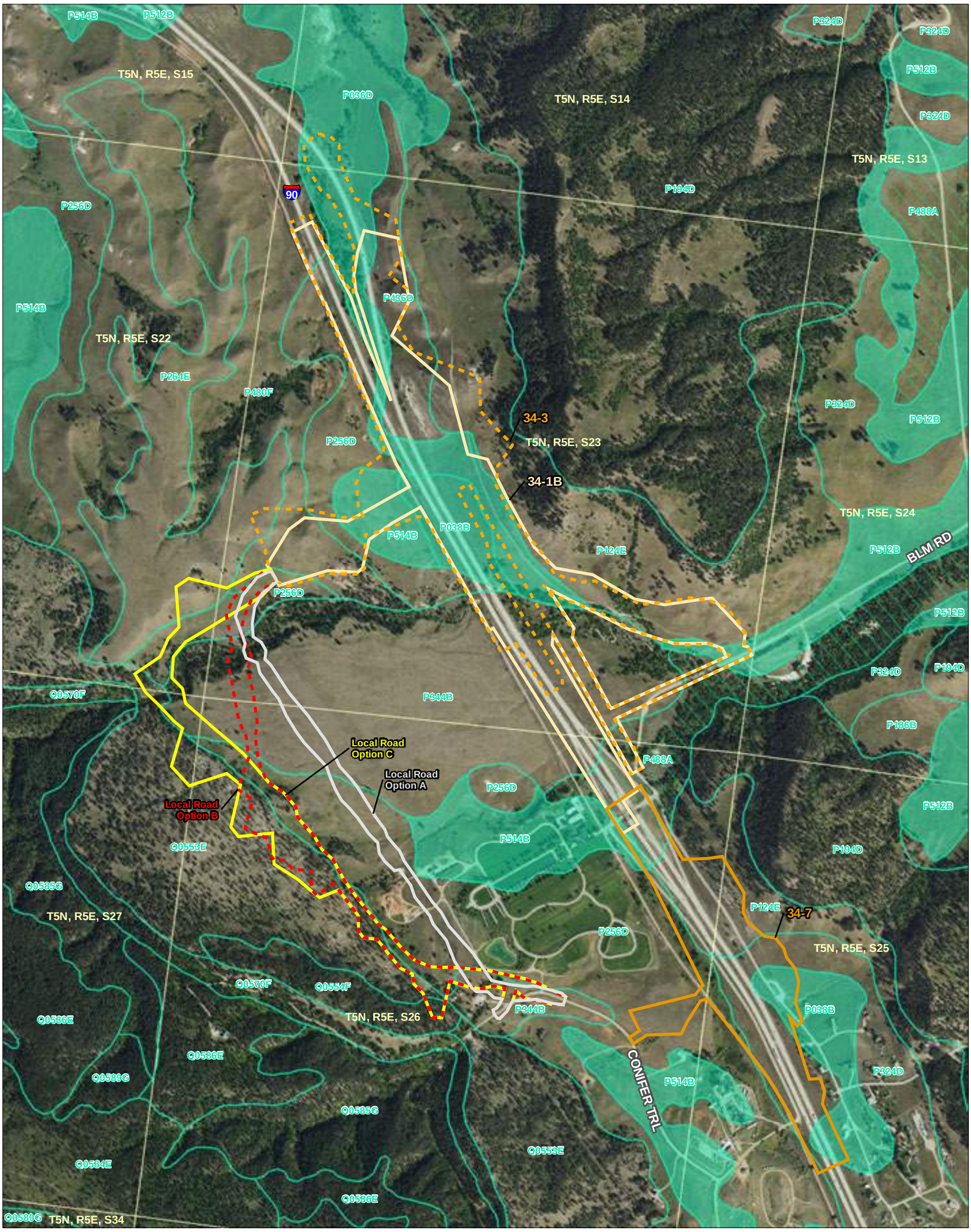
0 750 1,500 Feet

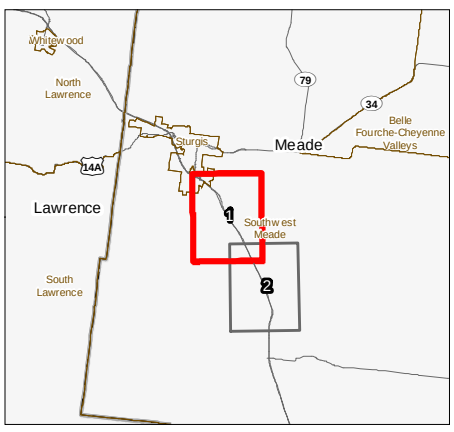
1:18,000 (At Original document size of 11x17)

N

Stantec

V:\19381\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig4_prime_farmland_193804017.mxd Revised: 2018-09-26 By: safoster





Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

NRCS Soil Survey Data

Prime Farmland
- Farmland of Statewide Importance
- Farmland of Local Importance
- Prime Farmland if Irrigated
- Not Prime Farmland

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, NRCS
3. Orthophotography: 2016 NAIP

Figure No.
4

DRAFT

Title
Prime Farmland and Farmland of Statewide Importance

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by xx on 2018-09-xx

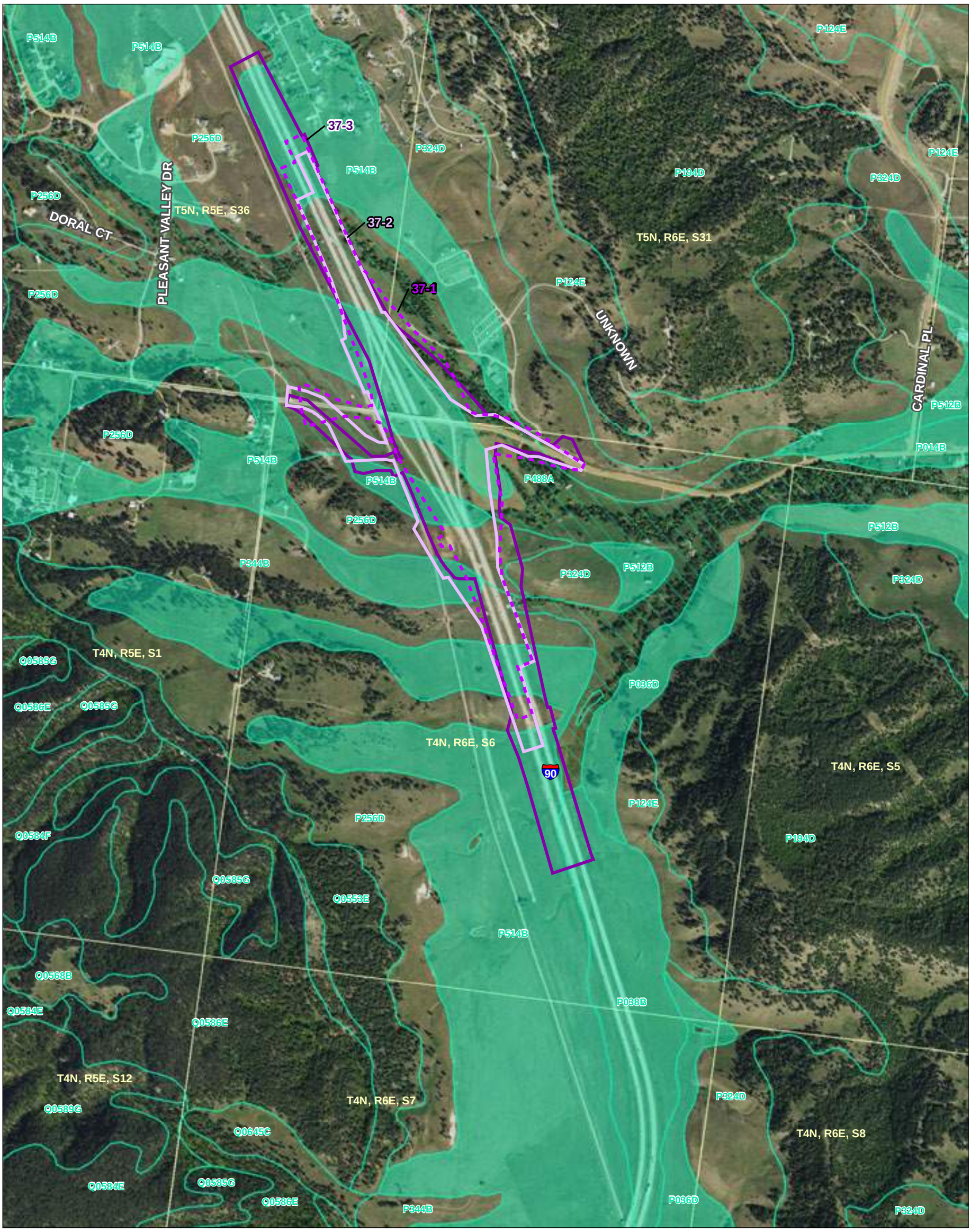
0 500 1,000 Feet

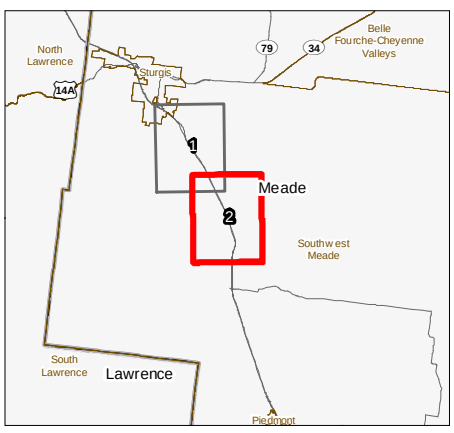
1:12,000 (At Original document size of 11x17)

N

Stantec

V:\19381\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig4_prime_farmland_193804017.mxd Revised: 2018-09-26 By: safoster





Legend

Grading Alternative
- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

NRCS Soil Survey Data

Prime Farmland
- Farmland of Statewide Importance
- Farmland of Local Importance
- Prime Farmland if Irrigated
- Not Prime Farmland

Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS, NRCS
3. Orthophotography: 2016 NAIP

Figure No.
4

DRAFT

Title
Prime Farmland and Farmland of Statewide Importance

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by xx on 2018-09-xx

0 500 1,000 Feet

1:12,000 (At Original document size of 11x17)

N

Stantec

V:\1938\Active\193804017\03_data\gis_cad\gis\mxds\alt_analysis\fig5_veg_wildlife_193804017.mxd Revised: 2018-09-26 By: safoster

T5N, R5E, S15

T5N, R5E, S14

T5N, R5E, S13

90

T5N, R5E, S22

34-3

T5N, R5E, S23

34-1B

T5N, R5E, S24

Local Road Option C

Local Road Option A

Local Road Option B

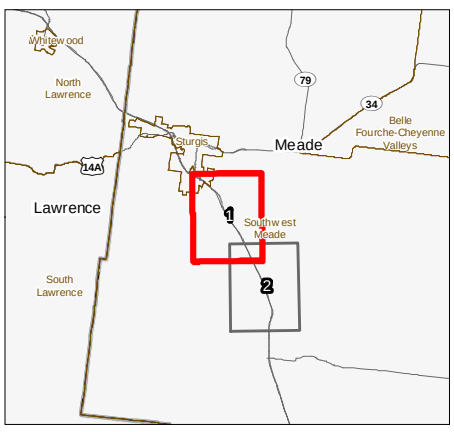
T5N, R5E, S27

T5N, R5E, S26

34-7

T5N, R5E, S25

T5N, R5E, S34



Notes
1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS
3. Orthophotography: 2016 NAIP

Legend

- Existing ROW
- Forest and Shrub Area

Grading Alternative

- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

Figure No.
5

DRAFT

Title
Vegetation and Wildlife

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

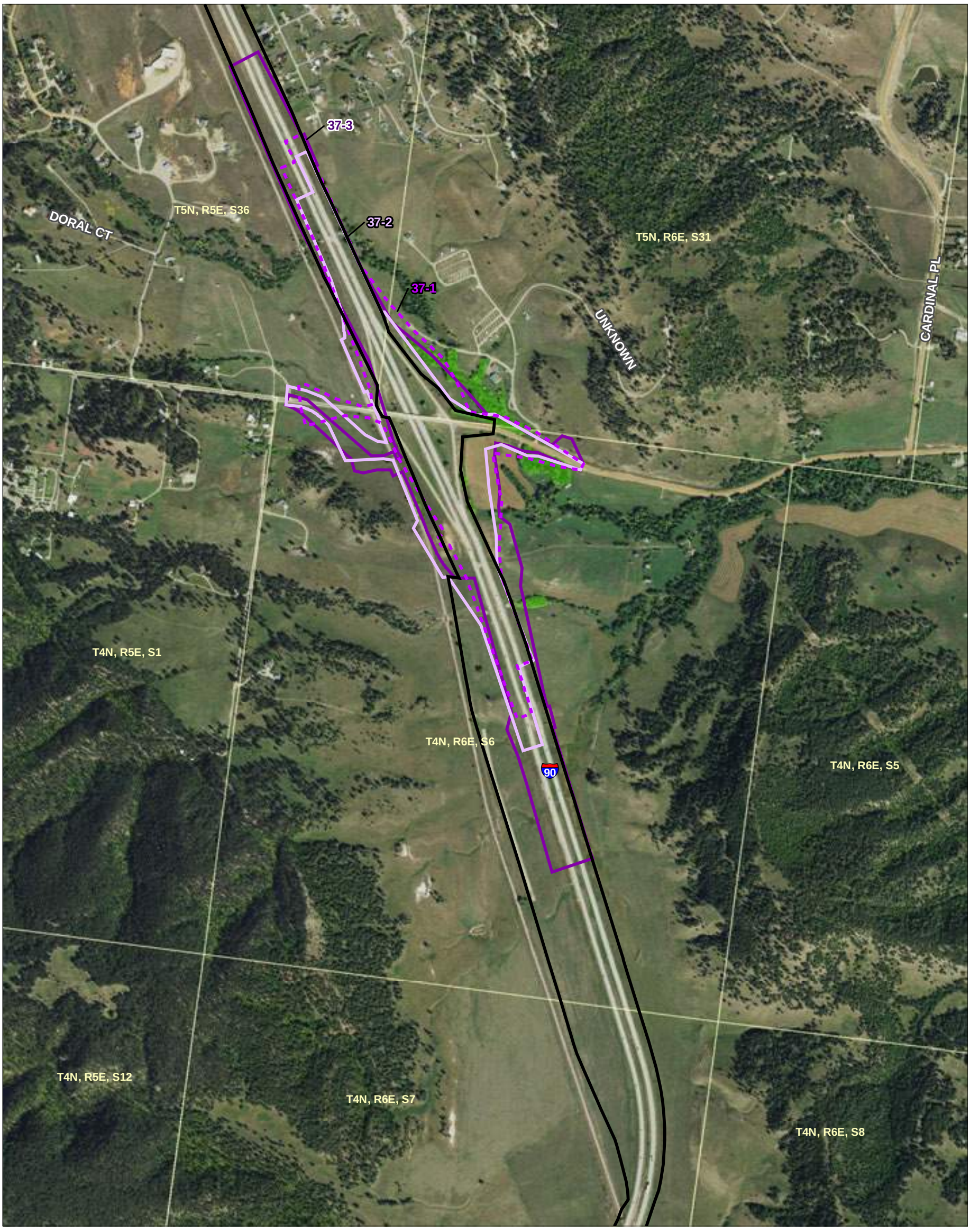
193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-26

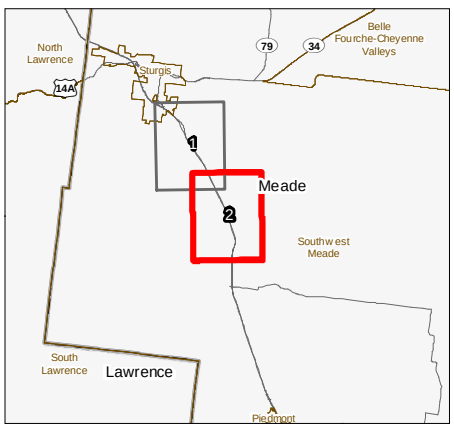
0 500 1,000 Feet

1:12,000 (At Original document size of 11x17)

N

Stantec





Legend

- Existing ROW
- Forest and Shrub Area

Grading Alternative

- Local Road Option A
- Local Road Option B
- Local Road Option C
- 34-1B
- 34-3
- 34-7
- 37-1
- 37-2
- 37-3

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Data Sources Include: Stantec, NADS, USGS
3. Orthophotography: 2016 NAIP

Figure No.
5

DRAFT

Title
Vegetation and Wildlife

Client/Project
South Dakota Department of Transportation
I-90 Exit 32 to Exit 40 Corridor Study and Design

Project Location
Meade Co., SD

193804017
Prepared by SF on 2018-09-20
Technical Review by JH on 2018-09-20
Independent Review by JK on 2018-09-26

0 500 1,000 Feet

1:12,000 (At Original document size of 11x17)

N

Stantec

I-90 Exit 32 to Exit 40 Corridor Study

Alternative Evaluation Matrix

		Evaluation Criteria										
		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Criteria Relative Importance		MORE IMPORTANT → LESS IMPORTANT										
Alternatives												
Exit 34	34-1B											
	34-3											
	34-7											
Local Road Connections	A											
	B											
	C											
Exit 37	37-1											
	37-2											
	37-3											
Exit 40	40-1											

- Is most positive regarding the Evaluation Criteria
- Is neutral regarding the Evaluation Criteria
- Is least positive regarding the Evaluation Criteria

NOTE: The preferred Local Road Connection alternative will be factored into the final criteria score for Alternatives 34-1B and 34-3.

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria

Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Improvement to Roadway Geometry	Superelevation	Black Hills National Cemetery (BHNC) Impacts	Roadway	Intersection Levels of Service	Complexity of Construction	City of Sturgis	Acres of Permanent Right of Way	Future Development Accommodated	Provides Bike Access	Impacts to existing private utilities
Reduction in Animal Collisions	Vertical Stopping Sight Distance	Bureau of Land Management (BLM) Impacts	Structures	LOS Opening Year 2023	Bridge Construction	Meade County	Acres of Temporary Right of Way	Future Local Road Improvements Accommodated		Impacts to existing public utilities
Overall Crash Reduction	Ramp Length/Tapers	Animal Migration (Elk and Deer)	Right of Way	LOS Design Year 2050	Staging Areas	South Dakota Motor Carriers (SDMC) Tilford Port of Entry				
Reduce Weather Related Run Off the Road Incidents	Facility Separation	Floodplain Impacts			Construction Impacts to Roadways and Access	Genesee & Wyoming Railroad (GWRR)				
Compliant Guardrail	Grade Requirements	Wetland Impacts			Risk	No Name City Luxury Cabins & RV				
Provides for Service Road Connections	Snow Deficiencies	Historic and Archaeological Impacts			Railroad	Black Hills National Cemetery				
	Separation from Railroad	Environmental Justice			Ability to keep I-90 Mainline Open to Traffic	Access for Emergency Vehicles				
		Noise Impacts			Ability to Accommodate Local Area Traffic					
		Regulated Materials								

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria Related to Each Alternative

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Exit 34	34-1B	+ Improves interchange and I-90 geometry + Replaces non-standard guardrail + Provides local road connection on north and south side of I-90	+ Corrects superelevation issues on Ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades - Provides at grade RR crossing on south leg of local road close to roundabout - May have snow drifting issues under I-90 bridges	+ Moves away from RV parks and Blucksberg + Anticip. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. - No wetland impacts - Approximately 12 acres of wooded area present (NLEB) - 3 registered/recommended eligible sites within grading limits, 1 directly adjacent - Impacts Centennial Trail - Moves closer to Centennial Trail and Alkali Creek	- Added cost to realign I-90 - Interchange cost is high - Structure cost is high - Right of way costs are high	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be operated while new interchange is constructed + Minimal impact to railroad during construction + Moderate risk of issues during construction - Construction requires realignment of I-90 - Three new bridges constructed	+ Provides local road connection to new Black Hills National Cemetery expansion + Minimal impact to railroad + Improves access to existing Black Hills National Cemetery - Moves I-90 access away from No Name City Luxury Cabins & RV - Requires realignment of Old Stone Road - Emergency services access further away from area residents	+ No individual residents impacted - Requires moderate permanent right of way - Requires significant temporary right of way	+ Accommodates the future expansion of the Black Hills National Cemetery + Provides connection to Old Stone Road	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Moderate private utility impacts
	34-3	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on north and south side of I-90	+ Corrects superelevation issues on Ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades + Provides grade separation of railroad + Reduces snow drifting issues under bridges	+ Antic. no effect least tern, red knot, whooping crane + Moves away from RV parks and Blucksberg - 3 stream crossings - Alkali Ck. - >0.1 acre wetland impacts - Approximately 12 acres of wooded area present (NLEB) - 3 registered/recommended eligible sites within grading limits, 1 directly adjacent - Impacts Centennial Trail -Moves closer to Centennial Trail and Alkali Creek	+ No need to realign I-90 mainline - Interchange cost is high - Structure cost is very high - Right of way costs are high with more right of way needed on south side of railroad - Structure over railroad adds substantial cost - EB mainline profile raised	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be operated while new interchange is constructed + Minimal impact to railroad during construction + Moderate risk of issues during construction - Impact to railroad while structure is constructed - Two new bridges constructed	+ Provides local road connection to new Black Hills National Cemetery expansion + Improves access to existing Black Hills National Cemetery - Requires realignment of Old Stone Road - Moves I-90 access away from No Name City Luxury Cabins & RV - Emergency services access further away from area residents - Substantial impact to railroad	+ No individual residents impacted - Requires significant permanent right of way - Requires significant temporary right of way	+ Accommodates the future expansion of the Black Hills National Cemetery + Provides connection to Old Stone Road	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Moderate private utility impacts
	34-7	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on north and south side of I-90	+ Corrects superelevation issues on Ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades - Provides at grade RR crossing on south leg of local road close to roundabout - May have snow drifting issues under I-90 bridges	+Anticipate no effect to least tern, red knot or whooping crane + Approximately 3 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, - 0 stream crossings - 2 acre wetland impacts - Moves closer to RV parks and Blucksberg +Moves away from Centennial Trail and Alkali Creek	- Added cost to reconstruct I-90 over new local road connection requires I-90 grade raise - Interchange cost is high - Structure cost is high - Right of way costs are moderate	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be operated while new interchange is constructed + Minimal impact to railroad during construction + Moderate risk of issues during construction - Requires reconstruction of I-90 for grade raise - Three new bridges constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive - Does not provide local road connection to new Black Hills National Cemetery expansion	+ Requires minimal permanent right of way + Requires minimal temporary right of way - Residential impact	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Blucksberg Drive + Accommodates bicycle access to the south local road connection	+ No public utility impacts - High private utility impacts

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria Related to Each Alternative

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Exit 37	37-1	+ Improves interchange ramp geometry + Replaces non-standard guardrail	+ Corrects superelevation issues on ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades + Provides greater separation from at grade RR crossing on south leg of local road - Does not correct bridge skew and drivers sight lines	+ Anticipate no effect to least tern, red knot or whooping crane - 2 stream crossings - Approximately 2 acres wetland impacts (1.85 acres PFO) - Approximately 3.5 acres of wooded area present (NLEB) - 0 registered and recommended eligible sites within grading limits	+ Does not require construction of new bridge over I-90 - Moderate cost to reconstruct ramps - Requires retaining wall construction - Right of way costs are moderate	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Room for construction staging + Existing interchange can be operated while new ramps are constructed + Minimal impact to railroad during construction - Difficulty in constructing a new bridge where existing bridge is located and keeping it open to traffic.	+ Minimal impact to railroad + No change for emergency services access - Impact to adjacent farmland and residence	- Impact to adjacent residence - Requires moderate permanent right of way - Requires moderate temporary right of way	+ Does not change access for existing or future land use	+ Accommodates bicycle access to I-90	+ No public utility impacts - Minimal private utility impacts
	37-2	+ Improves interchange ramp geometry + Replaces non-standard guardrail + Removes bridge skew for local road over I-90	+ Corrects superelevation issues on ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades + Corrects bridge skew and improves drivers sight lines	+ Anticipate no effect to least tern, red knot or whooping crane - 2 stream crossings - Approximately 1 acre PFO - Approximately 2 acres of wooded area present (NLEB) - 0 registered and recommended eligible sites within grading limits	- Moderate cost to reconstruct ramps - Requires retaining wall construction - Required construction of new bridge over I-90 - Right of way costs are more significant	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Room for construction staging. + New bridge can be constructed while existing bridge is in use. + New ramps can be constructed while existing ramps are in use. - Minimal impact to railroad during construction but requires relocation of the railroad crossing.	+ Minimal impact to railroad + No change for emergency services access - Impact to adjacent farmland and land west of railroad	+ Requires minimal permanent right of way - Impact to adjacent farmland - Requires moderate temporary right of way	+ Does not change access for existing or future land use	+ Accommodates bicycle access to I-90	+ No public utility impacts - Minimal private utility impacts
	37-3	+ Improves interchange geometry + Replaces non-standard guardrail + Removes bridge skew for local road over I-90	+ Corrects superelevation issues on ramps + Corrects vertical stopping sight distance on ramps. + Provides for standard ramp lengths + Improves roadway grades + Corrects bridge skew and improves drivers sight lines + Provides standard distance between ramp terminals	+ Anticipate no effect to least tern, red knot or whooping crane - 2 stream crossings - Approximately 2.5 acres wetland impacts (1 acre PFO) - Approximately 3 acres of wooded area present (NLEB) - 0 registered and recommended eligible sites within grading limits	- Moderate cost to reconstruct ramps - Requires reconstruction of I-90 mainline - Required construction of new bridge over I-90 - Right of way costs are high - Requires box culvert extension	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Room for construction staging. + New bridge can be constructed while existing bridge is in use. - Minimal impact to railroad during construction but requires relocation of the railroad crossing - Requires realignment of I-90. - Higher risk of issues during construction - Construction and traffic staging will be more complex and will affect I-90 and local road access.	+ Minimal impact to railroad + No change for emergency services access - Significant impact to adjacent farmland and land west of railroad	- Impact to adjacent farmland - Requires significant permanent right of way - Requires moderate temporary right of way	+ Does not change access for existing or future land use	+ Accommodates bicycle access to I-90	+ No public utility impacts - Minimal private utility impacts

