I-90/US 85 Spearfish Rest Area/Welcome Center Corridor Study

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Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Acknowledgements

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Executive Summary

This study is aimed at recommending a location for the reconstruction of the Spearfish rest area along Interstate 90 (I-90) with a welcome center. Interstate safety rest areas called 'rest areas' by South Dakota Department of Transportation (SDDOT) are an important part of South Dakota's transportation infrastructure. Rest areas across the state were reviewed in May 2016 with the South Dakota Interstate Rest Area Revitalization Plan developed by the State departments of Tourism and Transportation. Since then, rest areas along I-90 and I-29 have been improved through reconstruction, adding welcome centers and/or the remodeling of facilities. The state's long-term vision for welcome centers and rest areas is:

> *"South Dakota's interstate rest areas and welcome centers provide a safe, clean, accessible, and functional place for travelers to rest and rejuvenate. They present and positive impression that is welcoming and delivers educational value for visitors which enhances and extends their stay in South Dakota. The facilities are modern and aesthetically pleasing, while being cost-effective."*

The state's vision is to have five Welcome centers, one on each Interstate border location and one in Chamberlain.

At the time of the revitalization plan development, the City of Spearfish and local developers were exploring a possible partnership opportunity with the departments of Tourism and Transportation and Lawrence County. The intent of this study is to look at various potential site locations, while staying true to the Interstate rest area and information center/welcome center definitions.

> *Interstate Rest Areas – Public facilities located along South Dakota's two interstates at which travelers can rest, use restrooms, stretch and rejuvenate. Services can include restrooms, vending machines, picnic shelters, pet exercise areas, truck and regular vehicle parking.*
>
> *Information Centers or Welcome Centers – Facilities located within the interstate rest areas. Information centers or welcome centers are staffed by seasonally employed travel counselors who offer additional traveler information about South Dakota's tourism offerings.*

Based on previous studies, the Spearfish rest area was identified as in need of remodel or reconstruction to meet ADA standards and improve tourist information outreach. The 2016 South Dakota Interstate Rest Area Revitalization Plan noted that it would be more cost effective to reconstruct this rest area than to remodel or add a welcome center.

This study reviewed existing conditions, development of site alternatives, and filtered locations to identify three feasible locations along the study corridor. The selected locations for further analysis included the existing location at mile marker 1 (MRM 1), Exit 10, and Exit 17. Detailed analysis as at each of these locations was completed for environmental, traffic, utilities, and cost considerations.

An evaluation matrix was created utilizing the data gathered and analyzed throughout the study process. The results of this evaluation will be used by the departments of Tourism and Transportation to make an

informed decision on the best location for a rest area/welcome center that will benefit the traveling public and taxpayers of the State of South Dakota.

Based on results from this study, it is recommended to utilize the existing location for the reconstruction of the rest area with a welcome center. The site is rural and provides a needed welcoming refuge for the public entering the state. Unlike the other locations, no right of way or utility extension costs would be needed, and the historic tipi structure could more than likely remain in its current location. The rural nature of the existing location also mitigates noise, traffic, safety, and lighting concerns for residents within the City of Spearfish. The cost of the construction at the existing location is approximately $5M. Costs associated with the other locations were three and four times more expensive and introduce additional cost, environmental, social, and traffic risks.

↑ *Existing Spearfish Rest Area and Tipi at Mile Marker (MRM) 1*

1 Introduction

Interstate rest areas or 'rest areas' are a tremendously important part of South Dakota's transportation infrastructure. In 2016, the South Dakota Department of Tourism and Transportation completed the 'South Dakota Interstate Rest Area Revitalization Plan' which recommended five welcome centers, one on each Interstate border location and one near the City of Chamberlain.

Through reconstruction and/or remodels, welcome centers have been added to Valley Springs on I-90 at the South Dakota/Minnesota border, at Homestead (Vermillion) on I-29 in the southeast part of the state, Wilmot on I-29 in northeast South Dakota, and at Chamberlain in the middle of the state on I-90. Figure 1 shows the rest areas and rest areas with welcome centers currently in operation within South Dakota.

The Spearfish Rest Area (also known as Northern Hills) is on the Wyoming/South Dakota border and is the remaining facility identified in the South Dakota Interstate Rest Area Revitalization Plan as a location for a rest area/welcome center. The existing Spearfish Rest Area is approximately 1 mile from the western state border and 9 miles from the City of Spearfish. During the rest area revitalization plan process, tourism advocates for the City of Spearfish encouraged locating the rest area closer to the city when reconstruction occurs. The purpose of this study is to consider if the rest area should remain at its current location or be relocated, possibly closer to the City of Spearfish. A final recommended location will be provided based on community engagement, partnership possibilities, physical and operational constraints, and environmental considerations.

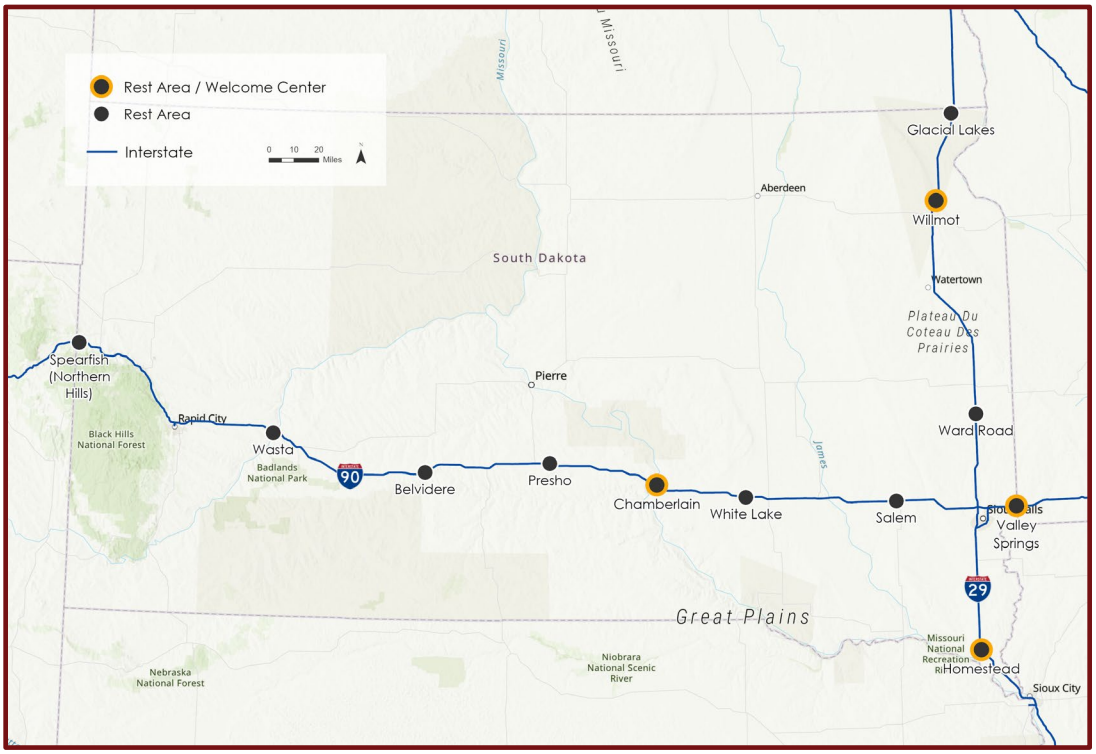


Figure 1 – South Dakota Rest Areas and Welcome Centers

1.1 Study Background

Although the existing facility provides a safe place for travelers, it is outdated and needs several ADA upgrades to meet current standards. In 2016, the South Dakota Department of Tourism and SDDOT completed the 'Interstate Rest Area Revitalization Plan' which recommended a full reconstruction of the existing Spearfish facility, based on cost effectiveness and the desire to add a welcome center, to further support the State's tourism industry.

1.1.1 Study Area

The study area encompasses I-90 from the Wyoming/South Dakota border to Exit 17 (to Deadwood/Lead), and US 85 at Exit 10 north approximately 2 miles and US 85 at Exit 17 south approximately 1.5 miles. It includes the existing rest area located at Mileage Reference Marker (MRM)1, along with the following interchanges:

- Exit 2 at Red Hill Rd
- Exit 8 at McGuigan Rd
- Exit 10 at North US 85
- Exit 12 at Jackson Blvd
- Exit 14 at N 27th St
- Exit 17 at South US 85

Figure 2 shows the study location in yellow and the City of Spearfish municipal boundaries.

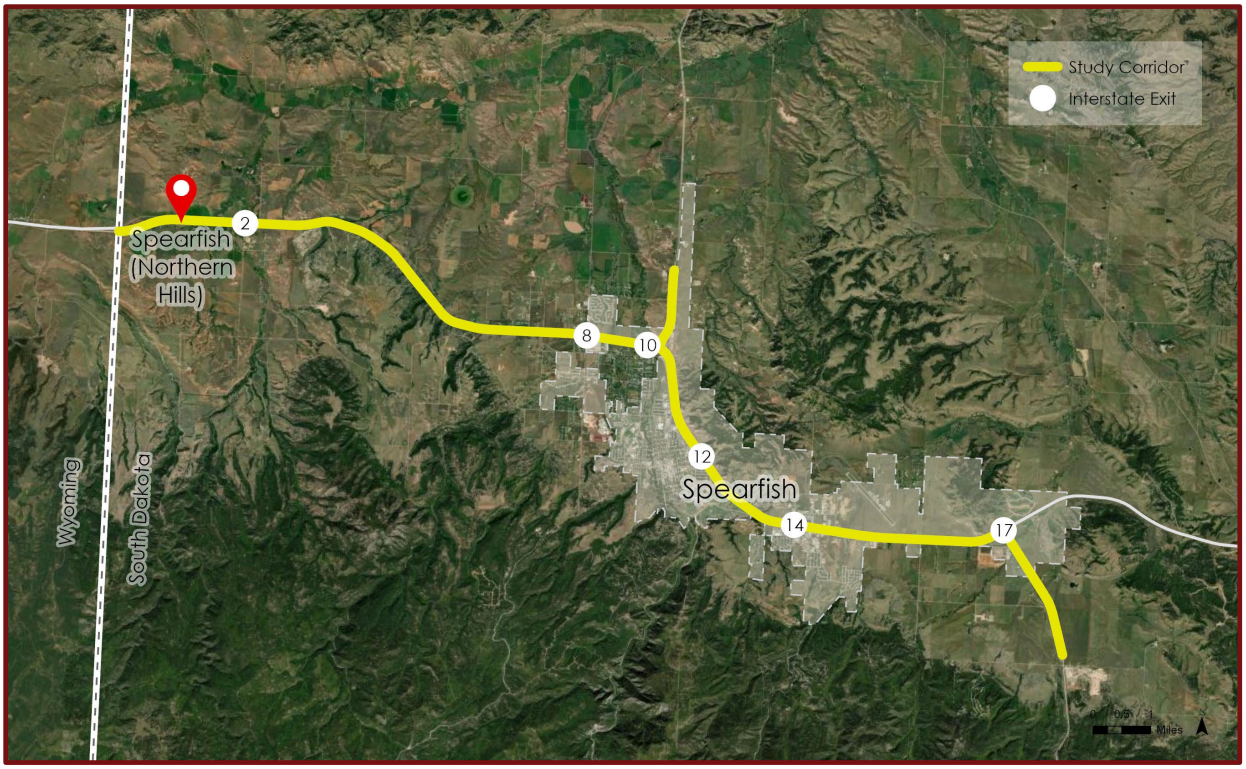


Figure 2 – I-90/US 85 Spearfish Rest Area/Welcome Center Corridor Study Location

2 Study Process Overview

The study started with a kickoff meeting and Methods and Assumptions (M&A) meeting in June 2022. The Methods and Assumptions (M&A) process is a formalized practice of developing and recording the data criteria, data assumptions, data collection procedures, data analysis methodologies, and data measures of effectiveness needed for a federally funded planning study. This process includes holding a M&A meeting and creating an M&A document for SDDOT and FHWA approval. The M&A document is utilized throughout the project, specifically within the traffic study. It is an appendix in the Traffic Analysis Screening Report which can be found in Appendix A.

The primary tasks for the study included engagement, background review, site identification, environmental screening, traffic analysis, site assessment, alternative evaluation, and providing final recommendations. These primary tasks are listed below and shown in Figure 3, Study Schedule with Primary Tasks and Engagement.

- **Engagement** – Inform, listen, and communicate with stakeholders and the public throughout the study.
- **Background Review** – Collect existing conditions, traffic data, and review previous studies. Complete an environmental review and develop Purpose and Need.
- **Site Identification** – Examine the study corridor for viable properties for a rest area welcome center and eliminate sites with physical constraints that would be difficult or prohibitively expensive to overcome.
- **Environmental Screening** – Filter properties through the project's purpose and need. Develop feasible scenarios for the remaining properties and review for social and environmental impacts.
- **Traffic Analysis** – Collect traffic counts at identified locations. Review feasible scenarios for traffic impacts.
- **Site Assessment** – Identify approximate size and needs of the new rest area and welcome center and compare against feasible scenarios.
- **Alternative Evaluation** – Rank feasible scenarios against several criteria important to the function and use of rest areas/welcome centers.
- **Final Recommendations** – Provide site recommendations and next steps in final Study Report.

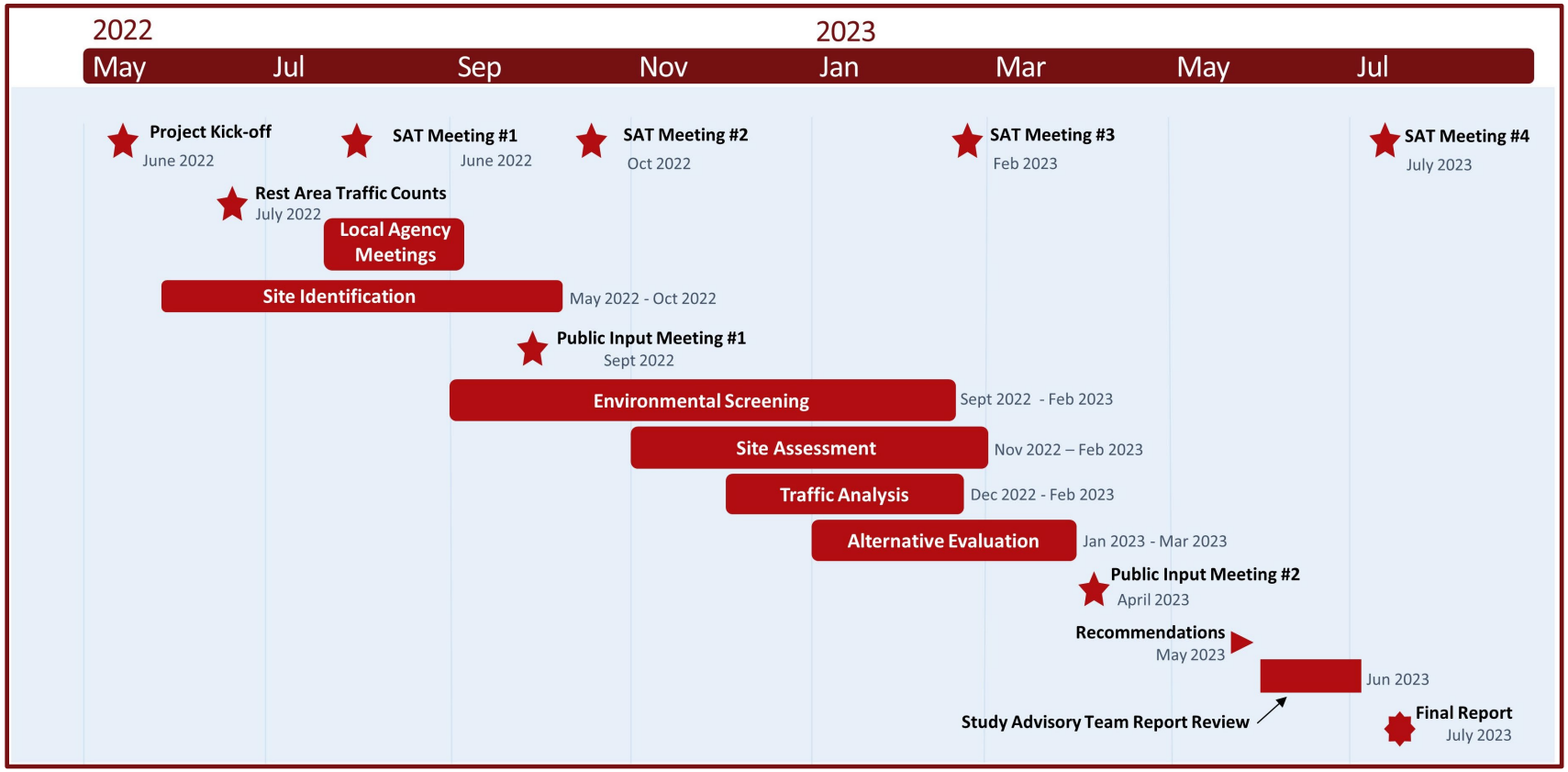


Figure 3 – Study Schedule with Primary Tasks and Engagement

2.1 Stakeholder Involvement

A stakeholder is considered anyone who has interest in the project. For this study, identified stakeholders included local government agencies, business owners, landowners, advocacy groups, state and federal agencies, and the travelling public. Coordination with project stakeholders was accomplished through the creation of a Study Advisory Team (SAT), individual listening sessions, and public outreach efforts (project website, project updates, and public input meetings).

2.1.1 Study Advisory Team (SAT)

A Study Advisory Team (SAT) was formed to help guide the project by bringing together a representative group of technical and non-technical stakeholders, including:

- Black Hills & Badlands Tourism Association
- Community Advocate
- City of Spearfish
- Federal Highway Administration (FHWA)
- South Dakota Department of Transportation (SDDOT)
- South Dakota Department of Tourism
- Visit Spearfish

Five SAT meetings (including the kickoff meeting) were held at critical milestones throughout the project. Meeting dates and key discussion items are summarized below. Full SAT meeting summaries can be found in Appendix B.

- **June 13, 2022 – Kickoff Meeting**
  - Introduce the project, confirm project scope and overall project criteria.
- **August 22, 2022 – SAT #1**
  - Summarize the local agency/stakeholder meetings held in August 2022, review/confirm stakeholder meeting groups for September 2022 meetings, and discuss meeting materials to be presented at the public meeting in September 2022.
- **October 14, 2022 – SAT #2**
  - Provide an overview of September 2022 stakeholder, public input meetings, and survey results, review/gain feedback on the constraints matrix, purpose and need, and evaluation criteria for the project.
- **February 27, 2023 – SAT #3**
  - Finalize the purpose and need, discuss conceptual designs at Exit 10 and Exit 17, review the evaluation matrix, review/confirm stakeholder groups to meet with in April 2023, discuss the April 2023 public input meeting.

- **July 18, 2023 – SAT #4**
    - Summarize April public input and stakeholder meetings, provide the project team's recommendation, review the draft report, and discuss the final recommendation.

2.1.2 Stakeholder and Local Agency Listening Sessions

Prior to site identification and in conjunction with each public input meeting, the study team conducted multiple one-on-one listening sessions with key stakeholders identified by the SAT. Three separate listening sessions were held to capture input at various stages of the study.

In August 2022, listening sessions focused on gaining a variety of perspectives to better understand area resources and local needs. These meetings were a critical first step in identifying key development areas, physical constraints, potential locations for the new rest area/welcome center, and future visions.

In September 2022, the listening sessions were held to gain insight on stakeholder needs and issues, provide information about the study, and hear concerns or opportunities about relocating the existing rest area closer to city limits.

A third set of listening sessions were held in April 2023 to solicit input on the three identified site concepts (Existing location at MRM 1, Exit 10, and Exit 17) and the draft evaluation matrix. Stakeholders shared thoughts and concerns about the proposed locations, provided perspectives on how the sites/adjoining properties are used, and commented on the draft evaluation matrix.

Listed below are the stakeholders and date of meeting in alphabetical order.

- **Black Hills & Badlands Tourism Association** (August 18, 2022)
- **Black Hills State University** (September 28, 2022)
- **Belle Fourche Economic Development Corporation** (September 27, 2022)
- **City of Spearfish** (August 16, 2022)
- **City of Spearfish Council Representative** (April 6, 2023)
- **Community Advocate Kristi Wagner** (August 8, 2022)
- **Custom Corners** (April 28, 2023)
- **Deadwood Chamber of Commerce** (September 27, 2022)
- **Developer Joe Jorgenson** (August 8, 2022 & April 28, 2023)
- **Elk Horn Ridge** (September 27, 2022 & April 6, 2023)
- **Gas Station Owners** (September 27, 2022)
- **Golf Spearfish** (August 8, 2022)
- **Visit Spearfish** (August 9, 2022)
- **Lawrence County Commissioners** (September 27, 2022 & April 6, 2023)
- **Lawrence County Planning & Zoning** (August 9, 2022)
- **Rest Area Maintenance** (September 27, 2022)
- **South Dakota Department of Tourism** (August 18, 2022)
- **South Dakota Trucking Associations** (September 27, 2022 & April 6, 2023)
- **Spearfish Bicycle Collective** (September 27, 2022)
- **Spearfish Chamber of Commerce** (August 8, 2022)

- **Spearfish Economic Development Corporation** (August 9, 2022)
- **South Dakota Humanities Council** (September 27, 2022)
- **WBI Energy & Montana-Dakota Utilities** (April 6, 2023)

Full stakeholder meeting summaries can be seen in Appendix C.

