

# ENVIRONMENTAL ASSESSMENT

## INTERSTATE 90 EXIT 406 INTERCHANGE

Project Number: HP5596(18) P / IM-NH 0909(46)406, Project Code: PCN NA/4433

Brandon (Minnehaha County), South Dakota



Submitted pursuant to 42 U.S.C. 4332(2)(c) by the FHWA and SDDOT

**Lead Agency - Federal Highway Administration**



**South Dakota Department of Transportation**



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# ENVIRONMENTAL ASSESSMENT INTERSTATE 90 EXIT 406 INTERCHANGE



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## PUBLIC COMMENT PERIOD

The public comment period for this document begins on the date of Federal Highway Administration signature and ends October 4, 2019. Written comments on this document can be submitted through the project website [www.sehinc.com/online/406](http://www.sehinc.com/online/406) or by mail or email to the following address:

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A public meeting for this project will be held at the Holiday Inn Express at 1103 N Splitrock Blvd in Brandon on September 18, 2019 from 6 p.m. to 7:30 p.m.

An electronic copy of this document will be available at the project website [www.sehinc.com/online/406](http://www.sehinc.com/online/406) and printed copies of the document will be available for review at the following locations during the comment period:

SDDOT Sioux Falls Area Office  
5316 W. 60th Street North; Sioux Falls, SD

Brandon City Hall  
304 Main Avenue; Brandon, SD

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APPENDICES –AVAILABLE ONLINE AT [WWW.SEHINC.COM/ONLINE/406](http://WWW.SEHINC.COM/ONLINE/406)

NOTE: An Interchange Modification Justification Report (IMJR) was completed for this project in 2018. As a standalone report, it is not an Appendix to this Environmental Assessment. However, many of the findings in this EA are based on findings from the IMJR study. Therefore, the IMJR serves as a valuable reference document for the EA and it can be found at the web site listed above.

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## LIST OF ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
AJD	Approved Jurisdictional Determination
APE	Area of Potential Effect
BMPs	Best Management Practices
BNSF	Burlington Northern Santa Fe
CFR	Code of Federal Regulations
DDI	Diverging Diamond Interchange
EA	Environmental Assessment
ESA	Environmental Site Assessment
ESS	Environmentally Sensitive Site
FEMA	Federal Emergency Management Administration
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
IMJR	Interchange Modification Justification Report
IPAC	Information for Planning and Consultation
LOS	Level of Service
LSDC	Low Slump Dense Concrete
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
REC	Recognized Environmental Conditions

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ROW	Right-of-Way
SDDENR	South Dakota Department of Environment and Natural Resources
SDDOT	South Dakota Department of Transportation
SHPO	State Historic Preservation Officer
TSM	Transportation System Management
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
WOUS	Waters of the United States



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## 1 INTRODUCTION

2 This Environmental Assessment (EA) has been prepared for the Interstate  
3 90 (I-90) Exit 406 Interchange Project (“Project”). I-90 Exit 406 is located  
4 on the northern end of the City of Brandon in Minnehaha County (see  
5 Figure 1, Project Location and Study Area). Brandon (population 9,923 in  
6 the US Census 2016 estimate) is approximately 6 miles east of Sioux Falls.  
7 Figure 1 shows the Study Area designated for this EA which is a general  
8 boundary to initiate coordination and conduct studies for the EA process.

9 The study area includes the I-90 Exit 406 Interchange and areas within the  
10 surrounding transportation system. This includes the I-90 Exit 406  
11 Interchange, and roadway corridors as follows: the I-90 corridor between  
12 the Burlington Northern Santa Fe (BNSF) railroad crossing to the west and  
13 Split Rock Creek bridges to the east, and the local street network along  
14 the South Dakota Highway 11 (SD 11) / Splitrock Boulevard (Splitrock  
15 Blvd) corridor between Redwood Boulevard / 261<sup>st</sup> Street (Redwood Blvd)  
16 to the south and ending at Hemlock Boulevard / 260<sup>th</sup> Street (Hemlock  
17 Blvd) to the north. These corridor endpoints form the logical termini for  
18 the EA.

19 I-90 is part of the Federal Interstate Highway System and is the longest  
20 transcontinental highway in the United States. The approximately 1-mile  
21 long section in the Study Area is a concrete 4-lane divided highway with  
22 asphalt-paved shoulders and a grassed median. The I-90 Exit 406  
23 Interchange is a traditional diamond interchange in which Splitrock Blvd  
24 passes over I-90. The Splitrock Blvd structure is a 2-lane umbrella-type  
25 concrete bridge featuring four spans totaling 254 feet to make the  
26 crossing over I-90. The I-90 exit ramp ends at Splitrock Blvd are two-way  
27 stop controlled. There are stop signs for traffic coming from I-90, while  
28 traffic on Splitrock Blvd is not controlled by stop signs.

Figure 1. Project Location and Study Area



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1 Splitrock Blvd is part of the 2-lane regional SD 11 that ties into SD 42 to the south and becomes Minnesota Highway 269 at the Minnesota state line to the  
2 north and east. Splitrock Blvd serves as a primary arterial street for north-south travel in Brandon. The roadway cross-section varies through the study area  
3 with a 5-lane section from the southern study limits to Ash Street, 4-lane section from Ash Street to the eastbound ramp terminal intersection, 2-lane section  
4 between the ramp terminal intersections (which includes the bridge over I-90), and a 3-lane section with 12-foot outer lanes/shoulders from the westbound  
5 ramp terminal intersection through the northern study limits. Curb and gutter with back of curb sidewalk is present along the east side of the roadway  
6 between Redwood Boulevard and Birch Street and on both sides of Splitrock Blvd at the north end of the corridor within Corson.

7 In order to provide capacity for future traffic demands, the South Dakota Department of Transportation (SDDOT) in 2010 conducted a “Decennial Interstate  
8 Corridor Study.” The study evaluated interchange needs across South Dakota and identified the I-90 Exit 406 interchange as a Mid Range Improvement  
9 priority. This bridge was constructed in 1960. A low slump dense concrete (LSDC) overlay was placed in 1985. The bridge is not considered structurally  
10 deficient at this time. However, the bridge and LSDC overlay were determined by the SDDOT Office of Bridge Design to be at the end of their service life.  
11 Replacement of the bridge is proposed before any major rehabilitation work is necessary. A Study Advisory Team, comprised of representatives from Federal  
12 Highway Administration (FHWA), SDDOT, Sioux Falls Metropolitan Planning Organization (MPO), and Brandon has formed to lead the effort for development  
13 of the Interchange Modification Justification Report (IMJR) and this EA. The SDDOT intends to begin construction of the I-90 Exit 406 interchange within  
14 federal fiscal years 2022-2025.

15 This EA has been prepared in compliance with the requirements of the National Environmental Policy Act (NEPA) and guided by the methods outlined in the  
16 SDDOT *Environmental Procedures Manual*. The purpose of this EA is to analyze the proposed action, determine if there is a potential for significant  
17 environmental impacts, and to inform and allow input from decision-makers and the public.

### **WHAT IS THE PURPOSE OF THE PROJECT?**

18  
19 The “Purpose” defines the primary intended transportation objective and related goals to be achieved by a proposed transportation improvement.

20  
21 The purpose of the Project is to reconstruct the I-90 Exit 406 Interchange to meet current design standards. Several design deficiencies were noted for this  
22 interchange in the 2010 Decennial Interstate Corridor Study. Ultimately, improvements to the I-90 Exit 406 interchange were identified as a project need in  
23 the 2010 study. Other goals intended to be achieved by the proposed project include safety improvements and greater efficiency of the transportation  
24 system along the I-90 interstate corridor and Splitrock Blvd.

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### 1 **WHAT ARE THE NEEDS FOR THE PROJECT?**

2 A “Need” is a condition sought to be relieved. The project Need proves that the problem exists and provides data that support the Project Purpose. The  
3 Project Need guides the decision-making process throughout this document. The needs that will be addressed through reconstruction of the I-90 Exit 406  
4 interchange include: geometric deficiencies, transportation congestion, traffic operations, and safety.

#### 5 **Geometric Deficiencies Problem: Interchange Design**

6 Geometric deficiencies at the I-90 Exit 406 interchange have been documented in previous studies, including the 2010 SDDOT study. Based on current  
7 SDDOT design standards, deficiencies with the interchange include:

- 8 • Ramps on the east side of the interchange are too steep; both the westbound exit ramp and the eastbound entrance ramp are steeper than the  
9 5% maximum grade design standard.
- 10 • Outside shoulder width on the ramps are 6 feet; the design standard is for an 8-foot shoulder.
- 11 • Slopes adjacent to the roadway shoulders are too steep; existing slopes are 4:1 and design guidance is for a 6:1 slope within the right-of-way  
12 (ROW) clear zone.
- 13 • Ramp intersections with I-90 are 300 feet from the centerline of Splitrock Blvd; the design standard for that distance is a minimum of 550 feet.  
14 The storage capacity of exit ramps is too short for projected traffic volumes and there is a risk for traffic to back up onto the I-90 mainline, as  
15 supported by the crash data in Table 2.

16 The existing structure over I-90 has a total bridge roadway width of 30 feet. This width restricts the ability to accommodate increasing travel demand and  
17 multi-modal mobility. (Multi-modal mobility includes traffic modes other than vehicle traffic such as pedestrian and bicycle traffic.) Two lanes of traffic  
18 (one in each direction) serve the existing bridge. This 2-lane section causes a bottleneck between the 4-lane roadway section to the south and 3-lane  
19 roadway section to the north. Also, this means there are no left turn lanes for turning movements from the bridge to the I-90 entrance ramps. This  
20 restriction causes congestion on Splitrock Blvd when vehicles turning left onto I-90 entrance ramps must wait for a gap in oncoming traffic. Additionally,  
21 the 2-lane bridge deck does not provide adequate shoulder space between travel lanes and the bridge railing and separate pedestrian/bicycle facilities are  
22 not provided.

#### 23 **Congestion Problem: Traffic Volumes Exceed Capacity at Ramp Terminal Intersections**

24 Project study area traffic volumes (Average Daily Traffic, or ADT) were measured in 2016. Forecast ADT for I-90 and the Splitrock Blvd corridor were  
25 generated out to the 2045 planning year. The following are key findings from the forecasting effort:

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- 1 • ADT along I-90 in July 2016 was measured at 25,200 vehicles between Exits 402 and 406 and 17,400 between Exits 406 and 410.
- 2 • Through the 2045 planning year, the Sioux Falls MPO travel demand model forecasts volumes to increase to 47,300 and 29,700 west and east of
- 3 Exit 406, respectively.
- 4 • Splitrock Blvd corridor volumes between I-90 and Redwood Boulevard are currently estimated to be approximately 13,300 vehicles per day.
- 5 • Traffic volumes on Splitrock Blvd south of I-90 are expected to exceed 23,000 by 2045.
- 6 • The segment between I-90 and Hemlock Blvd has a current estimated 6,400 vehicles per day, and is forecast to be at 11,900 by 2045.

7 These forecast volumes and the methods used to determine them are documented in more detail in the September 2018 I-90 Exit 406, SD11/Splitrock  
8 Boulevard IMJR.

9 Studies like the IMJR use a “Level of Service” (LOS) method of measurement for congestion levels. The level of congestion for the I-90 and Splitrock Blvd  
10 corridors in this study area are described in the IMJR in terms of current and future LOS. Future LOS is based on forecasted volumes. Based on criteria in  
11 the 2010 Highway Capacity Manual, LOS is a measure of how freely or congested traffic flows on average on a roadway segment. LOS A represents free-  
12 flowing traffic with limited conflicts and higher level of comfort for drivers. LOS F is at the opposite end of the spectrum, representing unstable flow of  
13 traffic with demand exceeding capacity. Long back-ups will occur at intersections and roadway segments will be congested in a LOS F condition. LOS C is  
14 the minimum allowable LOS for interchange ramp intersections.

15 LOS F is currently experienced in both the AM and PM peak periods at the westbound/Splitrock Blvd ramp intersection and in the PM peak period at the  
16 eastbound ramp/Splitrock Blvd intersection. Based on forecasted growth through the 2045 Planning Year on both the I-90 and Splitrock Blvd corridors,  
17 operations are expected to continue to degrade at both ramp intersections with Splitrock Blvd. 2045 Planning Year traffic operations exhibit long queues,  
18 lengthy delays, and LOS F measures in AM and PM peak periods at both ramp intersections.

### **Traffic Operations Problem: Access Locations on Splitrock Blvd Leading to Poor Traffic Operations**

20 Multiple private commercial and residential drives directly access Splitrock Blvd within the study area. This is especially problematic on Splitrock Blvd  
21 south of the I-90 Exit 406 interchange. Specifically, the area between the interchange and Ash Street exhibits the following:

- 22 • Between the I-90 Exit 406 interchange and Ash Street there are full access commercial driveways located relatively close to the I-90 Exit 406  
23 interchange.
- 24 • Immediately north of this location, the bridge over I-90 carries two lanes of traffic (one in each direction).

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- The segment of Splitrock Blvd between the I-90 bridge and Ash Street is four lanes (two in each direction), with one northbound lane dropping at the right turn to the eastbound I-90 ramp, and one southbound lane coming into Splitrock Blvd at the right turn from the westbound I-90 ramp.