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria Related to Each Alternative

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Local Road Connections	A	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+ Antic. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. - No wetland impacts - Approximately 1 acre of wooded area present (NLEB) - Crosses Fort Meade Archeological Site - Impacts Centennial Trail - Parallels BHNC - 130 feet - Level C property - 65 feet - Bisects view from BHNC	+ Shortest and least expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Avoids steep terrain to the west + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Moves access to existing Black Hills National Cemetery further away - Alignment goes through expansion area of Black Hills National Cemetery - Emergency services access further away from area residents	+ No individual residents impacted - Requires moderate temporary right of way - Requires moderate permanent right of way - Significantly impacts the expansion of the Black Hills National Cemetery property	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts
	B	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+ Anticip. no effect least tern, red knot, whooping cr. - 2 stream crossings - Alkali Ck. - No wetland impacts + Anticip. no effect least tern, red knot, whooping crane - Approximately 16 acres of wooded area present (NLEB) - Crosses Fort Meade Archeological Site - 1 BLM site within grading limits, 2 directly adjacent - Impacts Centennial Trail - Parallels BHNC - 650 feet - Level C property - 65 feet - Bisects view from BHNC	- Longer and more expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - Construction is in area of steep terrain - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Moves access to existing Black Hills National Cemetery further away - Alignment goes through a minimal amount of the expansion area of the Black Hills National Cemetery - Emergency services access further away from area residents	+ No individual residents impacted - Requires significant temporary right of way - Requires moderate permanent right of way	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts
	C	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+Anticip. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. - No wetland impacts - Approximately 26 acres of wooded area present (NLEB) - Crosses Fort Meade Archeological Site - 1 listed site in grading limits - 1 BLM site within grading limits, 1 directly adjacent - Impacts Centennial Trail - Parallels BHNC - 650 feet - Level C property - 65 feet - Bisects view from BHNC	- Longest and most expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - Construction is in area of steep terrain - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Alignment avoids the expansion area of the Black Hills National Cemetery + Moves access to existing Black Hills National Cemetery further away - Emergency services access further away from area residents	+ No individual residents impacted - Requires significant temporary right of way - Requires moderate permanent right of way	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria Related to Each Alternative

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Exit 40	40-1	+ Improves ramp geometry and merge onto I-90	+ Corrects superelevation issue on EB Ramp + Provides for standard EB off and WB on ramp lengths + Improves ramp grades - May continue to have snow drifting issues on EB off ramp	+ Anticipate no effect to least tern, red knot or whooping crane - 1 NWI stream crossing - 0 wetland impacts - Approximately 0.5 acres of wooded area present (NLEB) - 0 registered and recommended eligible sites within grading limits,	- Moderate cost to reconstruct ramps - Right of way costs are minimal	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be operated while new ramps are constructed + Moderate risk of issues during construction	+ Does not change existing access to interchange	+ Minor individual residences impacted + Requires minimal permanent right of way + Requires minimal temporary right of way	+ Does not affect existing or future land use	+ Accommodates bicycle access to I-90	+ No public utility impacts + Minimal private utility impacts

Stantec

I-90, Exit 32 to 40 Corridor Study & Design

MEAD_IM 0901(195)32N_IM 0901(198)32N
November 14th & 15th, 2018
SDDOT Rapid City Regional Office

Stakeholder Meetings #2

NAME	ORGANIZATION	PHONE NUMBER	E-MAIL ADDRESS
Danny Dalton	RLPE	307-660-4208	ddalton@gwrr.com
Aaron Cook	Stantec	701-989-7087	Aaron.Cook@stantec.com
Theresa Maahs	"	651-604-4786	Theresa.Maahs@Stantec.com
Tom Horan	SDDOT	605 394 2244	Tom.Horan@State.sd.us
Jeff Breckenridge	Corps of Engineers	605-341-3169 ext. 3621	jeff.l.breckenridge@usace.army.mil
Rick Bush	City of Sturgis	605-347-1832	rbush@sturgisgov.com
Daniel Ainslie	City of Sturgis	347-4422	dainslie@sturgisgov.com
Daniel Velder	BLM	605-892-7000	dvelder@blm.gov
Ryan Larson	BLM	605 892-7033	rlarson@blm.gov
Brenda Shierts	BLM	605 892-7005	bshierts@blm.gov
Dav VanDen Heede	BHNC	605 390-4389	dav.VandenHeede@VA.gov
Terry Corkins	BHNC	605-347-3830	terry.corkins@va.gov
Trenton Haffley	SD GFP	394-2394	trenton.haffley@state.sd.us

Stantec

I-90, Exit 32 to 40 Corridor Study & Design

MEAD_IM 0901(195)32N_IM 0901(198)32N

November 14th & 15th, 2018

SDDOT Rapid City Regional Office

Stakeholder Meetings #2

NAME	ORGANIZATION	PHONE NUMBER	E-MAIL ADDRESS
Annie Apodaca	USFS	605-673-9239	aapodaca@fs.fed.us
John Kelley	USFS - NZ Lands & Rec	605 443 3074	john.m.kelley@usda.gov
Mike Carlson	SDDOT	605 394 1635	
Ed Ludwick	No Name City	605 490 8909	camping@nonamecity.com
Richard Morkert	Ret	605-347-5573	— —

Project: 193804017

Public Information Meeting #2 - Summary

To:	Steve Gramm	From:	Dale Grove
	SDDOT		Rochester MN Office
File:	MEAD_IM 0901(195)32N_IM 0901(198)32N_I-90 Exit 32-40	Date:	February 4, 2018

I-90, Exit 32 to Exit 40 Corridor Study Public Information Meeting #2
December 10, 2018, 4:30 pm to 7:00 pm MST

Overview

The South Dakota Department of Transportation (SDDOT) hosted a public information meeting to share the project alternatives developed for the Interstate 90 (I-90) Exit 32 to Exit 40 Corridor Study and receive input from the public. The public information meeting was held on Monday, December 10, 2018, at Brown High School in Sturgis, SD (12930 SD-34, Sturgis, SD 57785) from 4:30 pm to 7:00 pm MST.

Approximately 60 people attended the meeting (Sign-In sheet is attached) to learn about the project and provide input. Attendees ranged from Meade County residents and landowners to various key stakeholders.

The meeting was advertised through the following methods:

- Notification in
  - Black Hills Pioneer – November 19th & 30th
  - Rapid City Journal – November 30th
- Public Service Announcements
- Direct mailings
- Flyers placed in Sturgis community buildings

Displays were set up for the public to review the alternatives and the SDDOT project team members were available to discuss issues and answer questions. The opportunity to submit written or oral comments was provided.

Formal presentations highlighting the progress of the project were given by Stantec employees Dale Grove and Theresa Maahs at 4:45 pm and 6:00 pm.

Formal Presentation

Dale Grove kicked off the presentation by welcoming the public. He introduced the project and gave an overview of the *Project Needs and Goals*. Dale then reviewed the *Concept Development* and identified alternatives that were developed, indicating which have been dismissed and which will be analyzed further. Theresa Maahs presented the *Environmental Concerns* found within with corridor. Dale concluded the presentation by reviewing the *Alternative Evaluation*, *Next Steps,* and *How to Get Involved*.

PDF copies of the presentation are included as an attachment.

Reference: I-90 (Exit 32 to Exit 40) Corridor Study Public Information Meeting #1

Displays

Project boards and two identical plots were displayed identifying the existing conditions/issues, including public comments received at and after the first public meeting in December 2017. The nine boards included the following information:

- *Welcome*
- *Exit 34 Existing Conditions*
- *Exit 34 Preliminary Concepts (Alternatives 34-1B, 34-3, and 34-7)*
- *Local Road Connections (Existing Conditions and Preliminary Concepts)*
- *Exit 37 Existing Conditions*
- *Exit 37 Preliminary Concepts (Alternatives 37-1, 37-2, and 37-3)*
- *Exit 40 (Existing Conditions and Preliminary Concept)*
- *Alternative Evaluation*
- *Next Steps/Project Schedule*

Stantec representatives were on hand to facilitate discussion and write down thoughts, concerns, and ideas from the public. The displays from the public information are included as an attachment to this summary as well as on the project website.

Comments

Attendees had the option of giving oral or written comments at the meeting. Comment forms were available for attendees to take home and submit after the meeting. The public was given until December 24th to submit comments by mail, email, phone, or by using the interactive map on the project webpage. Eight (8) written comments and nine (9) comments from the project website were received and are included as an attachment.

STANTEC CONSULTING SERVICES INC.

Dale A Grove

Dale Grove
Principal

Phone: (507) 529-6039
Fax: (507) 282-3100
Dale.Grove@stantec.com

Attachment: Meeting Sign In Sheet
Meeting Advertisement
Meeting Presentations
Meeting Displays
Comments Received

c. Aaron Cook, file

South Dakota Department of Transportation
I-90 Exit 32-40 | Public Informational Meeting #2 | December 10, 2018

Name	Email	Organization
Steve Gramm	Steve.gramm@state.sd.us	SDDOT
RJ Ludwick	camping@nonamecity.com	No Name City Campground
Dick & Lonna Moorkert	—	20951 Boulder Cyn Rd
Ken Moorkert	Kmmoorkert@yahoo.com	" "
Sam Gilkerson	Samuel.gilkerson@state.sd.us	SDDOT
Jerry Lolley	arrowgtr.circle@yahoo.com	
Mike Schmeltzer	Blucksberg DR	NO-EMAIL
Ann + Gary Uhde	annblair1000@msn.com	self. (landowner)
Talbert Ranch		sold
Tom Schmidt	tom.schmidt@dot.gov	FHWA
Cathy Roberts	sdcate69@gmail.com	self.
Dustin Hamilton	dustin.hamilton@hdrinc.com	HDR
Andrew Snyder	Snydercattlecompany@gmail.com	
Steve Palmer	steve.palmer@state.sd.us	SDDOT
Lonnie & Judy Hall	judyhall56@hotmail.com	landowner
Aaron Cook	Aaron.Cook@Stantec.com	Stantec
Dale Grove	Dale.Grove@stantec.com	Stantec
Peggy Harter	Peggy.Harter@stantec.com	Stantec
Theresa Maahs	Theresa.Maahs-Henderson@stantec.com	Stantec

South Dakota Department of Transportation
I-90 Exit 32-40 | Public Informational Meeting #2 | December 10, 2018

Name	Email	Organization
Mark Hoines	mark.hoines@dot.gov	FHWA
Liz Wunderlich	lwunderlich@sturgisgov.com	Sturgis
Paul & Shila Steiger	pashst84@gmail.com	
Bill & Susan Harsanyi	Sbharsanyi@gmail.com	Homeowner
Larry & Terry Hahne	lthahne@rcrede.net	Bulkley Canyon Rd Homeowner
Rebecca Porter-Watson	bporterwatson@gmail.com	homeowner
Michael Watson	michael52watson@gmail.com	Homeowner
Lynn Tribby	lynntribby@yahoo.com	homeowner
Daniel Ainslie	dainslie@sturgisgov.com	City of Sturgis
Brenda Shierts	bshierts@blm.gov	BLM
Ken Snyder	Kenneth.G.Snyder@gmail	Private Land Owner
Terry Corkins		Black Hills National Cemetery
Michael Strain	mike@mormenlaw.com	Attorney / Landowner
TOM HORAN	TOM.HORAN@STATE.SD.US	DOT
Linda Davis	linda.j.davis@live.com	
Don & Sue Smalley		land owner
Ed Byers	edbyers@gmail.com	landowner
Erik Figueroa	Erik.figueroa@gmail.com	

South Dakota Department of Transportation
I-90 Exit 32-40 | Public Informational Meeting #2 | December 10, 2018

Name	Email	Organization
Gordon Kotab	get emails	Self
Amanda Hinglin	ahinglin@tie.net	Stanley Economic Dev. Corp.
Eleanor Richards	Sdriveyranch@msn.net	Self
David Richards		1399 Otter Rd Stanley
Shane Matt	shanematt@rap.midco.net	Terra Site Design
Brenda Janovy	bjanovy@gmail.com	Cetrea
Betty Morris	dbmorris@rushmore.com	Self.
Boone & Caron Collins		
Ron Rosenboom		DOT Commission
Rich Liggett		
Randy + Sue Hanson	ladyskh@yahoo.com	
Kirk VanRocked	kirk.vanrocked@dot.gov	FHWA
Kpharrington	Kpharrington@rcgov.org	RCMPO
Sonia Downs	sonia.downs@sd.us	SDDOT
Kevin Forrester	K4oster@yahoo.com	Self
Doreen Creed	doreencreed@gmail	Meade Co.
Mike Carlson	mike.carlson@state.sd.us	SDDOT
Bill Metrose	drbill@midco.net	Home owner
Robin Strain	robin@sdstarbase.org	Homeowner
ROBERT CONNOR	ROBERTCONNOR47@gmail.com	

Name	Email	Organization
Ted Seaman		Meade Co

SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION NOTICE OF PUBLIC INFORMATION MEETING

IM-FP 0901(195)32 N PCN 021G &
IM 0901(198)32 N PCN 06DN,
MEADE COUNTY
I-90 Exit 32 to 40
Corridor Study and Design Project

WHEN AND WHERE?

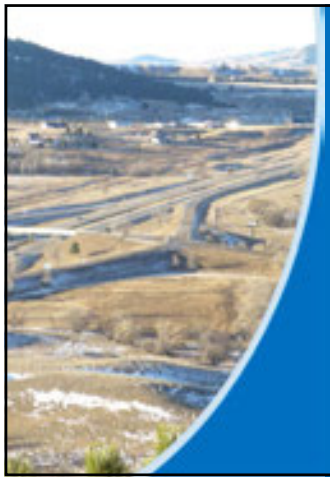
Monday, December 10, 2018
Informal Open House 4:30 – 7:00 PM
Two Presentation Times:
4:45 PM
6:00 PM
Lecture Hall Room 111
Brown High School
12930 E. Highway 34
Sturgis, SD 57785

Representatives from the South Dakota Department of Transportation, Meade County, and their consultant will be on hand to answer your questions, discuss the project(s) with you, and receive your input.

If you cannot physically attend the open house, the information presented will be available for you to review on the project website at **www.i90Exit32to40.com** within a few days after the meeting.

Notice is further given to individuals with disabilities that this open house meeting is being held in a physically accessible place. Any individuals with disabilities who will require a reasonable accommodation to participate in the open house meeting should submit a request to the SDDOT's ADA Coordinator at 605-773-3540 or
1-800-877-1113 (Telecommunication Relay Services for the Deaf). Please request the accommodations no later than two business days prior to the meeting in order to ensure accommodations are available.

Comments will be accepted through December 24, 2018. Written comments about this project should be mailed to Dale Grove; Stantec Project Manager; 6188 Rome Circle NW, Rochester, MN 55901. Comments can also be submitted through the project webpage at **www.i90Exit32to40.com**.
Published once at the approximate cost of $_____.

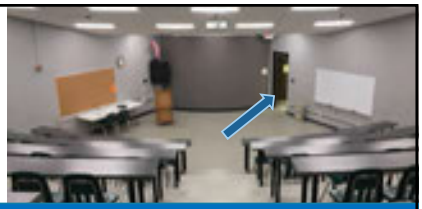


I-90 Exit 32 to 40 Corridor Study + Design

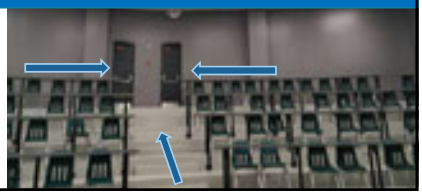
Public Meeting #2
December 10, 2018
Brown High School, Sturgis, SD

Agenda

1. Introductions & Housekeeping
2. Project Need & Goals
3. Concept Development
4. Environmental Concerns
5. Alternative Evaluation
6. Next Steps & How to Get Involved



Housekeeping exit locations



Project Stakeholders

DOT
Connecting South Dakota and the Nation

FHWA

MEADE COUNTY

Project Need & Goals

- Replace eastbound lanes
- Drainage structures nearing end of useful life
- Interchanges do not meet design standards
- Address queuing issues at Tilford

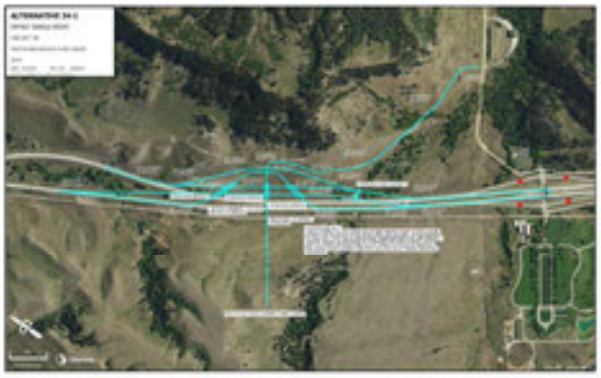
Project Need & Goals

- Identify and analyze conceptual improvements (corridor and interchanges)
- Develop feasible construction projects within the study area
- Design and construct improvements

Concept Development

- Issues and deficiencies were identified
- Project Study Advisory Team (SAT) workshop in May, 2018
- Concepts developed
- SAT workshop to review and refine options in Sept. 2018
- Preliminary decision to advance with two projects

Exit 34 - Dismissed Concepts



Exit 34 - Dismissed Concepts

Exit 34 - Dismissed Concepts

Exit 34 - Dismissed Concepts

Exit 34 - Dismissed Concepts

Exit 34 - Dismissed Concepts

Exit 34 – Concepts for Further Study

Exit 34 – Concepts for Further Study

Exit 34 – Concepts for Further Study

Exit 34 – Local Road Options

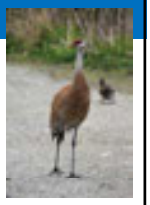
Exit 37 – Concepts for Further Study

Exit 37 – Concepts for Further Study

Exit 37 – Concepts for Further Study

Exit 40 – Preferred Concept

Environmental Concerns



Key Issues

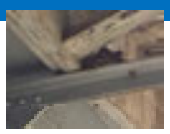
- Water Resources
  - ✓ Wetlands/Floodplains/Surface waters
- Wildlife and Vegetation
  - ✓ Bird and Animal Migrations/Threatened and Endangered
- Cultural Resources
  - ✓ Archaeological Sites and Structures/Historic Properties
- Parks and Recreation Facilities (4(f))
- Noise/Visual Resources

Environmental Concerns

Agency Coordination

- Bureau of Land Management (BML)
- U.S. Forest Service (USFS)
- Black Hills National Cemetery/National Park Service (BHNC/NPS)
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Service (USFWS)
- Federal Highway Administration (FHWA)
- S.D. Department of Environment and Natural Resources (SDDENR)
- South Dakota State Historic Preservation Office (SHPO)
- Tribal Historic Preservation Office (THPO)
- South Dakota Game Fish and Parks (SDGFP)
- City of Sturgis
- Black Hills Trails

Environmental Concerns



Studies Completed

- Water Resources
  - ✓Desktop Delineation Completed Spring 2018
  - ✓Field Work Delineation Completed Spring/Summer 2018
  - ✓Reviewed FEMA Floodplain Mapping 100 year and 500 year
- Wildlife and Vegetation
  - ✓USFWS Database and SDGFP Information (NatureServe)
- Cultural Resources
  - ✓Class I Survey (Windshield survey, records search, BLM)

Exit 34 – Environmental Concerns

Water Resources

- Delineated Wetlands
- Surface waters
  - –Alkali Creek
  - –Unnamed Creek

Exit 34 – Environmental Concerns

Public Lands

- Bureau of Land Management
- Black Hills National Cemetery
- Alkali Creek Centennial Trail
- 7th Calvary Trail System
- Fort Meade Recreation Area

Exit 34 – Environmental Concerns

Cultural Resources

- Fort Meade Archeological Site
- Fort Meade Historic District
- Registered/ Recommended Sites

Exit 37 – Environmental Concerns

Water Resources

- Delineated Wetlands
  - –Forested Wetlands
- Surface waters
  - –Unnamed Creek

Exit 37 – Environmental Concerns

Public Lands

- Controlled Hunting Access Program (CHAP)

Exit 37 – Environmental Concerns

Cultural Resources

- Registered/ Recommended Sites

Alternative Evaluation

Next Steps

Corridor Study: End of 2018

Identify Construction Projects: Spring 2019

Submit Interchange Modification Justification Reports: Summer 2019

Complete Environmental Studies (1st Project): Fall 2019

Finish Detail Design (1st Project): Fall 2021

Construction Start: 2022 & 2024

How to Stay Involved

Which is your favorite? Comments or concerns?

Please let us know.

Submit Comments:

Tonight

- Written (place in comment box)
- Oral

After Tonight (Comments accepted until December 24, 2018)

- Written (Take a comment card with you)
- Website (www.i90exit32to40.com)
- Contact Us (phone, email, letter)

How to Stay Involved

Attend the Next Public Meeting - Summer 2019

Landowner Meetings - Fall 2019

Sign up for the State's listserve to receive email updates:
https://listserv.sd.gov/scripts/ wa.exe?A0=I90EXIT34TO37

Visit us on our webpage: www.i90exit32to40.com

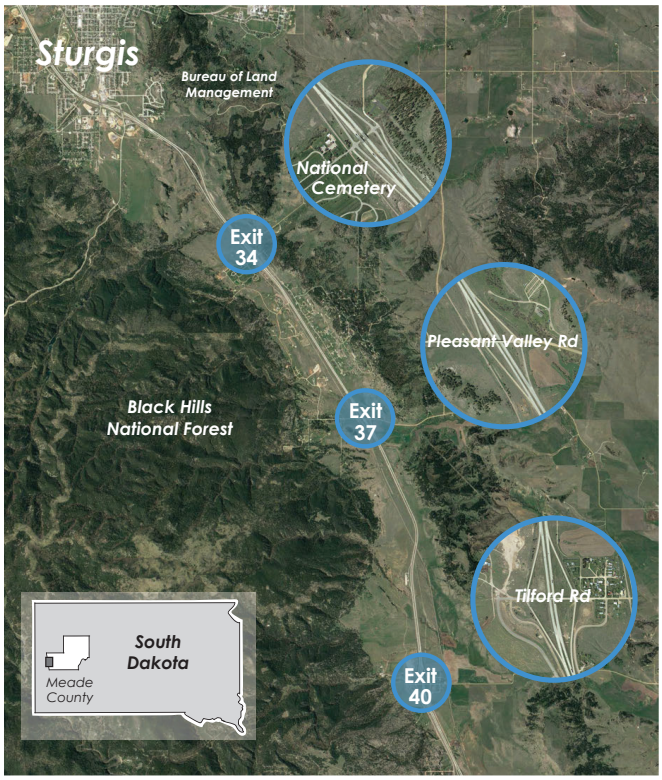
Thank You!

Thank you for coming.

Project Staff are available to answer questions (Stantec, SDDOT, Meade County, FHWA)

Please drive home safely!