2.1.3 Public Input Meetings

Two public input meetings were held to inform the public about the study and solicit input on the proposed rest area and welcome center planning. Meetings were held at Spearfish City Hall and were advertised via the Black Hills Pioneer, SDDOT website/social media channels, various local news outlets, local governmental agencies, and via the project website. A summary of each of the meetings is provided below. Full engagement summaries including public input materials, community survey results, comments, and pictures are included in Appendix D.

- **Public Meeting #1 - September 28, 2022**
    - This meeting was held to provide project information, answer questions, and collect feedback from the public. Residents, business owners, and daily commuters were encouraged to participate in the meeting and given the opportunity to present written comments and complete a survey pertaining to the project.
- **Public Meeting #2 – April 27, 2023**
    - This meeting was held to give the public an update on the study progress, discuss conceptual layouts at MRM 1, Exit 10, and Exit 17, and collect feedback on the proposed evaluation criteria.

↑
The study website allowed the public to stay up to date on the project and send comments to the study team.

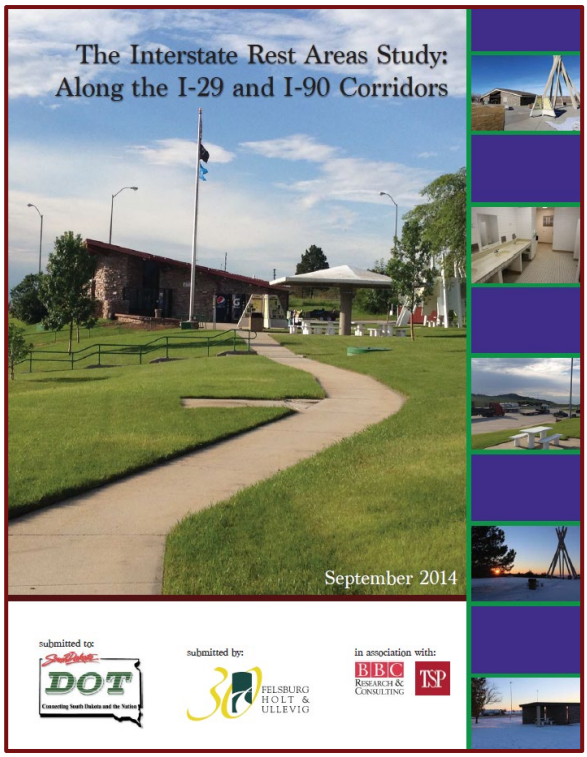
←
A survey was available from September 1 to October 12, 2022 online, in the rest area, and at the first public input meeting.

↑
Attendees at Public Input Meeting #1 reviewing a layout of existing conditions with SDDOT Project Manager Tammy Williams.

↑
Attendees at Public Input Meeting #2 listening to a live presentation by Consultant Project Manager Aaron Cook.

3 Existing Conditions

Prior to site identification, data was collected from various online resources, agency sources, and field data collection techniques to analyze the existing conditions of the study area. Data collected included but was not limited to previous planning studies, utility information, traffic data (counts, safety, and average daily traffic), crash data, trails and pedestrian facilities, right of way, zoning, aerial mapping, parcels, floodplains, wetlands, airport influence area, development plans, and previous tourism surveys. Details pertaining to the entire study area are discussed below. The existing conditions of the existing rest area site at mile marker 1 (MRM 1) are in Section 4.2.1.



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Previous studies such as the 2014 Interstate Rest Area Study and 2016 Rest Area Revitalization plan laid the groundwork for the need to reconstruct South Dakota's boarder rest areas to include welcome centers.

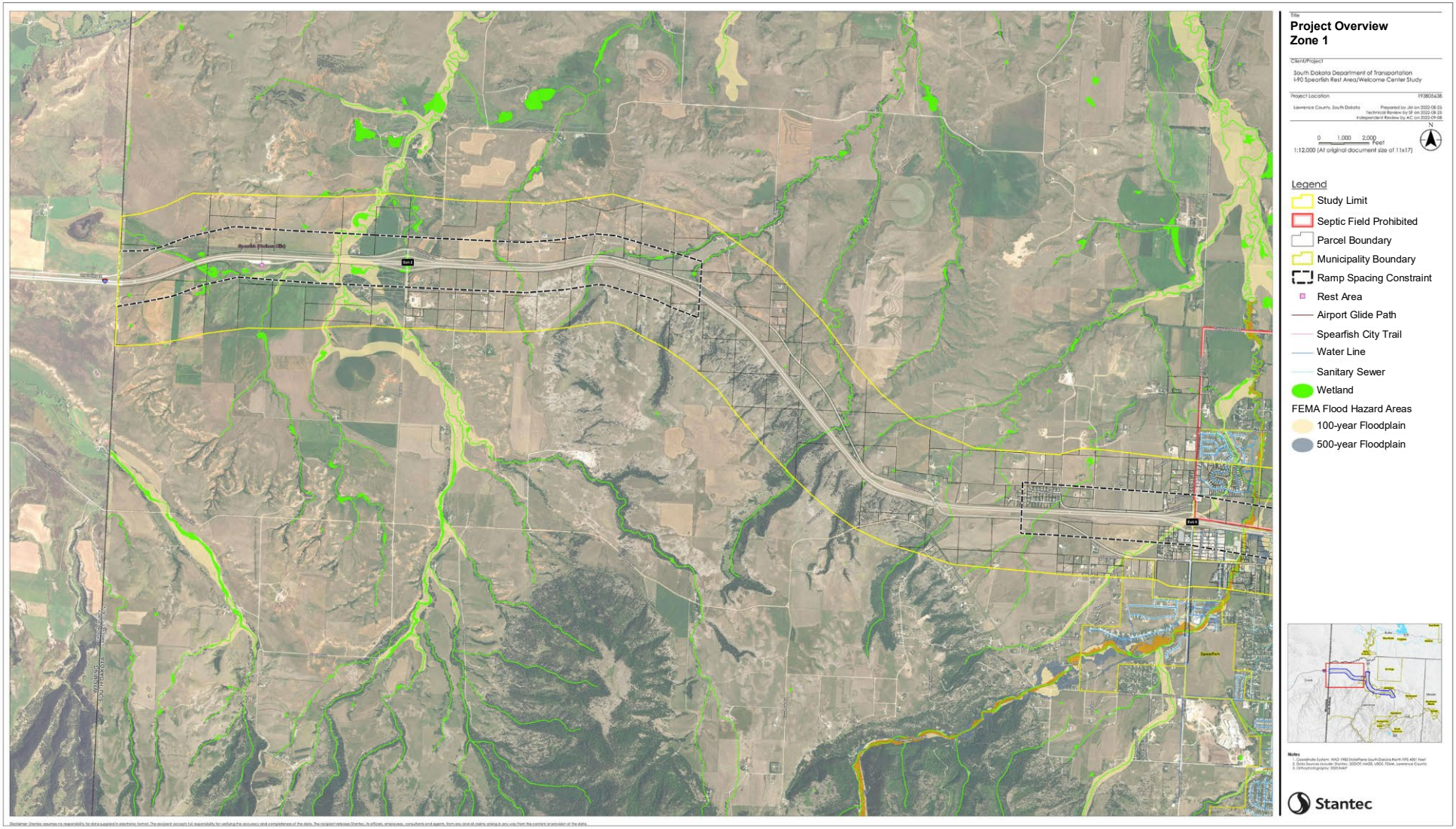


Figure 4 – Existing Conditions (Zone 1)

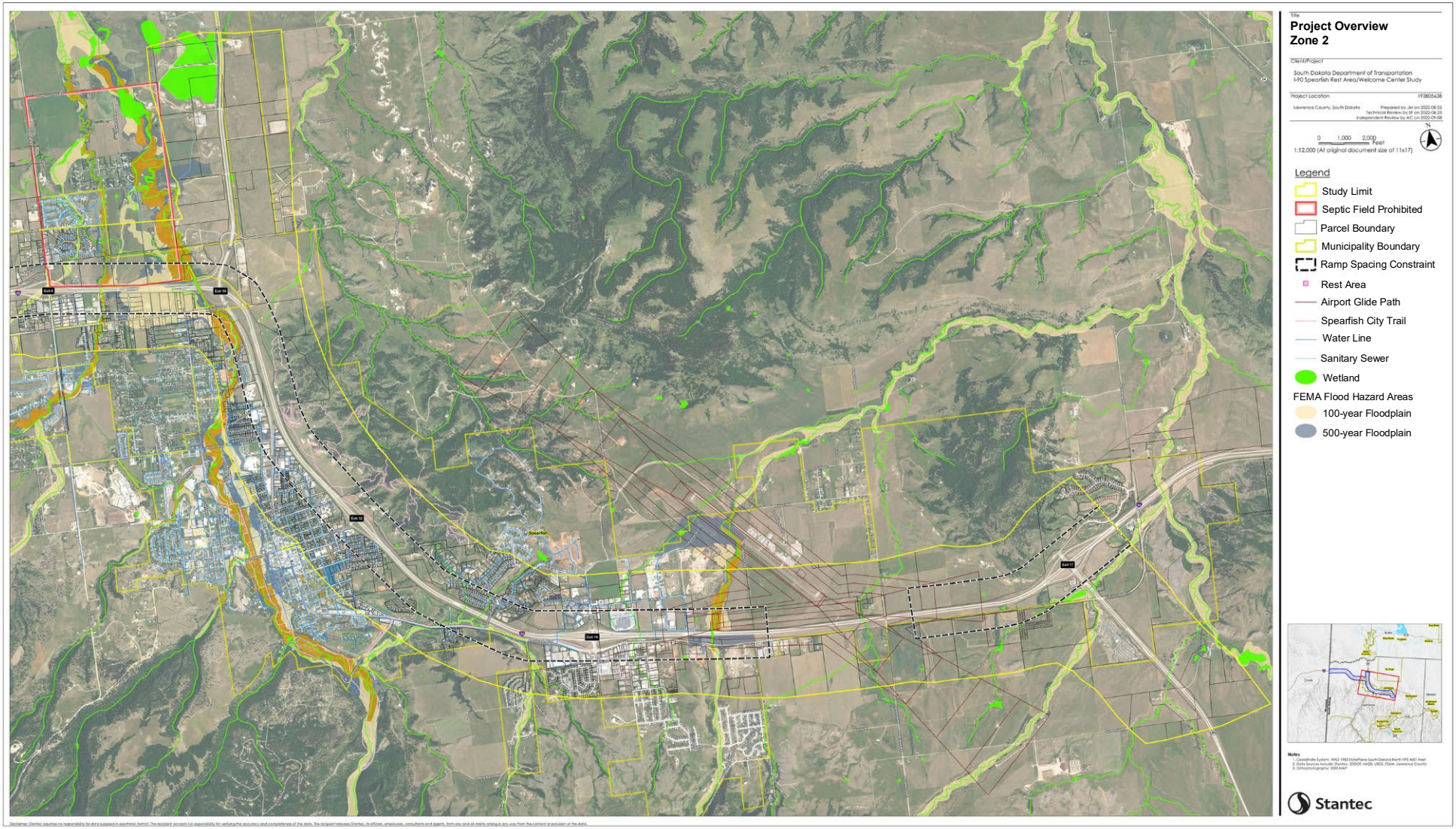


Figure 5 – Existing Conditions (Zone 2)

3.1 Previous Studies

Relevant previous studies were reviewed as the foundation for the I-90/US 85 Spearfish Rest Area/Welcome Center Corridor Study. These studies are listed below in chronological order with a summary of each.

- **Traffic Impact Study I-90 Exit 17, 2021**

  The purpose of this study was to evaluate potential impacts of a proposed housing development and sports complex on the adjacent roadway network. The proposed development is located along Colorado Boulevard near the I-90 Exit 17 interchange and the intersection of US 85 and Colorado Boulevard just east of the City of Spearfish. The study made several recommendations for improvements in the years 2022 and 2045.

- **Decennial Interstate Corridor Study (ICS), 2020**

  Analyzed the Interstate System and facilities to guide future SDDOT investments.

- **Truck Parking, 2018**

  Analyzed truck parking demand at 31 truck parking, truck pullout, and rest area locations along I-90 and I-29.

- **Interstate Rest Area Revitalization, 2016**

  Developed a long-term vision for the state's rest areas and welcome centers.

- **Dept of Tourism Survey, 2016**

  The purpose of the questionnaire was to gather information on how travelers currently use the Interstate Welcome Centers and Rest Areas, what services and amenities are most important to travelers, and what influence the Welcome Centers have on the travel plans of visitors.

- **City of Spearfish HWY 85 Utility Study, 2016**
  The purpose of this plan was to help the City of Spearfish respond to requests by developers along Highway 85 north of Spearfish to extend water and sewer.

- **Interstate Rest Area Investment Study, 2014**

  The Spearfish rest area was not included in this study. However, the study's recommendations indicated that the studies facilities were rapidly deteriorating and becoming increasingly expensive to preserve. As funds become available, the department should prioritize reconstructing the facilities. This study laid the groundwork to begin the process of rehabilitating the state's rest areas.

- **US Highway 14A Corridor Study, 2012**

  This study identified the single-point interchange as the best option for the reconstruction of Exit 14. The construction of the interchange was completed in 2014.

- **Spearfish Area Study, 2011**

  Created a list of transportation issues and needs, developed feasible solutions, and created guidance for implementation. Projects prioritized by the plan directly related to the I-90 corridor

include interchange improvements at both Exit 14 and 17. Exit 14 at Colorado Blvd was shown as having existing capacity issues at the time of the plan.

3.2 Functional Classification

I-90 is functionally classified as an interstate which offers the highest level of mobility at the highest speeds over the longest uninterrupted distance. It serves as a crucial connection between Wyoming and Minnesota and provides access to many of South Dakota's major cities and tourism attractions. It is a four-lane divided highway with access connections to grade separated interchanges.

Since the rest area is an interstate facility, it is subject to Federal Highway Administration (FHWA) access control requirements, meaning new access points within the area of control are prohibited. Although this will not change anything at the existing location, it could have implications at locations where the rest area is located further away from the interstate.

For study purposes, the area from the state border to Exit 8 was considered rural and from Exit 8 east to Exit 17 was considered urban. The American Association of State Highway and Transportation Officials (AASHTO) recommends interchange spacing should be greater than 2 miles apart in rural areas and greater than 1 mile in urban areas. Introducing access points to the interstate such as a new interchange or ramps to a rest area closer than those distances tends to impact the performance of the facility. Areas within these limits were excluded from further analysis.

US 85 is functionally classified as a freeway or expressway north of I-90 between Spearfish and Belle Fourche, and as a principal arterial south of I-90 from Spearfish to Lead/Deadwood. Roads classified as a freeway or expressway look similar to interstates and are designed and constructed to maximize their mobility function, and do not directly serve abutting land uses. This segment of US 85 within our study area is a four-lane divided highway with minimal at-grade crossings.

Principal arterials serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas. Unlike their access controlled counterparts, abutting land uses can be served directly. This segment of US 85 within the study area is a four-lane divided highway with minimal at grade crossings.

Figure 6 shows the functional classifications for the state of South Dakota.

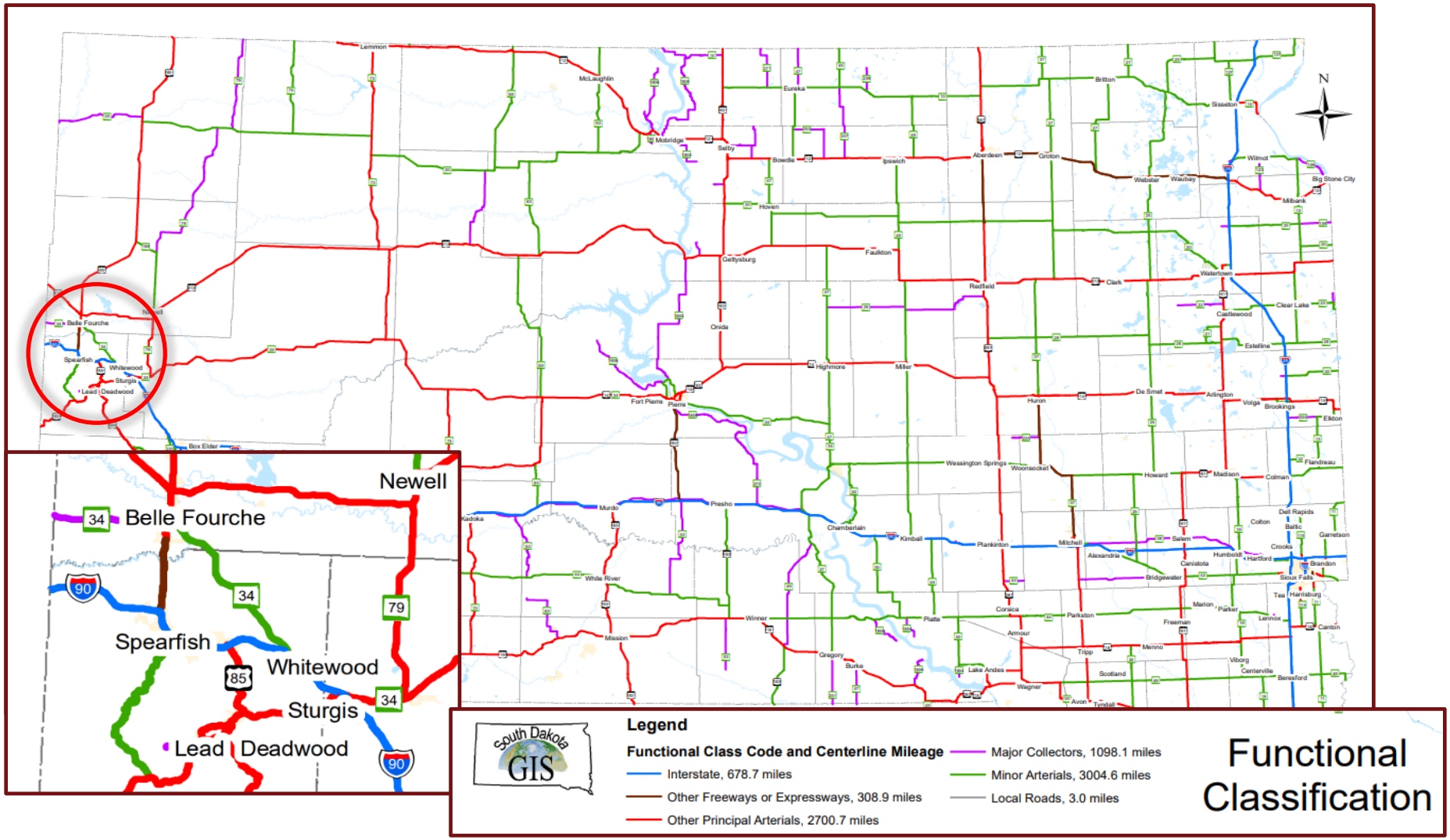


Figure 6 – South Dakota Functional Classification Map and Spearfish Study Area

3.3 Land Use

3.3.1 Existing Development

Existing land-use surrounding the corridor is primarily agricultural with residential and commercial mainly within the City of Spearfish municipal boundary. The City of Spearfish does not have an existing land use map, but they do have a zoning map shown in Figure 7. The city is currently in the process of updating their Comprehensive Plan which was last updated in 2013. Since 2013, the city has experienced a tremendous amount of growth, centered around Exit 17.

3.3.2 Future Land Development

Most of the growth within the study area is within the City of Spearfish municipal boundary. This growth is occurring mainly eastward along I-90, specifically around Exit 17. Through conversations with local developers and city staff, future development plans at Exit 10 and Exit 17 were noted. Other development is occurring within the city, but none of it had a significant impact on a possible rest area/welcome center with the city along I-90 or US 85. While development did not impact possible areas for a rest area/welcome center, safety rest areas are to provide a refuge for users in locations not developed. Based on 23 CFR § 752.5 - Safety rest areas "…should include development priorities to ensure safety rest areas will be constructed first at locations most needed by the motorist. Proposals for safety rest areas or similar facilities on Federal-aid highways in suburban or urban areas shall be special case and must be fully justified before being authorized by the FHWA Regional Administrator."

Figure 8 shows a development concept in the northeast quadrant of Exit 10 called Dakota Meadows. There are no imminent plans to construct this development.

Figure 9 shows an expansion concept for the Elk Horn Ridge Resort at Exit 17 south of the interchange with I-90 and in the northeast quadrant. This development is currently moving forward.