This configuration of lanes results in the left northbound lane on Splitrock Blvd acting as the “through” lane for traffic going across the interchange bridge. This lane is also where left-turning vehicles (turning into the businesses north of Ash Street) will be located. When left-turning vehicles are delayed in making a turn due to the lack of gaps in southbound traffic, traffic delays and higher than expected crash rates occur. This concern is most prevalent at the afternoon peak period, when a high volume of vehicles are making a right turn from the I-90 exit ramp on to southbound Splitrock Blvd.

### **Safety Problem: Higher than Expected Crash Rates**

Given existing traffic volumes, the existing interchange and Splitrock Blvd corridor present multiple safety concerns for drivers. Based on the crash data provided in Table 1, a safety concern is at the stop-sign controlled I-90 ramp intersections. These two-way stops (through traffic on Splitrock Blvd does not have a stop) show elevated crash rates. Of the 21 crashes that occurred at the eastbound ramp intersection, 16 crashes involved eastbound I-90 off-ramp vehicles. The manner of collision was evenly split between rear-end and angle crashes, indicative of long or unexpected queues, and vehicles pulling into crossroad traffic from stop-controlled intersection. In addition to the traffic operations issues listed above, stakeholder input identified limited intersection sight distances at both ramp intersections with Splitrock Blvd as a potential safety issue.

**Table 1. Splitrock Blvd Crash Data Summary (2010-2014)**

<b>Splitrock Blvd Intersection or Roadway Segment</b>	<b>Total Crashes</b>	<b>Calculated Crash Rate</b>	<b>Critical Crash Rate</b>
Hemlock Blvd Intersection	1	0.08	0.68
Hemlock Blvd to I-90 Westbound Ramp	2	0.37	3.34
I-90 WB Ramp Intersection	9	0.52	0.62
I-90 Westbound Ramp to I-90 Eastbound Ramp	0	0.00	5.27
I-90 EB Ramp Intersection	21	<b>0.76</b>	<b>0.56</b>
I-90 Eastbound Ramp to Ash Street	14	<b>6.58</b>	<b>4.73</b>
Ash Street Intersection	8	0.33	0.56
Ash Street to Birch Street West	4	1.38	4.32
Birch Street East Intersection	0	0.00	0.57
Birch Street West Intersection	2	0.09	0.57
Birch Street West to Redwood Blvd	0	0.00	5.27
Redwood Blvd Intersection	4	0.15	1.00
Total Crashes Splitrock Blvd Corridor	65		

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1 A compilation of crash data over the five-year 2010-2014 period<sup>1</sup> is provided in Table 1 and Table 2. As can be seen in the data (and identified with **BOLD**  
2 text), the safety hazard locations generally identified above do have crash rates that exceed the critical rate.<sup>2</sup> Table 1 shows the Splitrock Blvd corridor  
3 locations with safety concerns include the eastbound I-90 ramp intersection, and the segment of Splitrock Blvd between the I-90 eastbound ramp  
4 intersection and Ash Street to the south. This segment immediately south of the interchange stands out among the Splitrock Blvd segments as having a  
5 high crash rate, with 14 crashes occurring in the study timeframe. Crashes in the segment were nearly even in the direction of travel, with eight crashes in  
6 the southbound direction and six in the northbound direction. As described in more detail within the IMJR, the crashes were a mix of rear-end, angle, and  
7 side swipe collisions. Noteworthy features of the roadway in this 350-foot long corridor segment are the presence of two driveway access points along  
8 with vehicles entering Splitrock Blvd from the eastbound I-90 exit ramp onto a new southbound lane.

9 Table 2 presents I-90 corridor crash data over the 2010-2014 five-year period. As with the Splitrock Blvd corridor, there are a pair of locations where the  
10 calculated crash rate exceeds the critical crash rate.

### **Additional Goal of the Project: Support of Multi-Modal Transportation with Connected Routes**

12 The existing Splitrock Blvd corridor provides segmented accommodations for other modes of travel, i.e. bicycles and pedestrians, thus does not meet the  
13 needs for multi-modal demand along the entire corridor. Shoulders and sidewalk are not provided continuously through the corridor. The narrow, nearly  
14 shoulderless bridge over I-90 is an impediment to multi-modal uses. No sidewalk is available for pedestrian use on the bridge and bicyclists need to enter  
15 the lone travel lane in either direction to cross I-90 and make connections between Brandon and Corson. North of I-90, the existing shoulders provide a  
16 continuous travel route. South of the I-90 interchange sidewalks are disconnected and neither side of Splitrock Blvd offers continuity for multi-modal  
17 users.

18 The 2009 Sioux Falls MPO Bicycle Plan identifies the SD11/Splitrock Blvd. corridor as part of a “Primary Route” corridor connecting the communities of  
19 Brandon and Garretson. Primary routes are considered the best transportation bicycle route from one community to another assuming there is a usable  
20 shoulder. The 2009 plan identifies the area south of I-90 as an “Urban Bicycle Route,” suggestive of a need for more than a usable shoulder (e.g. a  
21 sidewalk) as being desirable.

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<sup>1</sup> Crash data for this project comes from the South Dakota Department of Public Safety

<sup>2</sup> The calculated critical rate is a statistically adjusted crash rate to account for the random nature of crashes, total vehicle exposure, and similar facility (e.g. road segment or intersection with like number of lanes) type. If the existing crash rate is higher than the critical rate, it represents an intersection or segment that should be further investigated.

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Table 2. I-90 Corridor Crash Data Summary (2010-2014)

I-90 Roadway Segment	From	To	Total Crashes	Calculated Crash Rate	Critical Crash Rate
Eastbound I-90	3,000 feet west of Splitrock Blvd	1,000 feet west of Splitrock Blvd	7	2.14	2.66
Eastbound I-90	1,000 feet west of Splitrock Blvd	Splitrock Blvd I-90 Exit Ramp	3	0.92	2.66
Eastbound I-90 Exit Ramp	Splitrock Blvd	Eastbound I-90	1	1.09	4.36
Eastbound I-90	Splitrock Blvd I-90 Exit Ramp	Splitrock Blvd I-90 Entrance Ramp	4	1.04	2.53
Eastbound I-90	Splitrock Blvd I-90 Entrance Ramp	1,000 feet east of Splitrock Blvd (merge area)	2	0.88	3.03
Eastbound I-90	1,000 feet east of Splitrock Blvd (merge area)	3,000 feet east of Splitrock Blvd	7	<b>3.26</b>	<b>3.08</b>
		Total Crashes Eastbound I-90	24		
Westbound I-90	3,000 feet east of Splitrock Blvd	1,000 feet east of Splitrock Blvd	11	<b>5.23</b>	<b>3.11</b>
Westbound I-90	1,000 feet east of Splitrock Blvd	Splitrock Blvd I-90 Exit Ramp	3	1.33	3.03
Westbound I-90	Splitrock Blvd I-90 Exit Ramp	Splitrock Blvd I-90 Entrance Ramp	2	0.52	2.52
Westbound I-90	Splitrock Blvd I-90 Entrance Ramp	1,000 feet west of Splitrock Blvd (merge area)	3	0.92	2.66
Westbound I-90	1,000 feet west of Splitrock Blvd (merge area)	3,000 feet west of Splitrock Blvd	3	0.89	2.64
		Total Crashes Westbound I-90	22		

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### 1 WHAT ALTERNATIVES WERE CONSIDERED?

2 The development of the initial I-90 Exit 406 and SD 11/Splitrock Blvd corridor concepts occurred after public and stakeholder meetings in June 2016. The  
3 goal of this initial design was to establish a comprehensive set of alternatives to address the project's purpose and need and include review of two  
4 alternatives identified as part of the 2010 Decennial Interstate Corridor Study.

5 The comprehensive set of alternatives included:

- 6 • No Build Alternative (no change from existing condition)
- 7 • Build Alternatives (alternatives that provide a change from existing access geometry)
- 8 • Improvements to Alternate Interchanges (improvements to I-90 interchanges east and west of Exit 406)
- 9 • Transportation System Management (TSM) Alternative (intelligent transportation systems, access metering, etc.)
- 10 • Alternative Transportation Modes (mass transit, bus, bicycle, and other transportation modes)
- 11 • Build Alternative Incorporating TSM and Alternative Transportation Modes

12 Concurrent with the development of this EA, the project team prepared the I-90 Exit 406/SD11/Splitrock Blvd IMJR. The IMJR has been established by the  
13 FHWA as a report to help determine if the proposed interchange improvements satisfy a variety of FHWA requirements concerning revised access to the  
14 interstate. The IMJR serves as a reference document for portions of this EA because it documents much of the decision-making around interchange  
15 alternatives, screening, and decisions about identifying a preferred alternative.

16 The following alternatives from the comprehensive set were not carried forward for further analysis. A brief summary of why these alternatives were not  
17 carried forward is below. Refer to the IMJR for further details.

- 18 • Improvements to Alternate Interchanges – While potentially necessary to address other needs, improvements to the Exit 402 or Exit 410  
19 interchanges would not sufficiently address existing and future traffic demand or address existing geometric deficiencies at Exit 406.
- 20 • TSM Alternative – Existing and forecasted traffic demand does not warrant metering or High Occupancy Vehicle facilities.
- 21 • Alternative Transportation Modes – There are no existing or planned bus or other fixed routes serving the study area (a route does run through the  
22 study area on I-90): future studies would need to address those needs.
- 23 • Build Alternative Incorporating TSM and Alternative Transportation Modes – TSM and Alternative Modes do not address the needs for the project.  
24 However, bicycle and pedestrian facilities would be improved within the build alternatives carried forward.

25



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## 1 ALTERNATIVES CARRIED FORWARD FOR EVALUATION

2 Chapter 5 of the IMJR documents the initial range of Build Alternatives. This initial range of interchange alternatives included versions of standard diamond,  
3 folded diamond, single point urban, and diverging diamond interchange types. A total of eleven Build Alternatives were in the initial range of interchange  
4 alternatives for consideration. Chapter 5.1 of the IMJR addressed these interchange options along with the range of corridor options for SD11/Splitrock  
5 Boulevard. Alternatives carried through the initial screening for further refinement and analysis within the IMJR included the following:

- 6 • No-Build Alternative
- 7 • Interchange Build Alternatives
  - 8 ○ Standard Diamond Interchange
  - 9 ○ Standard Diamond Interchange (shifted west)
  - 10 ○ Standard Diamond Interchange with roundabouts (shifted west)
  - 11 ○ Diverging Diamond Interchange (DDI)
- 12 • SD 11/Splitrock Boulevard Corridor Build Alternatives
  - 13 ○ South of the I-90 Interchange
    - 14 ▪ 5-Lane Undivided (existing condition, with modification to select accesses)
    - 15 ▪ 4-Lane Divided
  - 16 ○ North of the I-90 Interchange
    - 17 ▪ 3-Lane Undivided (existing condition)

18 After the initial screening of alternatives, the remainder of Chapter 5 considered the alternatives listed above in greater detail (through a combination of  
19 environmental and engineering factors) for determination of a preferred interchange and corridor alternative. From an environmental impacts perspective,  
20 the remaining alternatives occupied nearly identical footprints with minimal differentiation in impacts. However, the evaluation did identify substantive  
21 differentiators that allowed for screening to a preferred alternative. Screening outcomes can be summarized as follows:

- 22 • Standard Diamond Interchange was eliminated because it requires a temporary bridge in order to maintain traffic during construction.
- 23 • While the western shift of the Standard Diamond Interchange with Roundabouts alternative enabled continued traffic operations during  
24 construction, the roundabouts would not effectively accommodate turning movements of large trucks that use this interchange for access to I-90.  
25 Community opposition to this alternative was also notable for this alternative, more than for the other alternatives. Therefore, this alternative was  
26 eliminated from further consideration.

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- 1       • The Standard Diamond Interchange (shifted west) alternative was able to demonstrate valuable benefits, including maintenance of traffic during  
2       construction and accommodation of large trucks. However, compared to the DDI alternative, key benefits of the DDI made the Standard Diamond  
3       shifted west alternative less desirable. Notably, the DDI design is ideally suited to the directional traffic flows that occur between Brandon and Sioux  
4       Falls. Additionally, the DDI alternative had the best predicted safety performance of all alternatives.
- 5       • Options for the Splitrock Blvd corridor south of I-90 were also reviewed in Chapter 5, with the key decision being whether there should be a median  
6       in the roadway (and consequently 4 lanes instead of 5) from Ash Street to Redwood Blvd. Ultimately, data for the corridor did not indicate any  
7       notable safety or operational challenges in the existing corridor to warrant a change from the existing 5-lane section. In addition, changing over to  
8       a 4-lane section would create some challenges because the current pavement was constructed to easily accommodate a change to 4-lane section.  
9       Construction timing would cause the replacement of existing pavement that is in good shape and has no identified need to be replaced in the near  
10      future.

11      Based on the evaluation of alternatives as summarized above (see also supplemental information in Appendix A), one preferred alternative was determined  
12      for evaluation as the Proposed Action in comparison to the No-Build Alternative. The Proposed Action includes the following elements:

- 13      • Diverging Diamond Interchange
- 14      • 5-Lane Undivided Corridor South of I-90
- 15      • 3-Lane Undivided Corridor North of I-90

16      Further evaluation of the DDI was conducted in Chapter 7 of the IMJR. This evaluation compared various configurations of the DDI for optimal operations.  
17      These alternative configurations did not have substantive differences in their environmental impacts, eliminating the need for further environmental review  
18      of potential refinements. Chapter 7 of the IMJR concludes with final determination of the design configuration of the interchange that is presented in this  
19      EA as the Proposed Action.