Welcome



Study Area

The study area encompasses Interstate 90 from Exit 32 in Sturgis to Exit 40 at Tilford. The study area includes the following interchanges:

- **Exit 34** at Black Hills National Cemetery
- **Exit 37** at Pleasant Valley Road
- **Exit 40** at Tilford Road

The study section also includes the Tilford Port of Entry facility located along I-90 eastbound between Exits 37 and 40.

Pleasant Valley Road Over I-90

About the Project

The South Dakota Department of Transportation (SDDOT), in cooperation with Meade County and the Federal Highway Administration, is working to preserve the Interstate 90 (I-90) corridor between Exits 32 and 40. This section of I-90 serves as the primary connection between Sturgis and Rapid City, South Dakota.

The project includes a corridor study, interchange analysis and justification, environmental documentation, and design plans. The project will culminate with the construction of the selected alternatives studied. Two projects are planned to implement all the necessary improvements, construction of the first project is planned for 2022 and the second project is currently scheduled for construction starting in 2024.

Need for Study

This study was the the first step in the process to identify deficiencies and needed improvements to I-90 and the interchanges between Exits 32 and 40. The study will initiate the FHWA Interchange Modification Justificatio process for addressing the Interstate Access Modification Policy Points.

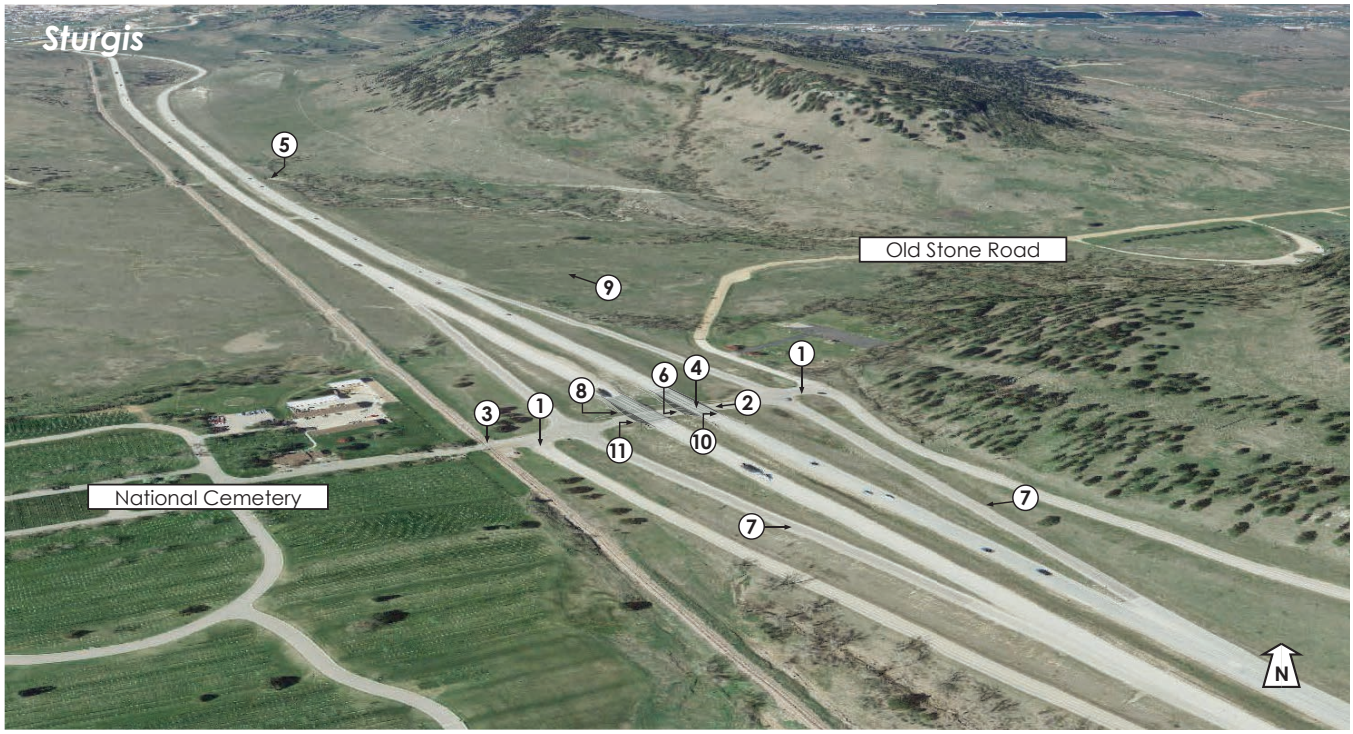
The SDDOT has determined the pavement in the eastbound lanes of I-90 between Exits 32 and 40 will require replacement before 2025. The pavement condition, combined with deteriorating drainage structures, substandard designs, and interchange capacity limits, has led the SDDOT to develop a comprehensive study to identify the necessary improvements in the corridor.

Tonight's Meeting

We have developed concepts for two projects to respond to comments we heard at the last public meeting. We want to know how the order of the Evaluation Criteria compares with your values.

Presentations:
4:45 and 6:00pm

Exit 34: Existing Conditions



1. 
Distance between ramps and frontage roads on the crossroad does not meet spacing standards.

2. 
Cross road doesn't meet emergency stopping standards.

3. 
Un-safe at-grade railroad crossing near the entrance to Black Hills National Cemetery.

4. 
Existing structures are nearing the end of their useful life.

5. 
Culvert at Alkali Creek nearing the end of its useful life.

6. 
Inadequate clearance under the bridges.

7. 
Ramp lengths and curves do not meet current standards.

8. 
Existing configuration allows snow to build-up under the crossing.

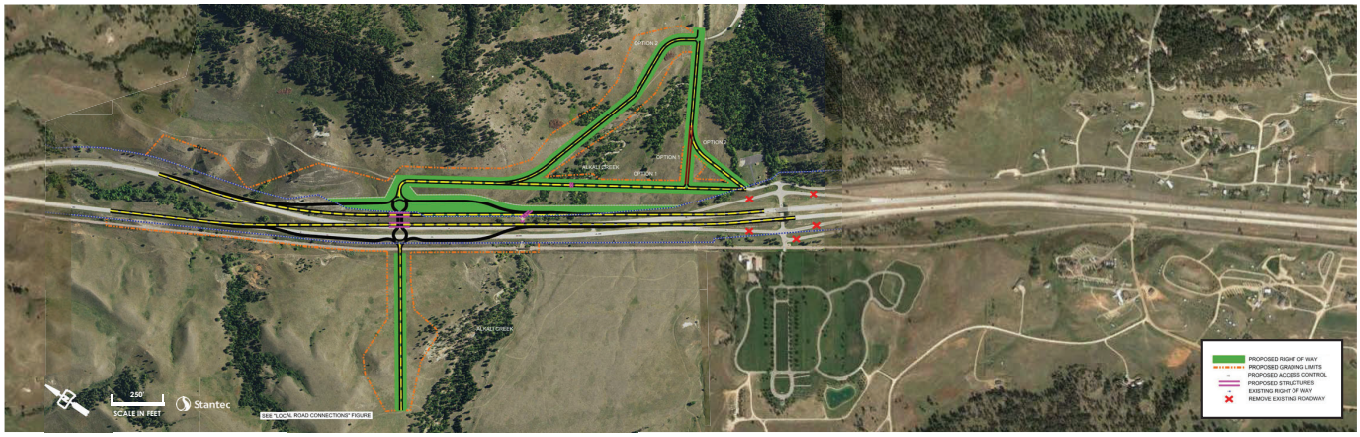
9. 
Lack of frontage road connection to Sturgis.

10. 
Bridge barriers do not meet current standards.

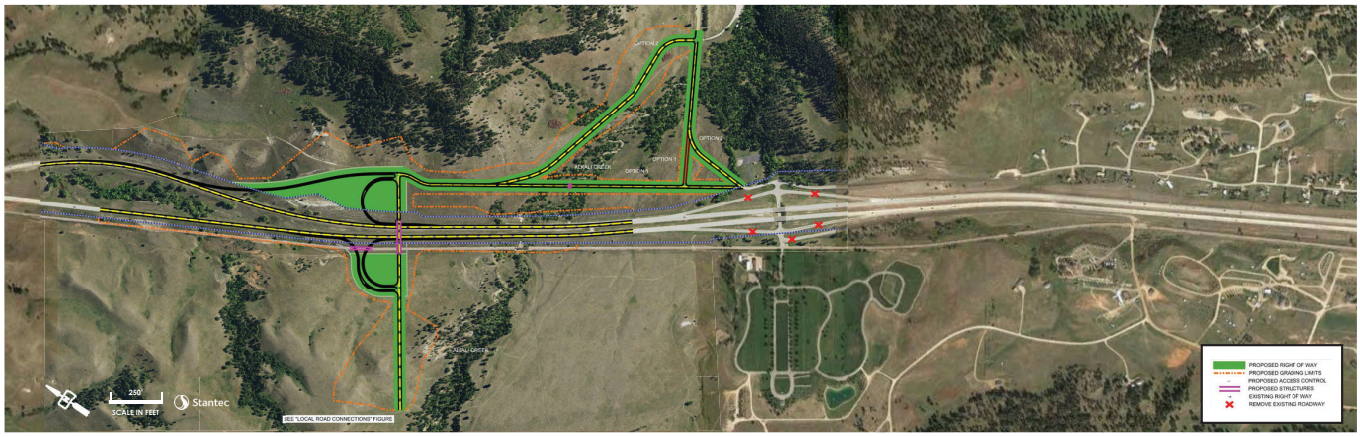
11. 
The distance between the traffic lanes and the bridge columns is substandard.

Exit 34: Preliminary Concepts

Alternative 34-1B: Roundabout Interchange



Alternative 34-3: Modified Folded Diamon



Alternative 34-7: Roundabout Interchange (South)

Exit 34: Local Road Connections

Connections to I-90 from local roads are critical. However, the existing frontage road at Exit 34 will be closed due to constraints. This board illustrates three proposed alternatives for a new frontage road applicable to Alternatives 34-1B and 34-3.

Existing Conditions

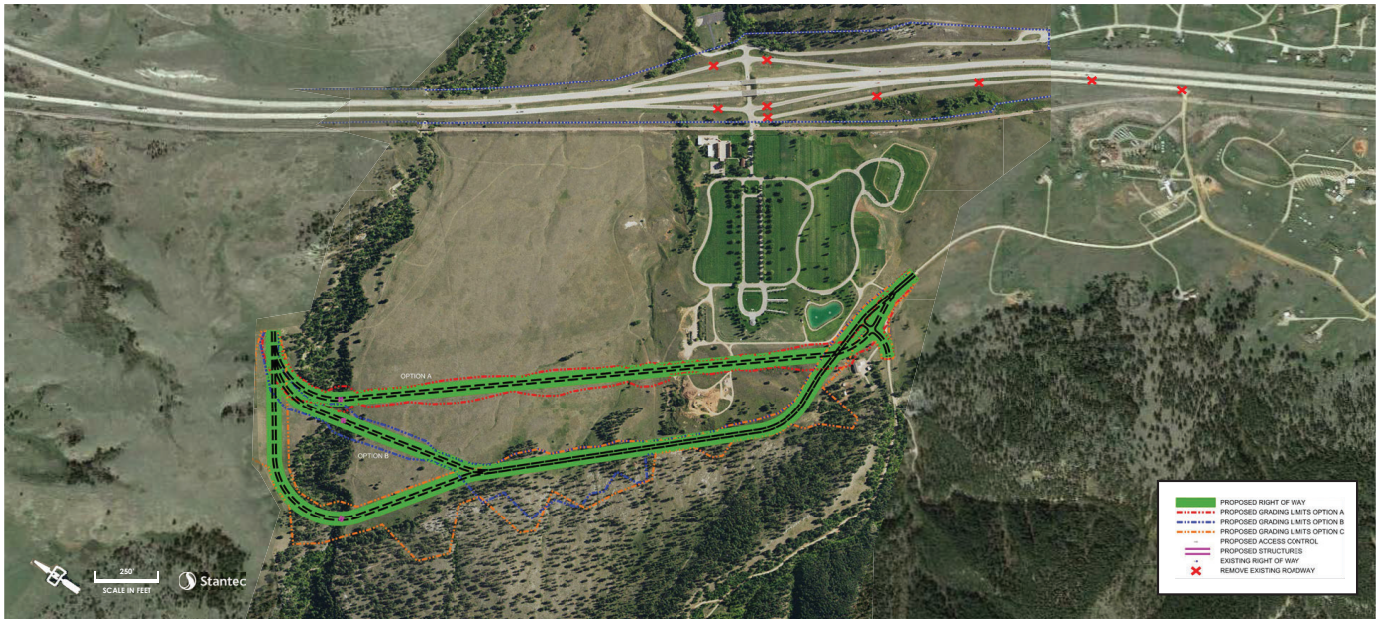
1. 

Due to constraints, the frontage road will be closed.

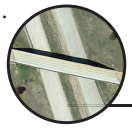
2. 

There are three different proposed alignments.

Preliminary Concepts



Exit 37: Existing Conditions

1. 
Distance between ramps and railroad on the crossroad does not meet spacing standards.

2. 
Intersection spacing does not meet emergency stopping standards.

3. 
Ramp lengths and curves do not meet current standards.

4. 
Merging difficulties

5. 
Existing structures are past the end of their useful life.

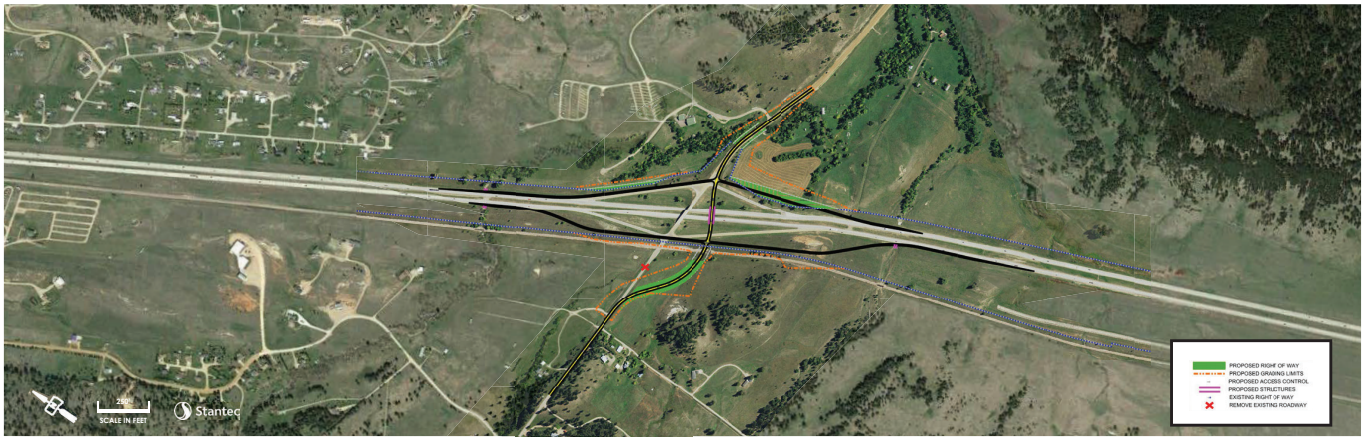
6. 
Inadequate clearance under the bridges.

7. 
Lack of frontage road connection to Blucksberg Drive.

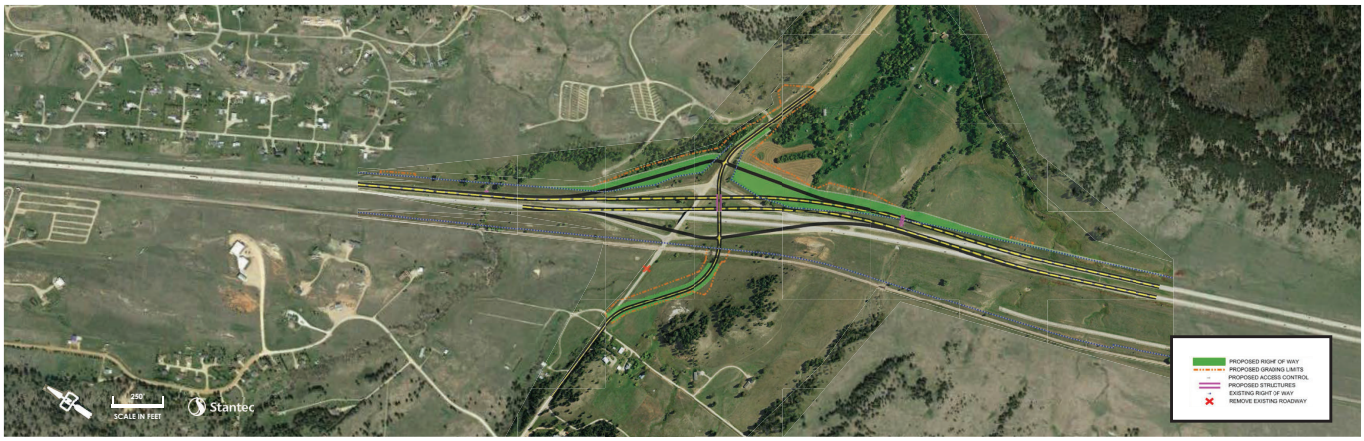
Exit 37: Preliminary Concepts

Alternative 37-1: Ramp Upgrade

Alternative 37-2: Squared Up Structure

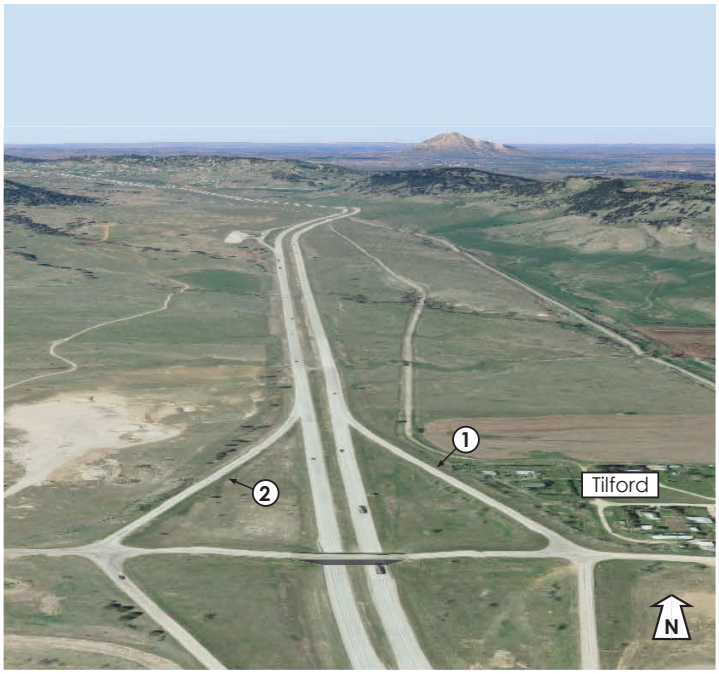


Alternative 37-3: I-90 Realignment

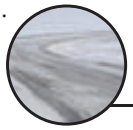


Exit 40

Existing Conditions

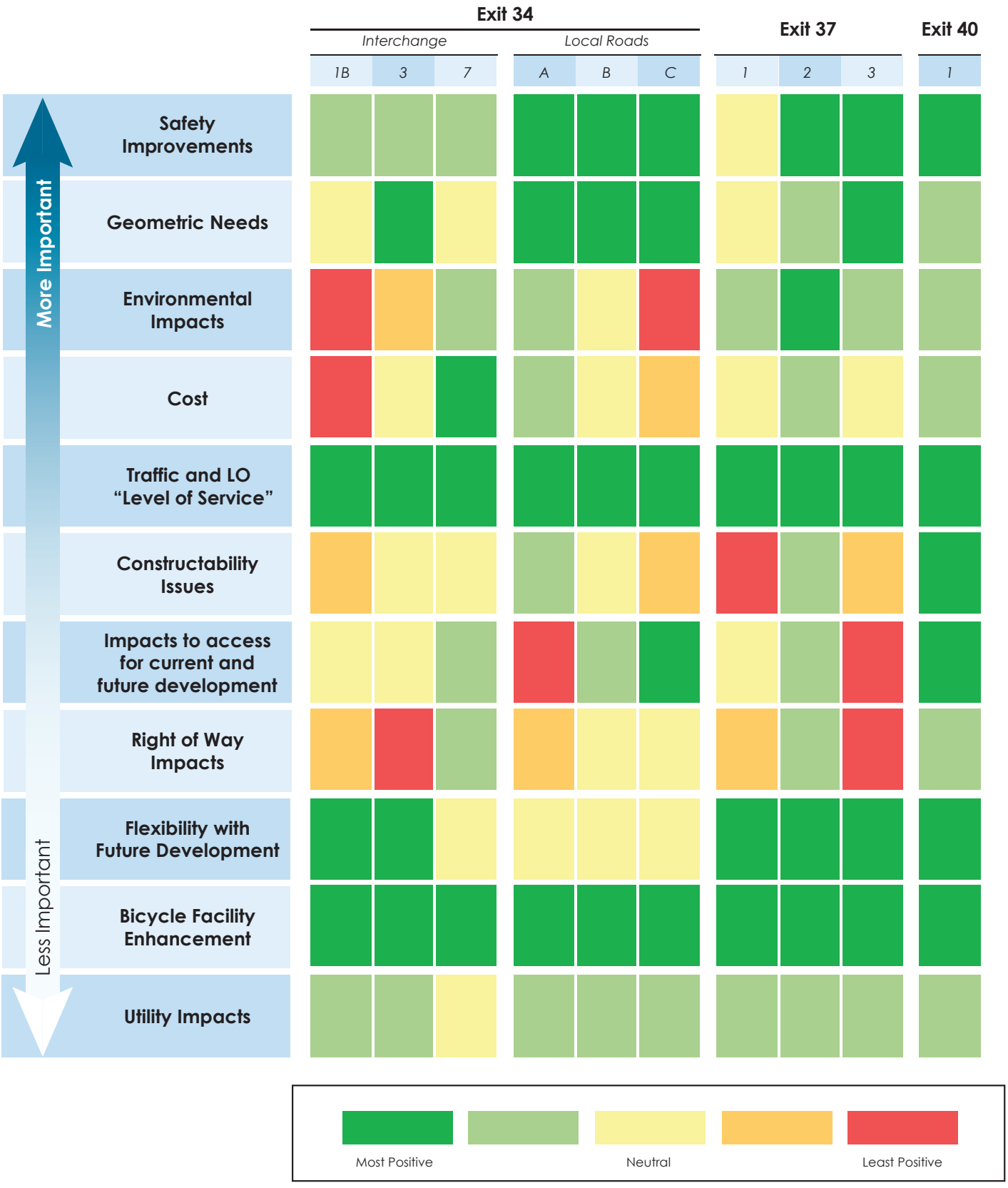


1. 
Ramp lengths and curves do not meet current standards.

2. 
Snow drifting issues on ramp.

Preliminary Concepts

Alternatives Evaluation



Next Steps

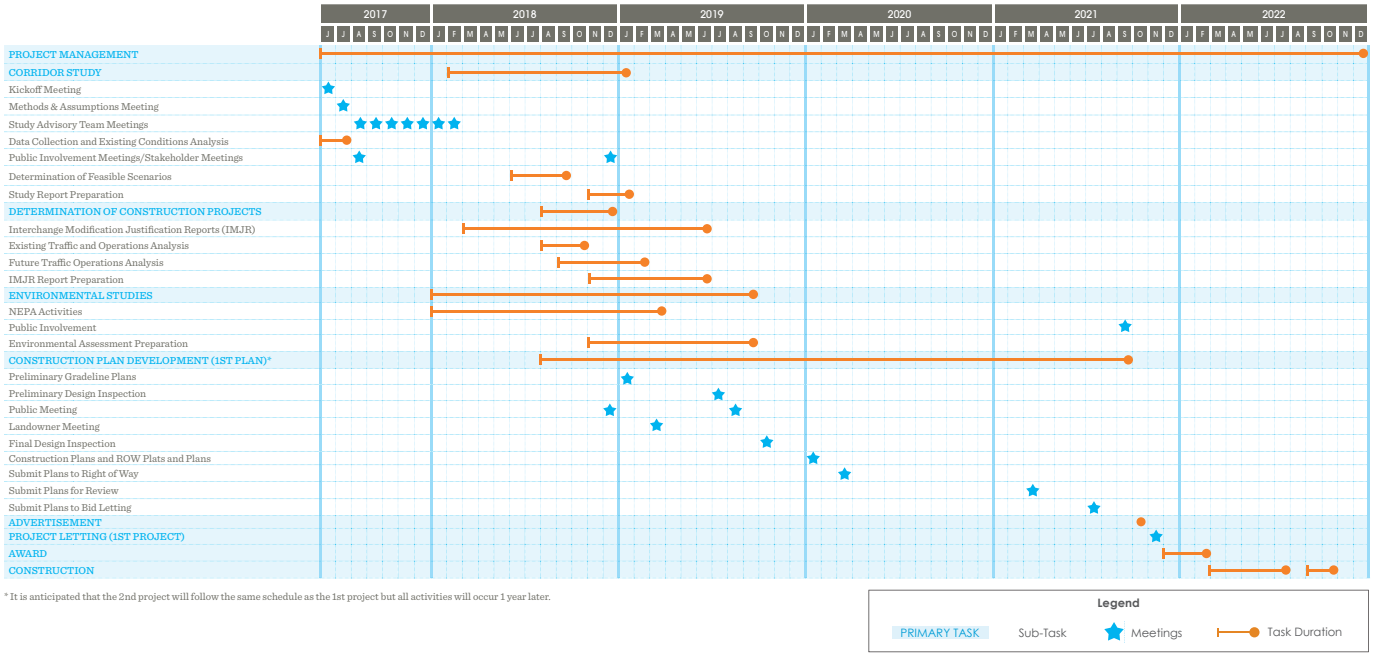
Project Schedule

The major activities of the I-90 Design and Study are following the schedule shown below:

1. **Corridor Study:**
   Substantially completed by the end of 2018
2. **Determination of Construction Projects:**
   Spring 2019
3. **Interchange Modification Justification Reports**
   Summer 2019
4. **Environmental Studies:**
   Fall 2019
5. **Detail Design Completed:**
   Fall 2021
6. **First Construction Project:**
   2022

Project Schedule — I-90 Exit 32 to Exit 40 Corridor Study & Design

Stantec



* It is anticipated that the 2nd project will follow the same schedule as the 1st project but all activities will occur 1 year later.