Figure 10 shows a development concept for Exit 17 in the northwest quadrant of the I-90 and Exit 17 interchange called Centennial Mountain. Portions of this plan are currently moving forward.

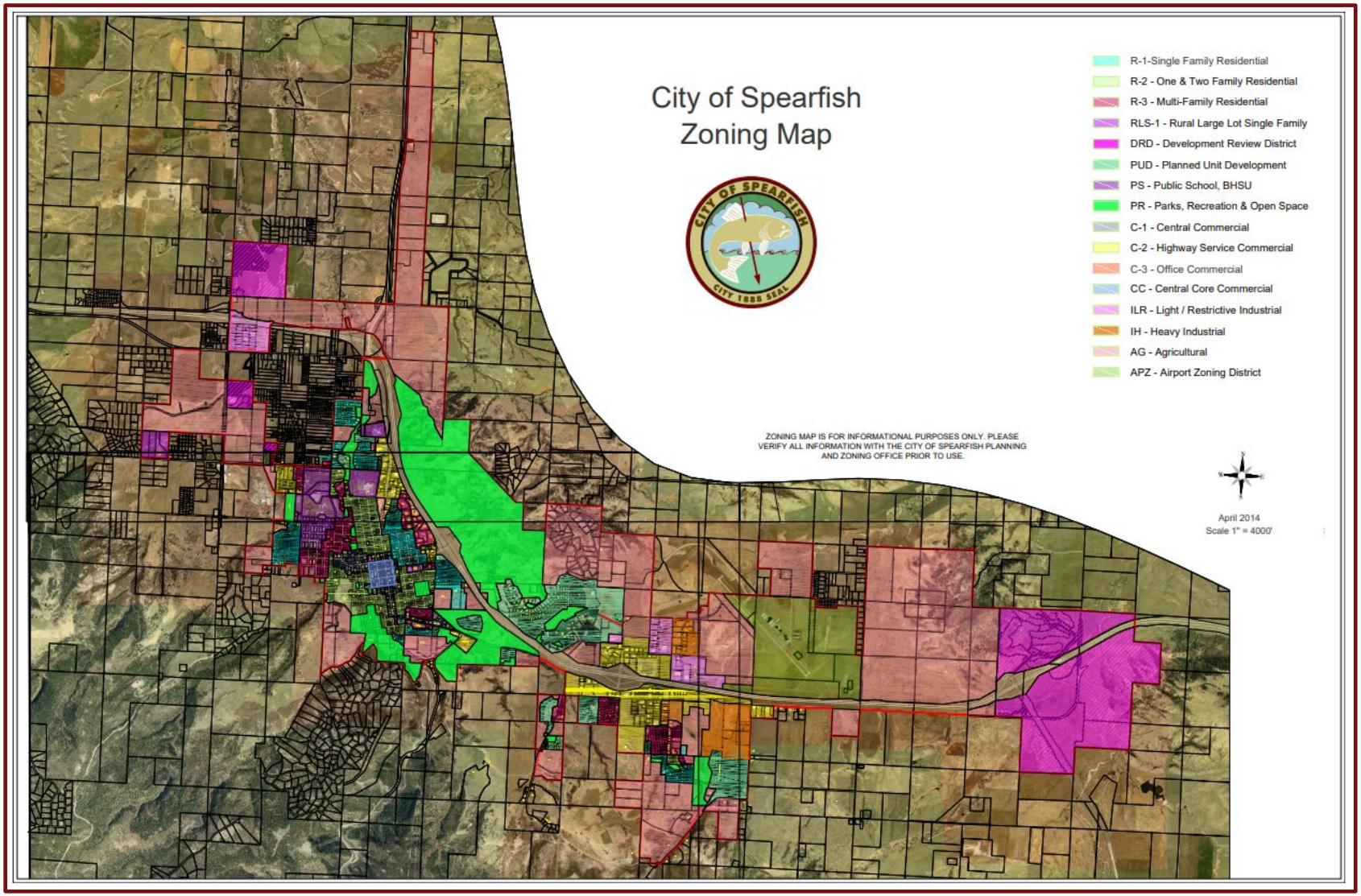


Figure 7 – City of Spearfish Zoning Map (2014)

Figure 8 – Dakota Meadows Development Concept at Exit 10.

Figure 9 – Elk Horn Ridge Expansion Concept at Exit 17

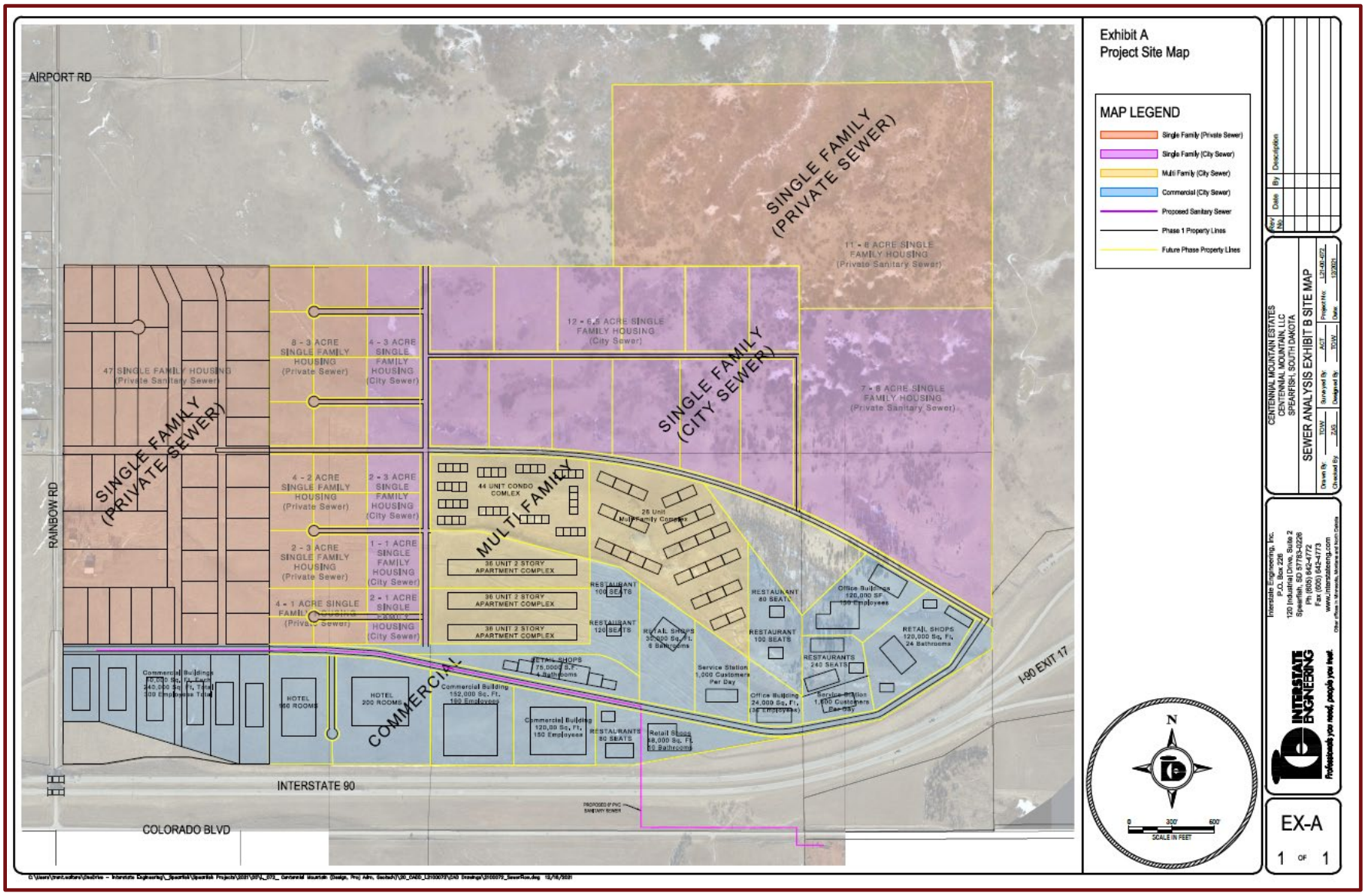


Figure 10 – Centennial Mountain Development Concept at Exit 17

3.4 Multimodal Facilities

Multimodal facility information was gathered from Lawrence County and the City of Spearfish. Figure 4 and Figure 5 shows the City of Spearfish mapped trails. Lookout mountain is a popular area for biking and is located on the north side of I-90.

3.5 Truck Parking

Multiple recent analyses of truck parking demand along the corridor have been completed over the course of the past 10 years to develop a picture of truck parking needs. The truck parking memo included as part of the traffic screening report, found in Appendix A, includes a review of the relevant studies of truck parking demand, provides a summary of applicable truck parking regulations and provides a summary of key findings as it relates to appropriate truck parking sizing for the future welcome center. For this rest area/welcome center study, these studies were reviewed and analyzed.

Findings of recent truck parking demand assessments and field reports indicate that the truck parking supply of 25 parking spaces at the existing rest area is adequate to accommodate current demand, and future forecasts. However, weekend traffic counts indicate some potential for occasional increased usage. Additional verification of field reports and/or weekend video parking data collection at the existing rest area may be appropriate to further clarify current parking usage and help inform site design.

If a new rest area/welcome center is constructed closer to or within the Spearfish city limits, additional truck parking supply beyond the existing 25 spaces should be considered. Data from the Interstate Corridor Study (ICS) indicate elevated truck parking usage levels at existing parking locations near Exits 14 and 17. In addition, if a new rest area/ welcome center is built to accommodate entering truck traffic from both directions of I-90 rather than the current eastbound only accommodation, parking demand could increase up to as much as 2 times the forecasted peak parking demand.

3.6 Traffic Safety

A mainline traffic safety review was completed along mainline I-90 from the Wyoming border, MRM 0.0, to approximately MRM 19.75. This excludes on and off-ramps, intersections, and crossroads. It includes rural areas and urban portions of I-90 near the City of Spearfish. The traffic safety memo is included as part of the traffic screening report, found in Appendix A. It summarizes recent crash history along the I-90 study corridor, identifies locations of elevated crash frequency and patterns, and identifies potential safety improvements that could be made with a rest area/welcome center project.

Crash findings are broken down by mile segments within approximately 1 mile of potential rest area/ welcome center locations, locations where the ICS identified mile segments of concern, and MRM 6-7, as it has shown the most significant increase in crashes between data sets are shown below.

Findings indicate crashes related to animals are significant. Crash data for this study does not reflect the benefits of SDDOT's 2021 wildlife fencing project from MRM 9.5 – 13.6.

MRM 0-1 and 1-2 incorporates the existing I-90 South Dakota rest area site. This is also a potential location for the new rest area/welcome center. There are few crashes by comparison to other mile segments and little change between the time periods. Most crashes are animal related in non-daylight conditions.

MRM 6-7 showed a significant increase in crash frequency with more recent data. A significant percentage of crashes are animal related and during non-daylight conditions. Collisions with other vehicles and during winter driving conditions are very low. This is a rural mile of highway with no interchanges. This may be an area that has seen increased animal activity.

MRM 9-10 and 10-11 includes the Exit 10 interchange with US85, a potential access to a new rest area/ welcome center location. There is a large curve on mainline on MRM 10-11. Minimal increase in crashes between time periods. Most crashes are during non-daylight conditions. On MRM 10-11, one-third of crashes are single vehicle roadway departure crashes. In the most recent data MRM 10-11 has the highest number of injury crashes in the study area.

MRM 12-13 segment was ranked in ICS as the #15 in highest safety concern relative to all mile segments on the entire South Dakota interstate system and more recent data continued the trend of elevated crash experience.

MRM 13-14 was ranked in the ICS as the #7 highest safety concern relative to all mile segments on the entire South Dakota interstate system, largely due to increased severe crashes reported between 2014-2018. More recent data show approximately 50 percent fewer severe crashes. The Exit 14 interchange was reconstructed in 2017-2018. Construction related crashes may be included in the dataset and deficiencies that existed prior to construction likely have been addressed, contributing to this improvement.

MRM 17-18 abuts the Exit 17 interchange on the west, a potential future rest area/welcome center location. Moderate increase in crashes from 2014-2018 to 2017-2021. A significant percentage of crashes are animal related and during non-daylight conditions. Collisions with other vehicles and during winter driving conditions are very low. This may be an area that has seen increased animal activity.

MRM 18-19 abuts the East side of the Exit 17 (US85) interchange. Most crashes are non-animal related and approximately half of crashes are during daylight conditions. One-fourth of crashes are during winter driving conditions. 39% of crashes are single vehicle roadway departure crashes, a higher percent than most mile segments.

4 Site Identification

4.1 Purpose and Need

In 1970 the National Environmental Policy Act (NEPA) was signed into law requiring all federal agencies to consider the impacts of their actions on the environment. The Purpose and Need (P&N) statement is an important part of the environmental documentation process of NEPA. It describes the underlying need to be met and the other factors relevant to the choice between alternatives.

The P&N statement has been divided into primary needs and goals. Primary needs are problems that are the driver for the project as opposed to goals which are other opportunities for improvements that may be addressed as part of the project.

The primary needs for this study were identified as:

- **Safe, Clean, and Accessible** - Provide a clean, safe, accessible, and comfortable place for travelers to rest and manage their needs.
- **Commercial Trucking** - Accommodate regional and nationwide commercial trucking needs. Specifically, the need for truck parking.
- **Highway Safety** - Encourage traveler safety.

The goals were identified as:

- **Balanced Setting** - Provide a safe place to stop within a reasonable distance of travel.
- **Information Centers** - Enhance user's experience encouraging visitors to extend their stay in South Dakota, further supporting the State's tourism industry.

Further details pertaining to these needs and goals can be found in the full Environmental Screening Report in Appendix E.

This study was completed in advance of the full NEPA process as outlined by the FHWA but does provide groundwork for the NEPA process once the next steps are taken. Pre-NEPA activities for this project include completing an environmental screen, developing a draft purpose and need statement, and outlining locations which cannot move forward for consideration due to unfeasible characteristics. The planning decisions made within this study can be carried forward into project development as well as to aid in determining the most reasonable and feasible option(s) to be advanced into further environmental studies.

4.2 Site Selection for Further Analysis

A range of rest area/welcome center site alternatives were developed along the corridor, including at the existing location. This first selection of sites meets basic criteria, such as access to I-90 and spacing, and serves as a starting point for review and elimination of early alternatives determined to be unfeasible to construct. These sites were reviewed for constraints or variables that would be difficult or costly to overcome along the corridor including airport glide path, FHWA ramp constraints, existing development, site size, and difficult terrain.

Following the development of potential locations and project concepts, an evaluation process was used to provide an objective, quantifiable and comprehensive approach to determining feasible build scenarios and locations for the rest area/welcome center improvements. A well-documented, traceable, evaluation process is required for the NEPA process and includes any environmental studies as conducted in this pre-NEPA stage. Any alternatives that are screened out will be supported by documentation in the form of reasoned arguments and matrices. The alternatives eliminated in the pre-NEPA study phase will mostly center around fatal flaws or those with largely unfeasible characteristics. The No-Build Alternative will also be included in the range of alternatives considered throughout the process.

The project team reviewed potential locations along the study corridor by using the process outlined below:

1) Review the study corridor for immovable or costly characteristics which would be difficult or impossible to overcome.
2) Eastbound traffic entering the state of South Dakota from Wyoming is the main direction of traffic the rest area is serving. Building a new interchange for the sole purpose of servicing a rest area is not reasonable. Therefore, locations on the north side of I-90 without access to the interstate were decided to be unsuitable.
3) Filter the remaining locations through the project's P&N statement.
4) Compare the remaining locations by utilizing an evaluation matrix.

Following steps 1 and 2, the project team determined five potential site areas to be carried forward for review against the project P&N:

- Between Exit 2 and Exit 8 with direct access off Old US 14
- NE and NW quadrants of Exit 10 (I-90 and US 85 North)
- Properties NW, NE, and South of Exit 14 (I-90 and 27th Street)
- NW quadrant of Exit 17 (I-90 and US 85 South)
- MRM 1 (existing location)

These locations were reviewed alongside the primary needs listed in the P&N statement. If a location was not able to meet a primary need for a new rest area/welcome center, it was removed from consideration and did not require further evaluation for this study. See Table 1 for a review of sites against the project purpose and need.

Table 1 - Review of Sites Against Project Purpose and Need

Location	Rest area use for commercial trucking	Safe, clean, and accessible	Truck Parking	Does this satisfy the P&N?
West of Exit 8 with direct access off Old US 14	Does not provide direct access for trucks. Trucks would need to backtrack and/or drive longer distances on Old US 14 to reach the rest area.	Does not provide quick and direct access for trucks therefore limiting the degree of accessibility.	Provides adequate distance from residential areas allowing trucks to be left running.	No
NE and NW quadrants of Exit 10 (I-90 and US 85 North)	Provides direct access for trucks traveling both I-90 and US 85 North.	Provides direct access for trucks traveling both I-90 and US 85 North.	Provides adequate distance from residential areas allowing trucks to be left running.	Yes
Properties NW, NE, and South of Exit 14 (I- 90 and 27th Street)	Does not provide direct access for trucks traveling on I-90. Trucks would need to travel on local roads.	Does not provide direct access for trucks therefore limiting the degree of accessibility. Local roadways would be impacted.	Close to residential properties creating noise and headlight concerns.	No
NW quadrant of Exit 17 (I-90 and US 85 South)	Provides direct access for trucks traveling both I-90 and US 85 South.	Provides direct access for trucks traveling both I-90 and US 85 South.	Provides adequate distance from residential areas allowing trucks to be left running.	Yes
MRM 1 (existing location)	Provides direct access for trucks in the eastbound direction which is the main direction intended to be served.	Provides direct access for trucks in the eastbound direction.	Provides adequate distance from residential areas allowing trucks to be left running.	Yes

Note: All locations meet the land size requirements for a new rest area/welcome center. This means the need to “address rest area deficiencies” and “provide information centers” will be accomplished by all locations and was not included in the table.

Of the five potential sites areas, only three were determined to meet the P&N:

- Existing Rest Area – Mile Reference Marker 1
- Exit 10 - NE and NW quadrants of Exit 10 (I-90 and US 85 North)

- Exit 17 - NW quadrant of Exit 17 (I-90 and US 85 South)

These three sites were carried forward for further review and analysis and are discussed in greater detail below.

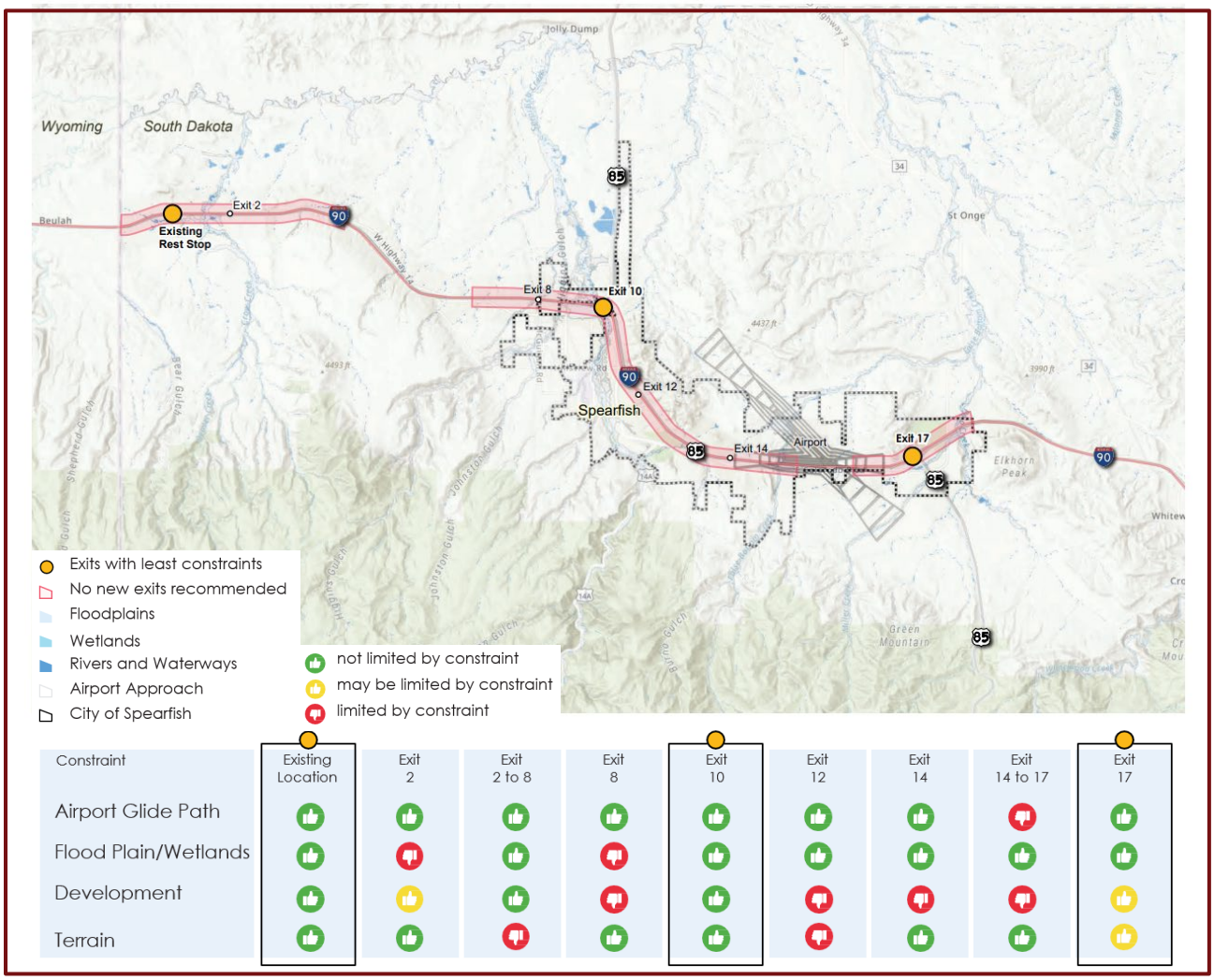


Figure 11 – Sites Selected for further Analysis

4.2.1 Existing Location (MRM 1)

The current Spearfish rest area and welcome center is located along Interstate 90 (I-90) servicing the eastbound direction of travel only. It is located at MRM 1 on the Wyoming/South Dakota approximately nine miles west of the City of Spearfish. It is accessed directly from I-90 and consists of the traditional one-way separated entry/exit ramp design.