### 20      WHAT IS THE PROPOSED ACTION?

21      The Proposed Action is to replace the existing I-90 Exit 406 Interchange and make additional improvements to the Splitrock Blvd corridor from Ash Street,  
22      the southern end point of a new interchange, to Redwood Blvd. North of the new interchange, no improvements will be made beyond those required to tie  
23      the new interchange into the existing Splitrock Blvd corridor. As part of the improvements, the exit and entrance ramps for the interchange will be  
24      lengthened to meet current SDDOT design standards.

25      As indicated in the IMJR, the preferred interchange type is a Diverging Diamond Interchange (DDI) design with a bridge deck accommodating a five-lane  
26      cross-section and a sheltered median/shared bike path for pedestrians and other non-motorized users. This alternative is best able to meet the project

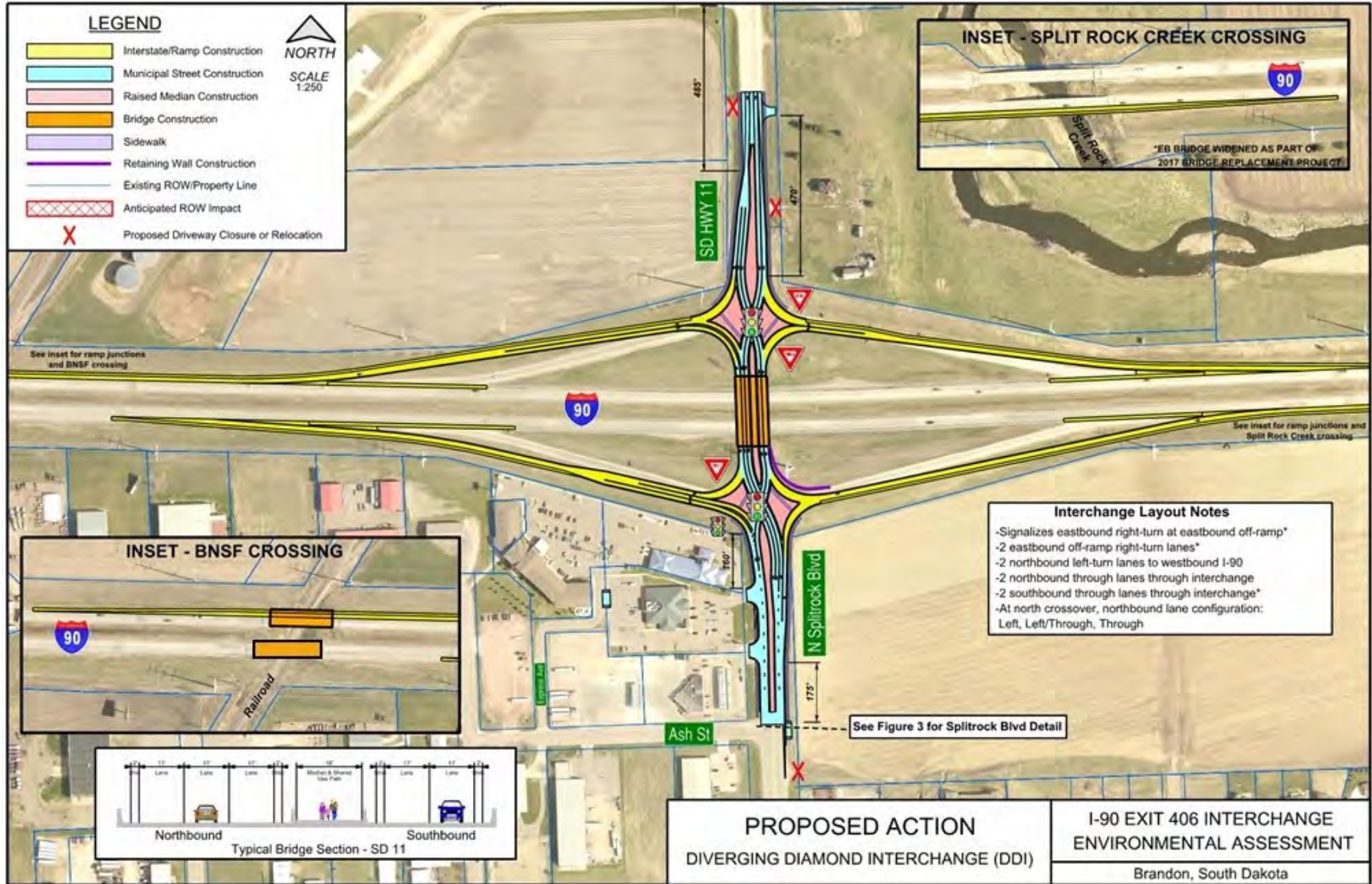
## **ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange**

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1 purpose and need factors identified for this study area while also minimizing environmental impacts. See **Figure 2** for an image of the proposed DDI design.  
2 The DDI design features a signalized cross-over of Splitrock Blvd road lanes at each of the ramp terminal locations in order to provide unsignalized left turns  
3 onto the freeway entrance ramps. This design is advantageous for the northbound Splitrock Blvd-to-westbound I-90 movement, one that has historically  
4 been a source of congestion in this project area. The new interchange will be shifted to the west (relative to the existing interchange bridge over I-90) in  
5 order to allow construction to occur while maintaining traffic. While temporary lane closures may occur as part of construction, traffic operations through  
6 this interchange will be maintained throughout construction of the Proposed Action.

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 2. Proposed Action (Plan view DDI)



2

## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

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1 Because the exit and entrance ramps will be lengthened, the I-90 bridges over BNSF railroad (west of the interchange) will also be replaced. This  
2 improvement would be necessary with any of the identified interchange alternatives, and was therefore not a deciding factor in the selection of a preferred  
3 alternative. The bridges over Splitrock Creek (east of the interchange) were recently improved by SDDOT; the improvements provided sufficient capacity for  
4 the ramp lengthening so as to avoid any additional improvements as a result of this Proposed Action. Because the Proposed Action has been developed in  
5 consideration of these and similar features, it is considered to have “independent utility.” That is the Proposed Action is not anticipated to create the need  
6 for additional improvements within or outside of the study area. It is a standalone project.

7 Associated with design and fundamental to proper operations of the new interchange, a median is added on Splitrock Blvd between the eastbound I-90 exit  
8 ramp terminus and Ash Street. Within this same segment of Splitrock Blvd, two existing access points on the west side of Splitrock Blvd will remain open.  
9 However, these two accesses will become right-in/right-out access due to the inclusion of the median. Northbound traffic on Splitrock Blvd destined for  
10 businesses located on the west side of the road will now use the Ash Street intersection for access. The Ash Street intersection will remain an unsignalized,  
11 full-access intersection. Similarly, on the north side of I-90 two existing accesses will be closed as part of the project due to the location of the interchange  
12 median and signalized intersection at the westbound I-90 ramp terminus.

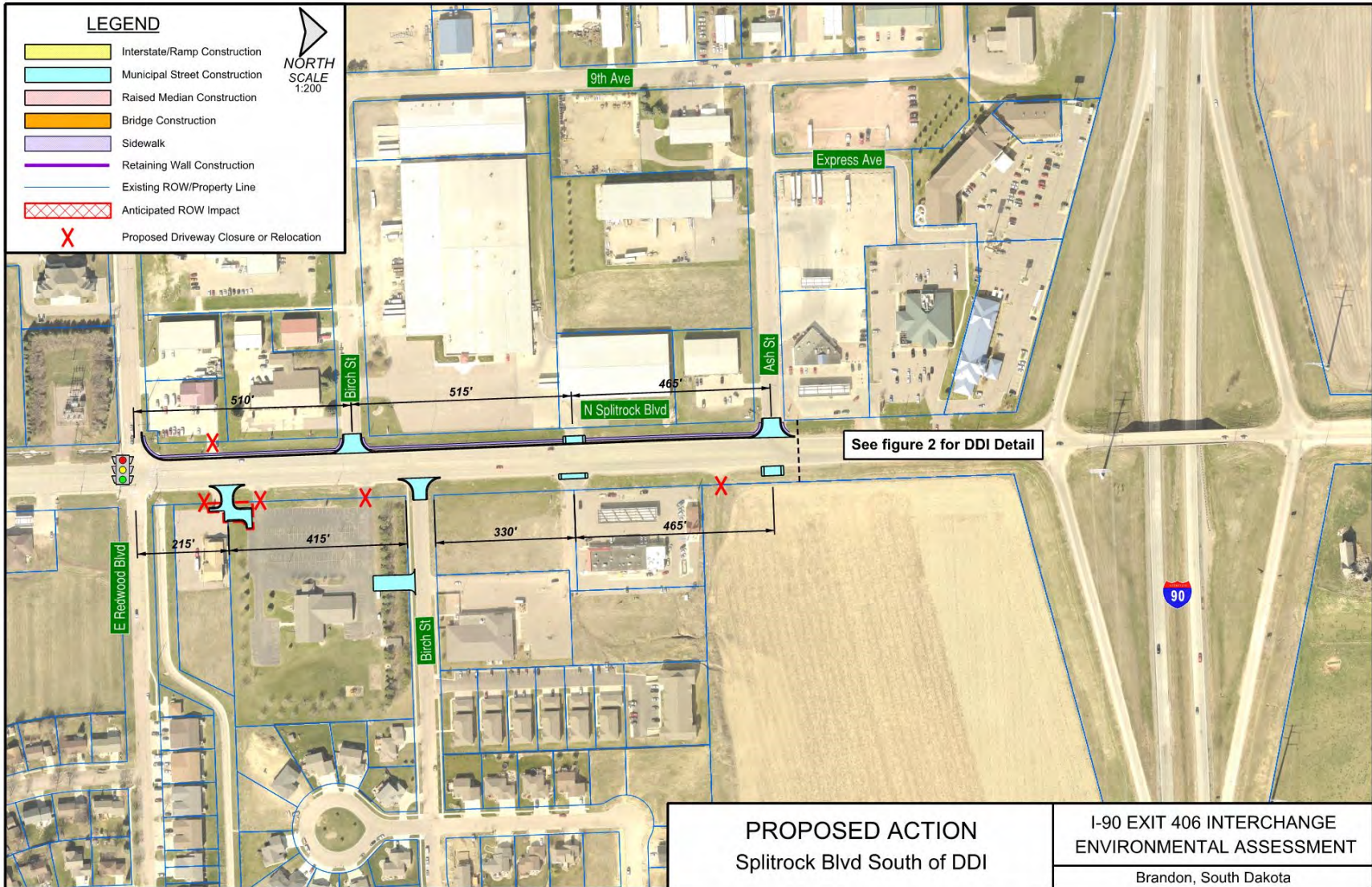
13 The southern segment of this project corridor (between Redwood Blvd and Ash Street) will remain unchanged in terms of the existing five-lane cross-section.  
14 The median associated with the DDI interchange stops at the Ash Street intersection, which minimizes impacts to the remaining southern segment of  
15 Splitrock Blvd corridor and makes this the environmentally preferred alternative. Changes to the corridor will include the construction of a sidewalk on the  
16 west side of Splitrock Blvd from Redwood Blvd to the DDI. In addition to the modification of accesses described above, five other access locations south of  
17 Ash Street will be closed as part of the project. Access to the affected properties will be maintained through various measures: by way of an existing access  
18 that is unchanged, the creation of a consolidated access serving two properties, or moving access so that an existing side street serves as the access or  
19 enables creation of access from the side street instead of Splitrock Blvd. **Figure 3** provides an overview of this segment of the project.

20 North of the DDI interchange, no changes will be made to the Splitrock Blvd corridor once the new interchange roadway ties into the existing roadway and  
21 the DDI sidewalk ties into the roadway shoulder. North of the DDI, the existing roadway with shoulder accommodates multi-modal pedestrian and bicycle  
22 uses. Connectivity to existing sidewalks is available in the residential area of Corson south of Hemlock Blvd. No changes to the Hemlock Blvd intersection at  
23 the north terminus of the corridor are proposed.