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Lynn Tribby

Address: 8233 S. Blucksberg Mtn. Rd. Sturgis, SD 57785

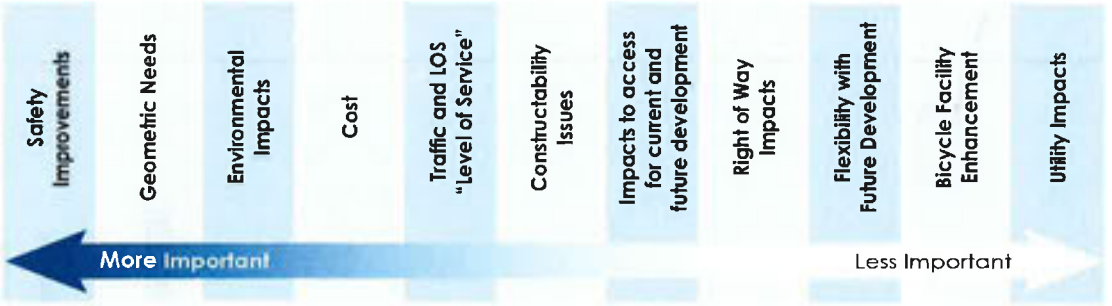
Phone:

E-mail: lynntribby@yahoo.com

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

Looking at the choices of possible changes near Blucksberg Mtn. Estates, # 34-7 has the least environmental and historical area impact. This would be my preference.

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)



PUBLIC OPEN HOUSE

Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Rebecca Porter-Watson
Address: 8616 Blucksberg Ct, Sturgis, SD 57785
Phone:
E-mail:

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

I am most in favor of Exit 37 #2 and #7 for exit 34 due to environmental impact and cost. I have concerns for the archeological artifacts in the Ft Meade Rec Area and the spring that flows beside the chapel.
Living in Blucksberg, it would also be closer so I would not have to back track as far.
I find round abouts efficient means of moving traffic

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)

1	4	2	3	6	7	8	10	5	9	11

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: RICHARD & LONNA MORKERT
Address: 20951 Bulldog Cy Rd STURGIS
Phone: 1-605-3475573
E-mail: none

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

DATE: LEAVE EXIT 43 AS IS: MOOE SERVICE Rd to the South along and NEAR R-ROAD AND INTESECT Existing R-R CROSSING

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)

5	5	5	5	1	1	1	1	1	11	1

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Jerry Lollex

Address: 8080 Blucksberg Dr. Sturgis, SD 57785

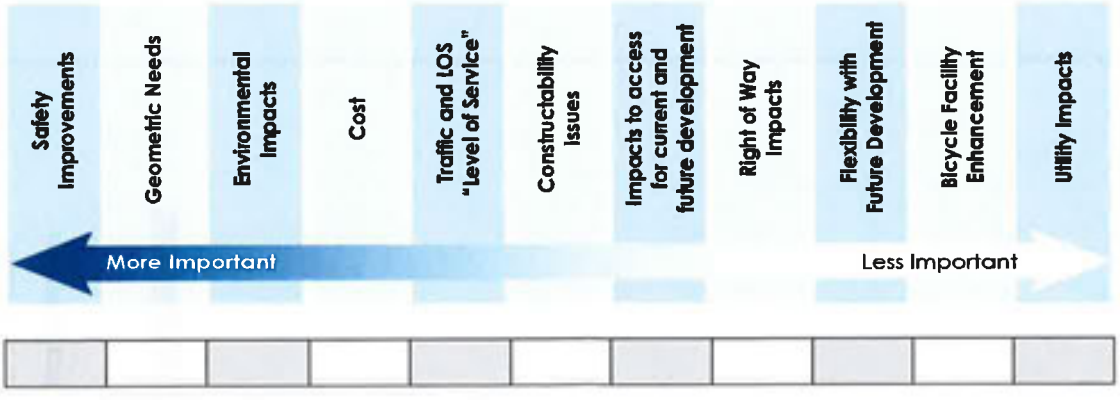
Phone: 605 206 0269

E-mail: arcowgtr.circle

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

Please DO NOT include Round-a-bouts

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)



PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

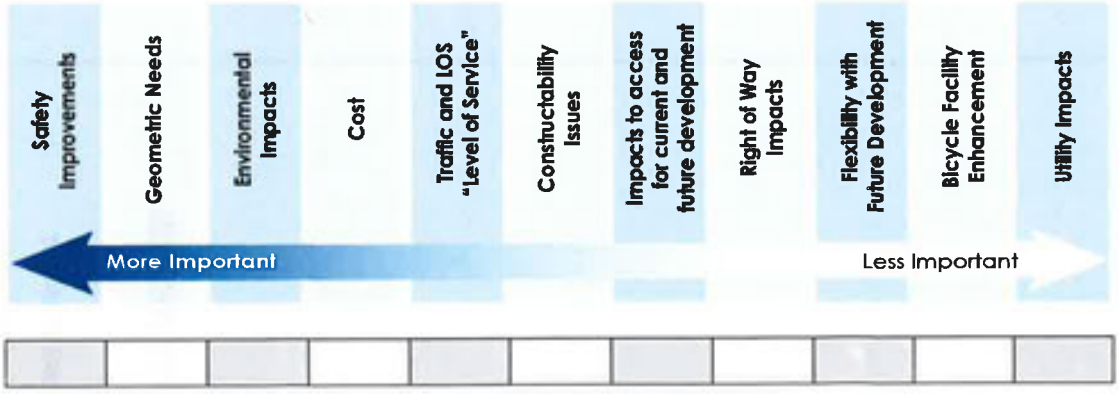
The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Nancy Remington
Address: 13189 Pleasant Valley Rd., Sturgis, SD 57785
Phone: (605) 347-4254
E-mail: ngremington@gmail.com.

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

Regarding the Exit 37 plan, I prefer Option #2. I want to minimize the impact on surrounding land. (I am member of a Blair family LLP that owns land immediately adjacent to Exit 37.)

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)



PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

[Landowner @ Exit 37.]

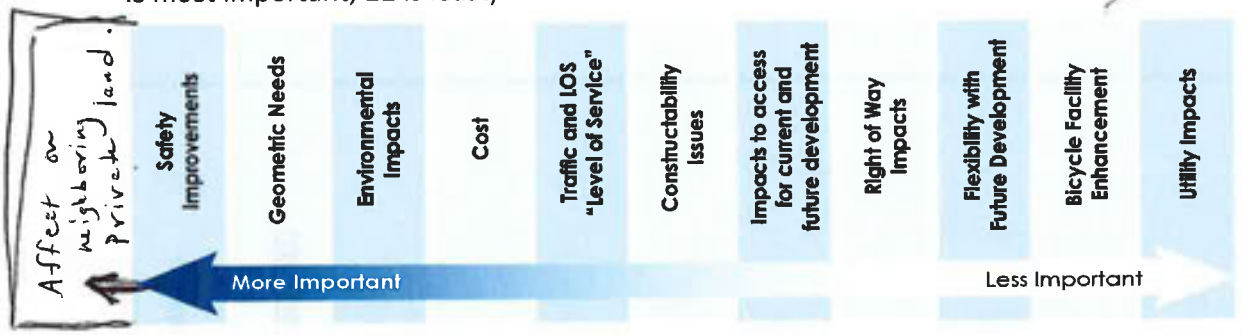
The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Ann Blair Uhde (on behalf of, George Blair & Family FLLP)
Address: 3157 Berwick Knoll + 13079 Pleasant Valley Rd.
Phone: (612) 819-0775 (member of FLLP.) Sturgis, SD 57785
E-mail: annblair1000@msn.com (landowner at/along Exit 37)

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

In terms of Exit 37, concept # 2 seems the least impactful. I wonder if it would be possible to have a hybrid of # 1 + # 2? Minimize land taking, but leave bridge in present location? Perhaps there is strong reason for moving bridge. Of the three, I would support # 2.

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)



1	6	7	10	8	5	9	2	4	3	11	6

? what is this?

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: MIKE SCHMELTZER

Address: 8067 BLUCKSBERG DR STURGIS S.D. 57785

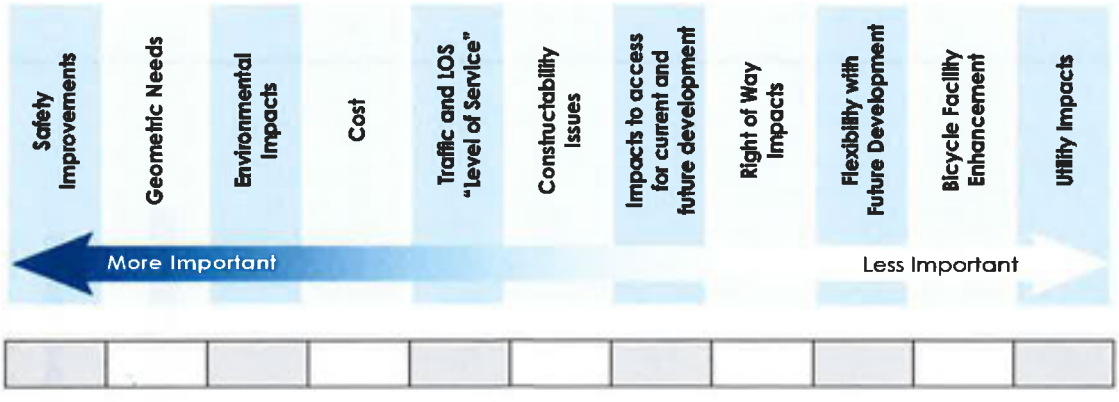
Phone: 605-431-9293

E-mail: NA

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

THE STATE DESIRES TO Rebuild EAST BOUND LANE I-90 BETWEEN EXIT 32 & 40. PLUS EXPENSE FOR FUTURE THIRD LANE. HOWEVER THE 350 odd HOMES IN BLUCKSBERG AND WEST & SOUTH OF THE NATIONAL CEMETARY WILL STILL HAVE NO WAY TO GET ANYWHERE WHEN I-90 closes DUE TO WEATHER. OLD STONE (BLM) closes IN WINTER AND THE Buffalo CHIP By-Pass will DRIFT making TRAVEL impossible.

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)



PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Monday, December 10, 2018 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until December 24, 2018.
To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Bill MEIROSE

Address: 170 OLD STONE Rd, STURGIS SD 57785

Phone: 490-1246

E-mail: drbill@midco.net

Comments: Write your comments below and/or rank the Evaluation Matrix criteria.

Evaluation Criteria Comment: How do you rate the importance of the following evaluation criteria used for this study? Assign a value 1-11 in the box below each item (1 is most important, 11 is least)

5	8	6	7	1	9	2	3	4	10	11

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
    - **Name** Liz Wunderlich
    - **Email** lwunderlich@sturgisgov.com
    - **Subject** Interchange options
    - **Message** I like the 34-7 option for Exit 34. The outlet is closer to the residences, etc, and is farther away from Alkalai Creek and the Centennial Trail. I prefer option 37-2
- **Sent on:** 13 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
    - **Name** Ken Snyder
    - **Email** kenronda.snyder@gmail.com
    - **Subject** I90 exit 34
    - **Message** Wow, this is a tough road to redesign. I truly believe in this circumstance design standards need to be bent in order to be respectiful to private home owners and to our nation's veterans. Really, what is wrong with the access road to the Pleasant Valley Drive area where it currently is? You say it is out of compliance with designs standards. You also know that there are hundreds if not thousands of miles of highways separted by a 3 foot high concrete barrier in major metro areas. And this area in no way has the volume of traffic of any metro area. I challenge you to spend a day at the Fort Meade VA cemetery. Attend a couple of services at the rotunda. Watch and listen as a widow or widower is presented the American flag for their loved one's service to our country. Listen to taps or the 21 gun salute by the honor guard. Walk amongst the graves of WWI, WWII, Korean, Vietnam, and Veterans of all the recent conflicts our country has been involved in. Take in the solemness of the setting. And then think to yourself, "I am considering putting a road through this sacred and somber place." Come on -please have some respect for the deceased - ESPECIALLY VETERANS. I cannot even believe the SD DOT, an agency of our government, would ask Stantec to consider a design that in any way impacts a national cemetery. Stantec should have the moral fortitude to say to the SD DOT; "we will not design a road that goes through the Fort Meade VA cemetery or any cemetery for that matter." It is worth repeating- Come on, have some respect for the dead- ESPECIALLY VETERANS. The other option you propose south of the VA cemetery has heavy impacts on peoples' homes. It appears your road designs have no respect for the dead or the living. You have room to lengthen the on/off ramps in your existing right of way. The access to the Pleasant Valley Drive and Blucksberg areas in this case should stay as they are. Road design/standards are not codified law. They are just what they are- ideas to strive for and sometimes, especially in this case, common sense MUST prevail.
- **Sent on:** 19 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
  - **Name** Ken Snyder
  - **Email** kenronda.snyder@gmail.com
  - **Subject** I90 Exit 37 bridge/on off ramps
  - **Message** We are land owners with property on both the East and West side of I90 near exit 37. I encourage you to consider design options that have the least impact on private land. I believe the DOT can meet the evaluation criteria of safety, geometric needs, evironment impacts and cost by keeping the bridge/ramps construction within existing right of way. I like a hybrid design of options 1 and 2. Rebuild the bridge in its present alignment and lenghten the ramps using existing right of way. We are a 4th generation ranching family established in 1946. Our cattle use the 3 box underpass south of exit 37 daily from early May until November. They need to be able to travel through the pass to access water on the east side. I noticed some work is to be done on the box culvert. We need daily access through the underpass for the months mentioned. We also lease land from the George Blair Family for grazing and use the underpass/box culvert to move cattle from one side of the highway to the other throughout the spring/summer/fall months. Any construction that impeeds cattle flow through the underpass/box culvert concerns me greatly. I strongly believe that right of way impacts should be second to safety in the evaluation criteria . The public has enough land for the geometric needs in the exit 37 footprint. By keeping the design in the existing footprint environmental impacts are a moot point, (there are no environmentally sensitive areas in the already disturbed lands) cost is grealty reduced, (no need to purchase private land that- by the way- is not for sale) and level of service for the traveling public is met. Again, be very, very mindful and respectful of private land.
- **Sent on:** 18 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
  - **Name** Ken Snyder
  - **Email** kenronda.snyder@gmail.com
  - **Subject** exit 40
  - **Message** We are the private land owners of the land adjacent to the on and off ramps at the Tilford I90 exit 40. I encourage you to use designs for the ramps that stay within the existing right away. We are a 4th generation family ranch established in 1946. Our livelihood is dependant upon our private lands. Please, give high consideration to design choices that miminize the taking of private lands.
- **Sent on:** 18 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
  - **Name** Bureau of Land Management (BLM)
  - **Email** bshierts@blm.gov
  - **Subject** Comments on alternatives for exit 34 of I90
  - **Message** Bureau of Land Management (BLM) South Dakota Field Office 309 Bonanza Street, Belle Fourche, South Dakota 57717 Comments on Alternatives for Reconstruction of I90 Exit 34 Our preferred alternative is 34-7, Roundabout at Blucksberg based on the least amount of disturbance to BLM. BLM concerns for other alternatives that transect BLM on the north and south sides of the interstate are: Range grazing- impact numbers that can graze, will increase number of water tanks and pipelines, and will require additional fences. Recreation- effect to access, will cause fragmentation-unusable slivers or pieces of BLM making them difficult to manage. It will take away the natural undisturbed experience on the south end. Will impact the Centennial Trail and other trail systems already in place. Potential effects to exiting ROW's Fort Meade is an Area of Critical Environmental Concern (ACEC) based on aspects of Cultural Resources, Recreation, and Wildlife. BLM has concerns for impacting the ACEC values. Cultural-impact contributing elements of the Fort Meade historic district a site that is listed on the National Register of Historic Places. This includes the first rock quarry used for rock materials used in building structures at Fort Meade on the south side where the service roads are planned. Additionally, there is a National Register Eligible buried prehistoric camp site, stone circle site, and prehistoric pictograph rocks, as well as other cultural resources that have not been evaluated yet that will be destroyed by reconstruction. Cumulative Effects with the Cemetery Land Transfer of 200 acres going from the BLM to the Veterans Administration (VA) would reduce the BLM's value for recreation and cause difficulty with livestock grazing.
- **Sent on:** 17 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
  - **Name** cathy a. smith
  - **Email** medicinemountain@gmail.com
  - **Subject** Property at Exit 37
  - **Message** I have been informed that there is a proposal to move the overpass at exit 37 and take some of my property for the Pleasant Valley road access to the overpass. I am now stating my opposition to this proposal, my land is not for sale. Please contact me ASAP. Thank you, Cathy A. Smith
- **Sent on:** 11 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
    - **Name** Susan Williams
    - **Email** sbharsanyi@gmail.com
    - **Subject** Meeting 12/10/18
    - **Message** First, thank you for the meeting. I have one objection to the way part of it was conducted. When a question was asked after the presentation, the speaker went to the person asking the question to answer the question. Why couldn't this be a public question and answer session? I would have liked to hear the answer and so would others I spoke with afterwards. Secondly, I would like a print out of the proposed options for exit 34, similar to what you had on display. We have a Board in the Blucksberg Mountain Estates and we would like to share the info with the residents at our monthly and annual meetings. Can we get those? Thank You
- **Sent on:** 12 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
    - **Name** Cathy Smith
    - **Email** medicinemountain@gmail.com
    - **Subject** owner of land at Exit 37
    - **Message** I am the landowner next to Exit 37 on i 90. I was not able to be at the meeting yesterday, but I was told that you have a plan to take my pasture on the west side of the exit. I am not pleased by this suggestion, my property is not for sale, please have someone contact me about this immediately. Cathy Smith 505-470-6650, medicinemountain@gmail.com
- **Sent on:** 11 December, 2018
- Thank you!

- **You have a new message:**
- Via: https://www.i90exit32to40project.com/
- **Message Details:**
  -
    - **Name** Ken Snyder
    - **Email** kenronda.snyder@gmail.com
    - **Subject** I90 exit 34
    - **Message** Wow, this is a tough road to redesign. I truly believe in this circumstance design standards need to be bent in order to be respectiful to private home owners and to our nation's veterans. Really, what is wrong with the access road to the Pleasant Valley Drive area where it currently is? You say it is out of compliance with designs standards. You also know that there are hundreds if not thousands of miles of highways separted by a 3 foot high concrete barrier in major metro areas. And this area in no way has the volume of traffic of any metro area. I challenge you to spend a day at the Fort Meade VA cemetery. Attend a couple of services at the rotunda. Watch and listen as a widow or widower is presented the American flag for their loved one's service to our country. Listen to taps or the 21 gun salute by the honor guard. Walk amongst the graves of WWI, WWII, Korean, Vietnam, and Veterans of all the recent conflicts our country has been involved in. Take in the solemness of the setting. And then think to yourself, "I am considering putting a road through this sacred and somber place." Come on -please have some respect for the deceased - ESPECIALLY VETERANS. I cannot even believe the SD DOT, an agency of our government, would ask Stantec to consider a design that in any way impacts a national cemetery. Stantec should have the moral fortitude to say to the SD DOT; "we will not design a road that goes through the Fort Meade VA cemetery or any cemetery for that matter." It is worth repeating- Come on, have some respect for the dead- ESPECIALLY VETERANS. The other option you propose south of the VA cemetery has heavy impacts on peoples' homes. It appears your road designs have no respect for the dead or the living. You have room to lengthen the on/off ramps in your existing right of way. The access to the Pleasant Valley Drive and Blucksberg areas in this case should stay as they are. Road design/standards are not codified law. They are just what they are- ideas to strive for and sometimes, especially in this case, common sense MUST prevail.
- **Sent on:** 19 December, 2018
- Thank you!

Stantec

Hello Bureau of Land Management (BLM),

Thank you for taking the time to follow the I-90, Exit 32 - 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Comments on alternatives for exit 34 of I90

"Bureau of Land Management (BLM) South Dakota Field Office 309 Bonanza Street, Belle Fourche, South Dakota 57717 Comments on Alternatives for Reconstruction of I90 Exit 34 Our preferred alternative is 34-7, Roundabout at Blucksberg based on the least amount of disturbance to BLM. BLM concerns for other alternatives that transect BLM on the north and south sides of the interstate are: Range grazing- impact numbers that can graze, will increase number of water tanks and pipelines, and will require additional fences. Recreation- effect to access, will cause fragmentation-unusable slivers or pieces of BLM making them difficult to manage. It will take away the natural undisturbed experience on the south end. Will impact the Centennial Trail and other trail systems already in place. Potential effects to exiting ROW's Fort Meade is an Area of Critical Environmental Concern (ACEC) based on aspects of Cultural Resources, Recreation, and Wildlife. BLM has concerns for impacting the ACEC values. Cultural-impact contributing elements of the Fort Meade historic district a site that is listed on the National Register of Historic Places. This includes the first rock quarry used for rock materials used in building structures at Fort Meade on the south side where the service roads are planned. Additionally, there is a National Register Eligible buried prehistoric camp site, stone circle site, and prehistoric pictograph rocks, as well as other cultural resources that have not been evaluated yet that will be destroyed by reconstruction. Cumulative Effects with the Cemetery Land Transfer of 200 acres going from the BLM to the Veterans Administration (VA) would reduce the BLM's value for recreation and cause difficulty with livestock grazing."

Your comments and preferences have been noted and will be incorporated into our analysis as we continue to develop the project at Exit 34 and make decisions on the options that will be included. Be assured that we share your concerns about negatively impacting BLM property and archaeological artifacts in the area. We plan to implement avoidance, minimization and mitigation measures to reduce or eliminate impacts to BLM resources.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale A Grove

Dale Grove

Stantec Consulting Services Inc.
6188 Rome Circle NW, Rochester MN 55901-4846

March 4, 2019

Attention: Ms. Cathy Smith & Ms. Jennifer Smith
20 A Summer Rd.
Santa Fe, NM 87506

Dear Ms. Cathy Smith & Ms. Jennifer Smith,

Reference: I-90, Exit 32-40 Corridor Study & Design Project, Response to Website Comments

Thank you again for taking the time to follow the I-90, Exit 32 - 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received two comments:

Subject: owner of land at Exit 37

"I am the landowner next to Exit 37 on i 90. I was not able to be at the meeting yesterday, but I was told that you have a plan to take my pasture on the west side of the exit. I am not pleased by this suggestion, my property is not for sale, please have someone contact me about this immediately. Cathy Smith 505-470-6650, medicinemountain@gmail.com"

Subject: Property at Exit 37

"I have been informed that there is a proposal to move the overpass at exit 37 and take some of my property for the Pleasant Valley road access to the overpass. I am now stating my opposition to this proposal, my land is not for sale. Please contact me ASAP. Thank you, Cathy A. Smith"

We also received your letter i90 Exit 37 Interchange Project dated January 25, 2019.