The current site is 38.5 acres and provides a single parking surface for both passenger vehicle and truck parking. Parking includes angled head-in parking spaces which eliminate the need to execute complex turning movements. The facility does not meet current ADA standards and needs tourist information outreach improvements.

Figure 12 provides an aerial view of the existing rest area location and Figure 13 shows additional site details and a list of existing amenities.

Figure 12 – Aerial View of the Existing Site (MM 1)

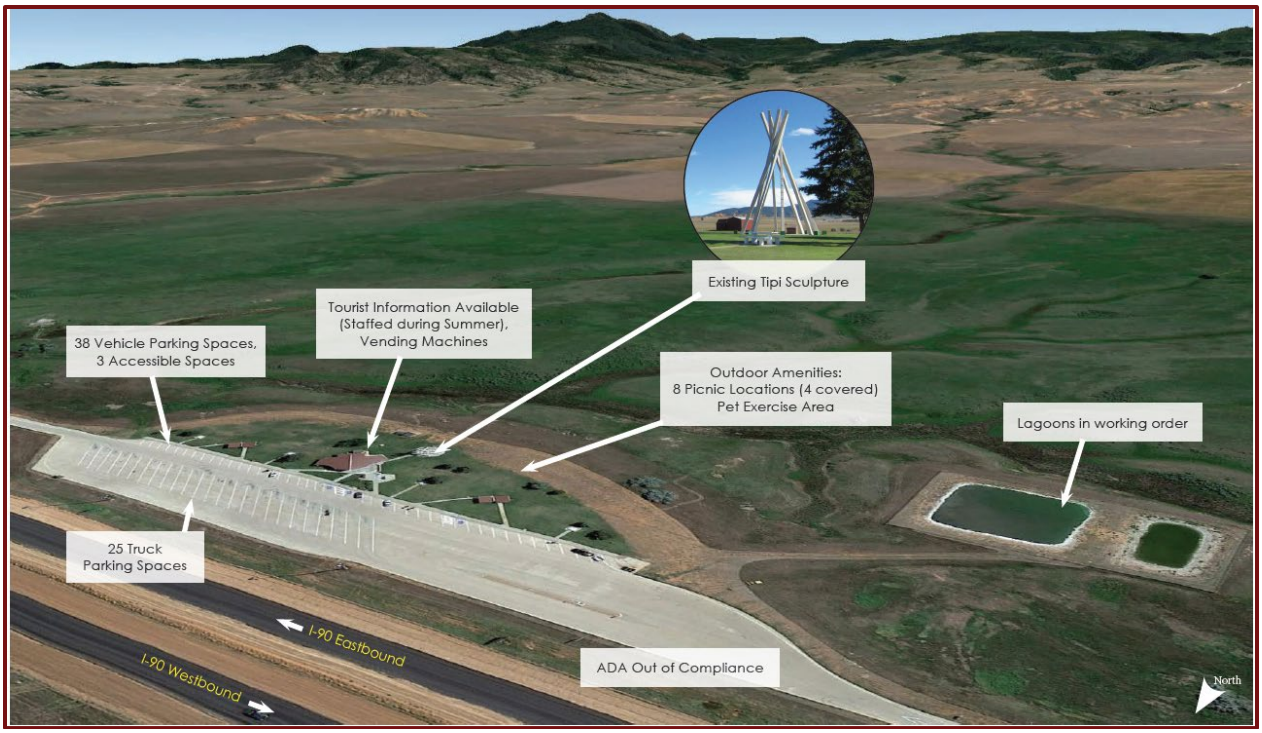


Figure 13 – Site details at the Existing Rest Area Location (MM 1)

4.2.2 Exit 10

The Exit 10 site concept is located north of I-90, in the northeast quadrant of the I-90 and US 85 North interchange, inside Spearfish city limits as seen in Figure 14. The location would serve both directions of I-90 traffic and US 85.

Traffic would access the site by heading north along US 85 a ½ mile, to Kerwin Lane then an additional ¾ of a mile to the site. The site would require 12 acres of land to construct. The site is situated on a portion of existing interstate right of way, which reduces the right of way needs from 12 acres to 10 acres. As the site concept is situated, the Exit 10 site would impact three properties.

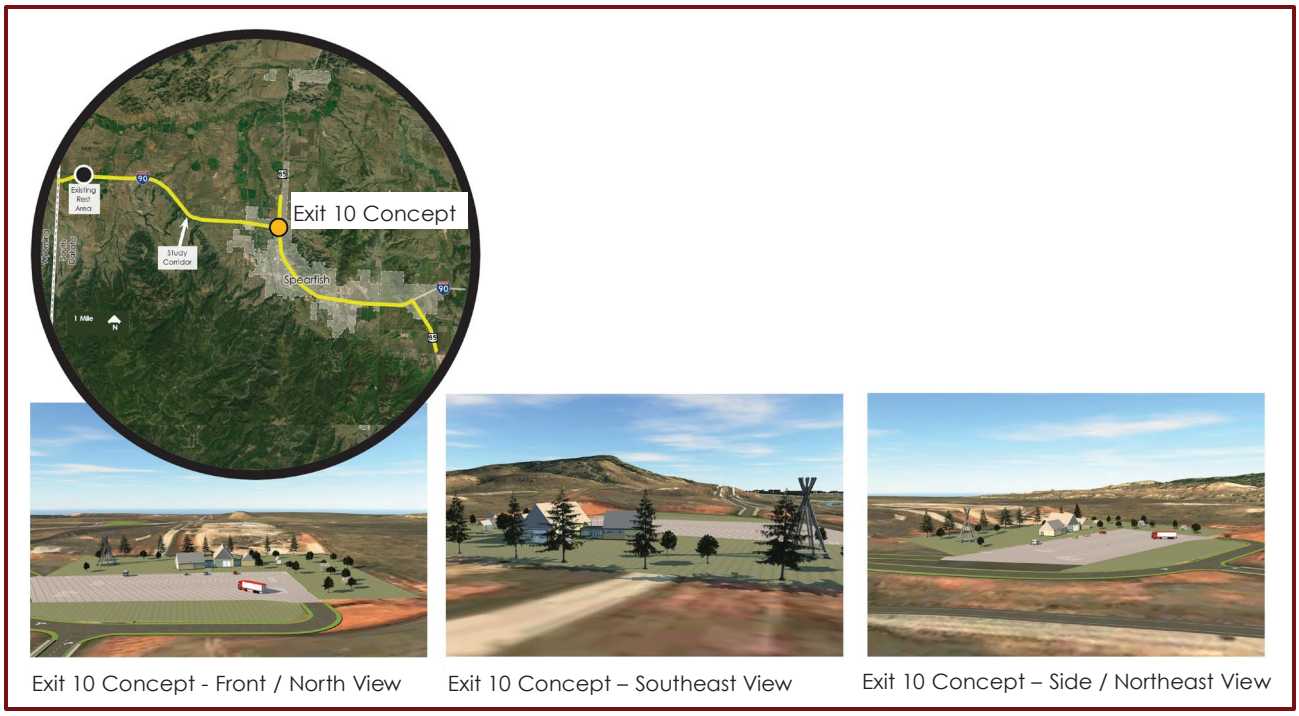
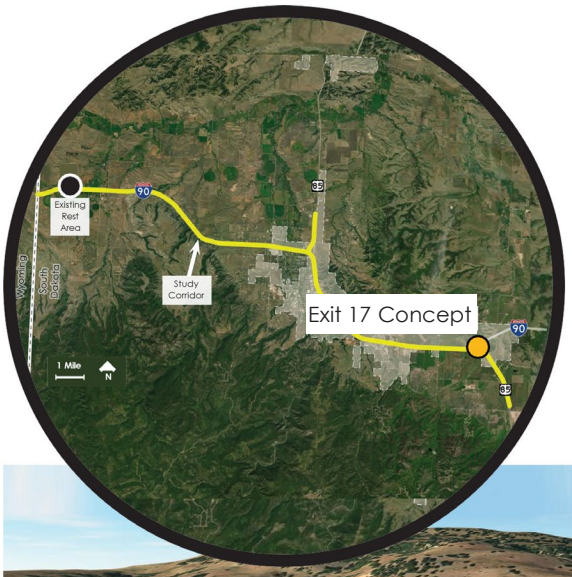


Figure 14 – Exit 10 Conceptual Layout

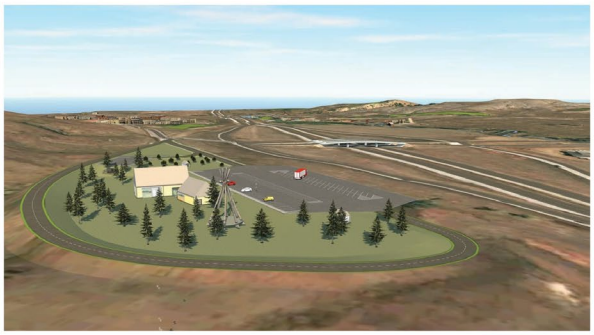
4.2.3 Exit 17

The Exit 17 site concept is located north of I-90, in the northwest quadrant of the I-90 and US 85 North interchange, inside Spearfish city limits as seen in Figure 15. The location would serve both directions of I-90 traffic.

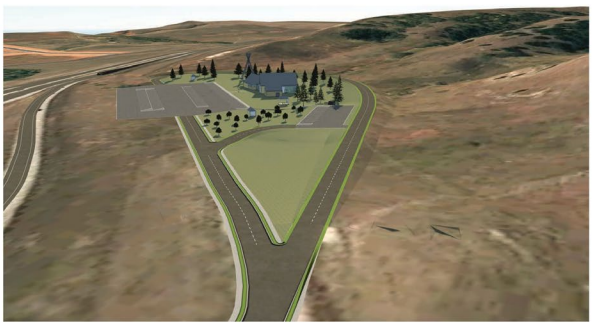
Traffic would access the site by heading north through the interchange 1/5 of a mile to the site. The site would require 9 acres, 2 acres of the total are part of existing interstate right of way. The remaining acreage would need to be acquired from two properties.



Exit 17 Concept - North View



Exit 17 Concept – East / Rear View



Exit 17 Concept – West / Front View

Figure 15 – Exit 17 Conceptual Layout

5 Site Analysis

The sites identified to move onto further analysis were the Existing Location (MRM 1), Exit 10, and Exit 17. Further analysis for each site included conceptual layouts, traffic analysis, utility evaluation, environmental screening, and estimated costs. A detailed evaluation matrix was developed to compare each site based on the following categories: safety, accessibility, cost, impact to existing development, truck friendly, impact to proposed development, environmental impact, welcoming, traffic impacts, and utilities. Details on site findings and the evaluation process for each site are described below.

5.1 Environmental Screening

An environmental screen was prepared to identify resources within the project study area and begin to evaluate the potential impacts to the human and natural environment that may result from the construction of a rest area/welcome center within the study area. The environmental screen included a desktop analysis of readily available data and a windshield survey of the environmental study area. Additionally, agency coordination letters were distributed requesting information from regulatory agencies and stakeholders. Environmental resources evaluated include:

- Airport Coordination
- Title VI/ Environmental Justice
- Wetland Review/Water Resources
- Climate Change/ Equity
- Floodplain
- Bicycle & Pedestrian Facilities
- Wild & Scenic Rivers
- Visual Resources & Aesthetics
- Wildlife, Threatened & Endangered Species
- Cultural Resources
- Air Quality
- 4(f)/6(f) Properties
- Hazardous Materials
- Land Use and Economic Resources
- Noise Impacts
- Community & Social Resources
- Right-of-Way, Acquisition, and Relocation Potential
- Prime and Unique Farmlands

Due to the distance between the sites and the lack of overlapping area, the environmental review discusses the three locations independently in the following sections. Paleontological resources, Section 6(f), air quality, and Wild and Scenic Rivers were determined to not be present in the project area or are not applicable at this point in the project process. These resources will be further reviewed in the NEPA phase.

To be conservative of the findings, any environmental resources that had potential impacts or required further coordination with respective agency to ensure a “no impacts” determination, have been categorized as having an impact. The full Environmental Screening Report can be found in Appendix E.

5.1.1 Existing Location (MRM 1)

During the screening process, the environmental resources listed below were identified as having a potential impact to the existing location.

Impacted Environmental Resources and Summary of Findings for the Existing Location:

- **Wetland Review/Water Resources**

  Impacts to wetlands will require coordination with the U.S. Army Corps of Engineers (USACE). The USACE will need to review the alternatives under consideration to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) for jurisdictional wetlands 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 proposed project will require a General Permit for Storm Water Discharges Associated with Construction Activities and the use of sediment and erosion control measures. During design the project should consider the use of best management practices (BMPs) from the SDDOT Erosion Control Guide.

  A Storm Water Pollution Prevention Plan (SWPPP) will also be required to implement groundwater contamination prevention measures. A National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit will be required from the SDDANR. The SWPPP will need to address onsite dewatering strategies.

- **Wildlife, Threatened & Endangered Species**

  No critical habitats have been identified within the study area. Known species within the USFWS IPaC include Northern Long-eared Bat, Tricolored Bat, Red Knot, and the Monarch Butterfly. If a Red Knot or Monarch Butterfly is sighted in the vicinity of the project or staging areas associated with the project, cease construction activities in the affected area until the Red Knot and/or Monarch Butterfly departs and immediately contact the Project Engineer. Additionally, if a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

  To determine if impacts are anticipated, coordination with the US Fish and Wildlife Service will be undertaken once construction limits are determined. Coordination with the USFWS and South Dakota Game Fish & Parks will be required if any Tree removal is needed between November 1 and March 31. 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 employed, and mitigation implemented.

- **Cultural Resources**

  The concrete tipi located at the existing rest area is listed on the National Register of Historic Properties as part of the Concrete Interstate Tipis of South Dakota Multiple Property Listing. The tipi was constructed for display at the current rest area; therefore, a determination of effect will need to be undertaken if any impacts are anticipated.

- **4(f)/6(f) Properties**

  The concrete tipi —a Section 4(f) property on the National Register of Historic Properties— is located at the existing rest area. Any impacts to the tipi would trigger a 4(f) evaluation. No 6(f) properties are located within the one-mile buffer of grading limits.

- **Visual Resources & Aesthetics**

  Any impacts to the concrete Tipi, particularly the relocation of the Tipi, would create visual changes and feel of the environment. Any anticipated impacts to the Tipi would require Section 4(f) review.

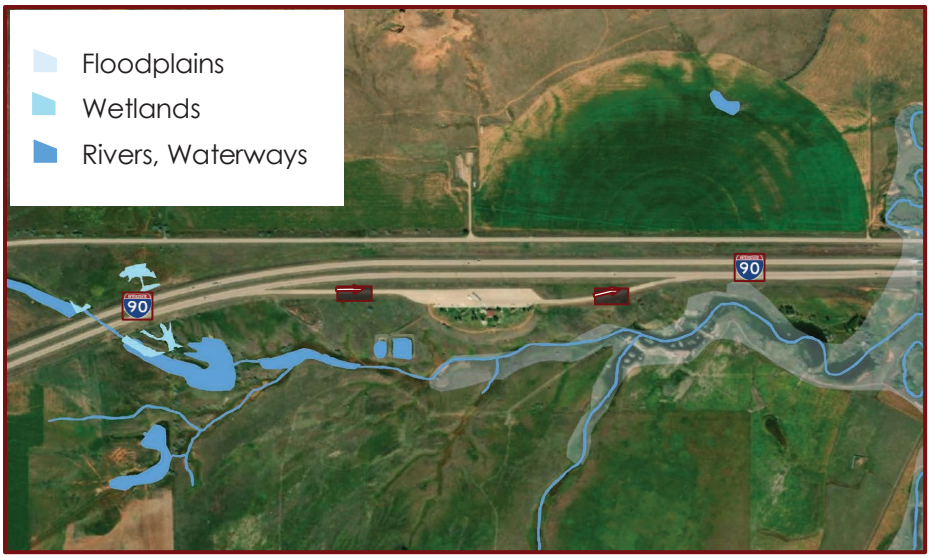
- **Prime and Unique Farmlands**

  Farmland of statewide importance was identified within the corridor. During NEPA, a review of the National Cooperative Soil Survey for all current project alternatives should be conducted using the Farmland Conversion Impact Rating Form. The form should be submitted to the local NRCS field office for review and determination of impacts.

- **Noise**

  Construction of a new rest area would be a Type I project, indicating that a noise analysis is required. The analysis should discuss if sensitive receptors are in proximity. The noise study should be completed in the NEPA phase of the project and needs to consider construction noise related to the project as well as traffic noise for the build and future conditions. If impacts are identified, an analysis of mitigation measures needs to be undertaken and public consultation is required.

The full table of environmental resources reviewed, potential resource impacted, and a summary of findings and mitigation measures can be found in Appendix E, the Environmental Screening Report.



← Existing Location Key Site Differentiators:

- Tipi sculpture kept in place.
- No land acquisition required.

Figure 16 – Existing Location Key Environmental Site Differentiators

5.1.2 Exit 10

During the screening process, the environmental resources listed below were identified as having a potential impact to the Exit 10 location.

Impacted Environmental Resources and Summary of Findings for Exit 10:

- **Wetland Review/Water Resources**

  Impacts to wetlands will require coordination with the U.S. Army Corps of Engineers (USACE). The USACE will need to review the alternatives under consideration to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) for jurisdictional wetlands 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 proposed project will require a General Permit for Storm Water Discharges Associated with Construction Activities and the use of sediment and erosion control measures. During design the project should consider the use of best management practices (BMPs) from the SDDOT Erosion Control Guide.

  A Storm Water Pollution Prevention Plan (SWPPP) will also be required to implement groundwater contamination prevention measures. A National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit will be required from the SDDANR. The SWPPP will need to address onsite dewatering strategies.

- **Wildlife, Threatened & Endangered Species**

  No critical habitats have been identified within the study area. Known species within the USFWS IPaC include Northern Long-eared Bat, Tricolored Bat, Red Knot, and the Monarch Butterfly. If a Red Knot or Monarch Butterfly is sighted in the vicinity of the project or staging areas associated with the project, cease construction activities in the affected area until the Red Knot and/or Monarch Butterfly departs and immediately contact the Project Engineer. Additionally, if a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

  To determine if impacts are anticipated, coordination with the US Fish and Wildlife Service will be undertaken once construction limits are determined. Coordination with the USFWS and South Dakota Game Fish & Parks will be required if any Tree removal is needed between November 1 and March 31. 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 employed, and mitigation implemented.

- **Cultural Resources**

  If the Exit 10 site is selected and a new rest area constructed, the existing rest area will close. The concrete tipi located at the existing rest area is part of the Concrete Interstate Tipis of South Dakota Multiple Property Listing. Further study will be required to determine if it is feasible to move the concrete tipi to a new site or if another mitigation strategy is used.

- **4(f)/6(f) Properties**

  If the 106 Process determines that impacts to the tipi located at the existing rest area are expected, an evaluation will need to be completed for impacts to historical properties under Section 4(f) of the Department of Transportation Act of 1966. No 6(f) properties are located within the one-mile buffer of grading limits.

- **Prime and Unique Farmlands**

  Farmland of statewide importance was identified within the corridor. During NEPA, a review of the National Cooperative Soil Survey for all current project alternatives should be conducted using the Farmland Conversion Impact Rating Form. The form should be submitted to the local NRCS field office for review and determination of impacts.