24

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 3. Proposed Action (Plan view Splitrock Blvd south of DDI; no changes proposed north of DDI)



2

## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

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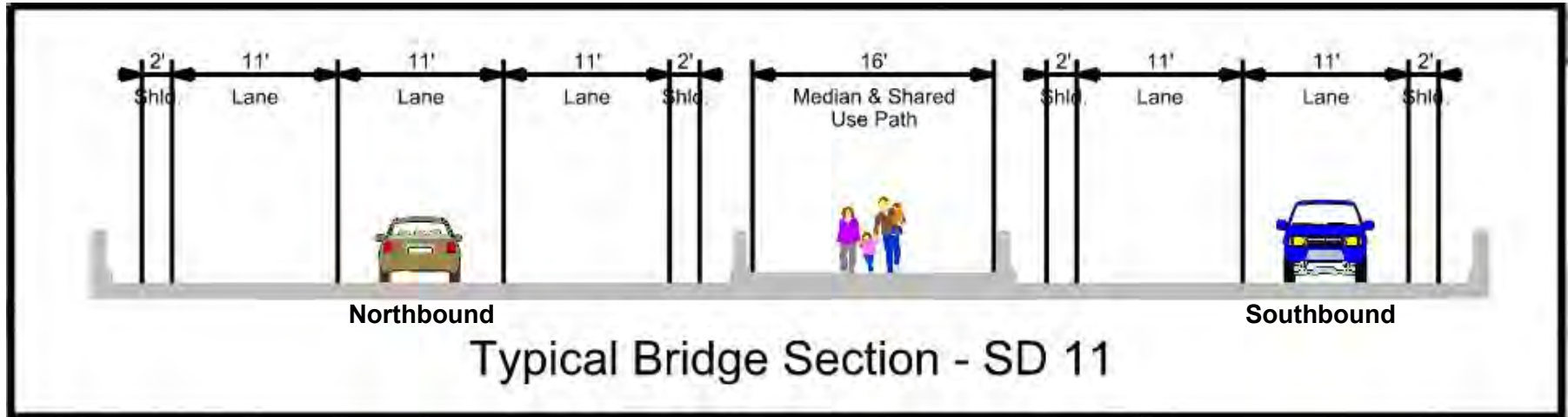
1 In summary, the Proposed Action consists of the following elements:

- 2 • Construction of a new I-90 Exit 406 interchange
  - 3 ○ DDI design with cross-section over I-90 of five traffic lanes plus a sheltered median for pedestrians and bicyclists
  - 4 ○ Median barrier on Splitrock Blvd between the eastbound I-90 exit ramp terminus and the Ash Street intersection
  - 5 ○ Extension of the entrance and exit ramps to meet current SDDOT design standards
  - 6 ○ The ramp terminal intersections are projected to operate at LOS B in 2045
- 7 • Retention of the existing cross sections on Splitrock Blvd; 5-lane undivided south of the interchange and 3-lane undivided north of the interchange
- 8 • Bicycle and pedestrian improvements
  - 9 ○ A new sidewalk on the west side of Splitrock Blvd between Redwood Blvd and the interchange
  - 10 ○ A signalized crossing of the eastbound I-90 exit ramp providing access to a sheltered median on the bridge over I-90. See **Figure 4**.
  - 11 ○ A transition from the interchange to the shoulders north of the interchange will be provided
- 12 • Access modifications
  - 13 ○ Conversion of two business accesses north of Ash Street to right-in/right-out access
  - 14 ○ Closure of five access locations south of the interchange with mitigation measures to retain access to all impacted properties. See **Figure 3**.
  - 15 ○ Closure of two access locations on the north side of the new interchange. See **Figure 2**.

16

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 4. Proposed Action Typical Bridge Section



2



## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

### 1 WHAT WILL HAPPEN IF THE PROPOSED ACTION IS NOT 2 IMPLEMENTED?

3 If the Proposed Action is not implemented, the existing interchange and  
4 associated roadway corridors will remain as they are today. In effect,  
5 the No-Action alternative would occur.

6 Under the No-Action alternative, existing geometric deficiencies will  
7 remain in place. **Figure 5** shows the narrow interchange bridge over I-90  
8 that would remain 30 feet wide, with a 2-lane section including most  
9 notably the narrow roadway width of 30 feet. Besides limiting capacity  
10 of the bridge, this narrow width prevents accommodations for left turn  
11 lanes. Additionally, the limited storage capacity of exit ramps from I-90  
12 to Splitrock Blvd will remain in place.

13 As traffic volumes increase over time, the geometric constraints would  
14 cause further degradation of traffic operations on Splitrock Blvd and I-  
15 90. Traffic signals would not be installed at the interchange ramp  
16 terminals; instead the current condition of stop sign controlled  
17 intersections would remain in place. See **Figure 6**. With Splitrock Blvd  
18 traffic volumes projected to increase by more than 70% by 2045,  
19 Conflicts due to the lack of gaps for left turns will worsen as traffic  
20 volumes increase, causing long queues, lengthy delays and congestion  
21 (LOS F measures) in the AM and PM peak periods at both ramp  
22 intersections.

23 In the No-Action alternative, the full access private drives between the I-  
24 90 Exit 406 interchange and Ash Street would remain in place. Existing  
25 safety problems would persist and worsen in the No-Action scenario,  
26 where the crash rate already exceeds the critical crash rate in this area.

**Figure 5. No-Action Alternative Images (TOP PHOTO: Existing Five-Lane Cross Section on Splitrock Blvd near Ash Street, BOTTOM PHOTO: Existing Interchange Bridge over I-90)**



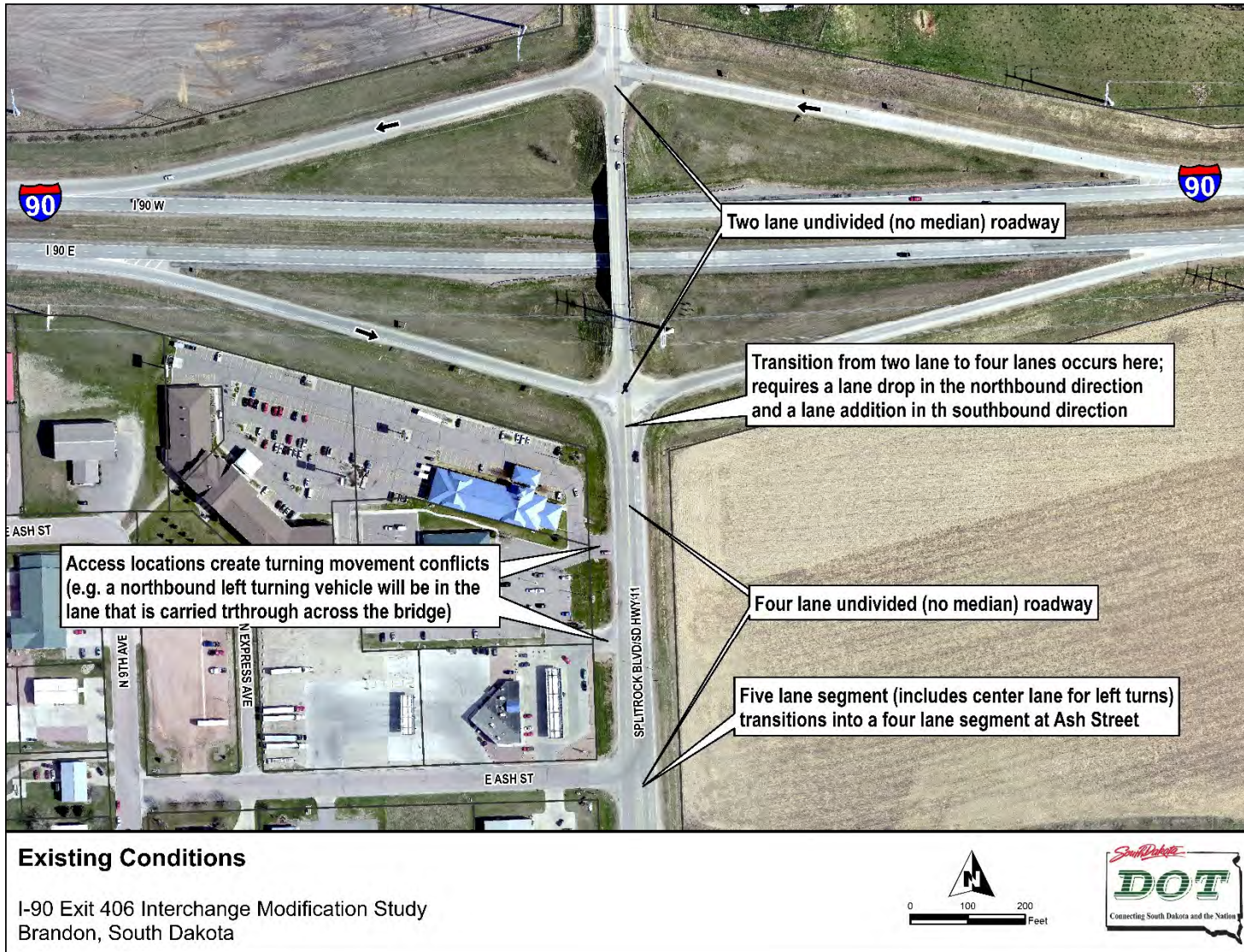
## **ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange**

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- 1 Bicycle and pedestrian users of the corridor would continue to have limited mobility, most notably when attempting to cross the bridge over I-90 where
- 2 the limited cross-section and lack of sidewalks creates unsafe mixing with vehicular traffic. Additionally, Splitrock Blvd. south of I-90 is generally developed
- 3 and provides connectivity with residential neighborhoods, yet does not have a continuous sidewalk for pedestrian users of the corridor. That situation
- 4 would remain in place in the No-Action alternative.
  
- 5 Maintenance of the existing infrastructure would continue as necessary under the No-Action alternative. This means that the existing Splitrock Blvd bridge
- 6 over I-90 would require major repair work to remain in place because it is near the end of its service life. Such an activity would likely require long-term
- 7 closure of the I-90 Exit 406 interchange during the repairs.

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 6. No-Action Alternative (Existing Conditions)



2

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

## HOW WELL DO THE NO-ACTION ALTERNATIVE AND PROPOSED ACTION MEET THE PURPOSE AND NEED?

Table 3 summarizes the specific project needs and how they are addressed by the No-Action Alternative and the Proposed Action.

**Table 3. Needs Summary for the No-Action Alternative and Proposed Action**

Project Needs	No-Action Alternative	Proposed Action
Geometric Deficiencies	Does not address the narrow bridge width (30-feet) which provides two lanes of capacity, nor does it address the short interchange ramps (300 feet long), which is a concern for traffic backing onto I-90 from the interchange ramp intersection at Splitrock Blvd, in addition to steep slopes.	Provides five lanes of capacity over I-90 and meets the current geometric design standard for interchange ramps.
Congestion	Does not address congestion at the interchange ramp intersections.	The Diverging Diamond design accommodates the high-volume turning movements that occur at the interchange ramp intersections.
Traffic Operations	Full access driveways between the interchange and Ash Street remain in place and lane drops at the interchange contribute to poor operations.	Addition of median between interchange and Ash Street along with signalized interchange ramp intersection help to resolve access conflict issues.
Safety	Increased traffic volumes with no changes to road geometry or controls would further degrade safety performance of the corridor.	Greater capacity at the interchange and the inclusion of a median barrier between Ash Street and the interchange with improved operational features will result in safety improvements.
Multi-Modal Improvement Goal	Existing breaks in pedestrian and bicycle accommodations (e.g. narrow bridge over I-90 and sidewalk discontinuity south of I-90) would remain in place while increased traffic volumes make the existing roadway less compatible for pedestrian and bicycle traffic.	Addition of sidewalk on the west side of Splitrock Blvd and protected median over I-90 provide a dedicated path for bicyclists in the corridor.

## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

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1 **WHAT ARE THE IMPACTS ASSOCIATED WITH THE NO-ACTION ALTERNATIVE AND PROPOSED ACTION?**

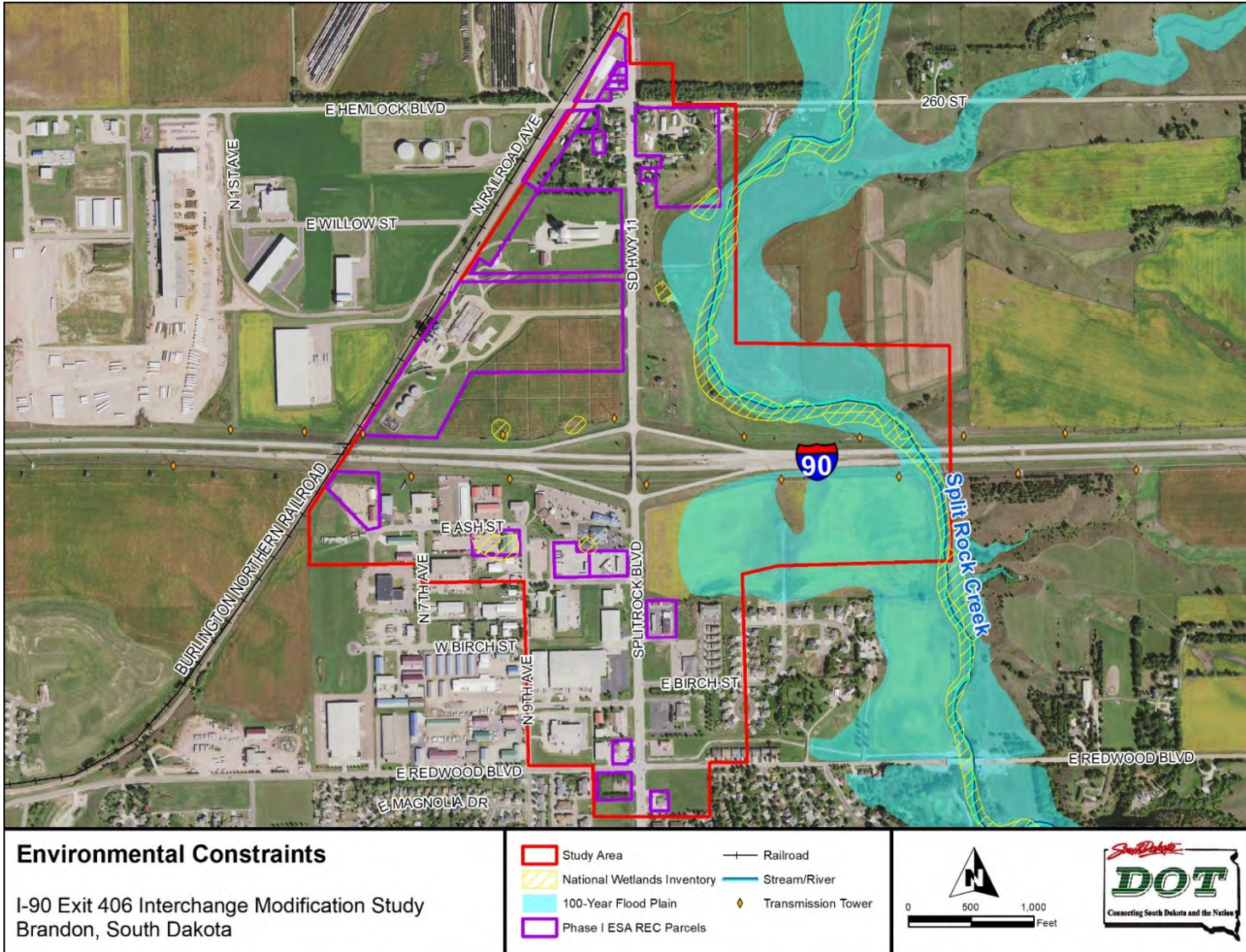
2 As referenced in the IMJR, all alternatives including the No-Action Alternative and Proposed Action have been evaluated for impacts to various resources  
3 present within the study area. **Figure 7** provides an overview of project area environmental resources that were analyzed as part of the impacts evaluation.  
4 **Table 4** is a summary of impacts to resources for the No-Action Alternative and Proposed Action. **Table 4** also references mitigation commitments that are  
5 identified by number in **Table 5**. Mitigation commitments are detailed in **Table 5**. **Table 4** is followed by **Figure 8**, a map of impacts from the Proposed  
6 Action. For additional information on the impacts, see the corresponding technical documentation in the attached **Appendices**.