Your comments and preferences have been noted and will be incorporated into our analysis as we make decisions on which options will be included in the project at Exit 37. As we discussed during our last phone call, we understand your concern about your property being impacted by this project. We prefer to avoid the need for additional property and try to keep construction within the existing right-of-way. However, as we balance the wide variety of project needs there are times it is necessary to purchase property. If that is the case at Exit 37, we will work to minimize the impacts and will offer to meet with landowners who are affected.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns.

Sincerely,

Dale A Grove

Dale Grove
Principal
Phone: (507) 529-6039
Fax: (507) 282-3100
Dale.Grove@stantec.com

cc: Steve Gramm, SDDOT, Jennifer Smith

Stantec

Hello Ken Snyder,

Thank you for taking the time to follow the I-90, Exit 32 - 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Subject: exit 40

"We are the private land owners of the land adjacent to the on and off ramps at the Tilford I90 exit 40. I encourage you to use designs for the ramps that stay within the existing right away. We are a 4th generation family ranch established in 1946. Our livelihood is dependant upon our private lands. Please, give high consideration to design choices that miminize the taking of private lands."

We understand your concern about potential impacts to your property. We too prefer to avoid the need for additional property and try to keep construction within the existing right-of-way. However, as we balance the wide variety of project needs there are times it is necessary to purchase property. If any new right-of-way is required at Exit 40, we will work to minimize the impacts and will offer to meet with landowners who are affected.

Subject I90 Exit 37 bridge/on off ramps

"We are land owners with property on both the East and West side of I90 near exit 37. I encourage you to consider design options that have the least impact on private land. I believe the DOT can meet the evaluation criteria of safety, geometric needs, evironment impacts and cost by keeping the bridge/ramps construction within existing right of way. I like a hybrid design of options 1 and 2. Rebuild the bridge in its present alignment and lenghten the ramps using existing right of way. We are a 4th generation ranching family established in 1946. Our cattle use the 3 box underpass south of exit 37 daily from early May until November. They need to be able to travel through the pass to access water on the east side. I noticed some work is to be done on the box culvert. We need daily access through the underpass for the months mentioned. We also lease land from the George Blair Family for grazing and use the underpass/box culvert to move cattle from one side of the highway to the other throughout the spring/summer/fall months. Any construction that impeeds cattle flow through the underpass/box culvert concerns me greatly. I strongly believe that right of way impacts should be second to safety in the evaluation criteria . The public has enough land for the geometric needs in the exit 37 footprint. By keeping the design in the existing footprint environmental impacts are a moot point, (there are no environmentally sensitive areas in the already disturbed lands) cost is grealty reduced, (no need to purchase private land that- by the way- is not for sale) and level of service for the traveling public is met. Again, be very, very mindful and respectful of private land."

As mentioned earlier, we understand the concerns of land owners and plan to minimize the need for new highway right-of-way. Balancing the diverse needs of a project, including the ones you mentioned, can be challenging and often require us to make difficult decisions that may include property acquisition.

We will include your suggestions on the evaluation criteria as we re-visit and finalize the ranking measures we will use to select the preferred alternatives.

Your comments about facilitating the movement of cattle have been noted and will be passed on to the project designers

Stantec

Subject I90 exit 34

“Wow, this is a tough road to redesign. I truly believe in this circumstance design standards need to be bent in order to be respectiful to private home owners and to our nation's veterans. Really, what is wrong with the access road to the Pleasant Valley Drive area where it currently is? You say it is out of compliance with designs standards. You also know that there are hundreds if not thousands of miles of highways separted by a 3 foot high concrete barrier in major metro areas. And this area in no way has the volume of traffic of any metro area. I challenge you to spend a day at the Fort Meade VA cemetery. Attend a couple of services at the rotunda. Watch and listen as a widow or widower is presented the American flag for their loved one's service to our country. Listen to taps or the 21 gun salute by the honor guard. Walk amongst the graves of WWI, WWII, Korean, Vietnam, and Veterans of all the recent conflicts our country has been involved in. Take in the solemness of the setting. And then think to yourself, "I am considering putting a road through this sacred and somber place." Come on -please have some respect for the deceased - ESPECIALLY VETERANS. I cannot even believe the SD DOT, an agency of our government, would ask Stantec to consider a design that in any way impacts a national cemetery. Stantec should have the moral fortitude to say to the SD DOT; "we will not design a road that goes through the Fort Meade VA cemetery or any cemetery for that matter." It is worth repeating- Come on, have some respect for the dead- ESPECIALLY VETERANS. The other option you propose south of the VA cemetery has heavy impacts on peoples' homes. It appears your road designs have no respect for the dead or the living. You have room to lengthen the on/off ramps in your existing right of way. The access to the Pleasant Valley Drive and Blucksberg areas in this case should stay as they are. Road design/standards are not codified law. They are just what they are- ideas to strive for and sometimes, especially in this case, common sense MUST prevail.”

I agree that this is a challenging design project! We share your concern about potential negative impacts and that is one reason we have been working with a variety of stakeholders including the Black Hills National Cemetery staff. Our work together will allow us to develop options that complement their expansion plans and operations and avoid or minimize adverse impacts. As these projects develop, we will continue looking at design standards and work to balance those requirements against project impacts, keeping safety at the top of our priorities.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale Grove

Stantec

Hello Kip Harrington,

Thank you for taking the time to follow the I-90, Exit 32 – 40 Corridor Study and Design Project and visiting our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Subject: I-90 Exit 32 to 40

"After attending the open house last night, I prefer Option 2 for Exit 37 due to the square bridge alignment and smaller structure to reduce overall cost. I also strongly prefer Option 7 for Exit 34, due to the smaller footprint. The other options will add to the local road system, impacting the National Cemetery and the Centennial Trail, both of which I visit frequently. Please contact me if you have any questions."

Your comments and preferences have been noted and will be incorporated into our analysis as we make decisions on which options will be included in the projects. We share your concern about negative impacts. We have been working with cemetery and trail management staffs to develop acceptable options that avoid or minimize impacts to their facilities and will continue to do so as the projects develop.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale A Grove

Dale Grove

Stantec

Hello Liz Wunderlich,

Thank you for taking the time to follow the I-90, Exit 32 - 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Subject: Interchange options

"I like the 34-7 option for Exit 34. The outlet is closer to the residences, etc, and is farther away from Alkalai Creek and the Centennial Trail. I prefer option 37-2."

Your comment and preference has been noted and will be incorporated into our analysis as we continue to develop the projects and make decisions on the options that will be included.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale A Grove

Dale Grove

Stantec

Hello Cathy Smith,

Thank you for taking the time to follow the I-90, Exit 32 - 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Subject: owner of land at Exit 37

"I am the landowner next to Exit 37 on i 90. I was not able to be at the meeting yesterday, but I was told that you have a plan to take my pasture on the west side of the exit. I am not pleased by this suggestion, my property is not for sale, please have someone contact me about this immediately. Cathy Smith 505-470-6650, medicinemountain@gmail.com"

Subject: Property at Exit 37

"I have been informed that there is a proposal to move the overpass at exit 37 and take some of my property for the Pleasant Valley road access to the overpass. I am now stating my opposition to this proposal, my land is not for sale. Please contact me ASAP. Thank you, Cathy A. Smith"

Your comments and preferences have been noted and will be incorporated into our analysis as we make decisions on which options will be included in the project at Exit 37. As we discussed during our phone call last month, we understand your concern about your property being impacted by this project. We prefer to avoid the need for additional property and try to keep construction within the existing right-of-way. However, as we balance the wide variety of project needs there are times it is necessary to purchase property. If that is the case at Exit 37, we will work to minimize the impacts and will offer to meet with landowners who are affected.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale Grove

Stantec

Hello Susan Williams,

Thank you for taking the time to follow the I-90, Exit 32 – 40 Corridor Study and Design Project and visit our website. We appreciate your feedback and willingness to participate in the process. Through the online submission form, we received your comment:

Subject Meeting 12/10/18

"First, thank you for the meeting. I have one objection to the way part of it was conducted. When a question was asked after the presentation, the speaker went to the person asking the question to answer the question. Why couldn't this be a public question and answer session? I would have liked to hear the answer and so would others I spoke with afterwards. Secondly, I would like a print out of the proposed options for exit 34, similar to what you had on display. We have a Board in the Blucksberg Mountain Estates and we would like to share the info with the residents at our monthly and annual meetings. Can we get those? Thank You"

We are glad that you took the time to attend the meeting last month. I'm sorry you weren't able to hear the answer to the question asked after the presentation. My goal was to have an easy, relaxed discussion with the person who asked the question, not to exclude anyone who was interested in the answer. If you are willing to submit the question, I would be happy to call or correspond with you to get you an answer. I've also attached copies of the options that are still being considered at Exit 34. Please note that these are still classified as preliminary and as the project develops there could be changes to the layouts.

We encourage you to stay involved in the process by visiting our project website: www.i90exit32to40.com. On the website, you can add your email to the list serve to stay up-to-date on announcements and upcoming events.

Please let me know if you have any additional questions or concerns throughout the process.

Thank you,

Dale Grove

RIGHT OF WAY EXHIBIT

ALTERNATIVE 34-1B

ROUNDABOUT INTERCHANGE

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

FILENAME: PW: 193804017\RightofWayExhibit_22x34.dgn DATE: 9/25/2018 PROJ. NO.: 193804017

OPTION 2

OPTION 2

OPTION 1

ALKALI CREEK

OPTION 1

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

250'

SCALE IN FEET

Stantec

PROPOSED RIGHT OF WAY

TEMPORARY RIGHT OF WAY

EXISTING ACCESS CONTROL

PROPOSED ACCESS CONTROL

REMOVE EXISTING ROADWAY

RIGHT OF WAY EXHIBIT

ALTERNATIVE 34-3

MODIFIED FOLDED DIAMOND

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

FILENAME: PW: 193804017\RightofWayExhibit_22x34.dgn DATE: 9/25/2018 PROJ. NO.: 193804017

OPTION 2

OPTION 2

OPTION 1

OPTION 1

ALKALI CREEK

ALKALI CREEK

SEE "LOCAL ROAD CONNECTIONS" FIGURE

250'

SCALE IN FEET

Stantec

PROPOSED RIGHT OF WAY

TEMPORARY RIGHT OF WAY

EXISTING ACCESS CONTROL

PROPOSED ACCESS CONTROL

REMOVE EXISTING ROADWAY

RIGHT OF WAY EXHIBIT

OPTION A, B, C

LOCAL ROAD CONNECTIONS

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

FILENAME: PW: 193804017\RightofWayExhibit_22x34.dgn DATE: 9/25/2018 PROJ. NO.: 193804017

OPTION A

OPTION B

OPTION C

250'

SCALE IN FEET

Stantec

PROPOSED RIGHT OF WAY

TEMPORARY RIGHT OF WAY OPTION A

TEMPORARY RIGHT OF WAY OPTION B

TEMPORARY RIGHT OF WAY OPTION C

EXISTING ACCESS CONTROL

PROPOSED ACCESS CONTROL

REMOVE EXISTING ROADWAY

RIGHT OF WAY EXHIBIT

ALTERNATIVE 34-7

ROUNDABOUT INTERCHANGE (SOUTH)

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

FILENAME: PW: 193804017\RightofWayExhibit_22x34.dgn DATE: 9/25/2018 PROJ. NO.: 193804017

ALKALI CREEK

250'

SCALE IN FEET

Stantec

PROPOSED RIGHT OF WAY
TEMPORARY RIGHT OF WAY
EXISTING ACCESS CONTROL
PROPOSED ACCESS CONTROL
REMOVE EXISTING ROADWAY

Concept Review and Project Identification Workshop

I-90 Exit 32 to 40; Corridor Study and Design Project

MEAD_IM 0901(195)32N_IM 0901(198)32N

September 27, 2018 @ 1:30 pm – 4:30 pm CST SDDOT Rm B-23 (27)

September 28, 2018 @ 9:00 am – 11:00 am CST SDDOT Rm B-23 (27)

Video conference connection will be available for staff in the SDDOT Rapid City Region Office

Workshop Invitees

SDDOT: Steve Gramm, Jeff Brosz, Mike Carslon, David Coley, Wade Dahl, Sonia Downs, Sam Gilkerson, Tom Horan, Dave Huft, Steve Johnson, Mark Leiferman, Steve Palmer, Neil Schochenmaier, Todd Seaman, Alice Whitebird

FHWA: Mark Hoines, Kirk Van Roekel, Mark Clausen, Tom Lehmkuhl

Meade County: Bill Rich, Kirk Chaffee

Stantec: Dale Grove, Aaron Cook, Theresa Maahs, Kevin Hoglund, Kyle Irvin

Workshop Purpose & Process

Materials identifying conceptual level profiles, structures, lane requirements, ITS improvements, right of way and access control and utility impacts within the corridor area have been developed. An Alternative Evaluation Matrix has been created to identify measures of effectiveness and compare the pros and cons of each option including: operational advantages or issues, estimated construction costs, environmental impacts, and right-of-way requirements. The data along with matrix will be reviewed and discussed. The Study Advisory Team will determine the potential build scenarios for the corridor.

Agenda - Thursday

1. Welcome & Introductions

   Workshop Facilitator: Dale Grove (Stantec Project Manager)

2. Review of the Proposed Concepts
   a. Concept Overview – Kevin Hoglund
      i. Brief description of the concepts developed for the corridor
   b. Traffic & Safety – Kyle Irvin
      i. Intersection lane designations
      ii. Safety review (IHSDM)
      iii. ITS
   c. Geometrics & Structures – Aaron Cook
      i. Profiles
      ii. Structures
      iii. Right-of-Way
      iv. Utilities
      v. I-90 lane grading options
   d. Environmental Constraints – Theresa Maahs
      i. Water resources (wetlands/waterbodies/floodplains)
      ii. 4(f) Properties/parks

iii. Cultural resources
iv. Farmland
v. Wildlife and vegetation

e. Detailed Concept Review – Kevin Hoglund
   i. Review of corridor needs (presented at previous workshop)
   ii. Exit 34
   iii. Exit 37
   iv. Exit 40
   v. Local Road Connections

3. Alternative Evaluation Matrix – Kevin Hoglund
   a. Criteria
   b. Preliminary weighting
   c. Preliminary scores and results

4. Other Issues – Dale Grove
   a. City of Sturgis requests
   b. Tilford Port of Entry updates
   c. Other miscellaneous issues or concerns

5. Small Group Discussions – Dale Grove
   a. Discuss the Workshop materials/data
   b. Review and discuss the proposed concepts
      i. Identify modifications as necessary
   c. Confirm the Alternative Evaluation Matrix criteria and weighting

Agenda - Friday

6. Corridor Projects and Sequencing – Kevin Hoglund
   a. Review the updated Alternative Evaluation Matrix
   b. Discuss selected alternatives
   c. Develop preliminary project sequencing

7. Next Activities – Dale Grove
   a. Review and summarize Workshop activities and decisions
   b. Discuss the upcoming schedule
   c. Identify next SAT activities

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Mike Kintigh, Regional Supervisor - SD GFP
Address: 4130 Adventure Trail
Rapid City SD 57702
Phone: 605-394-6837
E-mail: mike.kintigh@state.sd.us

Comments:

#1 - SD DOT does an outstanding job - Thanks.

#2 - My primary interest/concern with this project is consideration for the high number of wildlife strikes on I-90. Actually - From Rapid City to the WY line, we see high numbers of collisions with wildlife. GFP is not concerned with the wildlife loss - but we are interested in reducing personal injuries & property loss. Many new developments in mitigating wildlife crossings & GFP is willing to work with DOT in exploring feasible ways of mitigating these strikes

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Michael Kefferel

Address: 13122 Tilford Rd Piedmont SD

Phone: 605 490 7734

E-mail:

Comments:

off Ramp at weight Station should Be longer, third Lane for truck to slow Down.

on Ramp could Be Longer or third Lane

Service Road corner to sharp at the Snyder Driveway

PUBLIC OPEN HOUSE
Brown High School | Lecture Room 111
12930 E. Highway 34, Sturgis, South Dakota 57785
Wednesday, December 20, 2017 • 4:30 P.M. TO 7:00 P.M.

The South Dakota Department of Transportation is seeking input on infrastructure improvements along Interstate 90, from Exits 32 to 40. Please let us know your thoughts! Comments will be accepted by mail or online until January 5, 2018.

To learn more, visit our website at **www.I90Exit32to40.com**.

Name: Nancy Remington
Address: 13189 Pleasant Valley Rd
Sturgis, SD 57785
Phone: 605-347-4254
E-mail: ngremington@gmail.com

Comments:

I represent 2 entities near exit 37 (+ south) on east side of I90

- VB (Viola Blair) Trust
- George + Viola Blair Family LLP (8 siblings)

Concerns - drainage at Exit 37 (wetland/springs) currently has small culvert
- what land will be taken / how will it be assessed (at what value?)

APPENDIX **B** – REFINED INTERCHANGE **ALTERNATIVES & Alternative Evalution Matrix**

1) *Alternative 34-1c: Standard Diamond Interchange North*
2) *Alternative 34-3: Modified Folded Diamond*
3) *Alternative 34-8: 660' East COA*
4) *Alternative 34-9: 100' East COA*
5) *Alternative 34-10: 100' East COA Crossroad and Railroad Bridge*
6) *Alternative 34-11: Max COA (622') Without Impacting Archaeological Sites*
7) *Alternative 34-12: Roundabout Interchange 34-12*
8) *Alternative 34-13: 100' COA for East and West Frontage Roads*
9) *Alternative 34-14: 100' COA East and West Crossroad and Railroad Bridge*
10) *Alternative 34-15: Max COA (622') Without Impacting Archaeological Sites 100' COA West Frontage Road*
11) *Alternative 34-16: Relocation of Historical Entrance*
12) *Alternative 34-19: Lengthened Interchange*
13) *Alternative Evolution Matrix - October 2019*

IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-1c

STANDARD DIAMOND
INTERCHANGE NORTH

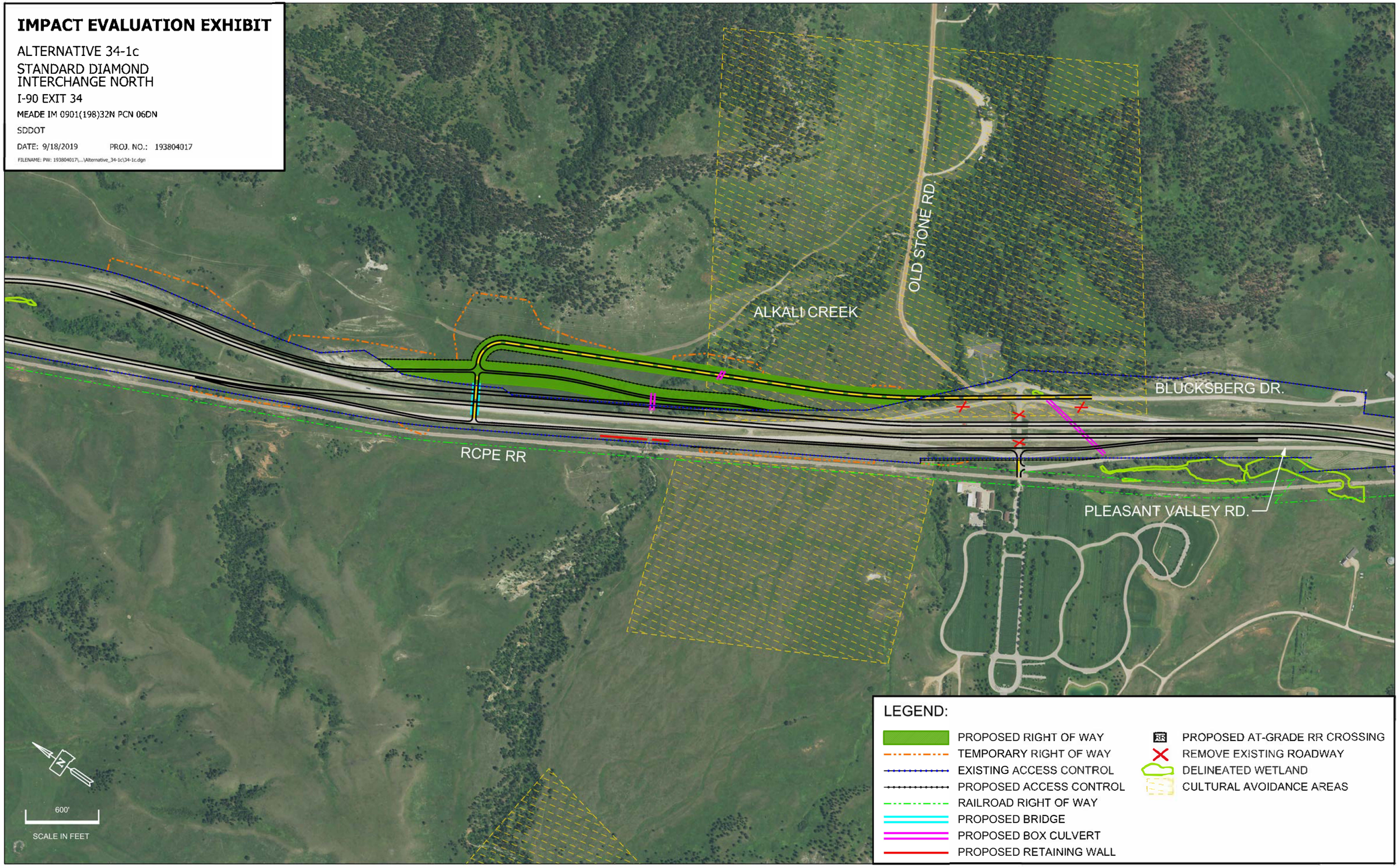
I-90 EXIT 34

MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Alternative_34-1c\34-1c.dgn



LEGEND:

- PROPOSED RIGHT OF WAY
- TEMPORARY RIGHT OF WAY
- EXISTING ACCESS CONTROL
- PROPOSED ACCESS CONTROL
- RAILROAD RIGHT OF WAY
- PROPOSED BRIDGE
- PROPOSED BOX CULVERT
- PROPOSED RETAINING WALL
- PROPOSED AT-GRADE RR CROSSING
- REMOVE EXISTING ROADWAY
- DELINEATED WETLAND
- CULTURAL AVOIDANCE AREAS

IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-3

MODIFIED FOLDED DIAMOND

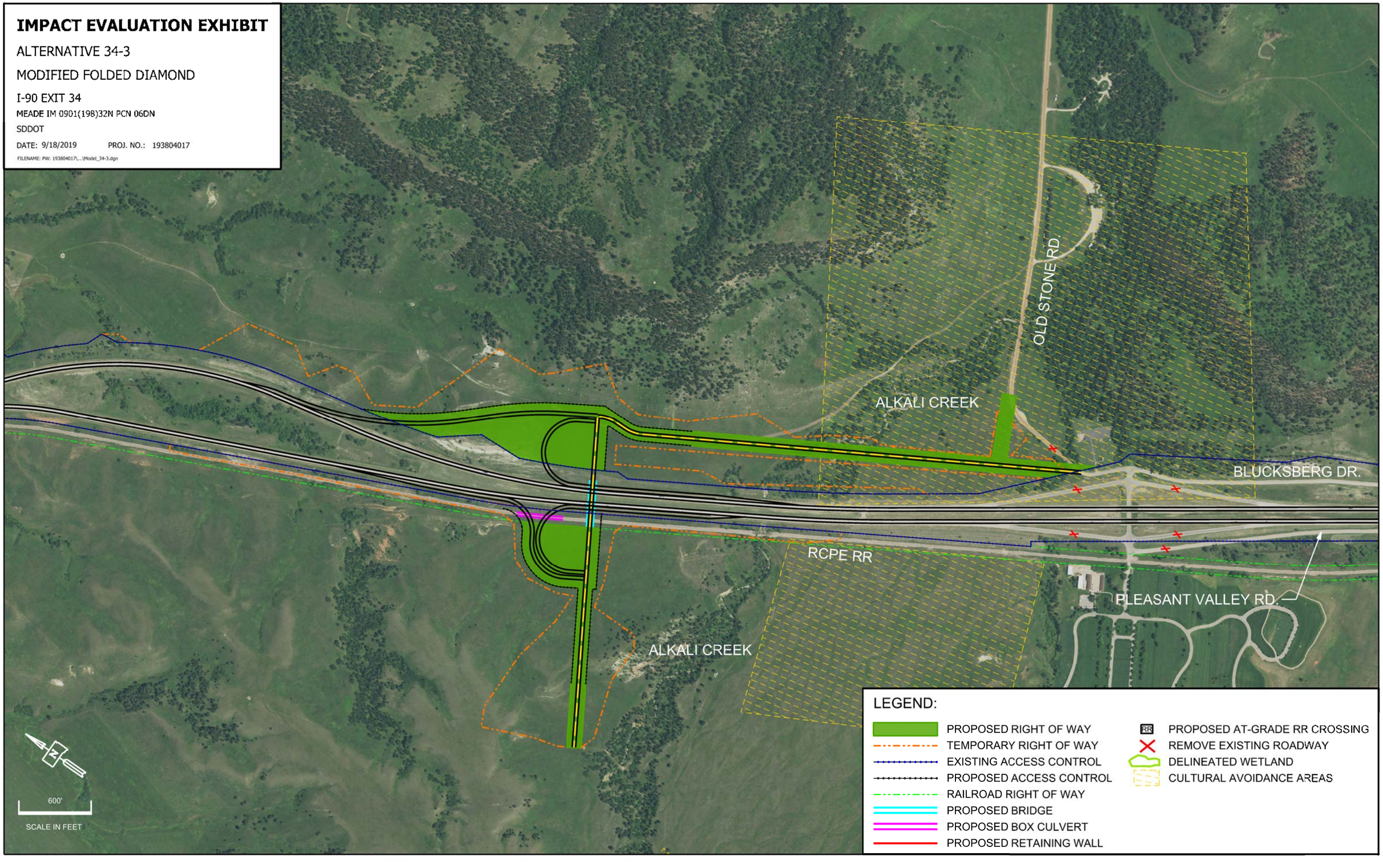
I-90 EXIT 34

MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Model_34-3.dgn



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-8

660' EAST COA

I-90 EXIT 34

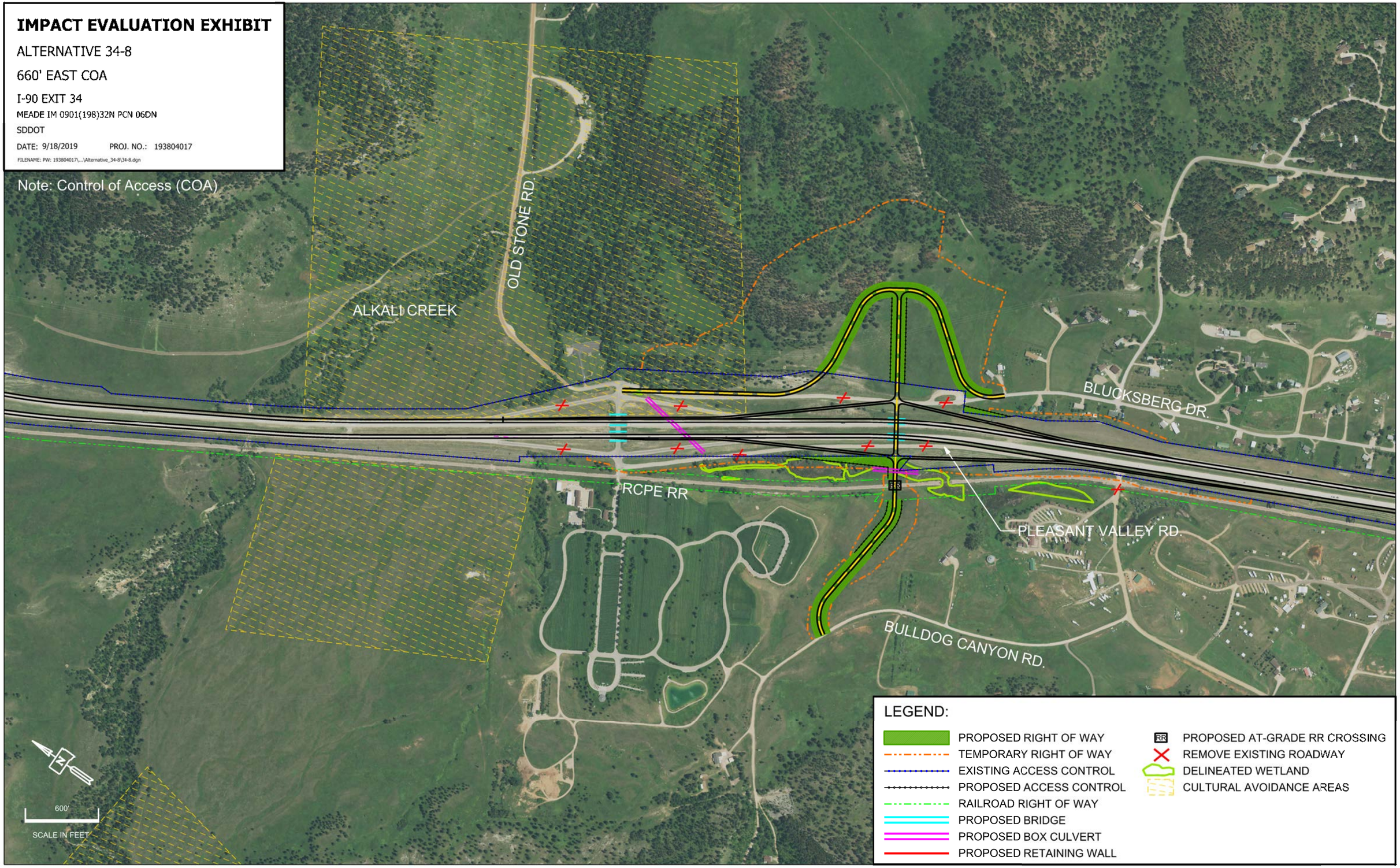
MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Alternative_34-8\34-8.dgn

Note: Control of Access (COA)



LEGEND:

- PROPOSED RIGHT OF WAY
- TEMPORARY RIGHT OF WAY
- EXISTING ACCESS CONTROL
- PROPOSED ACCESS CONTROL
- RAILROAD RIGHT OF WAY
- PROPOSED BRIDGE
- PROPOSED BOX CULVERT
- PROPOSED RETAINING WALL
- PROPOSED AT-GRADE RR CROSSING
- REMOVE EXISTING ROADWAY
- DELINEATED WETLAND
- CULTURAL AVOIDANCE AREAS

IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-9

100' EAST COA

I-90 EXIT 34

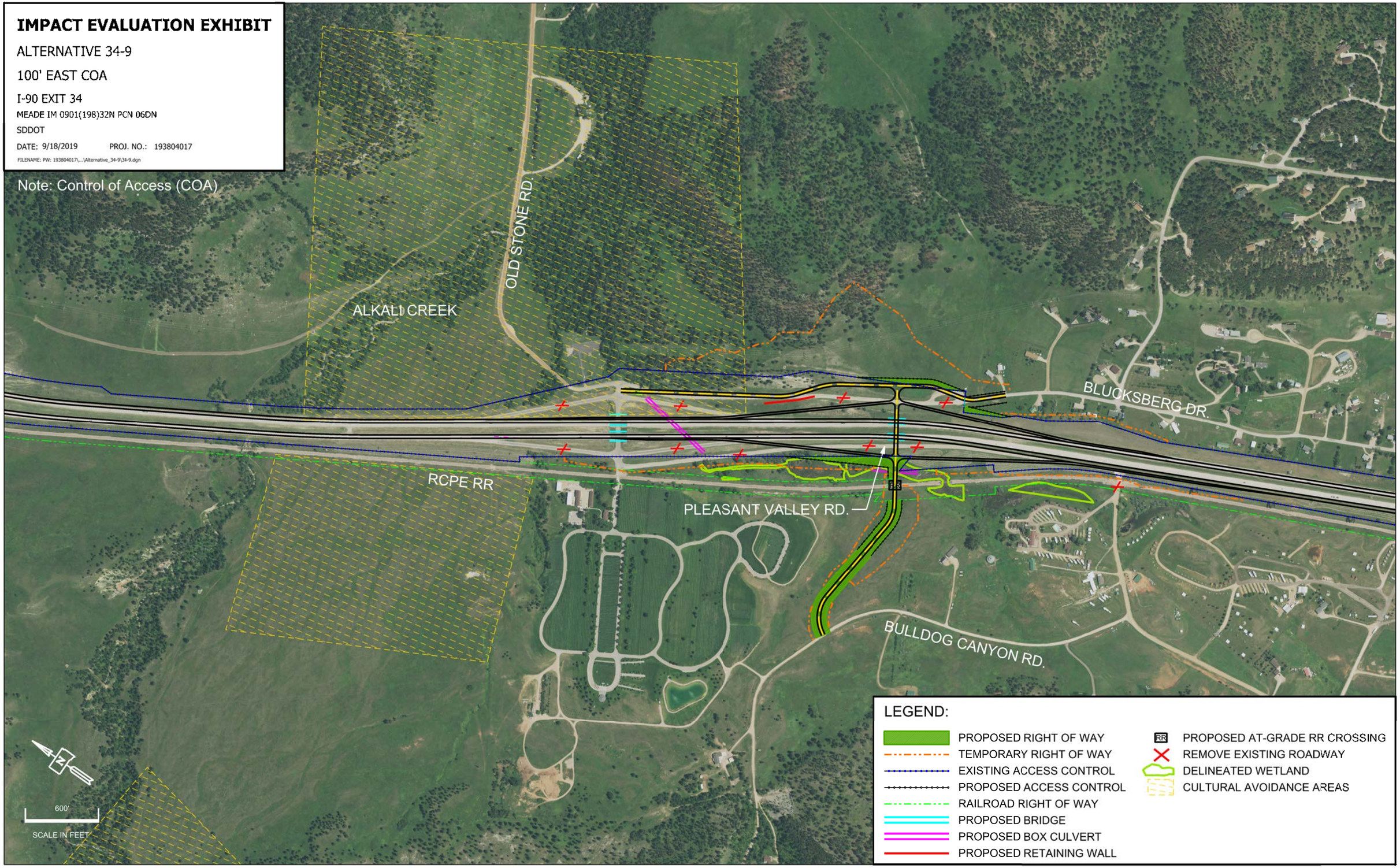
MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Alternative_34-9\34-9.dgn

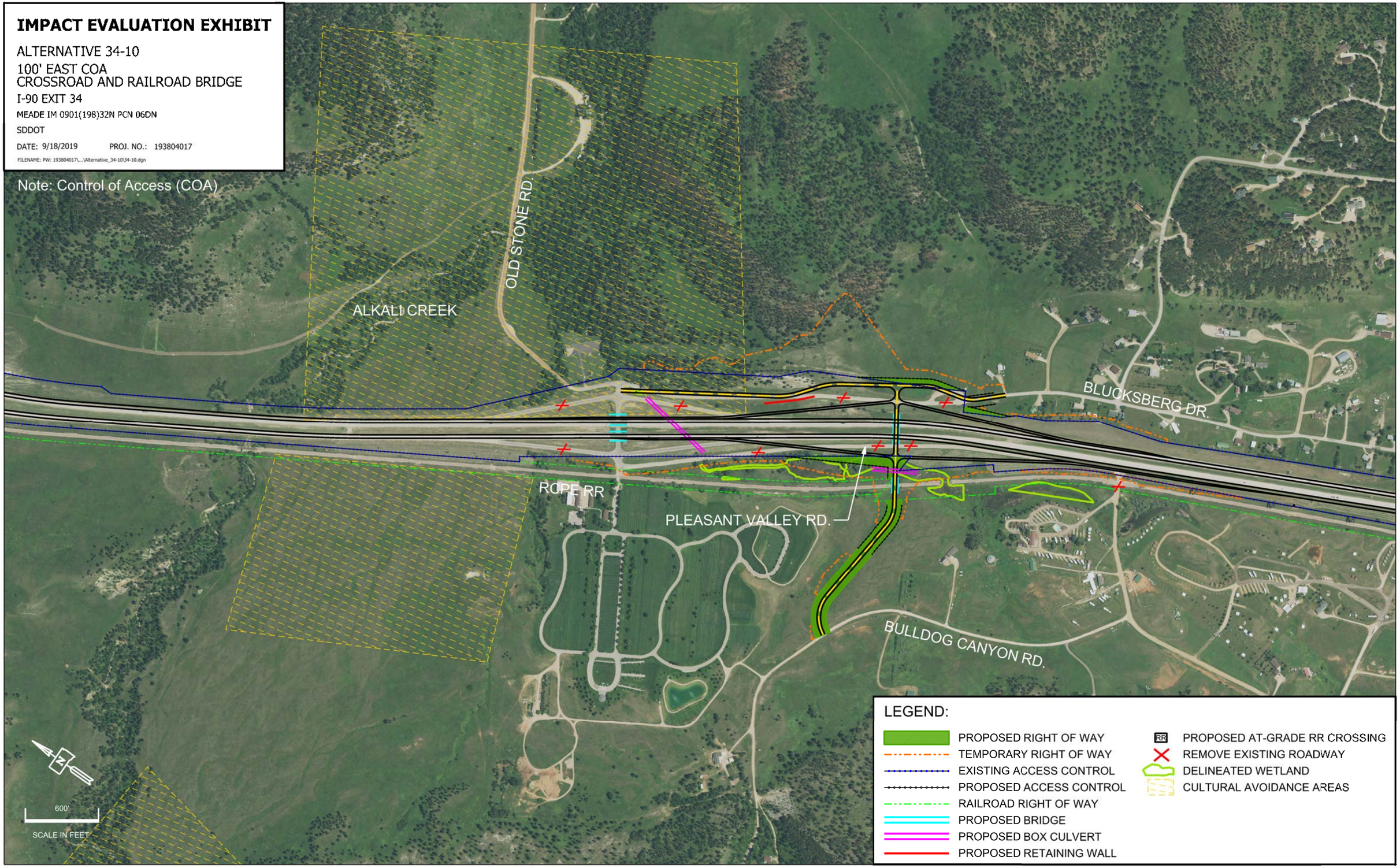
Note: Control of Access (COA)



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-10
100' EAST COA
CROSSROAD AND RAILROAD BRIDGE
I-90 EXIT 34
MEADE IM 0901(198)32N PCN 06DN
SDDOT
DATE: 9/18/2019 PROJ. NO.: 193804017
FILENAME: PW: 193804017\...\Alternative_34-10\34-10.dgn

Note: Control of Access (COA)



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-11

MAX COA (622') WITHOUT IMPACTING ARCHAEOLOGICAL SITES

I-90 EXIT 34

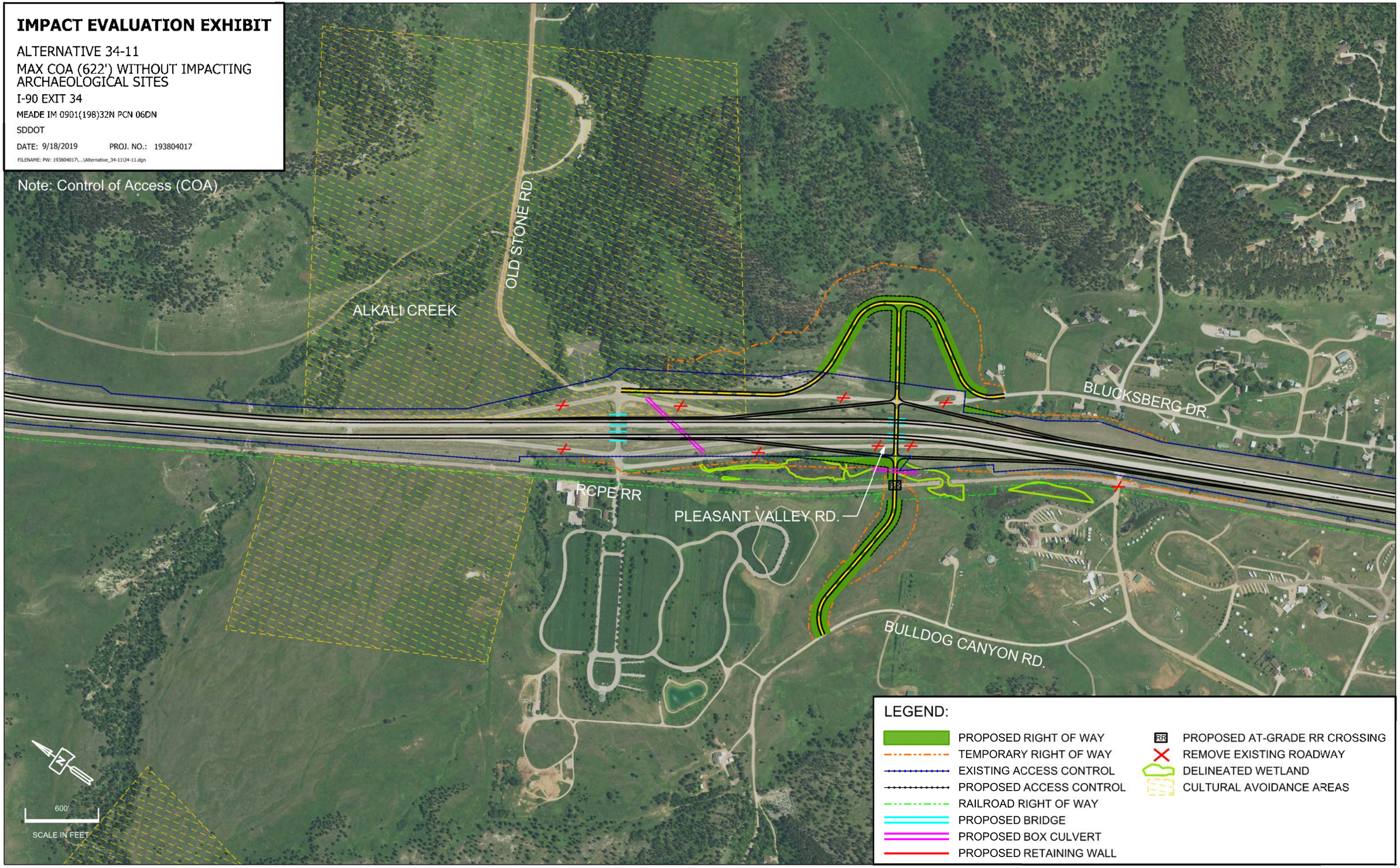
MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Alternative_34-11\34-11.dgn

Note: Control of Access (COA)



LEGEND:

- PROPOSED RIGHT OF WAY
- TEMPORARY RIGHT OF WAY
- EXISTING ACCESS CONTROL
- PROPOSED ACCESS CONTROL
- RAILROAD RIGHT OF WAY
- PROPOSED BRIDGE
- PROPOSED BOX CULVERT
- PROPOSED RETAINING WALL
- PROPOSED AT-GRADE RR CROSSING
- REMOVE EXISTING ROADWAY
- DELINEATED WETLAND
- CULTURAL AVOIDANCE AREAS

ALTERNATIVE 34-12

ROUNDABOUT INTERCHANGE (SOUTH)

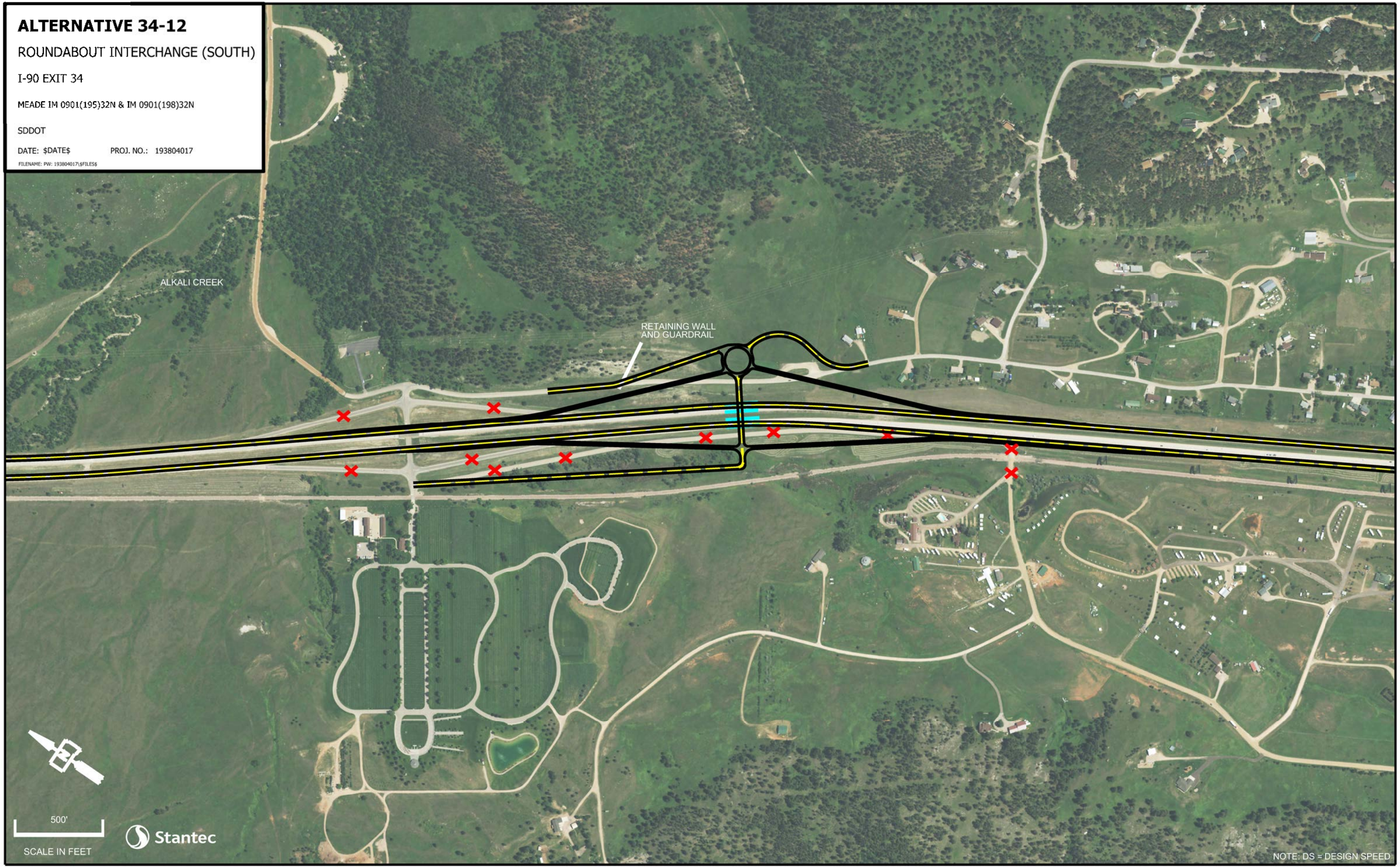
I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

DATE: $DATE$ PROJ. NO.: 193804017

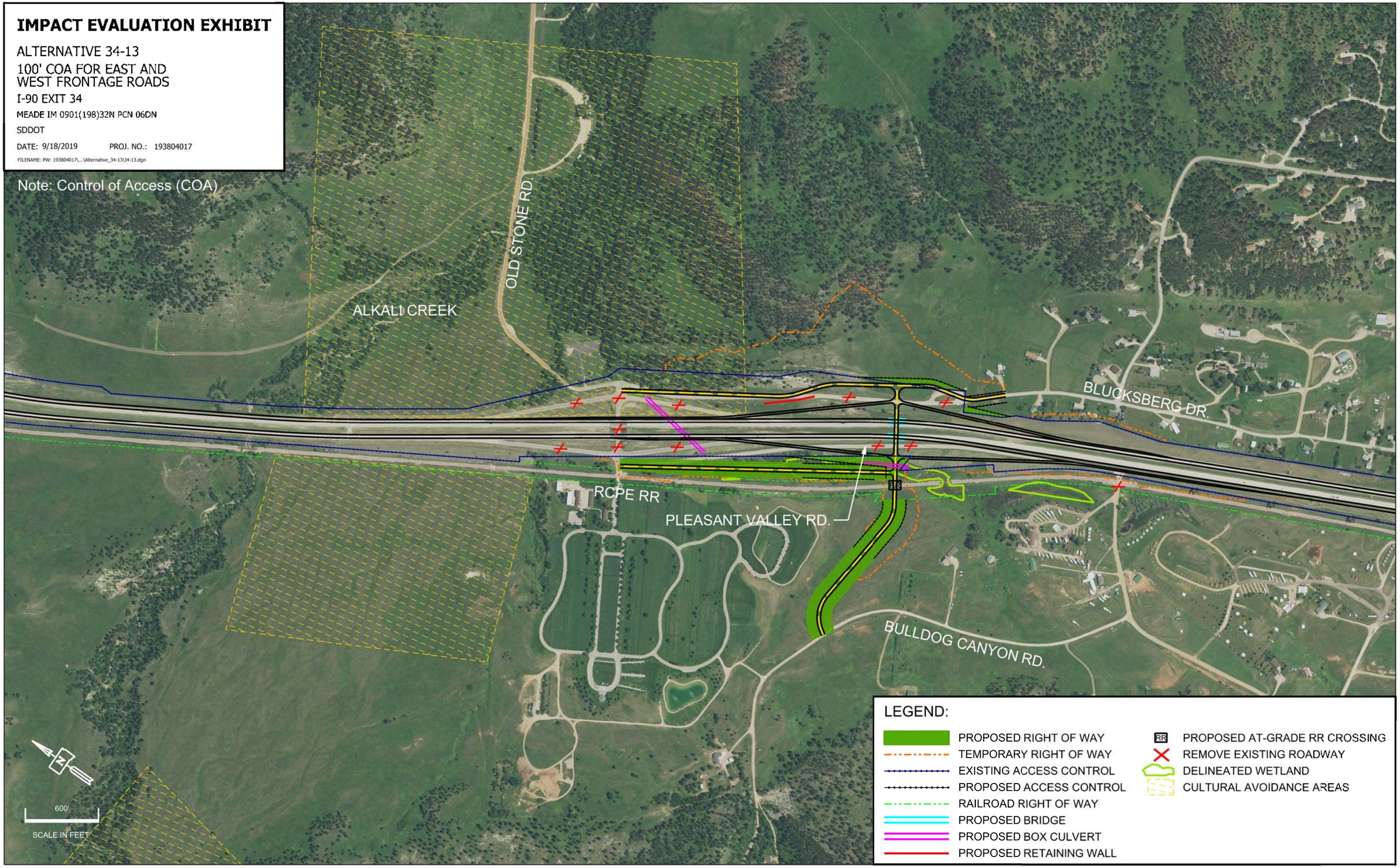
FILENAME: PW: 193804017\$FILES$



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-13
100' COA FOR EAST AND
WEST FRONTAGE ROADS
I-90 EXIT 34
MEADE IM 0901(198)32N PCN 06DN
SDDOT
DATE: 9/18/2019 PROJ. NO.: 193804017
FILENAME: PW: 193804017\...\Alternative_34-13\34-13.dgn