- **Hazardous Materials**

  Several hazardous material investigations have occurred within the Exit 10 location. For a couple of the investigations, proper clean-up actions have been taken and investigations have a “closure” status. However, the site of the alternative is noted to have a small potential impact to contaminated materials.

To ensure proper handling of these materials, data should be pulled again and coordination with SDDANR Hazardous Waste Section is a must to conduct and discuss requirements regarding the storage, treatment, transport, and disposal of hazardous waste in the state of South Dakota during the NEPA process. A mitigation plan should be developed to manage any hazardous waste encounters. These hazardous waste and solid waste mitigation measures shall be carried forward through the NEPA documentation and into the SDDOT environmental commitments for this project.

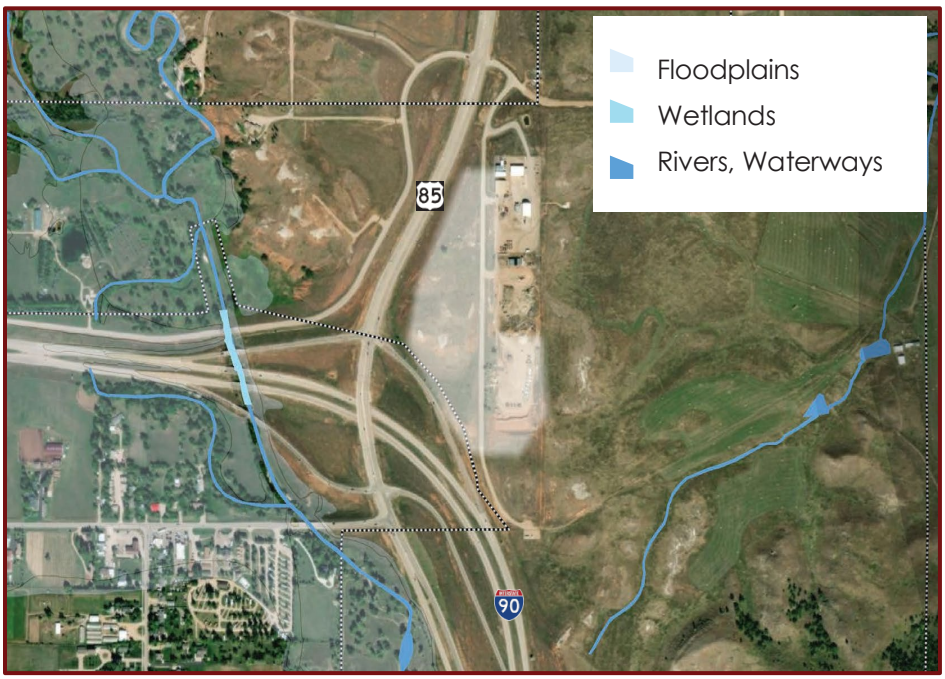
- **Noise**

  Construction of a new rest area would be a Type I project, indicating that a noise analysis is required. The analysis should discuss if sensitive receptors are in proximity. The noise study should be completed in the NEPA phase of the project and needs to consider construction noise related to the project as well as traffic noise for the build and future conditions. If impacts are identified, an analysis of mitigation measures needs to be undertaken and public consultation is required.

- **Right-of-Way, Acquisition, and Relocation Potential**

  The Lawrence County storage yard and two additional parcels abutting the site may be impacted. Early coordination and communication with the proper agencies and property owners are recommended.

The full table of environmental resources reviewed, potential resource impacted, and a summary of findings and mitigation measures can be found in Appendix E, the Environmental Screening Report.



← Exit 10 Key Site Differentiators:

- Tipi sculpture relocated.
- Three possible land acquisitions required.

Figure 17 – Exit 10 Key Environmental Site Differentiators

5.1.3 Exit 17

During the screening process, the environmental resources listed below were identified as having a potential impact to the Exit 17 location.

Impacted Environmental Resources and Summary of Findings for Exit 17:

- **Wetland Review/Water Resources**

  Impacts to wetlands will require coordination with the U.S. Army Corps of Engineers (USACE). The USACE will need to review the alternatives under consideration to determine the Least Environmentally Damaging Practicable Alternative (LEDPA) for jurisdictional wetlands 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 proposed project will require a General Permit for Storm Water Discharges Associated with Construction Activities and the use of sediment and erosion control measures. During design the project should consider the use of best management practices (BMPs) from the SDDOT Erosion Control Guide.

  A Storm Water Pollution Prevention Plan (SWPPP) will also be required to implement groundwater contamination prevention measures. A National Pollutant Discharge Elimination System (NPDES) Construction Storm Water Permit will be required from the South Dakota Department of Environment and Natural Resources. The SWPPP will need to address onsite dewatering strategies.

- **Wildlife, Threatened & Endangered Species**

  No critical habitats have been identified within the study area. Known species within the USFWS IPaC include Northern Long-eared Bat, Tricolored Bat, Red Knot, and the Monarch Butterfly. If a Red Knot or Monarch Butterfly is sighted in the vicinity of the project or staging areas associated with the project, cease construction activities in the affected area until the Red Knot and/or Monarch Butterfly departs and immediately contact the Project Engineer. Additionally, if a nest is observed within one mile of the project site, notify the Project Engineer immediately so that he/she can consult with the Environmental Office for an appropriate course of action.

  To determine if impacts are anticipated, coordination with the US Fish and Wildlife Service will be undertaken once construction limits are determined. Coordination with the USFWS and South Dakota Game Fish & Parks will be required if any Tree removal is needed between November 1 and March 31. 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 employed, and mitigation implemented.

- **Cultural Resources**

  The Frawley Historic Ranch is located east of the proposed site and has been identified as a historic landmark. While no impacts are anticipated, coordination with SHPO is recommended to receive formal determination once project limits have been defined.

  If the Exit 17 site is selected and a new rest area constructed, the existing rest area will close. The concrete tipi located at the existing rest area is part of the Concrete Interstate Tipis of South Dakota Multiple Property Listing.

  Further study will be required to determine if it is feasible to move the concrete tipi to a new site or if another mitigation strategy is used.

- **4(f)/6(f) Properties**
- Potential impacts to Frawley Ranch. A Section 4(f) review may be required. Additionally, closure of the existing site may affect the concrete tipi located at the current rest area. If the 106 Process determines that impacts to the tipi located at the existing rest area are expected, an evaluation will need to be completed for impacts to historical properties under Section 4(f) of the Department of Transportation Act of 1966. No 6(f) properties are located within the one-mile buffer of grading limits.**Land Use, Community, Social, and Economic Resources**

  As the purpose of rest areas is for travelers to rest and manage their needs within the State of South Dakota, the nature of the project will not induce growth, change land uses, or substantially change travel patterns within a community. Due to the development occurring along the corridor, the needs of future developments, changes to access requirements, or changes in traffic patterns would need to be reviewed in detail. During the NEPA process, socioeconomic resources should be evaluated for potential direct and indirect impacts.

- **Prime and Unique Farmlands**

  Farmland of statewide importance was identified within the corridor. During NEPA, a review of the National Cooperative Soil Survey for all current project alternatives should be conducted using the Farmland Conversion Impact Rating Form. The form should be submitted to the local Natural Resource Conservation Service (NRCS) field office for review and determination of impacts.

- **Noise**

  Construction of a new rest area would be a Type I project, indicating that a noise analysis is required. The analysis should discuss if sensitive receptors are in proximity. The noise study should be completed in the NEPA phase of the project and needs to consider construction noise related to the project as well as traffic noise for the build and future conditions. If impacts are identified, an analysis of mitigation measures needs to be undertaken and public consultation is required.

- **Right-of-Way, Acquisition, and Relocation Potential**

Additional ROW acquisition may be required for Exit 17. Early coordination and communication with the property owner are recommended.

The full table of environmental resources reviewed, potential resource impacted, and a summary of findings and mitigation measures can be found in Appendix E, the Environmental Screening Report.

← Exit 17 Key Site Differentiators:

- Tipi sculpture relocated.
- Two possible land acquisition s required.

Figure 18 – Exit 17 Key Environmental Site Differentiators

5.1.4 Environmental Conclusions

For the build alternatives under consideration for the rest area, no significant effects on the environment have currently been identified. Based on early input from project stakeholders, review of the project area, and past experience on similar actions, the Spearfish Rest Area Project is not anticipated to have significant social, economic, or environmental impacts (individually or cumulatively). These preliminary indications suggest that the project could fall under the category for a Class II: Categorical Exclusion (CE).

To qualify as a CE it must be sufficiently evident that the project will not:

- Induce significant impacts to planned growth or land use for the area
- Require the relocation of significant numbers of people
- Have a significant impact on any natural, cultural, recreational, historic, or other resource

- Involve significant air, noise, or water quality impacts

The Spearfish Rest Area Project will require a federal permit/approval and will therefore be considered a federal action under the FHWA's responsibility. Regardless of the NEPA class selected, the environmental review will still need to demonstrate compliance with all other environmental laws and regulations including Section 106 clearance, Threatened & Endangered Species concurrence, agency reviews and coordination. As the NEPA process progresses, if it is determined that the level of controversy or degree of impacts exceeds the anticipated levels, the FHWA or SDDOT may require the assumed class of action be elevated to a higher NEPA documentation level (EA).

5.2 Traffic Analysis

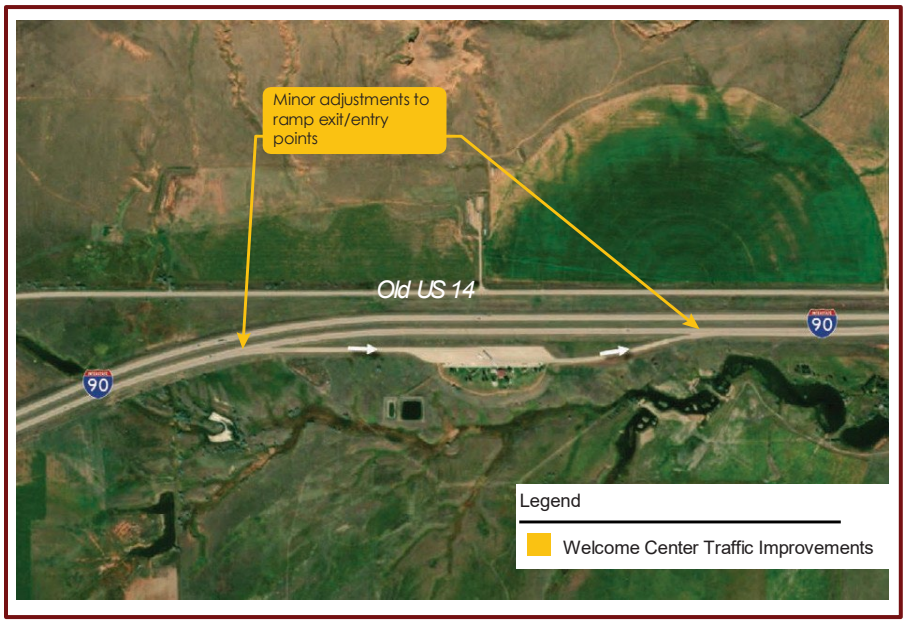
A Traffic Analysis Screening Report was completed for each potential site and can be found in Appendix A. The traffic analysis addresses current and future traffic conditions at intersections and identifies transportation improvements needed to maintain acceptable traffic operations (desired Level of Service [LOS] C or better) into the future with general traffic growth and the addition of rest area/welcome center traffic. Traffic projections for the future were broken up into near-term future (2028) and long term future (2050).

The following sections discuss the key traffic elements for each of the three potential sites. A Traffic Safety Memorandum and a Truck Parking Memorandum were also completed as part of the Traffic Analysis Screening Report and are provided in Appendix A.

5.2.1 Existing Location (MRM 1)

Traffic volumes entering the rest area were recorded during the summer of 2022. Weekday traffic and vehicle classification counts were recorded over the course of a week in mid-July, and weekend counts were recorded in late August. Figure 20 provides a graphical depiction of existing traffic levels at the rest area, including eastbound mainline I-90 traffic volumes. Both ramp junctions currently operate at LOS A during both weekday peak hours.

Future traffic projections were developed assuming a growth rate of approximately 2 percent per year to 2050, and near-term future (2028) traffic volumes were interpolated based on linear growth. In future traffic conditions, ramp junctions continue to operate at LOS A. Figure 21 and Figure 22 represent total traffic volumes and operations with a rest area/welcome center provided at the existing rest area location.



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At MRM 1, the addition of a reconstructed rest area/welcome center would necessitate minor adjustments to the ramp exit/entry points. No other improvements would be anticipated.