7 Data collection for the EA determined the following resources are either not present in the study area or are present but not impacted. These resources  
8 were not evaluated further and include the following:

- 9 • Environmental Justice
- 10 • Section 4(f) Publicly owned Parks, Recreational Resources, Wildlife, and Waterfowl Refuges
- 11 • Section 6(f) Resources
- 12 • Vegetation, Fish, & Wildlife
- 13 • Threatened and Endangered Species (See agency coordination correspondence in Appendix E)
- 14

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 7. Environmental Constraints Map



2

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Air Quality</b>	There are currently no nonattainment or maintenance areas designated by the U.S. Environmental Protection Agency (USEPA) within South Dakota. Therefore, the requirements of the transportation conformity regulations (40 Code of Federal Regulations (CFR) 93 Subpart A) do not apply to transportation projects in South Dakota.	<p><b><u>Permanent Impacts:</u></b> No permanent impacts to air quality would occur if the No-Action Alternative is implemented.</p> <p><b><u>Temporary Impacts:</u></b> No temporary impacts to air quality would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b> No permanent impacts to air quality would occur if the Proposed Action is constructed.</p> <p><b><u>Temporary Impacts:</u></b> Neighboring areas could be exposed to construction-related fugitive dust and construction equipment emissions during construction of the project. Standard SDDOT Best Management Practices (BMPs) are implemented on all construction projects to minimize impacts to air quality.  No sensitive receptors (i.e., schools, childcare facilities, or retirement centers) are located adjacent to the project area.</p>	1
<b>Farmlands</b> (Appendix B)	There are 103 acres of farmland in the study area. Farmland includes row crops, pasture, and hayfields. Of this, 83.5 acres is Prime Farmland, 0.1 acre is identified as Farmland of Statewide Importance and 19.4 acres is identified as Not Prime Farmland (United States Department of Agriculture (USDA) Web Soil Survey).  Farmland is zoned A-1 Agricultural District for areas in unincorporated Minnehaha County.	<p><b><u>Permanent Impacts:</u></b> No permanent impacts to farmland would occur if the No-Action Alternative is implemented.</p> <p><b><u>Temporary Impacts:</u></b> No temporary impacts to farmland would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b> Approximately 0.66 acres of farmland would be impacted by the project. Of this area, 0.38 acres is within soil map units identified as prime farmland and 0.28 acres is within soil map units identified as not prime farmland. Farmland would be impacted from clear zone setbacks resulting in minor ROW expansions in the northwest, northeast,</p>	2

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
Farmlands, cont. (Appendix B)			and southeast quadrants of the study area.  <b>Temporary Impacts:</b> Approximately 1.92 acres of farmland would be temporarily impacted by construction easements. The areas would be returned to farmland after construction is completed.	
<b>Floodplains</b> (Refer to Environmental Constraints Map, Figure 7; Refer to Federal Emergency Management Administration (FEMA) Flood Insurance Maps, Appendix C)	<p>A floodplain is defined as the area adjacent to a watercourse, including the floodway, inundated by a particular flood event. A floodway is the channel and any adjacent floodplain areas that must be kept free of encroachment to ensure that the 100-year (1-percent annual chance) flood is conveyed without increasing the flood height by more than 1 foot. For the purposes of discussion in this EA, floodplain is synonymous with the 100-year floodplain.</p> <p>Floodplain is mapped along Split Rock Creek north and south of I-90 within the study area. A total of 73.5 acres of floodplain is present in the study area. Minnehaha County is a participating member of the National Flood Insurance Program.</p>	<p><b>Permanent Impacts:</b> No permanent impacts to floodplains would occur if the No-Action Alternative is implemented.</p> <p><b>Temporary Impacts:</b> No temporary impacts to floodplains would occur if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b> Permanent fill of 2.1 acres of 100-year floodplain would occur from the construction of the Proposed Action. The fill would occur adjacent to the eastbound entrance ramp to I-90. The floodplain impacts are to mapped Zone A and Zone AE floodplains. Both floodplain zones map base flow area, or backwater area, of Split Rock Creek. Floodplain impact areas do not carry active floodway flow from the creek. Impacts will be confined to a single parcel in the southeast quadrant of the interchange. The parcel is zoned A1-General Agricultural and is located in Minnehaha County outside of the Brandon Corporate limit.</p>	3



# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Floodplains, cont.</b> (Refer to Environmental Constraints Map, Figure 7; Refer to FEMA Flood Insurance Maps, Appendix C)			The Proposed Action would have no impact to the floodway.  <u><b>Temporary Impacts</b></u> Temporary impacts would occur from materials or construction staging within the floodplain if the Proposed Action is constructed. Impacts would be minimal and materials and construction equipment would likely be moved prior to a flood event.	
<b>Water Quality</b>	Water resources within the Study Area include several isolated wetlands, Split Rock Creek, and wetlands adjacent to Split Rock Creek. This creek flows through the eastern half of the Study Area. It is a large perennial stream.	<u><b>Permanent Impacts:</b></u> No permanent impacts to water quality would occur if the No-Action Alternative is implemented. Runoff from existing road surfaces would continue to carry roadway pollutants into Split Rock Creek and wetlands via overland flow.  <u><b>Temporary Impacts:</b></u> No temporary impacts to water quality would occur if the No-Action Alternative is implemented.	<u><b>Permanent Impacts:</b></u> The Proposed Action will result in a net increase in impervious surface of 178,000 square feet (4.1 acres), a 45% increase in impervious surface in the study area. The increase is from expanded bridge lanes, creation of medians, longer ramps, sidewalks and curb and gutter. The project design will include stabilization in conformance with the SDDOT Road Design Manual.  <u><b>Temporary Impacts:</b></u> Temporary impacts to water quality could occur from ground disturbance, potential spills from equipment, and runoff not contained by BMPs.	4

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

**Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action**

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<p><b>Wetlands/Waters of the US (WOUS)</b> (Refer to Wetland Delineation Report: I-90 Exit 406 (SD 11/Splitrock Boulevard) Interchange, Appendix D &amp; Agency Coordination Letters Appendix E)</p>	<p>A wetland delineation was conducted for the Study Area in October 2016. Fifteen wetlands totaling 3.431 acres were identified in the study area, see Appendix D.</p> <p>One stream – Split Rock Creek – was identified during the wetland delineation in the eastern half of the study area.</p> <p>An Approved Jurisdictional Determination (AJD) and Preliminary Jurisdictional Determination were completed by the US Army Corps of Engineers (USACE) for the project. Ten wetlands totaling 0.991 acres were determined not to be Waters of the United States (WOUS) in the AJD. The remaining wetlands were associated with Split Rock Creek or prairie potholes and determined to be WOUS.</p>	<p><b><u>Permanent Impacts:</u></b> No permanent impacts to wetlands or open waters would occur if the No-Action Alternative is implemented.</p> <p><b><u>Temporary Impacts:</u></b> No temporary impacts to wetlands or open waters would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b> Permanent impacts to approximately 0.325 acres of wetlands would occur if the Proposed Action is constructed. The impacted wetlands include impacts to 0.195 acres of ditch wetlands considered to be Preamble Waters- artificial wetlands, irrigation, ditches, ponds or lakes, ornamental bodies, and water filled depressions created in dry land – and were determined not to be WOUS in the AJD. A 0.130-acre wetland in the existing ROW was determined to be associated with a prairie pothole wetland and is considered a WOUS.</p> <p><b><u>Temporary Impacts:</u></b> Temporary impacts to approximately 0.150 acres farmed prairie pothole wetlands would occur adjacent to fill areas.</p>	5
<p><b>Habitat and Wildlife</b></p>	<p>The study area is largely within maintained interstate and urbanized ROW. The project will not impact fish habitat or impact Split Rock Creek. No large trees which could serve as potential bat and eagle roosting areas are present within the study area.</p>	<p><b><u>Permanent Impacts:</u></b> No permanent impacts to habitat and wildlife would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b> Permanent wetland impacts would decrease overall available habitat within the study area. However, wetland habitat would remain.</p> <p>Bridge demolition has the potential to impact bat and migratory bird roosting</p>	None

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Habitat and Wildlife , cont.</b>		<p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to habitat and wildlife would occur if the No-Action Alternative is implemented.</p>	<p>areas. However, the BNSF bridges at the west end of the project area and the SD11 bridge are similarly constructed, have smooth concrete underneath the roadway, and do not have transverse or or parallel crevices, boxes, or beams used by bats and migratory birds (United States Fish and Wildlife Service (USFWS) Programmatic Biological Opinion, 2018). New bridge design could incorporate suitable roosting habitat.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>Temporary impacts to wetlands would reduce available habitat during construction.</p>	
<p><b>Historic and Archaeological Resources</b> (Refer to SHPO Comments, Appendix E)</p>	<p>Level I and Level III Archaeological Surveys were completed to inform the selection of an alternative for the I-90 Exit 406 interchange. The Level I survey recommended the completion of a Level III survey to evaluate if archaeological resources from three known sites (Environmentally Sensitive Sites, or ESS) in the vicinity of the Area of Potential Effect (APE) are present. Also, the survey would identify if new sites were present within the APE and evaluate potential</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>No permanent impacts to historic or archaeological resources would occur if the No-Action Alternative is implemented.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to historic or archaeological resources would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>A review of the Level III survey by the South Dakota State Historic Preservation Office (SHPO) concurred with the no historic properties affected determination. However, SHPO included three stipulations in its concurrence letter: 1) The ESS outside of the project's APE is to be treated as a potentially eligible site, with temporary fencing placed to ensure that ground-disturbing activities do not extend beyond the existing ROW, 2) Stipulation that the I-90</p>	6

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

**Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action**

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<p><b>Historic and Archaeological Resources, cont.</b> (Refer to SHPO Comment Letter, Appendix E)</p>	<p>new sites for eligibility for the National Register of Historic Places (NRHP). The Level III survey completed in May 2017 did not identify any previously unknown archaeological sites. Additionally, no archaeological resources were identified in the vicinity of two of the three known ESS locations outside of the APE. One known ESS extends into the APE. This site lacked archaeological integrity within the APE because of previous SD 11 construction and utility activities. Areas of this ESS outside of the project APE were not evaluated. The Level III survey concluded that there are no NRHP-eligible archaeological sites within the APE because of previous soil disturbance. Therefore, a no historic properties affected determination was made for the area within the APE. The archaeological surveys were conducted relative to the National Historic Preservation Act of 1966 (NHPA) which requires Federal agencies to take into account the effects of their undertakings on historic properties.</p>		<p>construction activities remain within the identified APE such that identified ESS are not disturbed, and 3) Activity occurring outside of the APE identified in the Level III survey, including staging areas, will require additional review for historic properties. <b><u>Temporary Impacts:</u></b> No temporary impacts to historic or archaeological resources would occur if the Proposed Action is constructed.</p>	

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<p><b>Section 4(f) Historic Resources</b></p> <p><b>Section 4(f) Historic Resources, cont.</b></p> <p>(Refer to SHPO Comment Letter, Appendix E)</p>	<p>SHPO review of the Level III Archaeological Survey concurred with the survey’s determination of no historic properties affected for areas within the project APE. The ESS previously identified outside of the APE, likely would not warrant eligibility or listing on the NRHP based on known characteristics of the site.</p> <p>To qualify for protection under Section 4(f), a historic site must be on or eligible for listing on the NRHP.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>No permanent impacts to Section 4(f) Historic Resources would occur if the No-Action Alternative is implemented.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to Section 4(f) Historic Resources would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>No permanent impacts to Section 4(f) Historic Resources would occur if the Proposed Alternative is implemented and SHPO stipulations mentioned above are used during construction.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to Section 4(f) Historic Resources would occur if the Proposed Alternative is implemented.</p>	6
<p><b>Land Use</b></p>	<p>The Study Area is located in the City of Brandon, South Dakota, the unincorporated village of Corson, and rural Minnehaha County. Within this area is a mixture of commercial, industrial, single and multi-family residential, and agricultural land use.</p> <ul style="list-style-type: none"> <li>Commercial land use is concentrated along both sides of SD 11/Splitrock Blvd south of I-90 with smaller commercial properties located in Corson.</li> <li>Industrial land use is west of SD 11/Splitrock Blvd.</li> <li>A small concentration of residential land use is located in Corson</li> </ul>	<p><b><u>Permanent Impacts:</u></b></p> <p>No direct permanent impacts to land use would occur as a result of the No-Action Alternative. Indirectly, the anticipated congestion and operational challenges associated with the No-Action Alternative may be a limiting factor in whether currently adopted land use plans will be implemented.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to land use would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>Minor land use impacts would occur from conversion of approximately 0.66 acre of farmland to maintained ROW.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to land use would occur if the Proposed Action is constructed.</p>	7

