



Montana Department of Transportation

PO Box 201001
Helena, MT 59620-1001



Memorandum

To: Ryan Dahlke, PE
Consultant Design Engineer

From: Bryan Miller, PE *Blm*
Consultant Plans Engineer

Date: June 20, 2019

Subject: STPX 90-8(191)450
Lockwood Interchange - Billings
UPN 9588000
Work Type 130 - Reconstruction – with added capacity

Please approve the attached Preliminary Field Review Report.

Approved *Ryan Dahlke* Date 6-21-2019
Ryan Dahlke, P.E.
Consultant Design Engineer

We are requesting comments from those on the distribution list. We will assume their concurrence if we receive no comments within two weeks of the approval date.

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Preliminary Field Review Report

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EPS Project Manager: Mark Studt

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Introduction

A scoping meeting was held at the MDT Billings District Office on February 5, 2019 at 3:00 pm and via Skype Meeting/conference call. A field visit was not held at the time of the scoping meeting. The following personnel attended the meeting.

Mark Studt – MDT Consultant Design*	Tim Erickson – HDR Project Manager
Robert Padmos – MDT Consultant Design*	Mick Johnson – HDR
Stan Brelin – MDT Traffic*	Kirk Spalding - Sanderson Stewart*
Roy Peterson – MDT Traffic*	DJ Clark – Sanderson Stewart*
Danielle Bolin – MDT Traffic*	Joey Staszczuk – Sanderson Stewart*
Rod Nelson – MDT Billings District Administrator	Lisa Fischer - HDR*
Katie Kay – Sanderson Stewart	Will Hume - HDR*
Bob Marvin – Marvin & Associates	

* Denotes attendance at MDT Helena Basement West Conference Room

+ Denotes attendance via Skype Meeting

Proposed Scope of Work

The proposed project is considered to be an OT Phase project and will focus on evaluating interchange improvement options at the Lockwood Interchange, east of Billings. The evaluation will consider both current and future traffic patterns, ramp functionality, operational issues on I-90 and connecting routes, proposed interstate modifications, safety considerations, and bridge construction options. The project will include evaluation for environmental, right-of-way, utilities and hydraulic improvements. This phase will take project development through the Alignment and Grade milestone, including Activity 930 and 935 as shown in the Consultant Design Flowchart.

This project will be designed in 3D model workspace as agreed during the review.

Needs and Objectives

The purpose of this project is to address roadway deficiencies and improve traffic operations at the Lockwood Interchange as well as along I-90 between Lockwood Interchange and Johnson Lane Interchange. Improvements to I-90 are currently being designed on the segment to the west of the project as part of the I-90 Yellowstone R – Billings project, which ends on the west side of the Lockwood Interchange and includes interstate widening to provide three through lanes in each direction. The interchange directly east of the project, Johnson Lane, will be reconstructed as part of the Billings Bypass project. This project will connect the two adjacent projects while taking into consideration the operations and access at the Lockwood Interchange.

Public Summary

The proposed project will be to evaluate alternatives to improve the access and operations at the Lockwood Interchange. The evaluation will include proposed modifications along I-90 from Lockwood Interchange to Johnson Lane Interchange, interchange improvement options, safety considerations, bridge construction options, environmental issues, right-of-way impacts, and other factors necessary to determine a preferred improvement alternative.

Project Location and Limits

This project is located along I-90 from the Lockwood Interchange to the Johnson Lane Interchange east of Billings in Yellowstone County. The project is located outside the city limit boundary of the City of Billings and is approximately 1.5 miles from Downtown Billings. The Lockwood Interchange is within the Census-Designated Place for Lockwood, MT. The project will include the ramps/connections with I-90 as well as the segment of Old US 87 from N Frontage Rd to Lockview Lane. I-90 operations and lane configurations will be examined from approximately RP 450.0+/- to RP 455.3+/-, which extends from 27th Street to Johnson Lane.

The as-built project numbers are summarized in the table below. Other as-built projects may exist but were not identified prior to the development of this PFR.

As-Built Projects

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Project ID	Location	Year Built	Description
I-IG 90-8(23) 447 Unit 2	27 th St to Lockwood	1966	Construction
I 90-8(70)388	Int Lockwood I 90 - Billings	1998	Bridge Rehab
IM 90-8(131)450	27 th St to Lockwood	2000	Overlay
IR90-8(102)455	Johnson Lane Interchange	1986	Construction
IR 90-8(118)453	Lockwood-Pinehill Interchange	1990	Construction

There are two adjacent projects that were identified during development of the PFR. These projects are listed in the table below.

Adjacent Projects

Project ID	From (RP)	To (RP)	Construction Year	Description
NCPD 56(55) UPN 4199	455+/-	456+/-	2022	Billings Bypass (Johnson Lane)
NHPB 90-8(176)450 UPN 7972	450.09	452.73	2021	I-90 Yellowstone R – Billings

The direction of this project is from west to east and staging will increase in the direction of the reference posts along I-90 and US 87.