Figure 19 – MRM 1 Traffic Improvement Summary

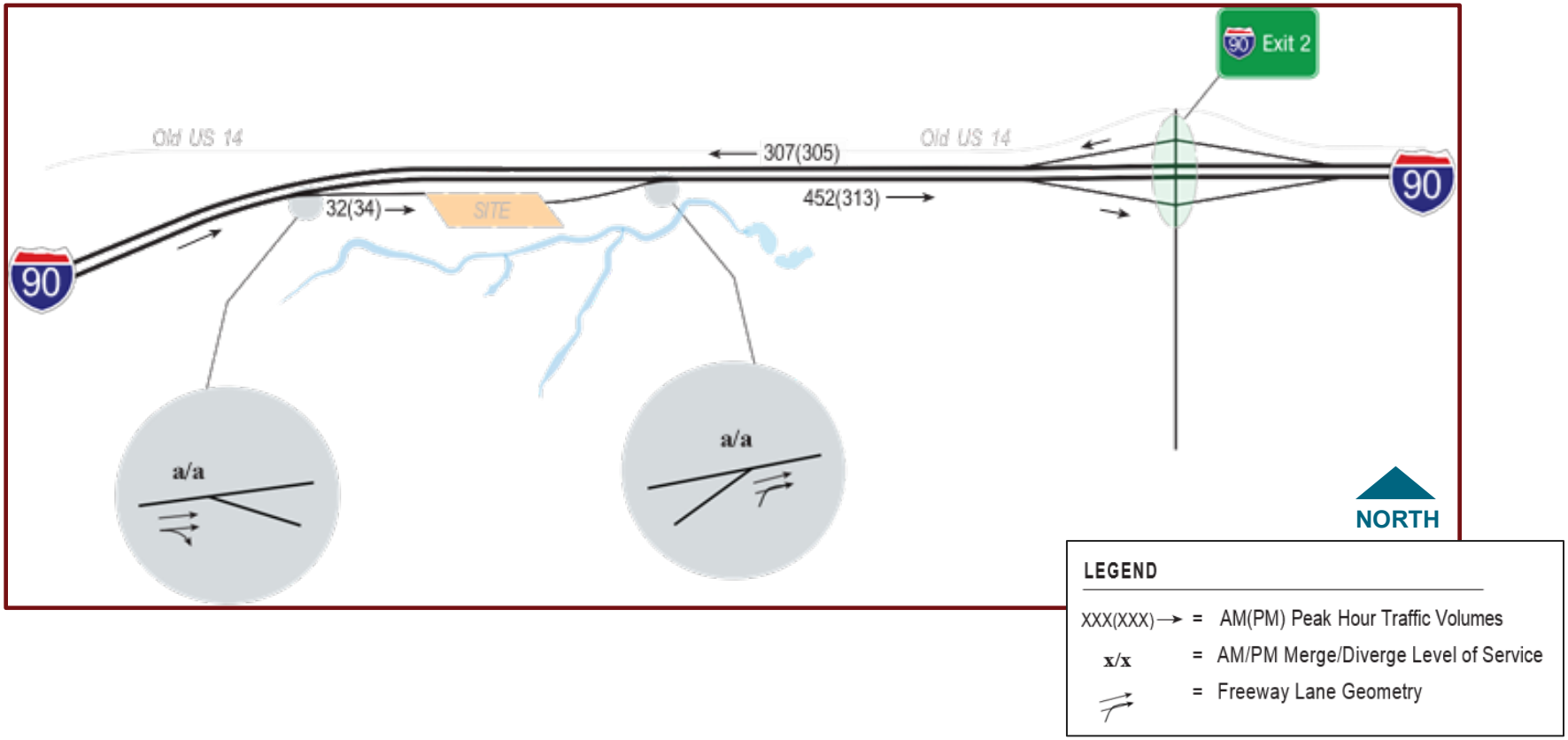

Figure 20 – MRM 1 Existing (2023) Traffic Conditions

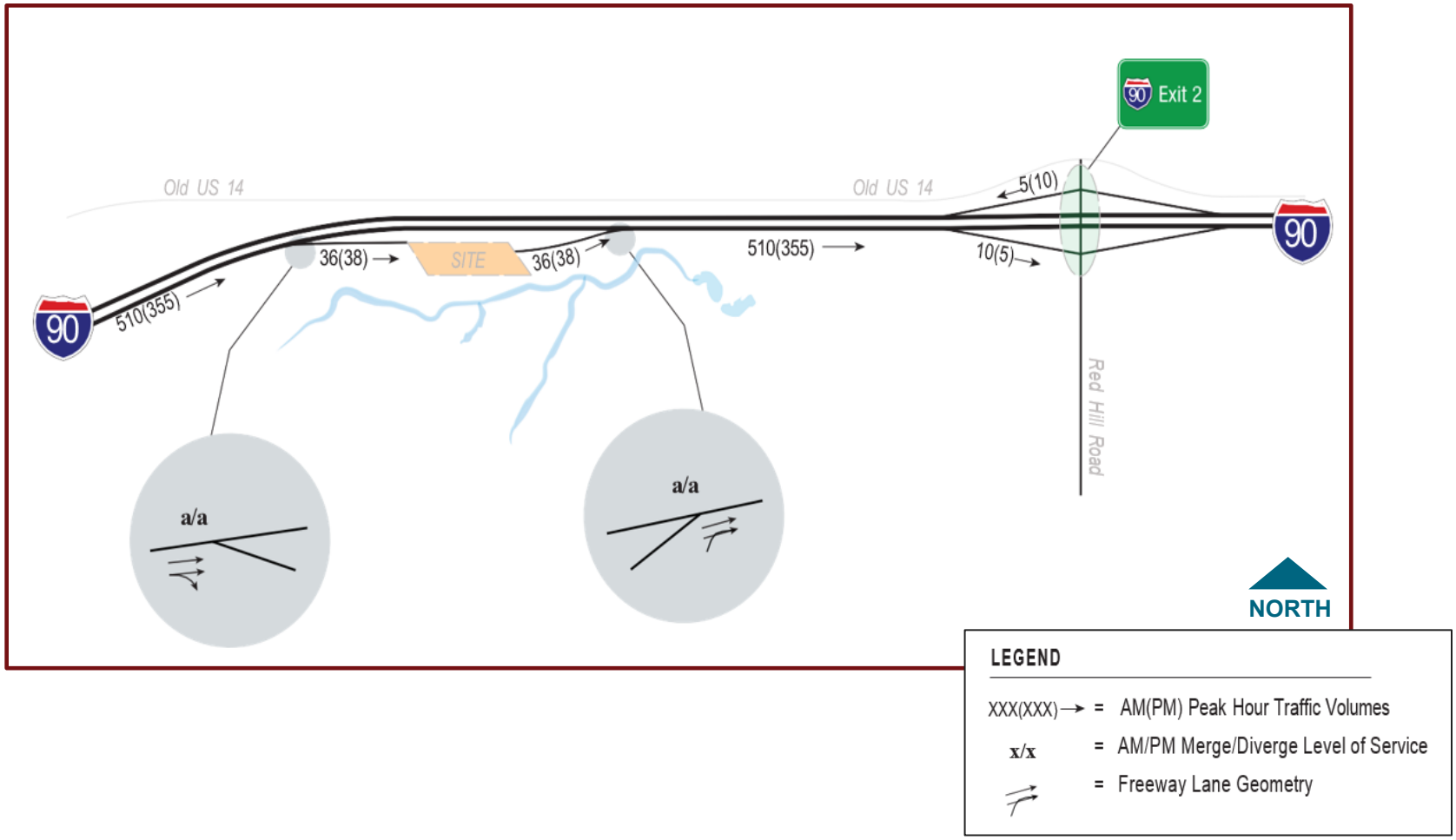

Figure 21 – MRM 1 Near Term Future (2028) Traffic Conditions

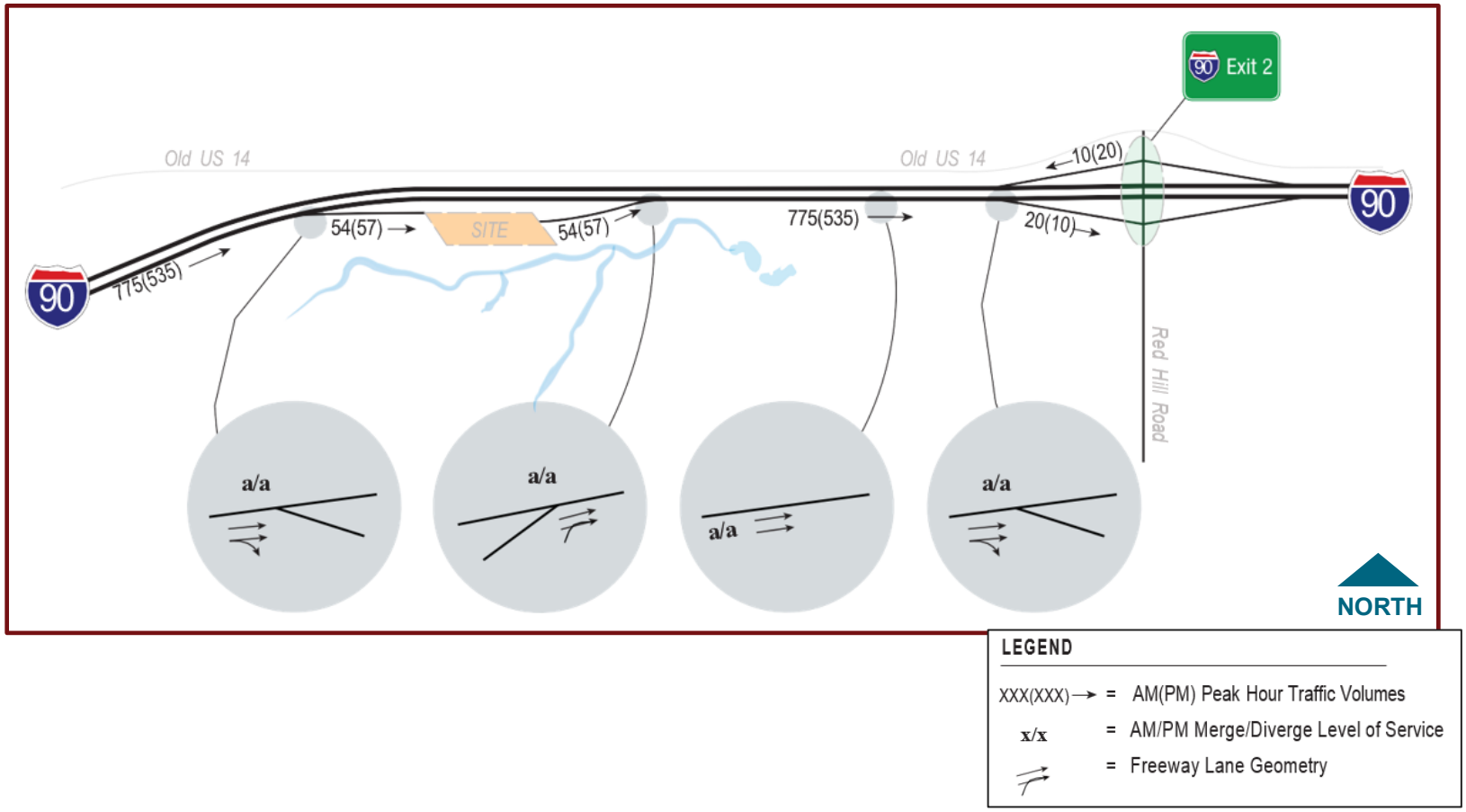

Figure 22 – MRM 1 Long Term Future (2050) Traffic Conditions

5.2.2 Exit 10

5.2.2.1 Existing Conditions

Year 2023 traffic volumes at the Exit 10 interchange were assembled using the following steps:

1. Compiled Year 2019 weekday AM and PM peak hour traffic counts for the interchange ramp terminal intersections recorded as a part of the 2020 Decennial Interstate Corridor Study (ICS).
2. Conducted traffic counts in January 2023 at the US 85/Kerwin Lane and North Avenue/Old US 14 intersections.
3. Assembled balanced traffic volume dataset through interchange representing a January 2023 condition, adding traffic volume to the counts from Step #1 as needed to create volume balance between adjacent intersections.
4. Applied seasonal adjustment factor of 1.6 to represent peak month (July 2023) condition. SDDOT furnished this factor to the study team. July levels reflect the highest traffic volume month of the year.

Figure 24 shows the existing traffic conditions at Exit 10. Existing deficiencies include:

- Stop-controlled minor street approach movements operate at LOS F during AM or PM peak hours at the ramp terminal intersections, and at LOS D at the US 85/Kerwin Lane intersection.
- Eastbound stop sign controlled movements at the North Street/Old US 14 intersection operate at LOS F.
- The intersection of North Street/Old US 14 is 150-feet away from the eastbound ramp terminal intersection which has contributed to safety concerns.

5.2.2.2 Future Conditions

Background traffic conditions represent the influence of future growth without the addition of welcome center traffic volumes. Background traffic growth would result in the operational outcomes depicted below in the Table 2.

Site generated traffic conditions represent the influence of future growth with the addition of welcome center traffic volumes. The addition of a welcome center would attract visitors passing the site along I-90 and along US 85. Figure 25 and Figure 26 depict total 2028 and 2050 traffic conditions at the intersections (background traffic + site generated traffic).

Similar operational results to those described in the background analysis section are seen here except for the US 85/Kerwin Lane intersection needing signalization. This means that all other deficiencies could potentially be an issue with or without a rest area; however, the addition of rest area/welcome center traffic impacts US 85/Kerwin Lane (signalization needed).

Table 2 - Exit 10 Area Background Traffic Operations Findings

Intersection	Year	Operational Findings	Potential Operational Treatments
US 85/Kerwin Lane	2028	Deficient operations along WB stop controlled approach	Add WB exclusive left turn lane; maintain stop control as signalization likely not warranted
	2050		
Exit 10 WB Ramp Terminal	2028	Deficient operations along WB stop controlled approach	Add WB exclusive left turn lane; signalize intersection when warrant is met to achieve LOS C or better conditions[1]
	2050		
Exit 10 EB Ramp Terminal	2028	Deficient operations along EB stop controlled approach	Add EB exclusive left turn lane; signalize intersection when warrant is met to achieve LOS C or better conditions[1]
	2050		
North Avenue/ Old US 14	2028	Deficient operations along WB stop controlled approach; close access spacing from EB ramp terminal	Widen EB approach to provide exclusive left and right turn lanes to prevent left turns from blocking right turns. Consider restricting intersection movements[2]
	2050		

[1]Also identified as potential option in 2020 Decennial ICS (Phase 2)
[2]In 2020 Decennial ICS, potential treatments for this intersection included restricting movements to right-turn only and providing alternative routing for left turns.

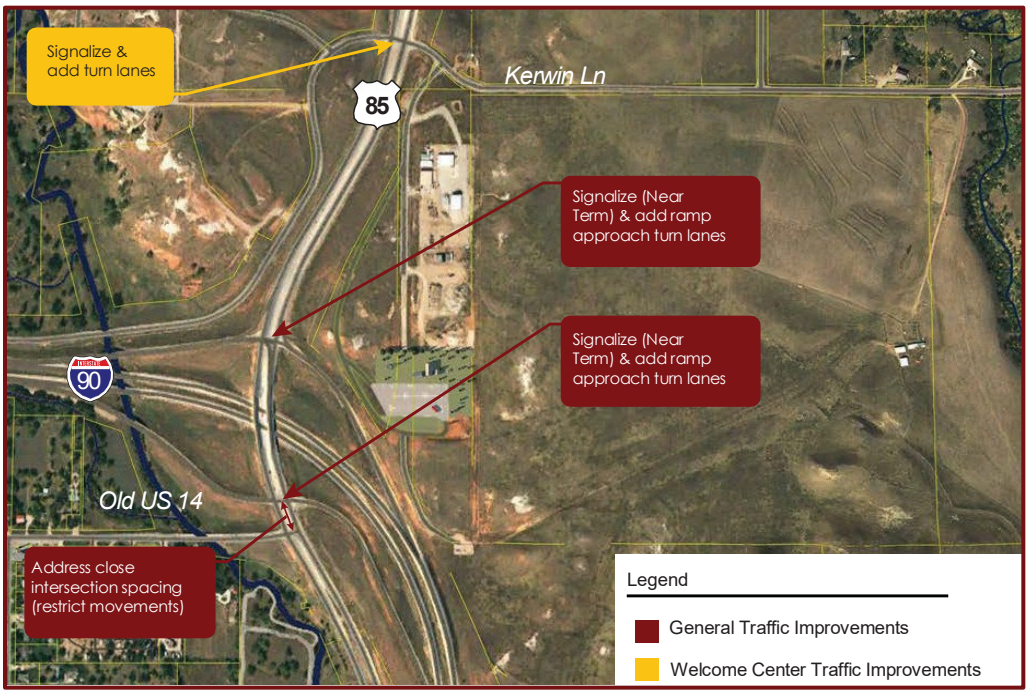

Figure 23 – Exit 10 Traffic Improvement Summary

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At Exit 10, construction of a rest area/welcome center would necessitate signalization at US 85/Kerwin Ln. The remaining improvement suggestions are due to general traffic growth in the area.

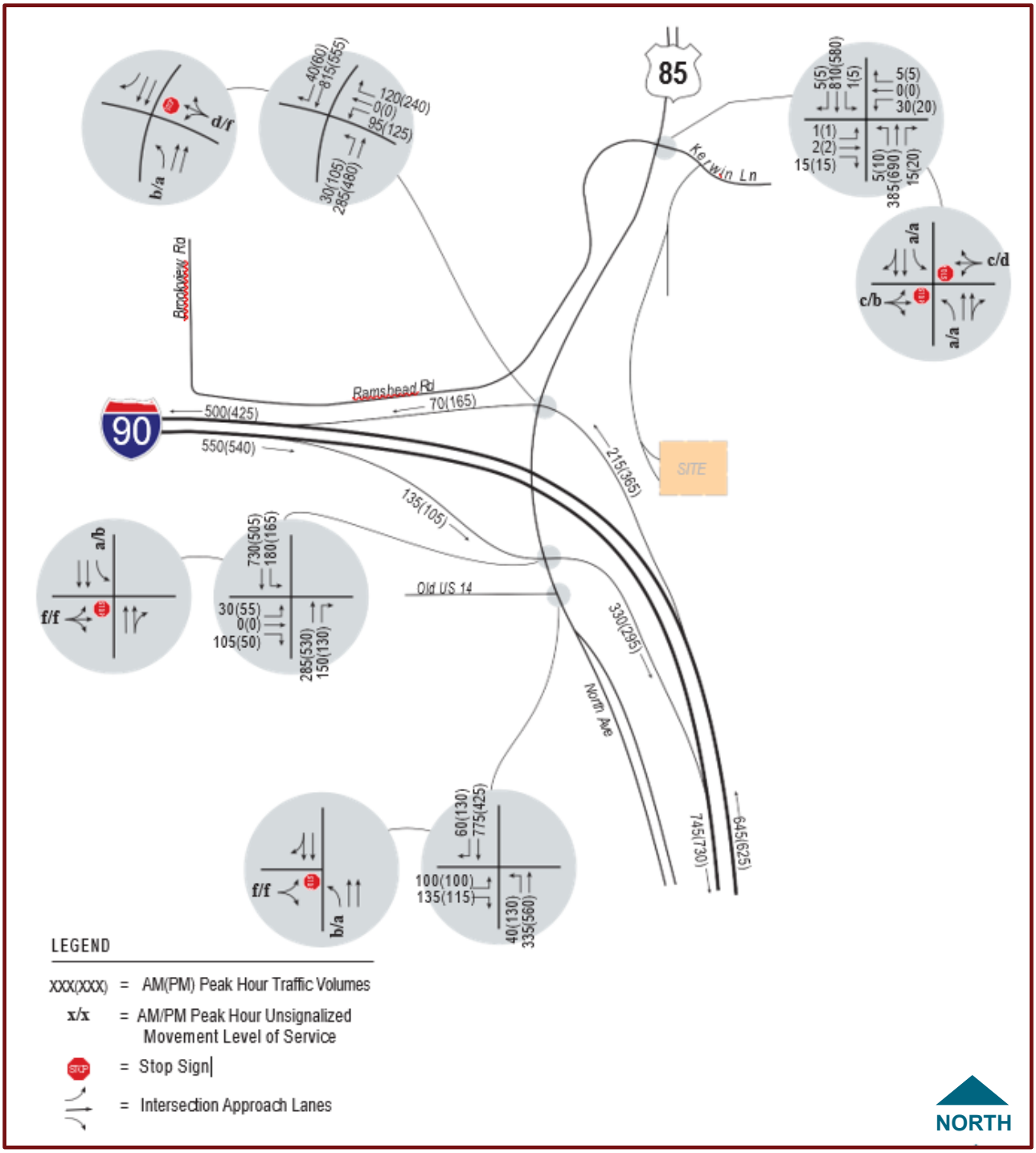

Figure 24 – Exit 10 Existing (2023) Traffic Conditions

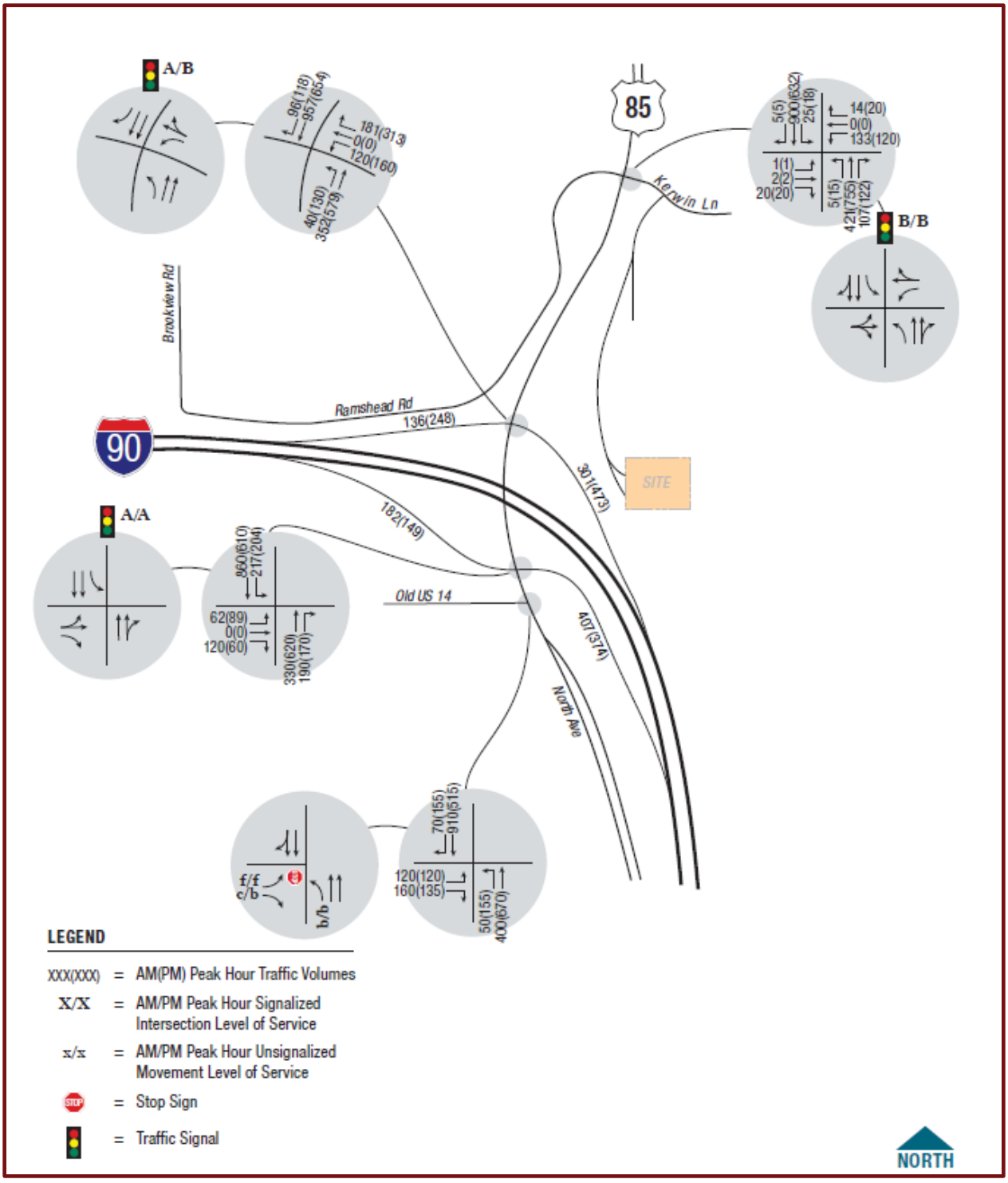

Figure 25 – Exit 10 Near Term Future (2028) Total Traffic Conditions

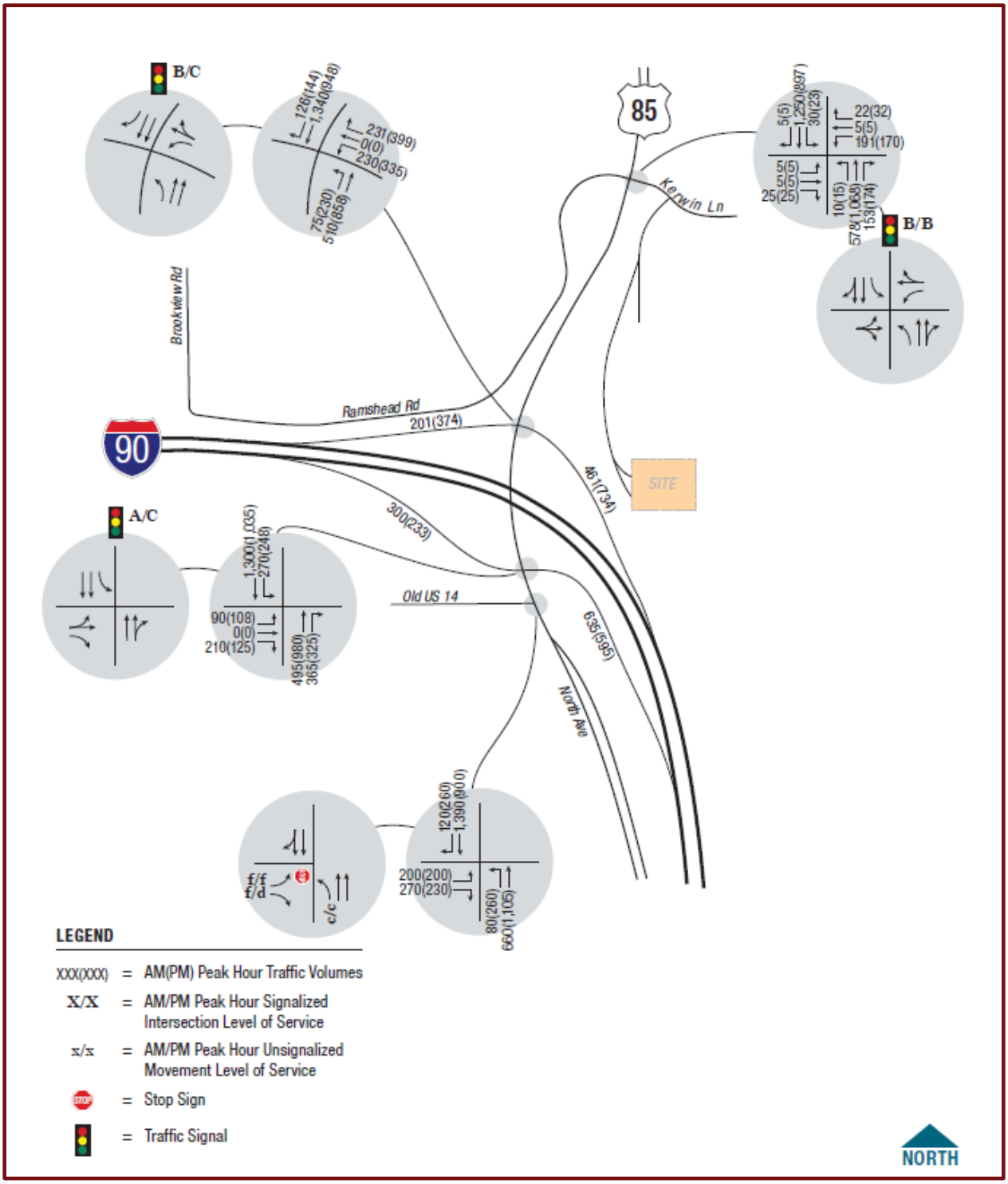

Figure 26 – Exit 10 Long Term Future (2050) Total Traffic Conditions

5.2.3 Exit 17

5.2.3.1 Existing Conditions

Year 2023 traffic volumes at the Exit 17 interchange were assembled using the following steps:

1. Compile Year 2019 weekday AM and PM peak hour traffic counts for the interchange ramp terminal intersections recorded as a part of the 2020 Decennial ICS.
2. Use available traffic counts taken in November 2022 at the three analyzed intersections. Counts were conducted as a part of the ongoing US Highway 85 Deadwood Corridor Study.
3. Apply the seasonal adjustment factor of 2.2 to adjust November traffic levels to represent peak month (July 2023) condition. SDDOT provided this factor to the study team. July levels reflect the highest traffic volume month of the year.