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
Land Use, cont.	<ul style="list-style-type: none"> <li>Larger areas of residential land use in Brandon south of I-90 and east of SD11/Splitrock Blvd.</li> <li>Agricultural land uses are located in the northwest, northeast, and southeast quadrants adjacent to Exit 406.</li> </ul> <p>The Study Area is identified as potential growth area in the Brandon Comprehensive Plan 2035. The 2035 plan states that growth into agricultural areas is likely where it abuts developed lands.</p>			
Right-of-Way (ROW)	Existing ROW near the interchange and along Splitrock Blvd reflect setbacks and clear zones from the existing roadways. Any change in pavement configurations could result in minor ROW impacts.	<p><b>Permanent Impacts:</b> No ROW changes would occur and therefore no permanent impacts would occur if the No-Action Alternative is implemented.</p> <p><b>Temporary Impacts:</b> No temporary ROW changes would occur if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b> Approximately 0.69 acres of new ROW would be impacted by the proposed action. The ROW impacts would require partial acquisitions of five parcels. The largest parcel acquisition is 0.39 acres of a 16.05-acre agricultural parcel. No relocations are anticipated for the project.</p> <p><b>Temporary Impacts:</b> Temporary easements on private property may be required for construction access. The specific locations of temporary easements will not be known prior to final design.</p>	8

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Bicyclists and Pedestrians</b>	<p>The existing Splitrock Blvd bridge over I-90 includes no sidewalk or walkable shoulder for pedestrians. Bicyclists and pedestrians must share the traffic lane with other traffic on the bridge in order to cross the bridge. Bicycle and pedestrian facilities are limited to shoulders along Splitrock Blvd north and south of the bridge, except for sidewalk on the east side of Splitrock Blvd from Birch Street south to Redwood Blvd.</p> <p>The 2009 <i>Sioux Falls MPO Bicycle Plan</i> identifies the SD11/Splitrock Blvd. corridor as part of a “Primary Route” corridor connecting the communities of Brandon and Garretson. Primary routes are considered the best transportation bicycle route from one community to another, with a usable shoulder.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>No improvements to the existing identified bicycle or pedestrian facilities would be made as part of the No-Action Alternative. Identified safety concerns would remain in place, and with anticipated additional congestion, conditions for bicyclists and pedestrians can be expected to degrade and become more unsafe.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to bicycle or pedestrian facilities would occur if the No-Action Alternative is implemented.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>Bicycle and Pedestrian facilities would be improved from the construction of a walkable median on the new bridge. Pedestrian signals would be present at the interchange intersections. Multi-modal passage through the interchange will be provided, enabling access to the SD11 corridor to the north, where traffic volumes are lower and use of existing facilities can reasonably occur.</p> <p>Additionally, new sidewalk would be constructed on the west side of Splitrock Blvd south of the interchange to Redwood Blvd, providing a continuous pedestrian facility connection through this developed portion of the study area.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>Temporary lane closures, narrow lanes, staged construction equipment, and construction dust and noise may prevent or severely limit bicycle and pedestrian traffic through the study area during construction.</p>	None

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Economic Resources</b>	Economic resources in the study area include interstate access-dependent commercial businesses including two hotels, two gas stations, and fast food restaurants. Additional economic resources include heavy industrial businesses north of I-90 including the CHS facility and Midwest Railcar Repair northwest of the study area. Light industrial and warehousing is present south of I-90 and west of SD 11/Splitrock Blvd.	<p><b>Permanent Impacts:</b></p> <p>Implementation of the No-Action Alternative will result in increased congestion and crashes in the corridor. Over time, these problems may be expected to diminish the desirability of the SD11/Splitrock Blvd corridor as a commercial destination and for shipping of freight. Impacts such as the loss of development opportunities, wages, or jobs may occur.</p> <p><b>Temporary Impacts:</b></p> <p>No temporary impacts to economic resources would occur if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b></p> <p>No permanent impacts to economic resources would occur because of the Proposed Action.</p> <p>Access from a public street will be maintained to all existing businesses. However, access points will change for some businesses. Three driveway accesses south of I-90 on SD 11/Splitrock will be closed. These closures include two access points to Faith United Church and closure of one access point to Vogel Motors at the corner of SD 11/Splitrock Blvd and Redwood Blvd. A new access to the church will be constructed from Birch Street and Vogel Motors will maintain access from Redwood Blvd.</p> <p>The construction of a median south of the interchange to Ash Street will remove left turn access for northbound SD 11/Splitrock Blvd traffic at two existing business access points on the west side of the highway. The Proposed Action includes construction of a new parking lot entry behind one of the west side businesses to retain access to businesses via Ash Street and Express Avenue.</p>	9



# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
Economic Resources, cont.			<p>Just as the No-Action Alternative could cause indirect, growth-limiting impacts to the study area, the traffic operational benefits of the Proposed Action could have indirect growth impacts such as new development on vacant land or redevelopment of properties near the corridor.</p> <p><b>Temporary Impacts:</b> Access to all existing businesses will be maintained during construction. However, access points could be restricted or rerouted during construction requiring customers and employees to identify the new temporary access points.</p>	
Utilities	<p>Electric, gas, water, and wastewater utilities are present in the study area. No utilities are present on the SD11/Splitrock Blvd bridge over I-90.</p> <p>Public utilities are provided by:</p> <ul style="list-style-type: none"> <li>•City of Brandon water and wastewater</li> <li>•Corson Sanitary District</li> <li>•Alliance Communications cable and phone</li> <li>•Sioux Valley Energy for electric</li> </ul>	<p><b>Permanent Impacts:</b> No permanent impacts to utilities would occur if the No-Action Alternative is implemented.</p> <p><b>Temporary Impacts:</b> No temporary impacts to utilities would occur if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b> No permanent impacts to utilities would occur if the Proposed Action is implemented.</p> <p><b>Temporary Impacts:</b> Temporary impacts to public utilities may occur during construction. These impacts would be similar to normal construction or reconstruction utility relocations. No disruption of services is expected to occur.</p>	10

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
Utilities, cont.	<ul style="list-style-type: none"> <li>•MidAmerican Energy for natural gas</li> </ul> <p>Additionally, Xcel Energy maintains Transmission Lines north and south of I-90 (See Figure 7 for tower locations).</p>		<p>Note: the high-voltage transmission lines, and their associated towers, running parallel to I-90 through this corridor represent important constraints to construction of the Proposed Action. Impacts to these resources are not anticipated, as any loss of service through these lines could impact thousands of Xcel Energy customers.</p>	
Public Facilities and Services	<p>Public Facilities include government buildings, schools, and emergency response buildings or facilities. No public buildings or facilities are present in the Study Area.</p> <p>Within the study area, Public Services are provided by:</p> <ul style="list-style-type: none"> <li>•Brandon Police Department</li> <li>•Brandon Volunteer Fire Department</li> <li>•Minnehaha County Sheriff’s Office</li> <li>•Minnehaha County EMS System (Paramedics Plus)</li> </ul>	<p><b><u>Permanent Impacts:</u></b></p> <p>No permanent impacts to public facilities and services would occur if the No-Action Alternative is implemented. Increased congestion could harm public service delivery, including emergency services during congested periods.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to utilities would occur if the No-Action Alternative is implemented.</p> <p>Repair of the existing bridge over I-90 would require closure of SD 11/Splitrock Blvd and result in a disruption of public services including forcing emergency vehicles to reroute several miles around the bridge closure.</p>	<p><b><u>Permanent Impacts:</u></b></p> <p>The Proposed Action would relieve traffic congestion and improve response times for emergency services.</p> <p><b><u>Temporary Impacts:</u></b></p> <p>No temporary impacts to public facilities and services would occur if the Proposed Action is implemented. The existing SD 11/Splitrock Blvd bridge over I-90 would remain open during construction of the Proposed Action.</p>	11

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

**Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action**

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<p><b>Noise</b> (Refer to Traffic Noise Analysis, Appendix F)</p>	<p>The addition of through lanes at the interchange has been interpreted as meeting the threshold for traffic noise analysis as a “Type 1” project according to CFR Part 772 “Procedures for Abatement of Highway Traffic Noise and Construction Noise”.</p> <p>Traffic noise analysis was also evaluated using SDDOT’s Noise Analysis and Abatement Guidance.</p>	<p><b>Permanent Impacts:</b> Traffic noise levels are predicted to increase as a result of the increase in traffic volumes over time.</p> <p><b>Temporary Impacts:</b> There will be no change in traffic noise levels if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b> Traffic noise analysis determined no receivers would be considered impacted by increases in traffic noise.</p> <p><b>Temporary Impacts:</b> Temporary increases from road and bridge construction and equipment would occur if the Proposed Action is implemented.</p>	12
<p><b>Visual Resources/ Aesthetics</b></p>	<p>The Study Area is located in a mix of urban and rural land uses adjacent to an existing interchange. Three distinct areas of visual effect are present in the study area – urban Brandon, rural Minnehaha County, and Corson village. The urban Brandon section is a typical recent urban commercial/corridor with business signs, traffic signals and signage, and a mix of building textures. The rural Minnehaha County section is adjacent to the northwest, northeast, and southeast quadrants of Exit 406. The interchange is situated above the east quadrants and provides open views of row crops or pasture sloping towards Split Rock Creek and bluffs east of Split Rock Creek. The northwest quadrant is row crops and at a</p>	<p><b>Permanent Impacts:</b> No permanent impacts to visual resources or aesthetics would occur if the No-Action Alternative is implemented.</p> <p><b>Temporary Impacts:</b> No temporary impacts to visual resources or aesthetics would occur if the No-Action Alternative is implemented.</p>	<p><b>Permanent Impacts:</b> The new DDI bridge over I-90 represents the most notable change to the visual environment created by the Proposed Action. Widening of the bridge alignment (and consequently the bridge over I-90) is necessary to meet the identified needs of the project. Views from the road are not expected to change substantially from the present condition. Views of the road will change slightly for viewers from the southwest quadrant of the interchange, where hotels are located. However, given the limited amount of ROW anticipated to be needed, the new bridge can be effectively considered to remain in the existing location. None of the impact thresholds for a detailed</p>	None

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Visual Resources/Aesthetics, cont.</b>	similar elevation of SD 11/Splitrock Blvd. The Corson Village includes a mix of residential and commercial structures generally older than the Brandon Section. The Corson section is flat and buildings in this area are immediately adjacent to the existing roadway.		Visual Impact Analysis are achieved with this Proposed Action. No permanent impacts to visual resources or aesthetics would occur if the Build Alternative is constructed.  <b>Temporary Impacts:</b> No temporary impacts to visual resources or aesthetics would occur if the Build Alternative is constructed.	
<b>Hazardous Materials</b> (Refer to Modified Phase 1 Environmental Site Assessment and Hazardous Materials Review, Appendix G)	A modified Phase I Environmental Site Assessment (ESA) for the study area was completed in 2016 to identify known and potential hazardous materials sites in the study area. The Phase I ESA did not evaluate the level or confirm contamination within the study area, but identified the potential for contamination at 17 recognized environmental conditions (RECs) in the study area for this project.  The Phase I ESA recommended Phase II soil and groundwater investigation in project construction and acquisition areas within or adjacent to RECs.	<b>Permanent Impacts:</b> No permanent impacts to hazardous materials would occur if the No-Action Alternative is implemented.  <b>Temporary Impacts:</b> No temporary impacts to hazardous materials would occur if the No-Action Alternative is implemented.	<b>Permanent Impacts:</b> One REC, identified in the Phase I ESA as #33 Vogel Motors Auto Repair, is within work areas for the proposed action. The work is a driveway closure of Splitrock Blvd. No impacts to hazardous materials are anticipated.  <b>Temporary Impacts:</b> No temporary impacts to Hazardous Materials would occur with the Proposed Action.	13

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

**Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action**

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<p><b>Secondary and Cumulative Impacts</b></p>	<p>Cumulative impacts analysis helps to evaluate the incremental impact of the Proposed Action, in addition to other past, present, or reasonably foreseeable futures actions. In other words, is there a risk that the individually insignificant impacts of several projects will accumulate into a larger, more significant impact?</p> <p>Within the project Study Area, there are few other short-term development plans under consideration. Commercial and recent expansion of the Brandon Industrial Zone north of I-90 suggests there is potential demand for long-term industrial or commercial development within or near the Study Area along Splitrock Blvd to the north.</p> <p>Additionally, a proposed commercial development in the southeast quadrant of the interchange could impact traffic through the study area. A supplemental traffic analysis was conducted to determine if additional traffic generated by the proposed development would impact the DDI configuration in the proposed action. The analysis concluded that no change in the DDI configuration</p>	<p>Under the No-Action Alternative, other community development and transportation system improvements would still reasonably be expected to continue. Lacking the improvements to the interchange and SD11 corridor, planned growth in and surrounding Brandon could be distributed to also include other locations where the infrastructure is able to support the demand.</p> <p>Some sensitive resources exist near the project area, notably Split Rock Creek. If development is reduced to the same extent due to the No-Action Alternative, the risk posed to the natural environment in this immediate area could be lessened. Growth and development will occur in the larger Sioux Falls/Brandon area, so while a reduction in development may occur in this immediate area, other environmental resources may be affected by distribution of growth.</p>	<p>Implementation of the Proposed Action would be consistent with the long-term planning proposals included in the 2035 Comprehensive Plan for Brandon (Plan), enabling development consistent with community objectives and regulation. Future commercial and industrial growth is anticipated to occur north of I-90 around the Splitrock Blvd corridor.</p> <p>In the 2035 Plan, Split Rock Creek is shown to be retained as an open space, thereby limiting the potential for negative cumulative impacts to that or adjacent natural resources. Permit requirements and local, state, and federal regulations are meant to provide protection of resources from individual projects.</p> <p>Capacity improvements, additional interchanges and construction on new location generally have a greater potential for indirect effects than projects that upgrade existing facilities. As discussed previously, traffic is anticipated to increase regardless of the proposed project. While this project is intended to relieve congestion by providing for increased capacity, access</p>	<p>None</p>

## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

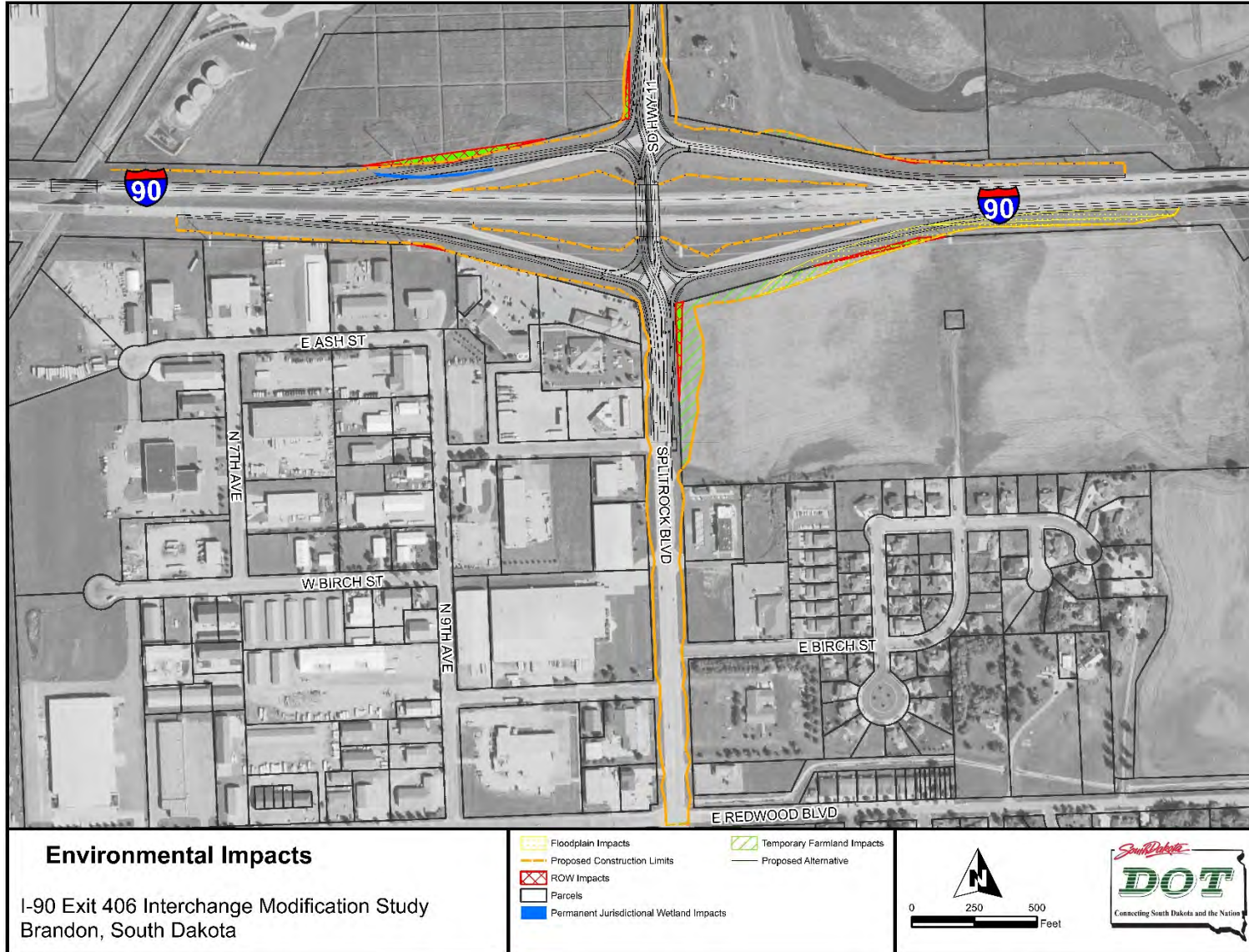
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**Table 4. Environmental Impacts of the No-Action Alternative and Proposed Action**

Resource	Context	No-Action Alternative	Proposed Action	Mitigation Number (see Table 5)
<b>Secondary and Cumulative Impacts, cont.</b>	<p>would be necessary, but LOS on Splitrock Blvd would be impacted. See Appendix J.</p> <p>The population of Brandon has grown steadily since 1990 when it was 3,545. The 2016 estimate is 9,923. The City’s Comprehensive Plan projects population to be 15,335 in 2035. Future residential growth in Brandon is anticipated to occur in all sectors of Brandon.</p>		<p>to the area currently exists and reconstruction of the existing interchange is not anticipated to have a direct effect on development in this area. Therefore secondary and cumulative impacts are not anticipated as a result of this project</p>	

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

1 Figure 8. Environmental Impacts Map



2

## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

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### 1 WHY ARE FHWA AND SDDOT RECOMMENDING THE PROPOSED ACTION?

2 FHWA and SDDOT are recommending that the proposed action be implemented because it best addresses the needs identified for this project corridor and  
3 has the least environmental impacts. Reconstruction of the I-90 Exit 406 interchange resolves the existing geometric deficiencies found at the bridge over  
4 I-90 and the interchange ramps while also meeting the future traffic demands of a growing City of Brandon population. The DDI design specifically addresses  
5 the highly directional turning movements at the interchange, where morning traffic generally makes the northbound-to-westbound turn toward Sioux Falls  
6 and evening traffic returns, making the eastbound-to-southbound movement.

7 Operations on the Splitrock Blvd corridor are improved by the addition of a median barrier from the interchange to the intersection at Ash Street. Converting  
8 the existing full access private driveways in this segment to right-in, right-out accesses reduces the number of conflicts, creating a safer corridor. Additionally,  
9 the interchange design is able to accommodate dedicated space for use by pedestrians and bicyclists by a combination of sidewalk connections and a  
10 protected median. As part of the proposed action, SDDOT will construct new sidewalk where needed on the west side of Splitrock Blvd in order to provide  
11 a continuous pedestrian/bicycle facility from Redwood Blvd through the interchange. That functionality does not exist on the current interchange or in the  
12 corridor to the south.

13

### 14 WHAT ENVIRONMENTAL COMMITMENTS WILL BE MADE FOR THE PROPOSED ACTION?

15 **Table 5** describes mitigation commitments listed for resource impacts identified in **Table 4**. **Table 5** summarizes impacts, mitigation commitments, and  
16 timing of mitigation. Additional details regarding the methodology and analysis of impacts and mitigations are found in agency coordination letters and  
17 technical memoranda in their respective appendices. Additionally, **Appendix I** describes specific Environmental Commitments using SDDOT's Environmental  
18 Commitment Checklist. The checklist will be updated using refined impact numbers from final design.



## ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 5. Summary of Impacts and Mitigation for the Proposed Action, Interstate 90 Exit 406 Interchange

#	Mitigation Category	Impact	Mitigation Commitment (Environmental Commitment Checklist Item in Environmental Commitments Appendix I, if applicable)	Timing/Phase that Mitigation will be Implemented
1	Air Quality	Construction-related emissions and dust.	Standard SDDOT BMP's are included in all SDDOT construction contract provision including implementation of all Federal, State, and local air quality requirements. No further mitigation will be implemented.	Construction
2	Farmlands	Farmland totaling 0.66 acres will be converted from agricultural use to ROW as a result of interchange construction. Of this area, 0.38 acres is prime farmland and 0.28 not prime farmland. Completion of NRCS Form AD-1006 showed an impact rating of 109 points.	No further coordination is necessary for impact ratings less than 160 points.	Design
3	Floodplains	Backwater floodplain fill.	A hydraulic analysis and a Floodplain Development permit will be obtained from Minnehaha County by the SDDOT. Floodplain permit conditions will be incorporated into the project plans, if necessary. With no floodway impacts, a "no rise" certification is not required.	Design
4	Water Quality	Runoff during construction and any point source discharges from dewatering activities during construction.	In accordance with South Dakota Department of Environment and Natural Resource's (SDDENR) general permit for stormwater discharge, a Storm Water Pollution Prevention Plan (SWPPP) will be included in the construction contract and implemented during construction to reduce or eliminate impacts due to erosion and sedimentation.  If construction dewatering is required, the Contractor shall obtain the General Permit for Temporary Discharge Activities from the SDDENR Surface Water Program. The Contractor shall provide a copy of the approved permit to the Project Engineer. (Commitment D)	Design and Construction

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 5. Summary of Impacts and Mitigation for the Proposed Action, Interstate 90 Exit 406 Interchange

#	Mitigation Category	Impact	Mitigation Commitment (Environmental Commitment Checklist Item in Environmental Commitments Appendix I, if applicable)	Timing/Phase that Mitigation will be Implemented
5	Wetlands and other Waters of the U.S.	<p>0.130-acre of jurisdictional wetland in the existing ROW converted to upland ROW.</p> <p>Additionally, 0.195 acres of Preamble Waters – ditches created in upland and not considered jurisdictional waters – will be impacted.</p>	<p>A 404 permit will be obtained from the USACE. The project is anticipated to be covered by a Nationwide Permit 14 for wetland impacts less than 0.5 acres.</p> <p>Wetland credits will be obtained through a wetland bank. The appropriate wetland mitigation option and the number of credits will be established through the 404 permitting process.</p> <p>Avoidance of wetlands and temporary impact areas will be described in project plans.</p> <p>The temporary impacts will occur within farmed prairie pothole wetland area and will be returned to crop rotation after the proposed action is completed.</p> <p>An Approved Jurisdictional Determination (AJD) for wetlands within the project area was issued on 11/27/17. The AJD is valid until 11/27/22. Additional coordination with the USACE will be required if permitting is not secured before the expiration date.</p> <p>The Contractor will notify the Project Engineer if additional easement is needed to complete work adjacent to any wetland. The Contractor will also be responsible for obtaining a Section 404 Permit for any dredge, excavation, or fill activities associated with material sources, storage areas, waste sites, and Contractor work sites outside the plan work limits that affect wetlands, floodplains, or waters of the United States. (Commitment A, Commitment N)</p>	Design and Construction

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 5. Summary of Impacts and Mitigation for the Proposed Action, Interstate 90 Exit 406 Interchange

#	Mitigation Category	Impact	Mitigation Commitment (Environmental Commitment Checklist Item in Environmental Commitments Appendix I, if applicable)	Timing/Phase that Mitigation will be Implemented
6	Historic and Archaeological Resources & Section 4(f) Historic Resources	Discovery of unidentified archaeological resources during construction.	<p>If inadvertent discovery of possible archaeological materials or human remains are found standard federal, state, or local provisions will be followed to protect, report, investigate, and evaluate the discovery.</p> <p>Fencing will be placed at the edge of the construction limits within the area of the avoidance areas identified as ESS. Fenced location will be shown on the plans in a manner that will not revealing the specific location but will ensure site is protected (i.e. avoidance area bubble).</p> <p>The locations of the ESS need to be accommodated during design to ensure SHPOs three stipulations in its concurrence letter are met and its No Historic Properties finding is maintained : 1) The ESS outside of the project’s APE is to be treated as a potentially eligible site, with temporary fencing placed to ensure that ground-disturbing activities do not extend beyond the existing ROW, 2) Stipulation that the I-90 construction activities remain within the identified APE such that identified ESS are not disturbed, and 3) Activity occurring outside of the APE identified in the Level III survey, including staging areas, will require additional review for historic properties. (Commitment I, Commitment Q)</p>	Design and Construction
7	Land Use	0.66 acres of agricultural land converted from agricultural to highway ROW.	Avoidance and minimization of property acquisitions was considered during selection of proposed action and will be further considered during the design process to minimize impacts to the greatest extent possible. Public opposition to minor conversions was not identified during the public involvement process.	ROW

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 5. Summary of Impacts and Mitigation for the Proposed Action, Interstate 90 Exit 406 Interchange

#	Mitigation Category	Impact	Mitigation Commitment (Environmental Commitment Checklist Item in Environmental Commitments Appendix I, if applicable)	Timing/Phase that Mitigation will be Implemented
8	Right-of-Way	Partial acquisition or easement on five parcels.	<p>For any person(s) whose real property interests may be impacted by this project, the acquisition of those property interests will fully comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act). The Uniform Act is a federally-mandated program that applies to all acquisitions of real property resulting from Federal or federally-assisted projects. All impacted owners will be provided notification of the intent to acquire an interest in their property including a written offer letter of just compensation specifically describing those property interests.</p> <p>No displacements are required for the Proposed Action.</p> <p>Temporary easements on private property required for construction must be consistent with other mitigation and permitting commitments related to resources describe in this table.</p>	ROW
9	Economic Resources	Access to commercial businesses along SD 11/Splitrock Blvd and industrial areas.	Access will be maintained to businesses during construction. Access signs indicating individual businesses by name will be included in construction signage. Construction will be phased to minimize traffic congestion impacts and overall time of construction in the study area. Access from a public street will be maintained to all existing businesses after as a result of the Proposed Action.	Construction
10	Utilities	Relocating utilities where necessary to construct interchange.	Existing utilities may need to be moved or placed in temporary conduit, but no disruption of service is proposed or anticipated. Coordination with the utility companies is required during design.	Construction
11	Public Facilities and Services	Temporary impacts from lane or access closures or congestion on the SD 11/Splitrock Blvd bridge over I-90.	The existing SD 11/Splitrock Blvd bridge and at least one traffic lane north and south of the bridge will remain open during construction at all times.	Construction

# ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange

Table 5. Summary of Impacts and Mitigation for the Proposed Action, Interstate 90 Exit 406 Interchange

#	Mitigation Category	Impact	Mitigation Commitment (Environmental Commitment Checklist Item in Environmental Commitments Appendix I, if applicable)	Timing/Phase that Mitigation will be Implemented
12	Noise	Temporary increases in noise would occur from construction.	To address temporary noise increases due to construction, mitigation measures will be incorporated into the construction contract.  Equipment exhaust systems will be in good working order.  When possible, construction will be completed in hours that are least disturbing to the general public. If night work is anticipated, a noise variance permit will be required from the City of Brandon.	Construction
13	Hazardous Materials/ Waste	Discovery of hazardous materials during construction.	A driveway closure located on a parcel is identified as an REC in the Phase I ESA. The REC is #33 Vogel Motors Auto Repair and is listed as an REC because of auto repair and storage tanks at the site. If contamination is identified at the REC or elsewhere during construction the Project Engineer will notify SDDENR to determine possible contamination. SDDOT will assess the property and develop a remediation plan, as necessary. (Commitment L)	Construction

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## **ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange**

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### 1 WHAT PERMITS ARE REQUIRED FOR THIS PROJECT?