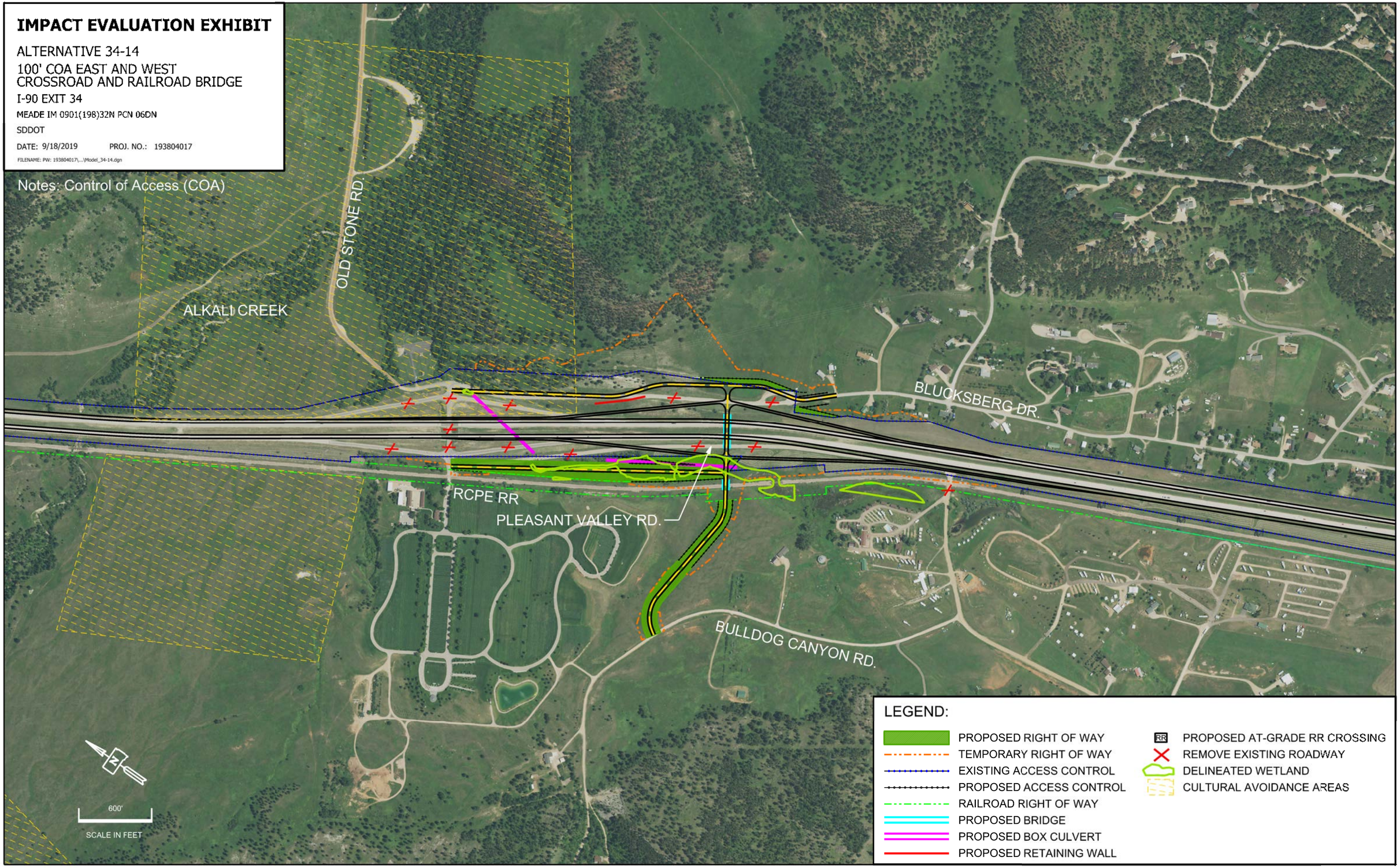
Note: Control of Access (COA)



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-14
100' COA EAST AND WEST
CROSSROAD AND RAILROAD BRIDGE
I-90 EXIT 34
MEADE IM 0901(198)32N PCN 06DN
SDDOT
DATE: 9/18/2019 PROJ. NO.: 193804017
FILENAME: PW: 193804017\...\Model_34-14.dgn

Notes: Control of Access (COA)



LEGEND:

- PROPOSED RIGHT OF WAY
- TEMPORARY RIGHT OF WAY
- EXISTING ACCESS CONTROL
- PROPOSED ACCESS CONTROL
- RAILROAD RIGHT OF WAY
- PROPOSED BRIDGE
- PROPOSED BOX CULVERT
- PROPOSED RETAINING WALL
- PROPOSED AT-GRADE RR CROSSING
- REMOVE EXISTING ROADWAY
- DELINEATED WETLAND
- CULTURAL AVOIDANCE AREAS

IMPACT EVALUATION EXHIBIT

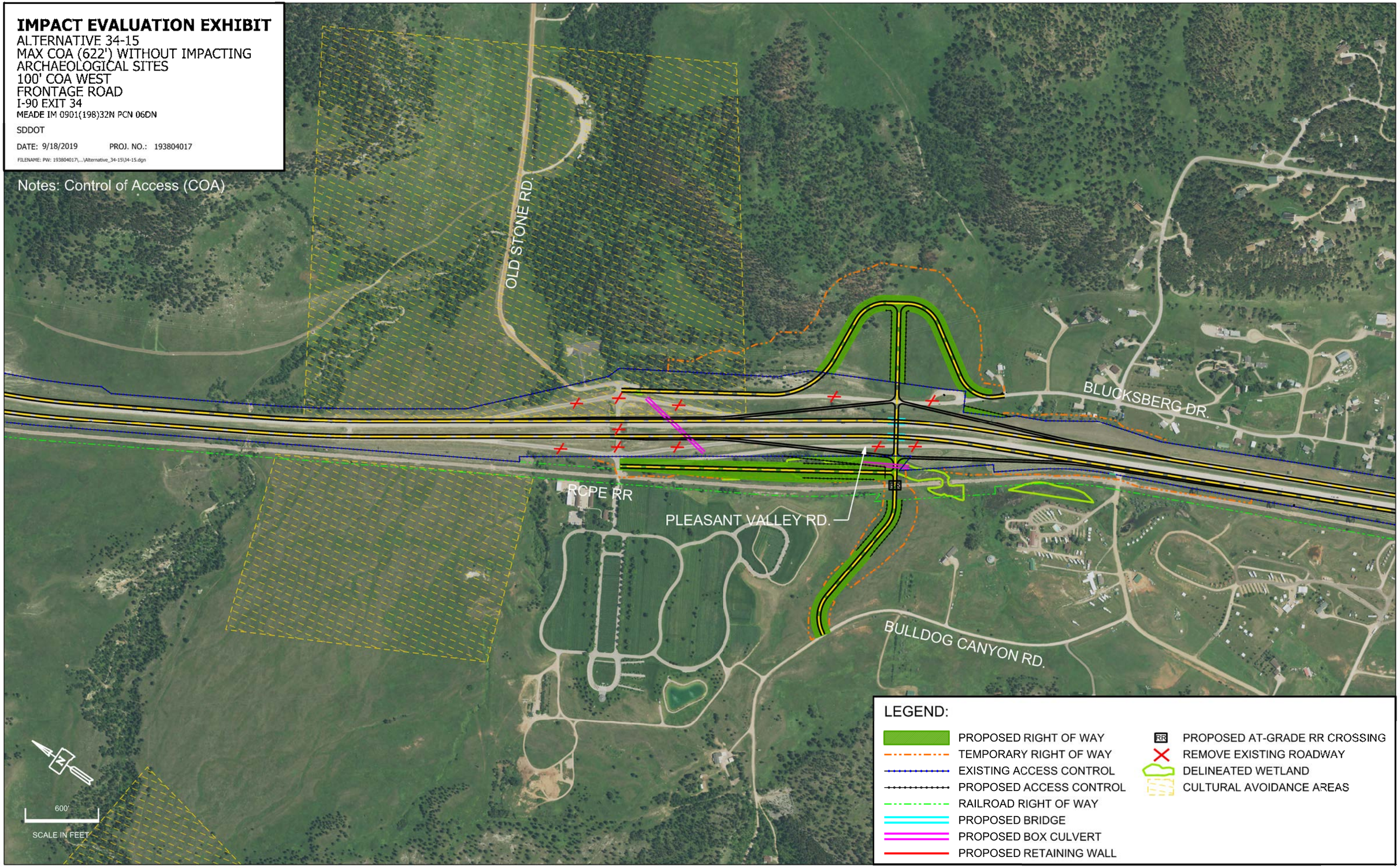
ALTERNATIVE 34-15
MAX COA (622') WITHOUT IMPACTING
ARCHAEOLOGICAL SITES
100' COA WEST
FRONTAGE ROAD
I-90 EXIT 34
MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 9/18/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Alternative_34-15\34-15.dgn

Notes: Control of Access (COA)



RIGHT OF WAY EXHIBIT

ALTERNATIVE 34-16

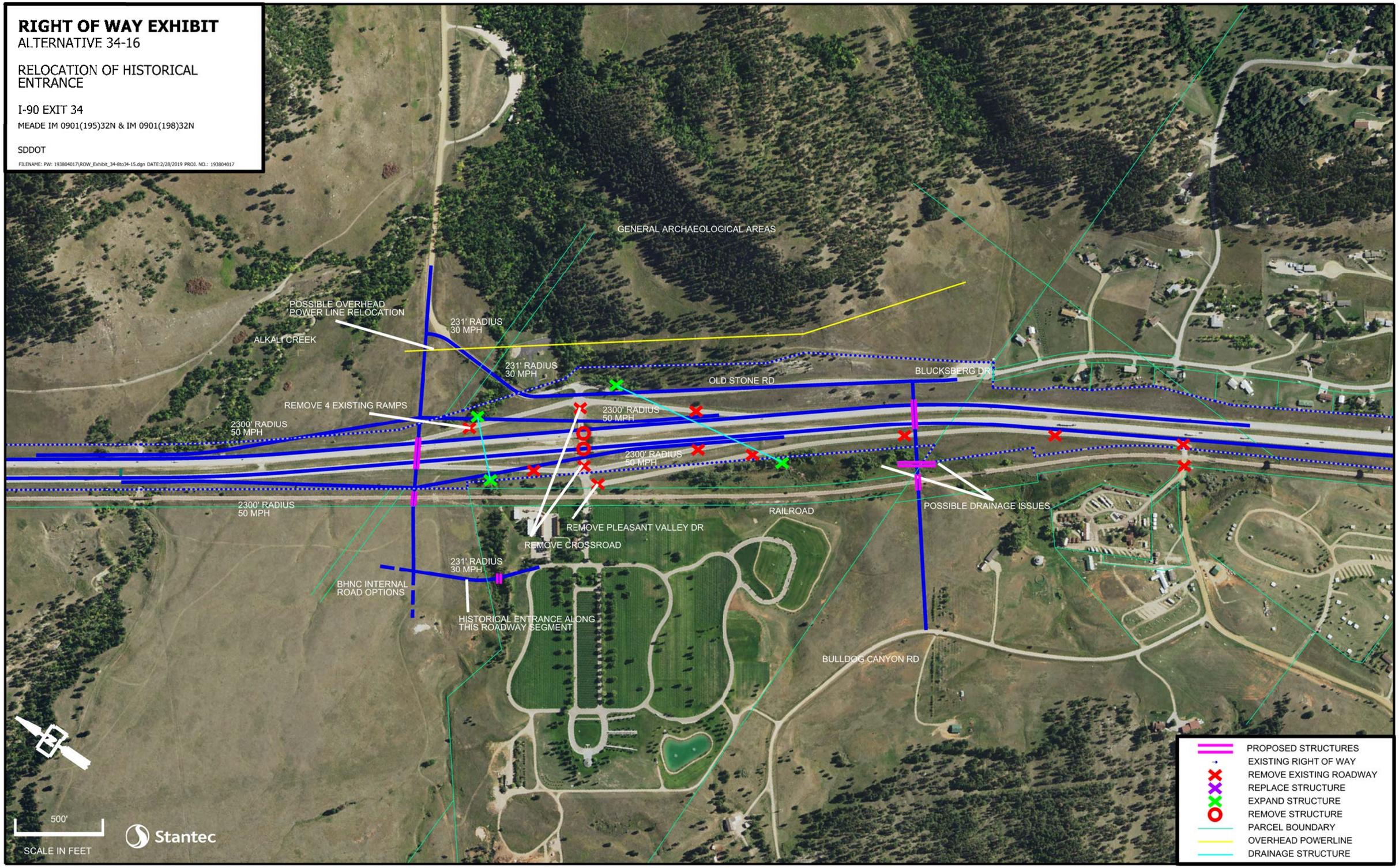
RELOCATION OF HISTORICAL ENTRANCE

I-90 EXIT 34

MEADE IM 0901(195)32N & IM 0901(198)32N

SDDOT

FILENAME: PW: 193804017\ROW_Exhibit_34-8to34-15.dgn DATE:2/28/2019 PROJ. NO.: 193804017



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-19

LENGTHENED INTERCHANGE

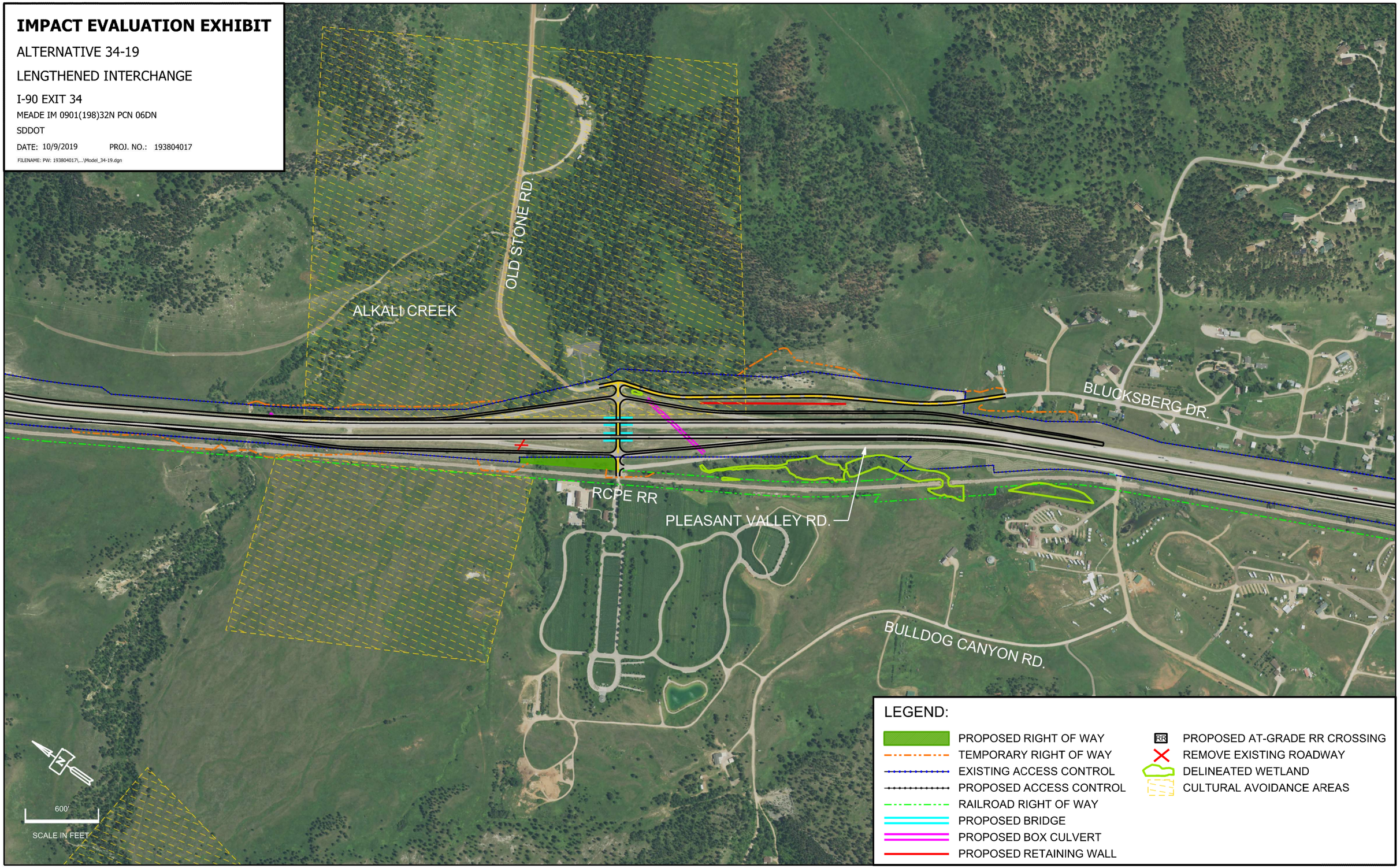
I-90 EXIT 34

MEADE IM 0901(198)32N PCN 06DN

SDDOT

DATE: 10/9/2019 PROJ. NO.: 193804017

FILENAME: PW: 193804017\...\Model_34-19.dgn



Date: September 25, 2019

I-90 Exit 32 to Exit 40 Corridor Study

Exit 34 Alternative Evaluation Matrix

	Evaluation Criteria											Overall Score of Alternative (Highest Value is Best)
	Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts	
Weight	4.7	4.5	4.4	4.0	3.9	3.8	3.4	3.3	3.2	2.0	1.9	
Alternatives												
34-1B	Alternative Removed - Traffic Volumes do not justify Roundabout Intersection. Alternative further refined as 34-1C.											
34-1C	3	5	3	3	5	5	3	2	4	5	2	143.7
34-3	4	3	3	2	5	2	3	1	5	5	4	127.7
34-7	Alternative Removed - Traffic Volumes do not justify Roundabout Intersection. Alternative refined as Alternatives 34-8 through 34-15.											
34-8	3	4	3	1	5	3	4	3	3	4	2	125.1
34-9	2	2	4	3	5	2	4	4	3	4	2	123.3
34-10	5	3	4	3	5	3	4	4	3	4	2	145.7
34-11	3	4	4	1	5	3	4	3	3	4	2	129.5
34-12	Alternative Removed - Traffic Volumes do not justify Roundabout Intersection											
34-13	1	2	1	4	5	1	4	4	3	4	3	107.5
34-14	4	3	1	3	5	3	4	4	3	4	4	131.6
34-15	3	3	1	2	5	3	4	3	3	4	2	115.8
34-16	Alternative Removed - Impact to Black Hills National Cemetery Unfeasible											
34-17	Alternative Removed - Driver Expectation of Ramp/Local Road Configuration Undesirable											
34-18	Alternative Removed - Driver Expectation of Ramp/Local Road Configuration Undesirable											
34-19	1	3	5	5	5	3	5	5	1	4	4	143.4

I-90 Exit 32 to Exit 40 Corridor Study

Evaluation Criteria

Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Improvement to Roadway Geometry	Superelevation	Black Hills National Cemetery (BHNC) Impacts	Roadway	Intersection Levels of Service	Complexity of Construction	City of Sturgis	Acres of Permanent Right of Way	Future Development Accommodated	Provides Bike Access	Impacts to existing private utilities
Reduction in Animal Collisions	Vertical Stopping Sight Distance	Bureau of Land Management (BLM) Impacts	Structures	LOS Opening Year 2023	Bridge Construction	Meade County	Acres of Temporary Right of Way	Future Local Road Improvements Accommodated		Impacts to existing public utilities
Overall Crash Reduction	Ramp Length/Tapers	Animal Migration (Elk and Deer)	Right of Way	LOS Design Year 2050	Staging Areas	South Dakota Motor Carriers (SDMC) Tilford Port of Entry				
Reduce Weather Related Run Off the Road Incidents	Grade Requirements	Floodplain Impacts			Construction Impacts to Roadways and Access	Genesee & Wyoming Railroad (GWRR)				
Compliant Guardrail	Snow Deficiencies	Wetland Impacts			Risk	No Name City Luxury Cabins & RV				
Provides for Service Road Connections		Historic and Archaeological Impacts			Railroad	Black Hills National Cemetery				
Facility Separation		Environmental Justice			Ability to keep I-90 Mainline Open to Traffic	Access for Emergency Vehicles				
Separation from Railroad		Noise Impacts			Ability to Accommodate Local Area Traffic					
		Regulated Materials								

Preliminary reviews of available data for floodplains found no mapped floodplains within the project boundaries. Review of available EPA EJ Tool data and conversations with SDDOT staff did not indicate sensitive EJ communities within or adjacent to the corridor. It was determined that these criteria do not provide a differentiation between the options under consideration. Section 4(f) properties are denoted in the detailed description on the following pages. No 6(f) properties were identifed within or adjacent to the project. These criteria will be reviewed in detail as part of the environmental process.