Figure 28 shows the existing traffic conditions at Exit 17. Existing deficiencies include:

- Stop-controlled eastbound and westbound ramp approach movements operate at LOS F during AM or PM peak hours at the ramp terminal intersections.

5.2.3.2 Future Conditions

Background traffic conditions represent the influence of future growth without the addition of welcome center traffic volumes. Site-generated traffic volumes for a potential proposed development site near Exit 17 were estimated and included in background traffic forecasts to reflect significant development expectations within the future year background traffic analyses.

The proposed development site would occupy approximately 500 undeveloped acres located north and west of Exit 17. Anticipated development types include retail, residential, lodging and dining uses. The development was considered in two phases. Phase 1 would be completed by 2028, take vehicular access to/from Rainbow Road and add some vehicular traffic to the Exit 17 interchange, phase 2 would complete the remainder of the development by the Year 2050 and would include the addition of a new north roadway connection to Exit 17. Background traffic growth would result in the operational outcomes described in Table 3.

Site generated traffic conditions represent the influence of future growth with the addition of welcome center traffic volumes. The addition of a welcome center would attract visitors passing the site along I-90 and along US 85. Figure 29 and Figure 30 depict total 2028 and 2050 traffic conditions at the intersections. Traffic volumes are the sum of background and site generated vehicle trips. Operational findings for the interchange ramp terminal intersections outline similar operational needs to those described in the background analysis section.

The addition of rest area/welcome center traffic to the Park-n-Ride/Duke Parkway intersection would heighten operational concerns already present due to background traffic growth. In light of this, the background recommendation to keep the WB ramp terminal intersection separate from the Duke Parkway/rest area/welcome center access intersection is upheld. The Duke Parkway intersection should be located a minimum of 300 feet north of the WB ramp terminal intersection. A consolidated 6-leg roundabout at this location would not function acceptably.

As shown, 2050 conditions with or without rest area/welcome center traffic would require signalization and turn lanes at the ramp terminal intersections and changes to the Duke Parkway intersection. In the Year 2028 scenario, the addition of site traffic catalyzes the need for signalization of the eastbound ramp terminal intersection.

Table 3 - Exit 17 Area Background Traffic Operations Findings

Intersection	Year	Operational Findings	Potential Operational Treatments
Duke Pkwy/ Park-n- Ride Lot	2028	Acceptable operations with existing laneage and traffic control	None identified
	2050	Deficient operations at two-way stop-controlled intersection with added north approach and associated traffic volumes	Four options considered: • All-way STOP control • Install traffic signal (LOS B/B) • Install 4-leg roundabout (LOS A/A) • Install 6-leg roundabout joining WB ramp terminal intersection with Duke Pkwy intersection (LOS D/F)
Exit 17 WB Ramp Terminal	2028	Deficient operations along WB stop controlled approach	Add WB exclusive left turn lane; signalize intersection when warrant is met to achieve LOS B or better conditions[1]
	2050	Deficient operations along WB stop controlled approach; NB left turn congestion	Add SB through lane, SB right turn lane and NB dual left turn lanes to 2028 treatments to achieve LOS C or better conditions
Exit 17 EB Ramp Terminal	2028	Acceptable operations with existing laneage and traffic control	None identified
	2050	Deficient operations along EB stop-controlled approach; NB right turn congestion	Add EB exclusive free right turn lane, restripe SB approach to provide exclusive left turn lane, provide exclusive NB right turn lane, signalize intersection when warrant is met to achieve LOS D or better conditions[1]

[1]Similar option identified in 2020 Decennial ICS

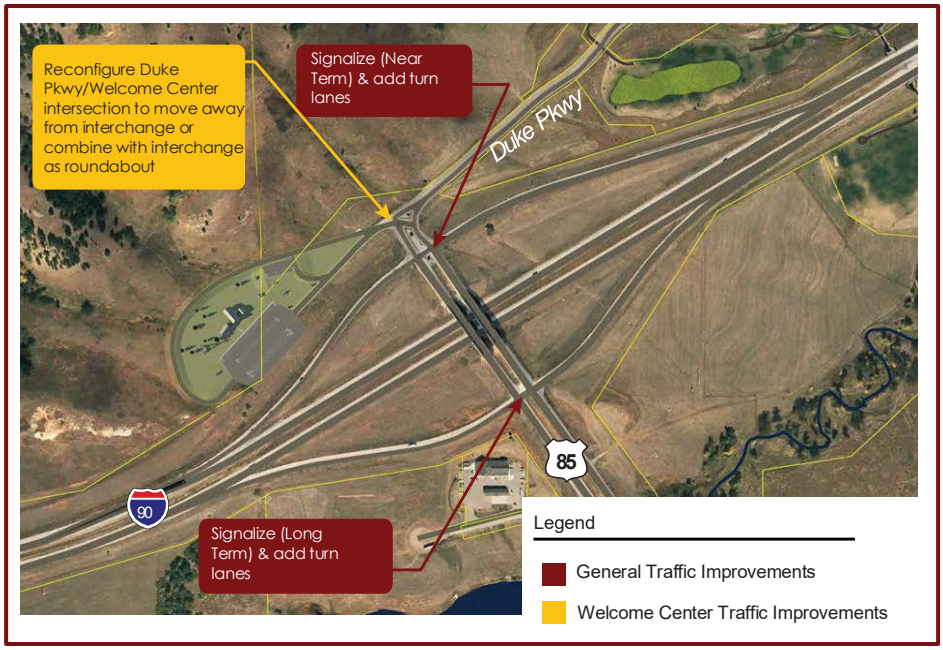

Figure 27 – Exit 17 Traffic Improvement Summary

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At Exit 17, construction of a rest area/welcome center would necessitate a reconfiguration of Dule Pkwy/Welcome Center intersection. The remaining improvement suggestions are due to general traffic growth in the area.

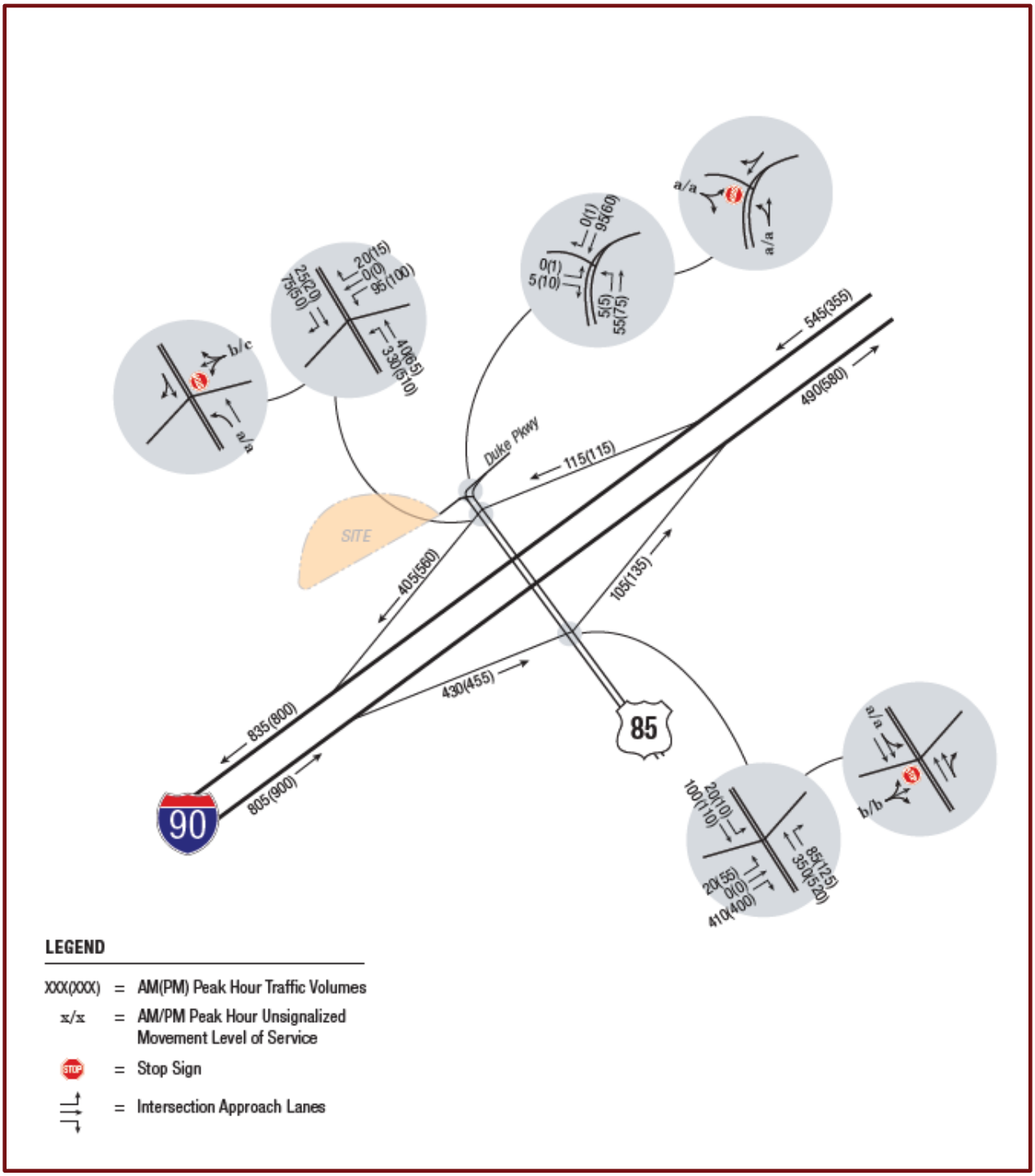

Figure 28 – Exit 17 Existing (2023) Traffic Conditions

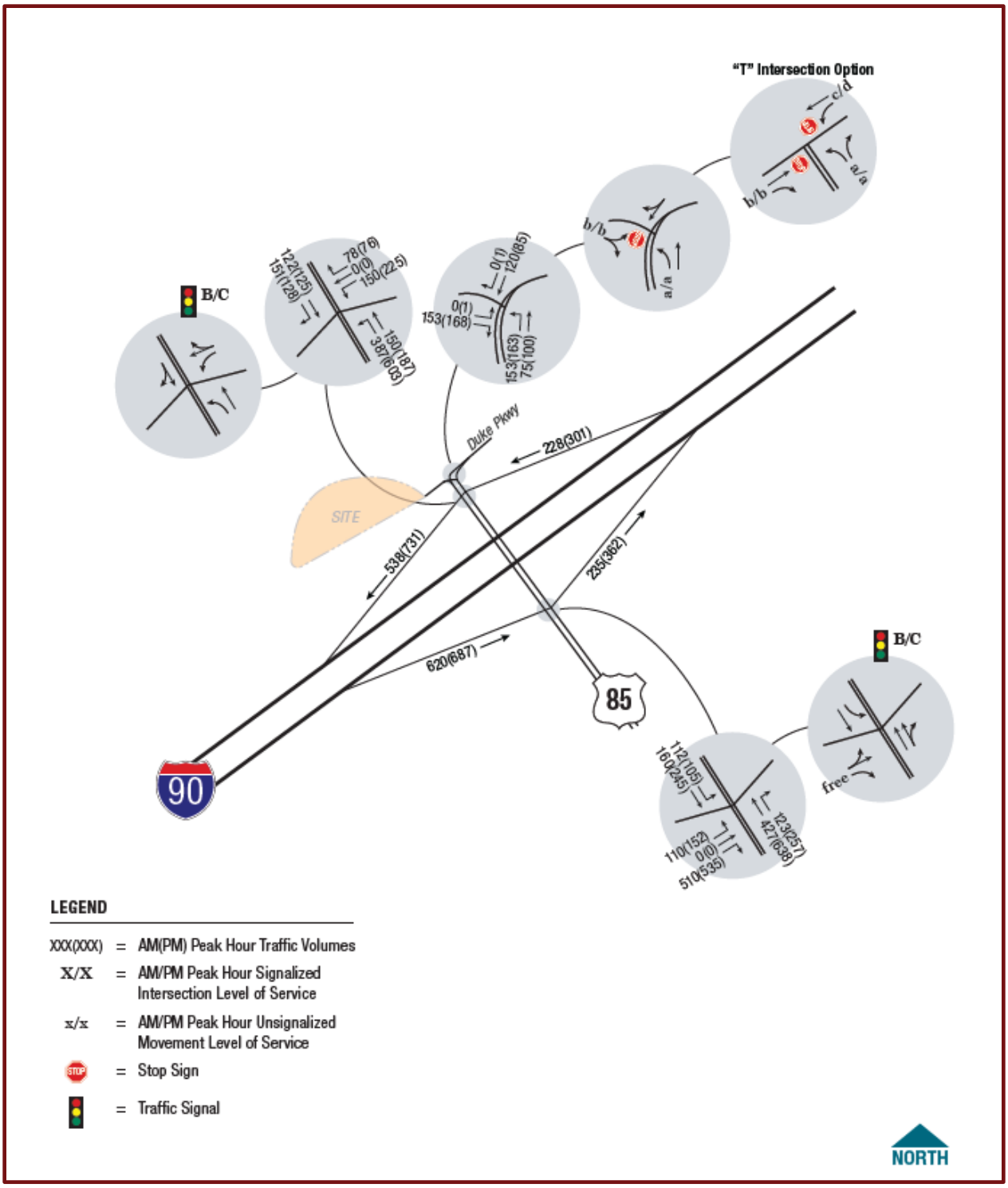

Figure 29 – Exit 17 Near Term Future (2028) Total Traffic Conditions

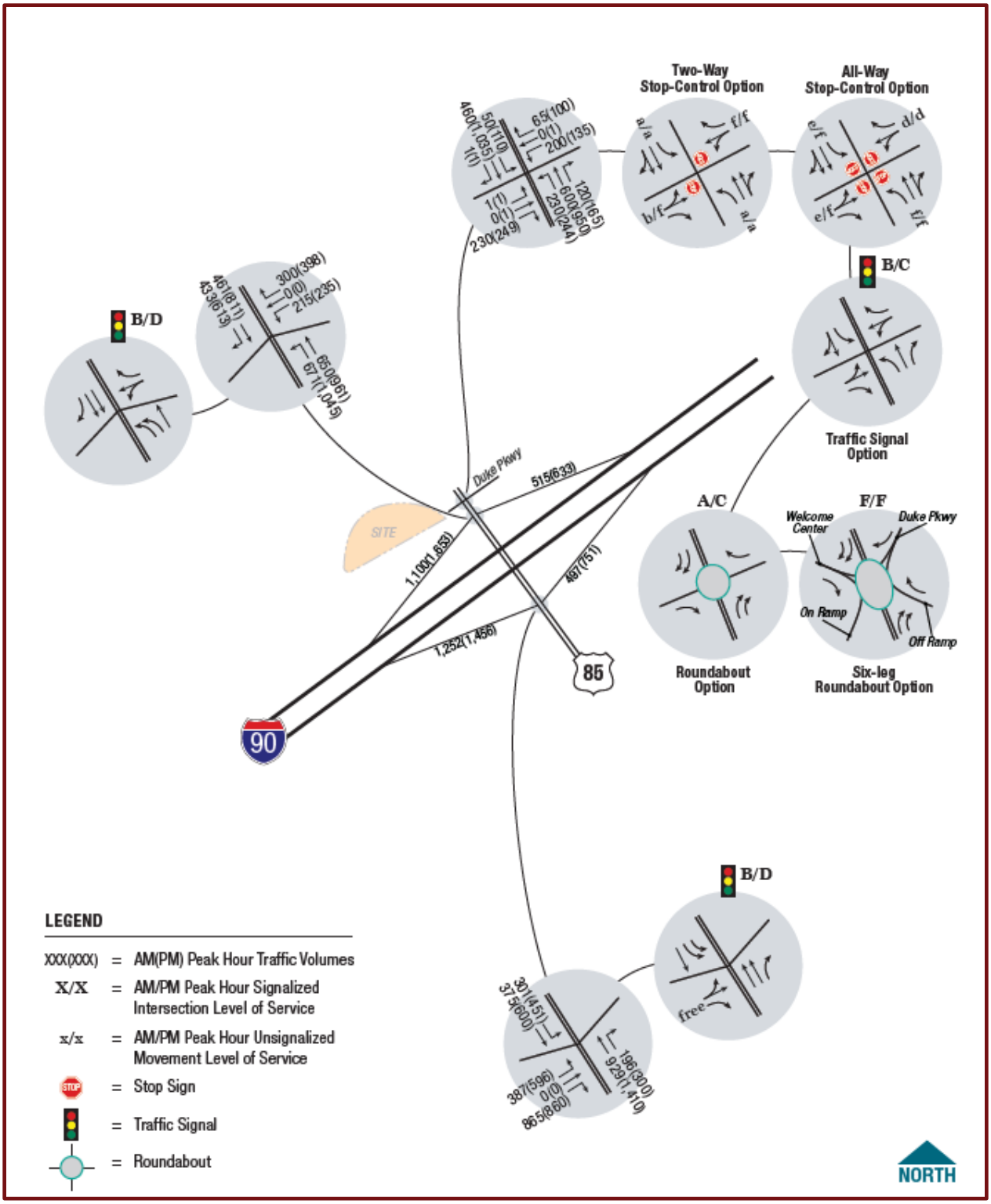

Figure 30 – Exit 17 Long Term Future (2050) Total Traffic Conditions

5.3 Utility Evaluation

The water and wastewater service components necessary to serve each location were evaluated based on the proximity to centralized services, availability of ground water and potential for a well system, potential for centralized wastewater treatment, availability of land for decentralized wastewater treatment estimated cost of water and sewer services and local and state approval.

Site location played a major factor in which system was acceptable for each location. While costs of decentralized systems tend to be less costly, if a site was located within city limits, then a decentralized system would not be accepted. The City of Spearfish Municipal code chapter 18 for Utilities requires commercial development within the city limits to be connected to the City of Spearfish potable water and sanitary sewer system.

The full water wastewater report has been included in the Appendix F.

5.3.1 Existing Location (MRM 1)

The existing rest area is serviced by on-site well and on-site lagoon systems.

The existing water supply well was constructed in 1977 to a depth of 600 feet, produces 60 gallons per minute and feeds a primary underground storage tank that feeds the rest area and irrigation systems. Figure 31 shows the existing water system site plan.

The existing sewer system design was obtained from SDDOT. Currently, there are no issues with capacity/demand, but the system should be reviewed for possible upgrades to the aging lines. If the existing location is selected for redevelopment, a detailed analysis will be required to determine the capacity and its ability to support a new rest area and visitor center.

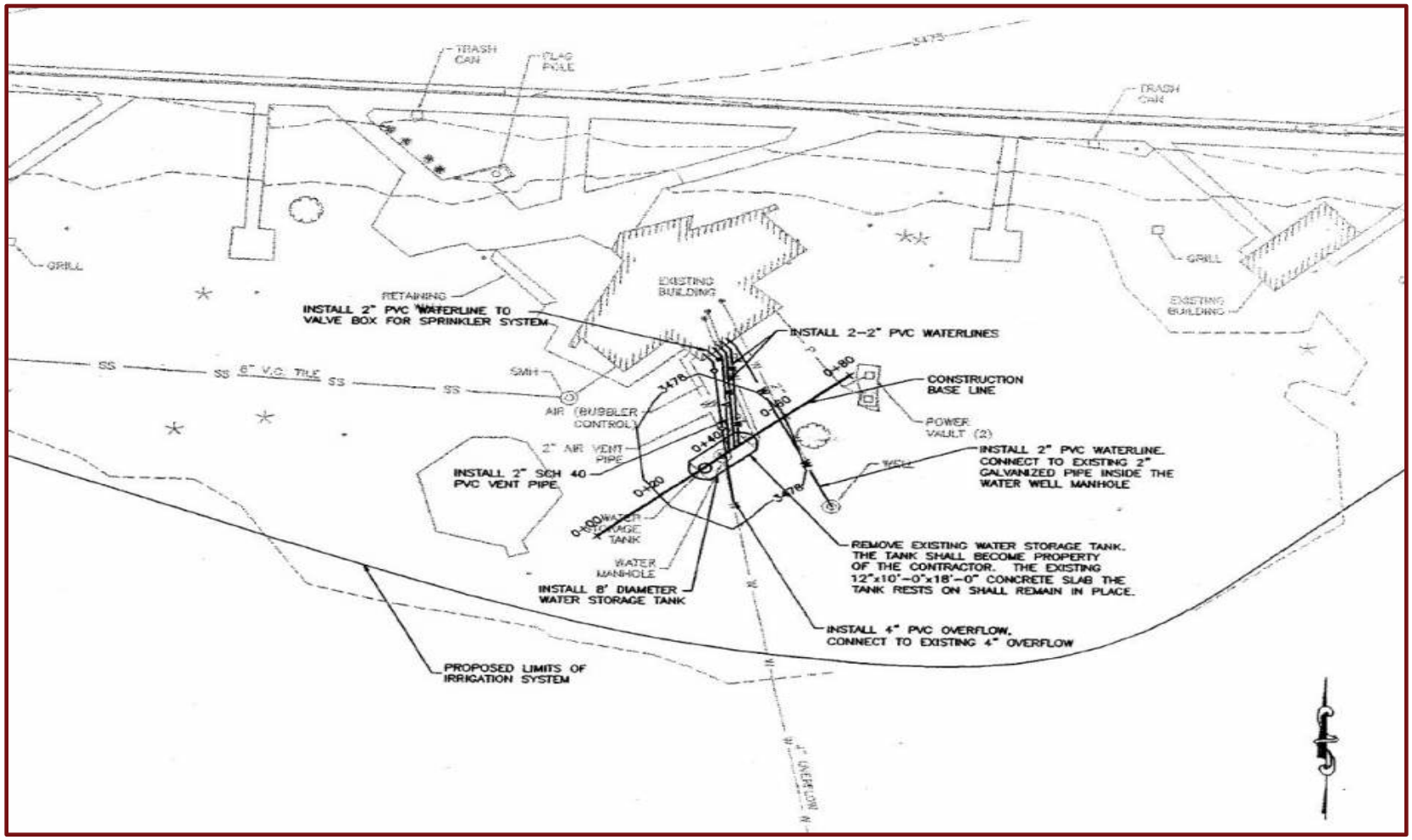

Figure 31 – MRM 1 Existing Water System Site Plan

5.3.2 Exit 10

The Exit 10 site is located within Spearfish city limits but is not currently served by public water or sanitary sewer. The site is served by electricity and natural gas. Figure 32 shows a utility improvement concept for Exit 10.