2 The following permits are likely to be required prior to construction, but this list may change during design:

- 3 • USACE 404 Permit
- 4 • SDDENR General Permit for Stormwater Discharges Associated with Construction
- 5 • Minnehaha County Flood Plain Permit
- 6 • SDDENR Temporary Discharge Permit
- 7 • City of Brandon Noise Variance Permit

### 8 WHAT OUTREACH AND OPPORTUNITIES FOR STAKEHOLDER PARTICIPATION WERE PROVIDED?

9 The I-90 Exit 406 interchange project EA has been developed in conjunction with an Interchange IMJR for the interchange. The IMJR examined several  
10 traffic factors and alternative options for potential improvements. The process of developing the IMJR provided opportunities for public and stakeholder  
11 input that aligned with the needs for both the IMJR and EA.

12 Stakeholder and public involvement activities were centered on major milestones within the IMJR and EA studies. Each of the following milestones included  
13 smaller group discussions with known project stakeholders. This allowed for small-group discussions with the study advisory team. Stakeholders consisted  
14 of property and business owners and managers along the SD11/Splitrock Boulevard corridor, emergency responders, government representatives, and  
15 others identified to have a strong transportation interest along the corridor. These stakeholder meetings occurred prior to, but on the same day of public  
16 meetings, as follows:

- 17 • Stakeholder and Public Meeting #1: Gather feedback on study area issues and needs (August 9, 2016).
- 18 • Stakeholder and Public Meeting #2: Gather feedback on proposed Build Alternatives for further refinement and analysis (January 23, 2017).

19  
20 At the initial set of public and stakeholder meetings, the study team gathered feedback from the public regarding the issues and needs they see within and  
21 around the I-90 Exit 406 Interchange. Many of the comments focused on traffic operations and safety at both ramp terminals and the subsequent upstream  
22 impacts along both the SD11/Splitrock Boulevard corridor and I-90 mainline. There were also several comments regarding the importance of maintaining  
23 access across I-90 along SD11/Splitrock Boulevard.

24 The second set of stakeholder and public meetings held January 23, 2017 presented the proposed interchange and corridor Build Alternatives developed  
25 for the study area that considered comments and feedback received at the August 9, 2016 public meeting. Overall, there was notable support for both the

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1 Standard Diamond (shifted west) and DDI Build Alternatives. While many understood the safety benefits of roundabouts at ramp terminals, the consensus  
2 from the public and businesses was that this location was not a good fit due to the high number of large trucks that use the interchange. There was also  
3 preference for the Standard Diamond (shifted west) over the Standard Diamond interchange because the shifted west variation maintains traffic across the  
4 existing bridge. Along the corridor, comments were mixed in preference to a corridor with a restrictive median or a continuous two-way center left-turn  
5 lane. Degree of access, such as full,  $\frac{3}{4}$  or right-in/right-out, at Ash Street and Birch Street (east) was of particular concern.

6 Project information has been disseminated to the public through the project website at <http://www.sehinc.com/online/406>. The website provides links to  
7 study materials such as concept and Build Alternative figures, evaluation summaries, and public information meeting material. The website also provides  
8 study contact information for SDDOT and consultant project managers. Viewers of the website have the opportunity to submit comments and questions  
9 directly from the website.

### 10 **Tribal Coordination**

11 The following Tribes were invited submit comments on the project and to Stakeholder and Public Meeting #1. No responses were received:

- 12 • Flandreau Santee Sioux Tribe
- 13 • Lower Brule Sioux Tribe
- 14 • Ponca Tribe of Nebraska
- 15 • Standing Rock Sioux Tribe
- 16 • Sisseton-Wahpeton Oyate
- 17 • Mandan, Hidatsa and Arikara Nation
- 18 • Yankton Sioux Tribe

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## 1 Federal, State and Local Agency Coordination

2 The following agencies were invited to comment on the project throughout the project. Responses are summarized below and copies of formal responses  
3 are in Appendix E.

- 4 • United States Army Corps of Engineers
  - 5 ○ USACE reviewed a wetland delineation report for the project. An AJD for the project was received on 11/27/17. The project will require a
  - 6 404 permit from the USACE and is anticipated to be covered by a Nationwide Permit 14. Wetland credits will need to be obtained through
  - 7 a wetland bank. The appropriate wetland mitigation option and the number of credits will be established through the 404 permitting
  - 8 process.
- 9 • United States Fish and Wildlife Service
  - 10 ○ The Information for Planning and Consultation (IPAC) website was reviewed for the potential presence of endangered species. Four
  - 11 Endangered Species Act species – the threatened northern long-eared bat (*Myotis septentrionalis*), the threatened red knot, a shorebird
  - 12 (*Calidris canutus rufa*), the endangered Topeka shiner, a minnow (*Notropis topeka*), and the threatened western prairie fringed orchid
  - 13 (*Platanthera praeclara*) were listed. A Determination Key within IPAC determined the project would have “no effect” on the northern
  - 14 long-eared bat. Habitat for the other listed species is not present in the study area so long as no impacts to Split Rock Creek occur. Split
  - 15 Rock Creek is a Topeka shiner inhabited stream.
  - 16 ○ Additionally, IPAC listed the bald eagle (*Haliaeetus leucocephalus*) as a migratory bird of concern because of The Bald and Golden Eagle
  - 17 Protection Act of 1940.
  - 18 ○ The USFWS South Dakota Ecological Services office in Pierre was reviewed the project in accordance with the Fish and Wildlife
  - 19 Coordination Act and has no objection to the proposed project .
  - 20 ○ The USFWS Madison Wetland Management District reviewed the project and the project will not impact USFWS conservation easements
  - 21 or Waterfowl Production Areas.
- 22 • South Dakota State Historic Preservation Office
  - 23 ○ SHPO requests if inadvertent discovery of possible archaeological materials or human remains are found standard federal, state, or local
  - 24 provisions will be followed to protect, report, investigate, and evaluate the discovery. Fencing will be placed at the edge of the
  - 25 construction limits within the area of the avoidance areas identified as ESS. Fenced locations will be shown on the plans in a manner that
  - 26 will not reveal the specific location(s) but will ensure site(s) are protected.
- 27 • South Dakota Department of Environment and Natural Resources
  - 28 ○ In accordance with SDDENR's general permit for stormwater discharge, a Storm Water Pollution Prevention Plan (SWPPP) should be
  - 29 included in the construction contract and implemented during construction to reduce or eliminate impacts due to erosion and
  - 30 sedimentation. Additionally, if construction dewatering is required, the Contractor will obtain the General Permit for Temporary Discharge
  - 31 Activities from the SDDENR Surface Water Program.



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- 1       • South Dakota Department of Game, Fish and Parks
- 2             ○ SDGFP identified Split Rock Creek as a known Topeka shiner inhabited stream. Topeka shiner is a federally endangered minnow species.
- 3             SDGFP may provide additional comments during project design.
- 4
- 5       • South Dakota Division of Parks & Recreation.
- 6             ○ No Section 6(f) properties are within the project area.
- 7       • Representatives of the following agencies were invited to the stakeholder meetings:
- 8             ○ Brandon Volunteer Fire Department
- 9             ○ Brandon Police Department
- 10            ○ South Dakota Highway Patrol
- 11            ○ Corson Village Sanitary District
- 12            ○ Minnehaha County Highway Department
- 13            ○ Minnehaha County Sheriff's Office
- 14            ○ Brandon Valley School District
- 15

### 16   WHAT ADDITIONAL OPPORTUNITIES FOR STAKEHOLDER PARTICIPATION WILL BE PROVIDED?

17   SDDOT is committed to providing on-going communications about the status of this project as appropriate. Coordination with applicable regulatory agencies,  
18   local government units, property owners, and the general public will occur, when necessary, through completion of this NEPA process, SDDOT's final design  
19   process, and project construction. The IMJR study was completed prior to completion of this EA.

20   A public notice will be published in area newspapers at the beginning of a 30-day public comment period. Additionally, a public meeting will be held during  
21   this review period. This public meeting will also incorporate findings from the IMJR document for public viewing. Comments received at the public meeting,  
22   via mail, email, fax, or through the project website will be considered and reviewed.

23   The FHWA will take into consideration all comments received during the comment period in determining whether the preferred alternative will or will not  
24   result in significant social, economic, and environmental impacts. Following the public meeting period, the EA will be revised, as appropriate, to reflect  
25   changes in the proposed action or mitigation measures resulting from comments received on the EA or at the public meeting. If it is found that Project does  
26   not result in significant impacts, a Finding of No Significant Impacts (FONSI) will be prepared and submitted to FHWA for approval. If there is identification  
27   for potential of significant impacts identified with Project, FHWA will determine whether it will be necessary to prepare an Environmental Impact Statement.

## **ENVIRONMENTAL ASSESSMENT: Interstate 90 Exit 406 Interchange**

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### 1 REFERENCES

- 2 106 Group, 2016. Level I Cultural Resources Literature Review and Windshield Survey for the I-90 Exit 406 Interchange Modification Study.
- 3 106 Group, 2017. Level III Archaeological Survey for the I-90 Exit 406 Interchange Modification Study.
- 4 City of Brandon, 2035 Comprehensive Plan
- 5 City of Brandon, Brandon Zoning Map (March 20, 2018)
- 6 FEMA, 2011. NFIP FIRM Pane 0477D Minnehaha County, South Dakota, Map Number 46099C0477D.
- 7 HR Green, 2017. Traffic Noise Analysis: I-90 Exit 406 (SD 11/Splitrock Boulevard) Interchange.
- 8 HR Green, 2017. Wetland Delineation Report: I-90 Exit 406 (SD 11/Splitrock Boulevard) Interchange.
- 9 Minnehaha County, Envision 2035 Minnehaha County Comprehensive Plan
- 10 SDDOT, 2010. Decennial Interstate Corridor Study: Phase 1.
- 11 SDDOT, 2010. Decennial Interstate Corridor Study: Phase 2 Report.
- 12 SDDOT, 2010. Decennial Interstate Corridor Study: Phase 3 Report – Implementation Plan.
- 13 SDDOT, 2015. Environmental Procedures Manual.
- 14 SDDOT, 2017. Draft I-90 Exit 406 SD 11/Splitrock Boulevard Interchange Modification Justification Report.
- 15 SDDOT, Updated. Plans for Proposed Project Nos. F 0011(23)78 & RS 3264(00)424: S.D. Highway No. 11/SD Highway No. 264, Minnehaha County.
- 16 SEH, 2017. Modified Phase I Environmental Site Assessment and Hazardous Materials Review. I-90 Exit 406 (SD11/Splitrock Boulevard) Interchange.
- 17 Sioux Falls MPO, 2009. Sioux Falls MPO Bicycle Plan.
- 18 Sioux Falls MPO, 2017. 2045 Travel Demand Model.

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1 REFERENCES, CONT.

- 2 South Dakota Department of Highways, 1958. Plans for Proposed Federal Aid Project No. 1 90-9(2) 404 Interstate Highway No. 90 Minnehaha County.
- 3 South Dakota Department of Public Safety Crash Records 2010-2014.
- 4 Southeastern Council of Governments, 2015. Brandon Comprehensive Plan 2035.
- 5 US Census Bureau, Accessed 8/2017, QuickFacts Brandon City, South Dakota <https://www.census.gov/quickfacts/fact/table/brandoncitysouthdakota/PST045217>
- 6 USDA, Accessed 9/2016, Web Soils Survey <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- 7 USEPA, Accessed 8/2017, Nonattainment Areas for Criteria Pollutants (Green Book), <https://www.epa.gov/green-book>.
- 8 USFWS, Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat, Revised February 2018.