I-90 Exit 32 to Exit 40 Corridor Study

Exit 34 Alternative Evaluation Matrix

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost			Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
						Construction	Maintanence							
	34-1C	+ Improves interchange and I-90 geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 + Facility separation meets standard on the east - Facility separation does not meet standard on the west - Railroad separation remains the same	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Corrects vertical stopping sight distance on ramps + Reduces snow drifting issues under bridges	+ Moves away from RV parks and Blucksberg (reduced noise impact potential) + Anticip. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. + <0.1 acre Permanent wetland impact - Approximately 7 acres of wooded area present (NLEB) - 3 registered/recommended eligible sites within grading limits, 1 directly adjacent - Moves closer to Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 1 bridge, 1 box culvert, 1 extended box culvert and 2 retaining wall constructed - Right of way needs are significant - Hill on east side requires significant grading	$22,133,000	$1,373,200	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be in operation while new interchange is constructed using temporary ramp connections + Minimal impact to railroad during construction - Construction requires realignment of I-90 - 1 bridge, 1 box culvert, 1 extended box culvert and 2 retaining walls constructed	+ Minimal impact to railroad + Maintains the historic Black Hills National Cemetery entrance - Moves I-90 access away from No Name City Luxury Cabins & RV - Extends Blucksberg Drive significantly impacting BLM land - Emergency services access further away from area residents	+ No individual residents impacted - Requires moderate permanent right of way (16 acres) + Requires minimal temporary right of way (7 acres)	+ Potential to accommodate the future expansion of the Black Hills National Cemetery + Provides connection to Blucksberg Dr	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts
	34-3	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 + Facility separation meets design standards + Provides grade separation of railroad + 1 at-grade railroad crossing is removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Corrects vertical stopping sight distance on ramps + Reduces snow drifting issues under bridges	+ Antic. no effect least tern, red knot, whooping crane + Moves away from RV parks and Blucksberg (Reduced noise impact potential) - 3 stream crossings - Alkali Ck. + <0.1 acre wetland impacts - Approximately 12 acres of wooded area present (NLEB) - 3 registered/recommended eligible sites within grading limits, 1 directly adjacent - Impacts Centennial Trail - 4(f) property -Moves closer to Centennial Trail (4(f) property) and Alkali Creek	+ No need to realign I-90 mainline - Interchange cost is high - 2 bridges constructed - Right of way needs are significant with more right of way needed on east side of railroad - EB mainline profile raised	$28,300,000	$1,834,000	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Can be constructed under I-90 and local traffic + Room for construction staging + Existing interchange can be operated while new interchange is constructed + Minimal impact to railroad during construction - Impact to railroad while structure is constructed - 2 bridges constructed	+ Provides local road connection to new Black Hills National Cemetery expansion + Improves access to existing Black Hills National Cemetery - Extends Blucksberg Drive significantly impacting BLM land - Moves I-90 access away from No Name City Luxury Cabins & RV - Emergency services access further away from area residents - Substantial impact to railroad	+ No individual residents impacted - Requires significant permanent right of way (35 acres) - Requires significant temporary right of way (57 acres)	+ Accommodates the future expansion of the Black Hills National Cemetery + Provides connection to Blucksberg Dr	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts + Minimal private utility impacts
	34-8	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 + Facility separation meets standard on the east - Facility separation does not meet standard on the west - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr - May have snow drifting issues under I-90 bridges	+Anticipate no effect to least tern, red knot or whooping crane + Approximately 5 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 0.8 acre Permanent wetland impacts - 0.4 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 4 new mainline bridges and 2 box culverts constructed - Hill on east side requires significant grading - Right of way needs are moderate	$54,393,000	$2,033,400	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction - Construction requires vertical and horizontal realignment of I-90 EB & WB - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 4 mainline bridges and 2 box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive significantly impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (9 acres) - Requires moderate temporary right of way (38 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts

Exit 34	34-9	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation significantly less than design standards - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr - May have snow drifting issues under I-90 bridges -Cross road vertical stopping sight distance issue	+Anticipate no effect to least tern, red knot or whooping crane - Approximately 5 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 0.9 acre Permanent wetland impacts - 0.4 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - Hill on east side requires moderate grading - 4 new mainline bridges and 2 box culverts constructed - Right of way needs are moderate	$20,150,000	$2,033,400	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction - Construction requires vertical and horizontal realignment of I-90 EB & WB - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 4 new mainline bridges and 2 box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive moderately impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (4 acres) - Requires moderate temporary right of way (18 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts
	34-10B	+ Improves interchange geometry + Provides Bridge over railroad + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation moderatly decreased from standard - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Corrects vertical stopping sight distance on ramps + Reduces snow drifting issues under bridges - Does not correct vertical stopping sight distance on Blucksberg Dr	+Anticipate no effect to least tern, red knot or whooping crane - Approximately 5 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 2.2 acre Permanent wetland impacts + 0.3 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - Right of way needs are moderate - 2 mainline bridges reconstructed, 1 new bridge over mainline, 1 new bridge over the railroad, and two new box culverts constructed -Hill on east side requires moderate grading	$18,310,000	$2,904,600	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Moderate impact to railroad during construction - Construction requires horizontal realignment of I-90 - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - One new bridge over mainline, one new bridge over the railroad, and two new box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive moderately impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (8.7 acres) - Requires moderate temporary right of way (21 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts
	34-11	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation minimally less than design standards on east - Facility separation does not meet standard on the west - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Reduces snow drifting issues under bridges + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr	+Anticipate no effect to least tern, red knot or whooping crane - Approximately 5 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 0.8 acre Permanent wetland impacts - 0.4 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 2 mainline bridges and 2 box culverts constructed - Right of way needs are moderate - Hill on east side requires significant grading	$26,800,000	$2,033,400	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction - Construction requires vertical and horizontal realignment of I-90 WB & EB - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 2 mainline bridges and 2 box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive significantly impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (9 acres) - Requires moderate temporary right of way (16 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts
	34-13	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation significantly less than design standards - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades - May have snow drifting issues under I-90 bridges + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr -Cross road vertical stopping sight distance issue	+Anticipate no effect to least tern, red knot or whooping crane - Approximately 7 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 2.1 acre Permanent wetland impacts + 0.1 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 2 mainline bridges, and 2 box culverts constructed - Right of way needs are moderate - Hill on east side requires moderate grading	$20,733,000	$1,066,700	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction - Construction requires vertical and horizontal realignment of I-90 EB & WB - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 2 mainline bridges, and 2 box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive moderately impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted - Requires moderate permanent right of way (10 acres) - Requires moderate temporary right of way (18 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts

	34-14	+ Improves interchange geometry + Provides Bridge over railroad + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation significantly reduced from design standards + Railroad separation is improved + 1 at-grade railroad crossing is eliminated	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades + Reduces snow drifting issues under bridges + Corrects vertical stopping sight distance on ramps - Does not correct vertical stopping sight distance on Blucksberg Dr	+Anticipate no effect to least tern, red knot or whooping crane + Approximately 3 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 2.5 acre Permanent wetland impacts + 0.1 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 1 bridge over mainline, 1 bridge over the railroad, 2 box culverts, and 1 retaining wall constructed - Right of way needs are moderate - Hill on east side requires moderate grading	$18,125,000	$1,939,600	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Moderate impact to railroad during construction - Construction requires horizontal realignment of I-90 - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 1 bridge over mainline, 1 bridge over the railroad, 2 box culverts, and 1 retaining wall constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive minimally impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (9 acres) + Requires moderate temporary right of way (13 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts + Minimal private utility impacts
	34-15	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation minimally reduced from design standards on east - Facility separation does not meet standard on the west - Railroad separation remains the same + 1 at-grade railroad crossing constructed, 1 at-grade railroad crossing removed	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades - May have snow drifting issues under I-90 bridges + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr	+Anticipate no effect to least tern, red knot or whooping crane + Approximately 7 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings - 2.2 acre Permanent wetland impacts + 0.1 acre Temporary wetland impacts - Moves closer to RV parks and Blucksberg (Increased noise impact potential) +Moves away from Centennial Trail (4(f) property) and Alkali Creek	+ EB and WB I-90 is realigned to create separation with railroad - 2 mainline bridges and 2 box culverts constructed - Right of way needs are significant - Hill on east side requires significant grading	$27,839,000	$1,066,700	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction - Construction requires vertical and horizontal realignment of I-90 EB & WB - Full Interchange access will not be maintained throughout construction - Moderate impacts to I-90 access by local traffic - 2 mainline bridges and 2 box culverts constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents - Requires realignment of Blucksberg Drive significantly impacting BLM property - Impacts residential parcel with connection to Bulldog Canyon Road - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (4) impacted - Requires moderate permanent right of way (13 acres) - Requires moderate temporary right of way (16 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts - Significant private utility impacts
	34-19	+ Improves interchange geometry + Replaces non-standard guardrail + Provides local road connection on east and west side of I-90 - Facility separation remains the same signifcantly less than design standards - Railroad separation remains the same - Railroad crossings remain unchanged	+ Corrects superelevation issues on Ramps + Provides standard ramp lengths + Improves roadway grades - May have snow drifting issues under I-90 bridges + Corrects vertical stopping sight distance on ramps + Corrects vertical stopping sight distance on Blucksberg Dr	+Anticipate no effect to least tern, red knot or whooping crane + Approximately 3 acres of wooded area present (NLEB) + 0 registered or recommended eligible sites within grading limits, + 0 stream crossings + >0.1 acre Permanent wetland impacts + 0.1 acre Temporary wetland impacts +Doesn't move closer to RV parks and Blucksberg (Reduced noise impact potential) -Doesn't move away from Centennial Trail (4(f) property) and Alkali Creek	+ No need to realign I-90 mainline + 2 mainline bridges and one retaining wall constructed + Hill on east side requires minimal grading + Right of way needs are minimal	$14,133,000	$1,117,600	+ Interchange Provides LOS A + LOS A or B for opening year and design year	+ Minimal impact to railroad during construction + Construction requires minor realignment of the I-90 WB lane and the WB & EB ramps - Full Interchange access will not be maintained throughout construction - Significant Impacts to local traffic to and from Blucksberg development while construction is taking place on Blucksberg Dr - 2 mainline bridges and one retaining wall constructed	+ Provides local road connection to existing Black Hills National Cemetery + Minimal impact to railroad + Moves interchange access closer to No Name City Luxury Cabins & RV + Emergency services access is closer to area residents + No change to Pleasant Valley Drive frontage road - Requires realignment of Blucksberg Drive minimally impacting BLM property - Does not provide local road connection to new Black Hills National Cemetery expansion	- Individual residents (6) impacted + Requires minimal permanent right of way (1 acres) + Requires minimal temporary right of way (4 acres)	+ Provides connection to Blucksberg Drive - Does not provide access to the future expansion of the Black Hills National Cemetery	+ Accommodates bicycle access to I-90 + Accommodates bicycle access along Old Stone Road + Accommodates bicycle access to the south local road connection	+ No public utility impacts + Minimal private utility impacts

Exit 34 Alternative Evaluation Matrix

Alternatives		Safety Improvements	Geometric Needs	Environmental Impacts	Cost	Traffic and Level of Service	Constructability Issues	Impact to existing land use or new development including access	Right of Way Impacts	Flexibility to accommodate future improvements or land use changes	Bicycle Facility Enhancement	Utility Impacts
Local Road Connections	A	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+ Antic. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. - No wetland impacts - Approximately 1 acre of wooded area present (NLEB) Cultural, HIstoric, and Parks - Crosses Fort Meade Archeological Site (4(f) impact) - Impacts Centennial Trail (4(f) impact) - Parallels BHNC- 130 feet (4(f) impact) - Noise Impact - Level C property - 65 feet - Visual quality impact - Bisects view from BHNC	+ Shortest and least expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Avoids steep terrain to the west + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Moves access to existing Black Hills National Cemetery further away - Alignment goes through expansion area of Black Hills National Cemetery - Emergency services access further away from area residents	+ No individual residents impacted - Requires moderate temporary right of way - Requires moderate permanent right of way - Significantly impacts the expansion of the Black Hills National Cemetery property	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts
	B	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+ Anticip. no effect least tern, red knot, whooping cr. - 2 stream crossings - Alkali Ck. - No wetland impacts + Anticip. no effect least tern, red knot, whooping crane - Approximately 16 acres of wooded area present (NLEB) Cultural, HIstoric, and Parks - Crosses Fort Meade Archeological Site (4 (f) impact) - 1 BLM site within grading limits, 2 directly adjacent - Impacts Centennial Trail (4(f) Impact) - Parallels BHNC - 650 feet (4(f) property) - Noise Impact - Level C property - 65 feet - Bisects view from BHNC	- Longer and more expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - Construction is in area of steep terrain - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Moves access to existing Black Hills National Cemetery further away - Alignment goes through a minimal amount of the expansion area of the Black Hills National Cemetery - Emergency services access further away from area residents	+ No individual residents impacted - Requires significant temporary right of way - Requires moderate permanent right of way	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts
	C	+ Provides local road connection on south side of I-90	+ New local road connection will meet geometric standards	+Anticip. no effect least tern, red knot, whooping crane - 2 stream crossings - Alkali Ck. - No wetland impacts - Approximately 26 acres of wooded area present (NLEB) Cultural, HIstoric, and Parks - Crosses Fort Meade Archeological Site (4(f) impact) - 1 National Historic Registered listed site in grading limits - 1 BLM site within grading limits, 1 directly adjacent (4(f) impact) - Impacts Centennial Trail (4(f) impact) - Parallels BHNC - 650 feet (potential 4(f) impact) - Noise Impact - Level C property - 65	- Longest and most expensive southern local road alternative - Requires structure across Alkali Creek - Right of way costs are high	+ LOS A for local road	+ Can be constructed without affecting local traffic + Existing interchange provides local road access while new interchange is constructed + Moderate risk of issues during construction - Construction is in area of steep terrain - One new box culvert for Alkali Creek	+ Provides local road connection to new Black Hills National Cemetery expansion + Alignment avoids the expansion area of the Black Hills National Cemetery + Moves access to existing Black Hills National Cemetery further away - Emergency services access further away from area residents	+ No individual residents impacted - Requires significant temporary right of way - Requires moderate permanent right of way	+ Accommodates the future expansion of the Black Hills National Cemetery - Provides a longer access route to No Name City Luxury Cabins & RV	+ Accommodates bicycle access to I-90 + Accommodates bicycle access to the south local road connection + Provides Centennial Trail route through box culvert	+ No public utility impacts - Minimal private utility impacts

APPENDIX **C - Geotechnical Refined Interchange Alternatives & Alternative Evolution Matrix**

1) *Alternative 34-19B: Existing Interchange*

2) *Alternative 34-23: Relocated Frontage Road*

3) *Alternative Evaluation Matrix - October 2020*

IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-19B

REFINED LENGTHENED INTERCHANGE

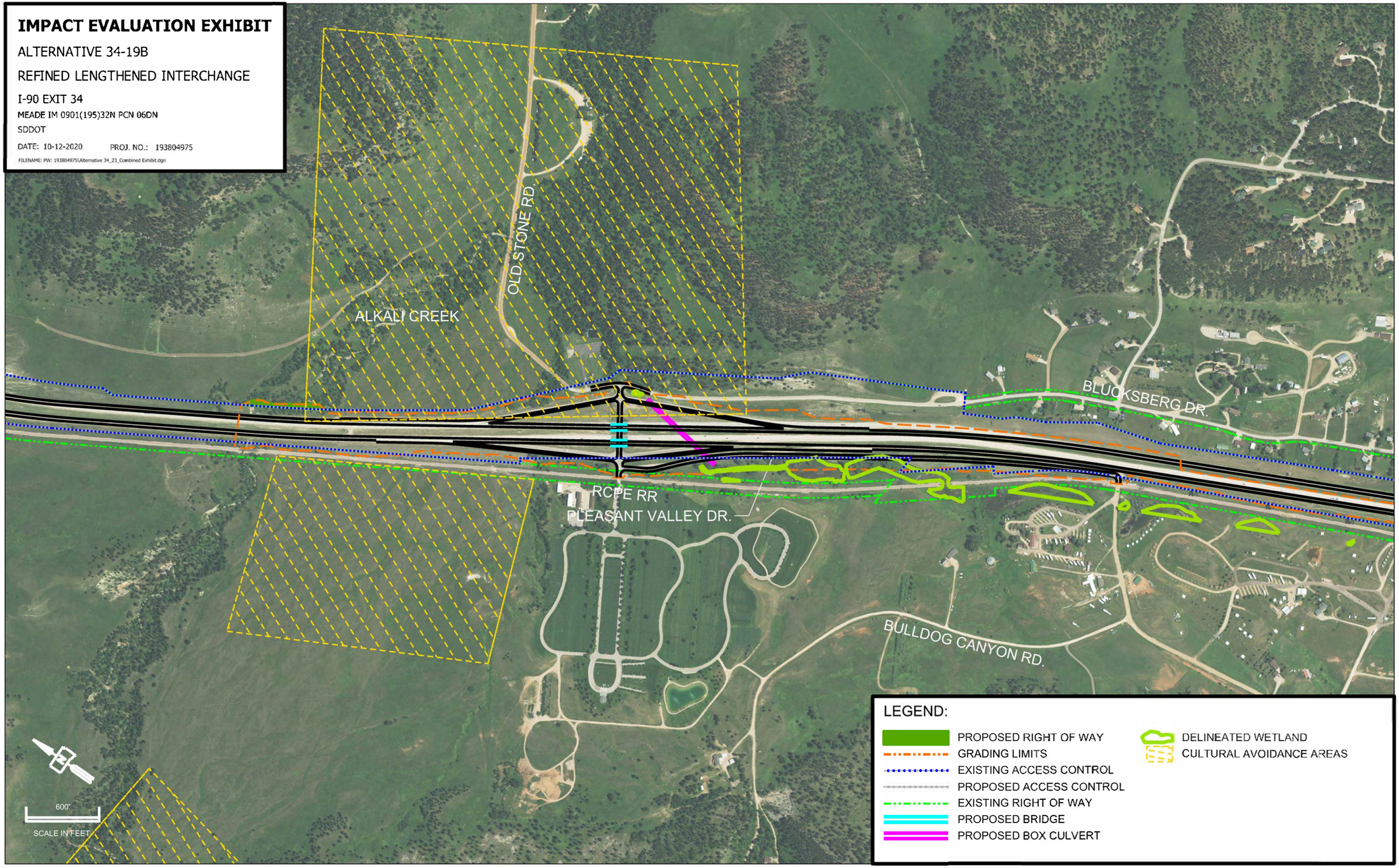
I-90 EXIT 34

MEADE IM 0901(195)32N PCN 06DN

SDDOT

DATE: 10-12-2020 PROJ. NO.: 193804975

FILENAME: PW: 193804975\Alternative 34_23_Combined Exhibit.dgn



IMPACT EVALUATION EXHIBIT

ALTERNATIVE 34-23

RELOCATED FRONTAGE ROAD

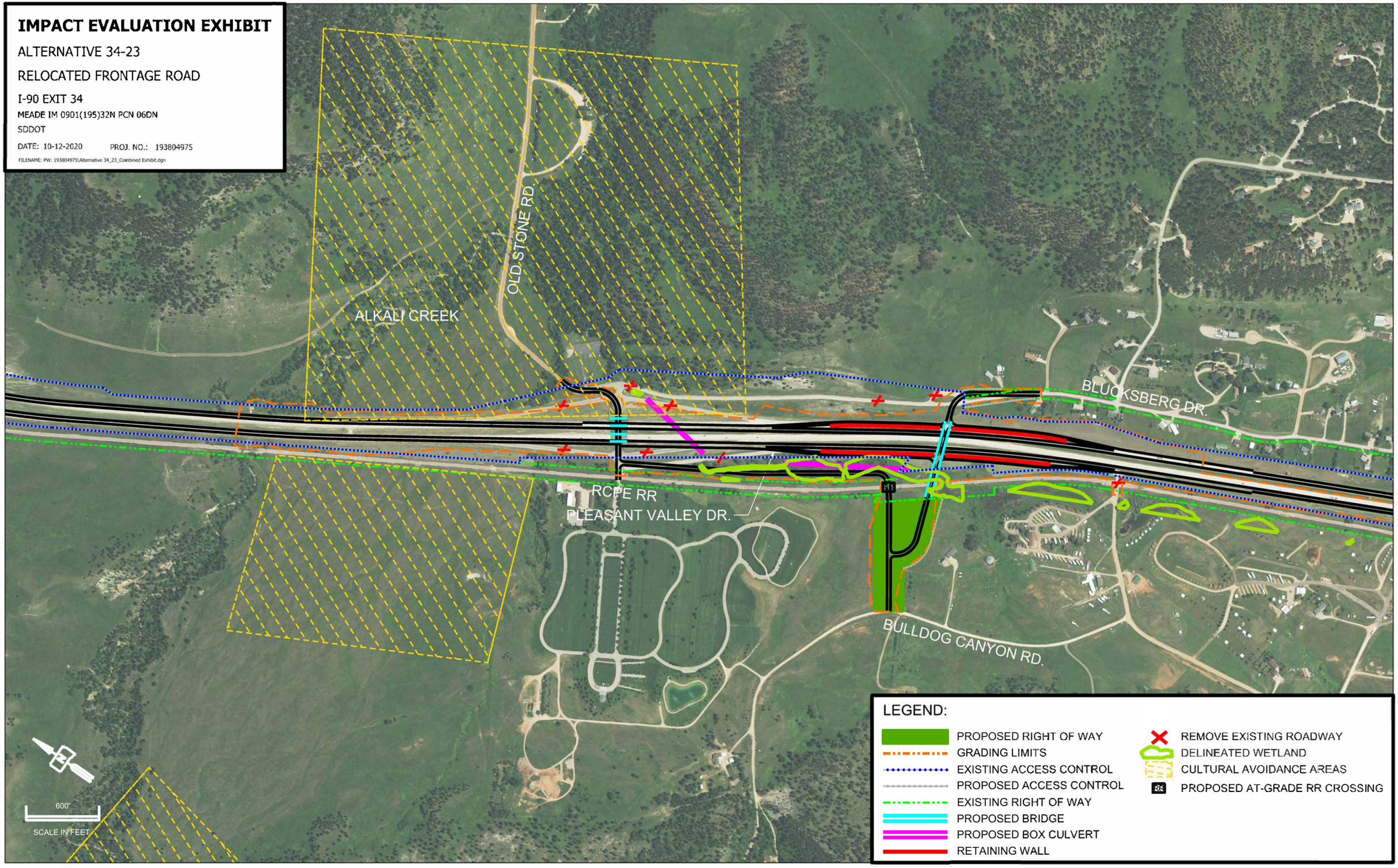
I-90 EXIT 34

MEADE IM 0901(195)32N PCN 06DN

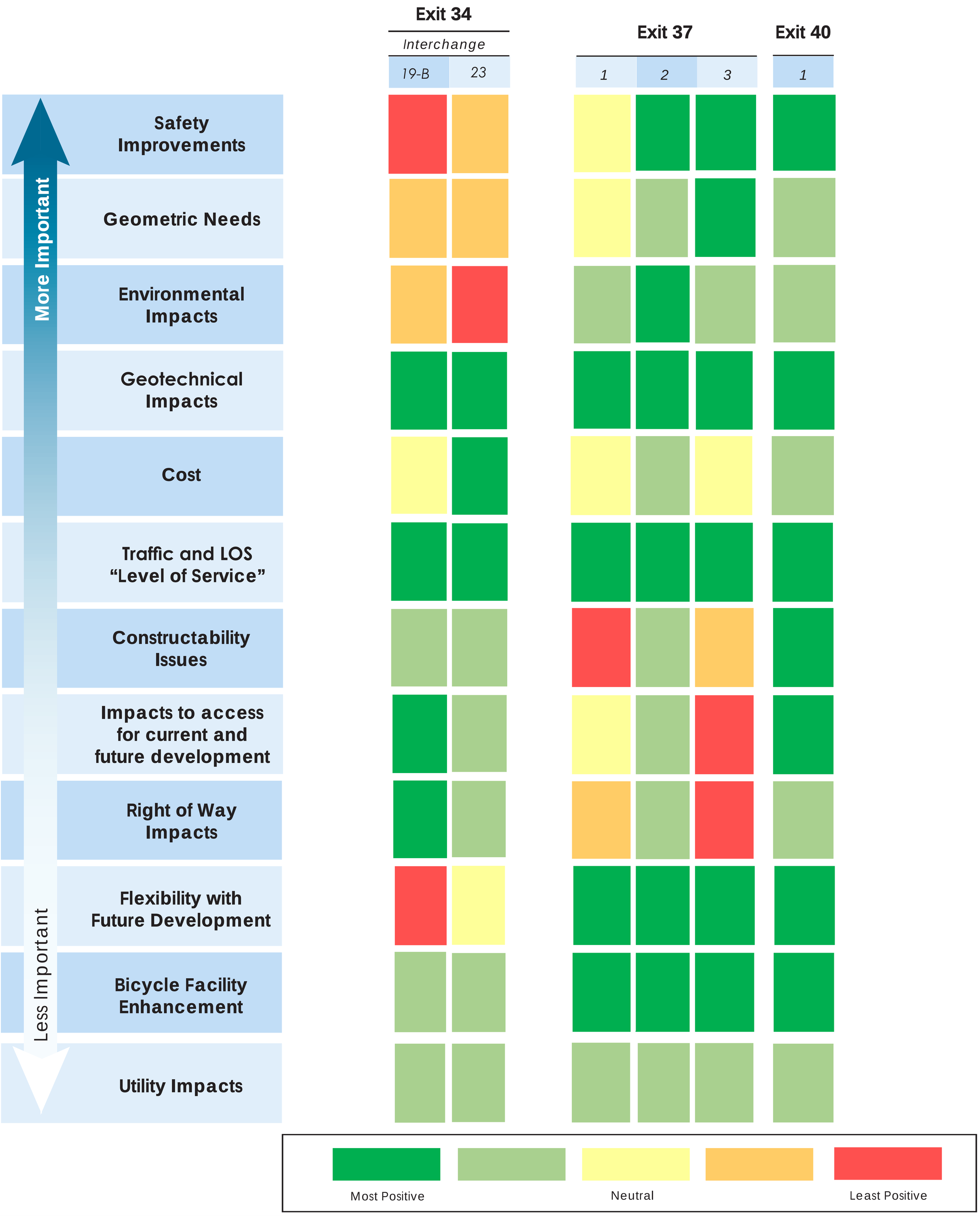
SDDOT

DATE: 10-12-2020 PROJ. NO.: 193804975

FILENAME: PW: 193804975\Alternative 34_23_Combined Exhibit.dgn



Alternatives Evaluation



I-90 Exit 32-40 Study and Design

Connecting South Dakota and the Nation