A Highway 85 utility study was conducted in 2015 which provided plans for future water connection which would service the Exit 10 location. The utility extensions in the study were part of a 20-year plan and are not currently in place. For the purpose of this utility evaluation, it was assumed future lines will need to be installed as part of the rest area/welcome center project.

The blue line in Figure 32 includes 2,380 feet of 12" water main extension, a bridge crossing at Spearfish Creek on Old US 14 consisting of 220 feet, 950 feet of directional boring under US 85 and I-90, and 100 feet of service line to service the new rest area. The red line includes 9,840 total feet of sanitary sewer main extension, a directional bore under US 85, and the new lift station.

Table 4 and Table 5 show cost estimates for water main and sanitary sewer connections respectively. The total cost for both water and sanitary extensions at Exit 10 was estimated to be $ 7,183,300.

Figure 32 – Exit 10 Utility Improvement Concept

Table 4 - Exit 10 Water Main Cost Estimate

No.	Description	Quantity	Unit	Unit Cost	Subtotal Cost
1.	12" Ductile Iron Main	2380	LF	$ 150	$ 357,000
2.	16" Casing Bored – US 85/I-90	950	LF	$ 1,500	$ 1,425,000
3.	Bridge Crossing (Old US 14)	220	LF	$ 300	$ 66,000
4.	Service Line to Rest Area Building	100	LF	$ 100	$ 10,000

Sub-Total	$ 1,858,000
Contingencies at 30%	$ 557,400
Engineering at 15%	$ 278,700
Total Estimate - Water	**$ 2,694,100**

Notes: (2023 dollars)
1. Cost Estimates are planning level cost estimates only.
2. Does not include the cost of Right-of-Way acquisition.

Table 5 - Exit 10 Sanitary Sewer Main Cost Estimate

No.	Description	Quantity	Unit	Unit Cost	Subtotal Cost
1.	8" C900 Service Main	2,460	LF	$ 130	$ 319,800
2.	10" C900 Transmission Main	2,500	LF	$ 150	$ 375,000
3.	12" C900 Transmission Main	2,790	LF	$ 180	$ 502,200
4.	15" C900 Transmission Main	1,720	LF	$ 200	$ 344,000
5.	18" C900 Transmission Main (Cross I85)	370	LF	$ 1,500	$ 555,000
6.	Sewer Manholes	25	EA	$ 8,000	$ 200,000
7.	Sewer Lift Station	1	LS		$ 800,000

Sub-Total	$ 3,096,000
Contingencies at 30%	$ 928,800
Engineering at 15%	$ 464,400
Total Estimate – Sanitary Sewer Improvements	**$ 4,489,200**

Notes: (2023 dollars)
1. Cost Estimates are planning level cost estimates only.
2. Does not include the cost of Right-of-Way acquisition.

Total Estimate for Utility Improvement at Exit 10 - $ 7,183,300

5.3.3 Exit 17

The Exit 17 site is located within Spearfish city limits but is not currently served by public water or sanitary sewer. Figure 33 shows a utility improvement concept for Exit 17.

The city reviewed sewer line capacity and found available capacity for the rest area. The project team heard during stakeholder meetings that the remaining capacity further downstream had already been purchased. In the case capacity is not available via Duke Parkway, a second option was identified connecting from the west.

Table 6 shows the cost estimate to extend the water main. Table 7 and Table 8 show cost estimates to extend the sanitary sewer via Duke Parkway or from the west. The total cost for both water and sanitary extensions at Exit 17 was estimated to be $ 488,215 to $759,278 depending on which sanitary sewer connection option was needed.

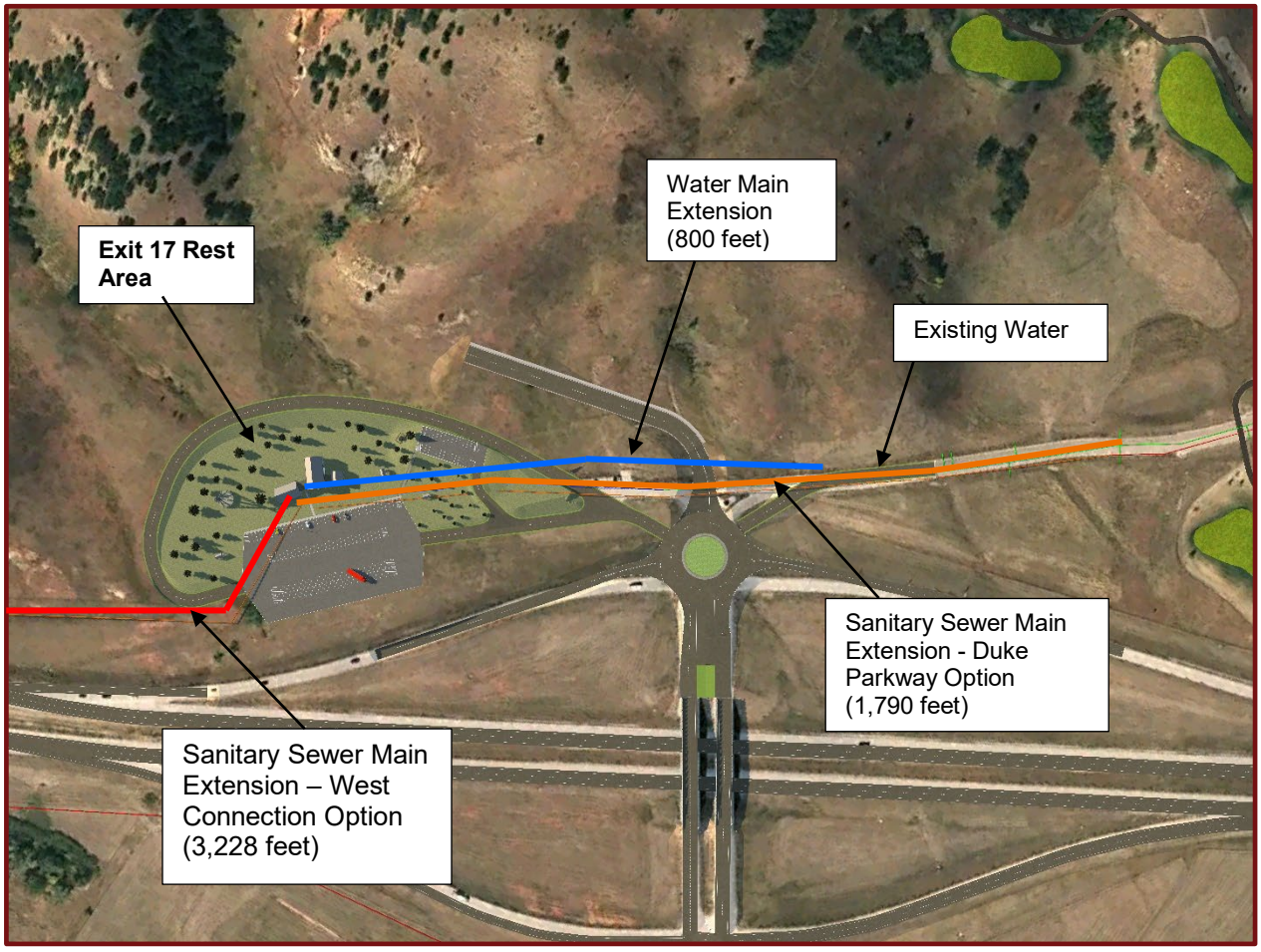

Figure 33 – Exit 17 Utility Improvement Concept

Table 6 – Exit 17 Water Main Cost Estimate

No.	Description	Quantity		Unit	Unit Cost	Subtotal Cost
1.	8" DI Transmission Main	800		LF	$ 130	$ 104,000
			Sub-Total			$ 104,000
			Contingencies at 30%			$ 31,200
			Engineering at 15%			$ 15,600
			Total Estimate – Water			**$ 150,800**

Notes: (2023 dollars)
1. Cost Estimates are planning level cost estimates only.
2. Does not include the cost of Right-of-Way acquisition.

Table 7 – Exit 17 Sanitary Sewer Main Cost Estimate (Duke Parkway Option)

No.	Description	Quantity	Unit	Unit Cost	Subtotal Cost
1.	8" C900 Sanitary Sewer Main	1,790	LF	$ 130	$ 232,700
		Sub-Total			$ 232,700
		Contingencies at 30%			$ 69,810
		Engineering at 15%			$ 34,905
		Total Estimate – Sanitary Sewer			**$ 337,415**

Notes: (2023 dollars)
1. Cost Estimates are planning level cost estimates only.
2. Does not include the cost of Right-of-Way acquisition.

Table 8 – Exit 17 Sanitary Sewer Main Cost Estimate (West Connection Option)

No.	Description	Quantity	Unit	Unit Cost	Subtotal Cost
1.	8" C900 Sanitary Sewer Main	3,228	LF	$ 130	$ 419,640
		Sub-Total			$ 419,640
		Contingencies at 30%			$ 125,892
		Engineering at 15%			$ 62,946
		Total Estimate – Sanitary Sewer			**$ 608,487**

Total Estimate for Utility Improvement at Exit 17 - $ 488,215 to $759,278

5.4 Cost Estimate

A cost estimate was prepared for the three rest area locations. The estimate included items that would need to be demolished, constructed, right of way purchases, as well as high level utility extension costs to provide a working facility. The cost estimate has been included in Appendix G of this report.

The cost estimate shows the most economical location is the existing rest area location at MRM 1 followed by Exit 17. Exit 17 is roughly three times more expensive than MRM 1 and Exit 10 is slightly under four times the cost of MRM 1.

The cost estimate did not account for the cost associated with relocating the Lawrence County shop at Exit 10. The county's storage yard would be impacted at this location. Further discussions outside of this study would need to take place if the Exit 10 concept was moved forward.

5.4.1 Existing Location (MRM 1)

The cost estimate for the existing location includes the cost to demolish the existing facility and reconstruct a new rest area facility with a welcome center. The utilities are in working order so there is no need for extension or connection costs. The right of way available at the site is adequate for the new facility. The parking capacity was reviewed at the existing parking lot, with the traffic analysis and previous studies, and no additional spaces would be needed. However, Americans with Disabilities Act (ADA) elements outside of the facility such as sidewalk and curb ramps would need to be brought up for current standards.

5.4.2 Exit 10

Along with the cost of the Exit 10 concept, the estimate includes the demolition of the existing rest area and parking lot, sidewalks picnic shelters and remediation of lagoons at MRM 1.

Since the facility would have limited access due to the rest area, a separate road would need to be constructed to access the MDU/WBI facility south of the existing county shop.

While not included in the cost estimate for the concept, the Lawrence County storage yard would likely be impacted by the proposed layout. The county has indicated a similar property would need to be located/purchased by the SDDOT to be used for county purposes. The coordination, planning, and right of way costs are outside of the scope of this study but would add risk not included in the cost estimate or evaluation matrix.

5.4.3 Exit 17

Along with the cost of the Exit 17 concept, the estimate includes the demolition of the existing rest area and parking lot, sidewalks, picnic shelters and remediation of lagoons at MRM 1.

The cost estimate would include the removal of the current Park-n-Ride, a new paved Park-n-Ride would be constructed just east of the rest area parking lot and would include a separate exit to US 85 without having to loop around through the rest area parking lot.

To locate the facility at the proposed location, property would need to be purchased. The landowner would require access to their remaining property via Exit 17. For this reason, access was included in the cost estimate to the property owner's property.

While not included in the cost estimate for the concept, the hillside to the north of Exit 17 has a history of slides. The proposed concept would require fill to reduce the impact to the hillside by the roundabout and access to the development west of the interchange. A geotechnical study to determine the stability of the hill is outside of the scope of this study but would help to identify risk not included in the cost estimate or the evaluation matrix.

5.5 Evaluation

To evaluate the possible rest area/welcome center locations, criteria important to rest areas and welcome centers were identified. The criteria was reviewed and ranked by the SAT to further understand the importance of each criterion in selecting the project site. The information generated over the course of the study was used to populate the benefits and shortcomings identified for each location.

The rankings for each alternative are shown in Figure 34. The criteria on the left is organized from more important to less important. Each criteria was ranked for each location ranging from Most Positive to Least Positive. Important notes for each location are listed below. An all-inclusive detailed bulleted list of benefits and shortcomings for each ranked criteria can be found in Appendix H.

5.5.1 Existing Location (MRM 1)

- The only possible points of conflict occur when merging and diverging and there are no intersections to pass through at this location.
- Located less than a quarter mile from the interstate. Straight forward easy on and off with no intersection to navigate through, the primary direction of travel is serviced, and it is located outside of city limits.
- This location would not require a ROW and would have no impact on present, existing, or proposed development. Very few environmental concerns arise at this location and the tipi would not require mitigation.
- The current location is 1 mile from the border, servicing eastbound traffic, and the closest home is 0.5 miles away. No impacts from the 2050 traffic projections would occur at this location.
- At this location there is an existing potable water system, an existing wastewater treatment system, and other utilities present, and there is a higher long-term water/ sanitary sewer maintenance.

5.5.2 Exit 10

- At this location there is an increase in possible points of conflict when merging, diverging, with turning movements and 3 intersections to pass through when eastbound. This complex interchange would be difficult for truck traffic.
- This location is located 1.45 miles from the interstate and would require 1 left turn and 2 right turns to enter the rest area when eastbound, however all 4 directions of travel could access this location which is within city limits.
- This location would require 2-3 ROW acquisitions, the tipi will require mitigation with possible location from existing site, and the construction would require the removal of existing building and picnic shelters, parking lot, lighting, landscaping, and rest area/ welcome center intersection improvements.
- Both the city water main and city sanitary sewer main would need to be extended to this location. There are other utilities present such as electrical and natural gas.

5.5.3 Exit 17

- This location would have more conflict points when merging, diverging, turning movements, and 3 intersections to pass through from eastbound. The location is 0.45 miles from the interstate and requires 2 left turns to be accessed when eastbound, however 3 directions of travel would be serviced at this location, which is within city limits.
- This location would require 2 ROW acquisitions, the tipi will require mitigation with possible location from existing site, and the construction would require the removal of existing building and picnic shelters, parking lot, lighting, landscaping, rest area/ welcome center intersection improvements, and would have possible geotechnical issues.
- A few environmental concerns arise at this location, a noise analysis would be required, and the tipi at the current location would likely need to be relocated.
- Both the city water main and city sanitary sewer main would need to be extended to this location. There are other utilities present such as electrical and natural gas.

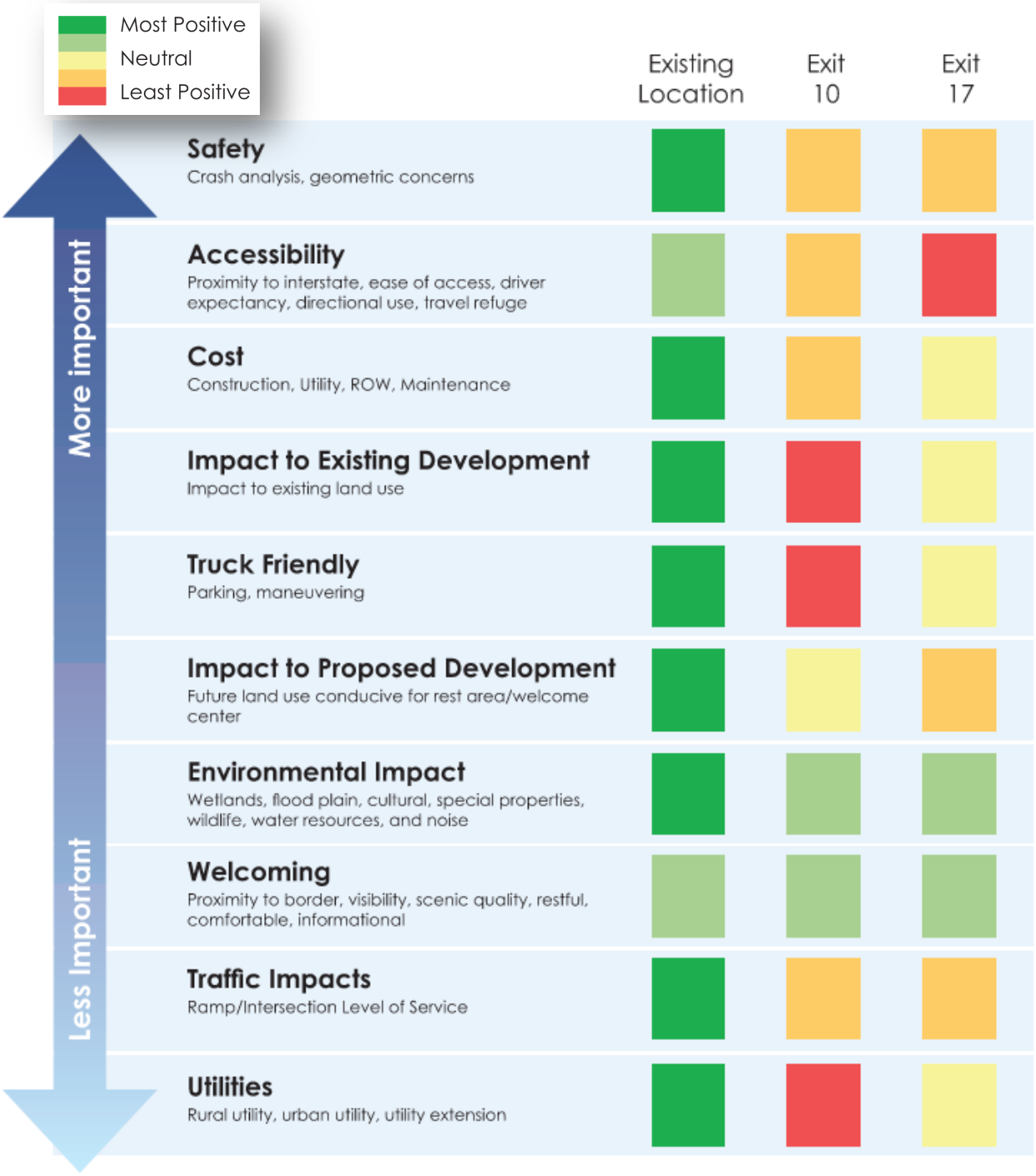

Figure 34 – MRM 1, Exit 10, and Exit 17 Evaluation Matrix

6 Recommendations

The main goal of this study was to provide a recommended location for a new rest area including a welcome center. This report discusses the culmination of data collection, technical analysis, and robust stakeholder/public engagement. The evaluation matrix shows the existing location at MRM 1 as the best location in all categories except for welcoming which all locations share a similar welcoming environment.

The SDDOT and South Dakota Department of Tourism list a clear vision for the state's rest areas and welcome centers. It states:

> *"South Dakota's interstate rest areas and welcome centers provide a safe, clean, accessible, and functional place for travelers to rest and rejuvenate. They present a positive impression that it is welcoming and delivers educational value for visitors which enhances and extends their stay in South Dakota. The facilities are modern and aesthetically pleasing, while being cost-effective."*

With a newly reconstructed facility, the existing rest area location will meet the vision stated above. Cost was not ranked as the most important criteria in the evaluation matrix, but it is an important consideration. The existing rest area is estimated at being three times cheaper than the closest viable option. By staying at the current location, additional risks such as preserving the tipi structures, environmental considerations, right of way acquisition, resident noise concerns, and truck usage within city limits are better mitigated and less likely to cause costly issues down the road.