Work Zone Safety and Mobility

At this time, Level 1 construction zone impacts are anticipated for this project as defined in the Work Zone Safety and Mobility (WZSM) guidance. The plans package will include a Transportation Management Plan (TMP) consisting mainly of a Traffic Control Plan (TCP). A limited Transportation Operations (TO) component and a limited Public Information (PI) component to address interchange ramp closures and wide load detours will also be included in the plan package. These issues are discussed in more detail under the Traffic Control and Public Involvement sections.

Physical Characteristics

The project's physical characteristics include the following:

- a. Interstate 90 (I-90) was originally constructed in 1966. The roadway was last overlaid in 2000.
- b. US 87 north of the interchange consists of 2-12' lanes, 6' outside shoulders and 2' inside shoulders in each direction with a raised median. The raised median width varies from 2' to 16' and provides left turn access at major intersections. Old Hwy 87/Old Hardin Rd south of the interchange transitions from the US 87 typical section to a single 12' lane with 6' shoulders in each direction.
- c. The existing I-90 mainline consists of 2-12' lanes, 10' outside shoulders and 4' inside shoulders in each direction for a total pavement width of 38' in each direction. Existing ramps consist of 14' lanes, 6' outside shoulders and 4' inside shoulders for a total pavement width of 24'. The existing median width varies within the project limits with an average width of 40'.
- d. The original construction of I-90 consisted of 0.35' plant mix over 0.15' crushed top surface over 1.9' crushed base course and 1.0' of special borrow. The ramps included the same pavement section but did not include the special borrow.
- e. I-90 mainline received a cold mill and pulverize including widening with 0.55' 50% RAP PMS with a final lift of 0.20' 25% RAP PMS in the year 2000. Total pavement thickness on mainline is 0.75'. The ramps received an overlay with 0.15' of 25% RAP PMS in the year 2000.
- f. US 87 received a 0.15' overlay of hot recycled plant mix (25%) RAP in 2016. The original surfacing thickness was 2.6'.
- g. The Pavement Management System's Pavement Condition and Treatment Recommendations are listed below. While the proposed scope is greater than the PvMS recommended treatment, to project's purpose and need is to increase capacity, not simply maintain the surfacing.
 - I-90 EB (RP 449.69 to RP 453.29)
 - Ride Index: 81.1 ("good" rating 80-100)

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- Rut Index: 62.8 (“good” rating 60-100)
 - ACI: 96.0 (“good” rating 60-100)
 - MCI: 98.6 (“good” rating 60-100)
 - Recommend treatment for 2019 is “AC Crack Seal & Cover”
 - I-90 EB (RP 453.29 to RP 456.60)
 - Ride Index: 81.6 (“good” rating 80-100)
 - Rut Index: 68.3 (“good” rating 60-100)
 - ACI: 97.9 (“good” rating 60-100)
 - MCI: 98.1 (“good” rating 60-100)
 - Recommend treatment for 2019 is “AC Crack Seal & Cover”
 - I-90 WB (RP 449.69 to RP 453.29)
 - Ride Index: 78.3 (“fair” rating 60-79.9)
 - Rut Index: 63.3 (“good” rating 60-100)
 - ACI: 94.7 (“good” rating 60-100)
 - MCI: 95.9 (“good” rating 60-100)
 - Recommended treatment for 2019 is “AC Crack Seal & Cover”
 - I-90 WB (RP 453.29 to RP 456.60)
 - Ride Index: 83.0 (“good” rating 80-100)
 - Rut Index: 69.6 (“good” rating 60-100)
 - ACI: 99.1 (“good” rating 60-100)
 - MCI: 98.7 (“good” rating 60-100)
 - Recommended treatment for 2019 is “AC Crack Seal & Cover”
 - US 87 (RP 0.00 to RP 1.08)
 - Ride Index: 60.0 (“fair” rating 60-79.9)
 - Rut Index: 73.8 (“good” rating 60-100)
 - ACI: N/A
 - MCI: N/A
 - Recommended treatment for 2019 is “Do Nothing”
 - US 87 (RP 1.08 to RP 2.18)
 - Ride Index: 57.2 (“poor” rating 0-59.9)
 - Rut Index: 60.5 (“good” rating 60-100)
 - ACI: 95.7 (“good” rating 60-100)
 - MCI: 85.9 (“good” rating 60-100)
 - Recommended treatment for 2019 is “Do Nothing”
- h. The general terrain of the project area is level terrain.
- i. The project is located on I-90 and HWY 87 adjacent to the Billings Urban Area.
- j. A general description of the existing horizontal alignment is provided below.
- I-90 Mainline: Consists of two horizontal curves with radii of 5730.0’ and 2083.5 from west to east.
 - I-90 Ramps: The EB ramps consists of three horizontal curves with radii of 1,909.86’, 996.45’ and 1,432.39’ from west to east. The WB ramps are also made up of two horizontal curves with radii 1,041.74’ and one 1,909.86’ radius curve from west to east.
 - US 87: There are two major horizontal curves along US 87. The curve located north of I-90 is a simple curve with a radius of 1,041.74’. The curve south of the interstate has a radius of 881.47’.
- k. The existing grade meets the proposed design maximum for I-90 mainline for level terrain. The existing grade on the ramps exceeds the proposed design maximum of 3% for level interstate, but meets the proposed design maximum for urban interstate of 5%. US 87 grades range from 0.61% to 3% within the project limits.
- l. The maximum gradient on the project is 3.0% on I-90 mainline and 5.0% on the Lockwood Interchange, located on the EB on-ramp.
- m. The existing cut and fill slopes are 5:1 inslopes with 2:1 maximum slopes as the freeway approaches the interchange bridge. The majority of the project is in fill condition with a cut located just west of the interchange.
- n. The existing bridge data is given below:

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<u>RP 450.52 (Int Lockwood I-90 - Billings)</u>	
Bridge Inventory Number	P00016000+00001
Year Built	1966
Year Reconstructed	1998
Length	275.9'
Deck Width (out-to-out)	82.1'
Bridge Rail Type	SBR T7
Superstructure Type	PS concrete girders
Sufficiency Rating	95.0
Deck Rating	6
Structure Status	Not Deficient

Traffic Data

Traffic counts will be completed for the two interchange intersections and the Frontage Rd/US 87 intersection. A growth rate will be established as part of the preliminary traffic report in Activity 112. The construction year has not yet been determined but is assumed to be 2024.

MDT Traffic Data Collection and Analysis Section provided the following traffic data:

I-90 RP 450.0 to RP 455.3

2019 AADT	28,570 – Present
2024 AADT	32,960 – Letting Year
2044 AADT	58,380 – Design Year
DHV	6070
T	13.8%
EAL	1675
AGR	2.9%

US 87 RP 0.0 to RP 1.0

2019 AADT	23,690 – Present
2024 AADT	24,900 – Letting Year
2044 AADT	30,380 – Design Year
DHV	3190
T	6.7%
EAL	353
AGR	1.0%

Old US 87 RP 0.0 to RP 0.510

2019 AADT	8,520 – Present
2024 AADT	8,960 – Letting Year
2044 AADT	10,930 – Design Year
DHV	1230
T	0.9%
EAL	47
AGR	1.0%

Coburn Rd RP 0.0 to RP 4.954

2019 AADT	800 – Present
2024 AADT	840 – Letting Year
2044 AADT	1,020 – Design Year
DHV	120
AGR	1.0%

Crash Analysis

As requested, a safety analysis was completed on a portion of I-90 (including interchange ramps) from approximate reference posts 452.4 to 455.9 and a portion of US 87 from approximate reference post 0.0 to 0.5, a portion of Old Hardin Road from approximate reference post 0.0 to 0.6, and the North Frontage

Road from approximate reference post 0.0 to 2.5 for the 5-year period January 1, 2013 through December 31, 2017.

The crash data shows the following information:

- 129 crashes along I-90 (including interchange ramps) between RP 452.4 and 455.9
- 108 crashes along US 87 between RP 0.0 and 0.5
- 44 crashes along Old Hardin Road between RP 0.0 and 0.6
- 21 crashes along North Frontage Road between RP 0.0 and 2.5

This data provided extends beyond the project limits and includes Johnson Lane, interchange ramps extending east from Johnson Lane.

MDT Safety Management summary identified no HSIP funded projects. The project summary identified six crash clusters along I-90:

- In 2016, the section from RP 450.236-450.836 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.
- In 2016, the section from RP 451.735-452.650 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.
- In 2018, the section from RP 451.835-452.450 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.
- In 2013/2014, the section from RP 449.990-450.481 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.
- In 2013/2014, the section from RP 452.800-453.293 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.
- In 2012/2013, the section from RP 452.800-453.293 was identified as a crash cluster. No feasible countermeasures were identified to address any observed crash trends within this section of roadway.

Major Design Features

- Design Speed.** The design speed for I-90 mainline is 70 MPH. The posted speed limits are 65 mph for all vehicles. Formal design speeds were not assigned but the ramp geometric features are designed for speeds between 35 and 60 mph. The speed limit along US 87 is 45 mph within the project limits. The design speed for US 87 is 40 mph following MDT geometric design standards for Urban Principal Arterials.
- Horizontal Alignment.** The horizontal alignment along I-90 will generally follow the existing median centerline. The proposed project will include an auxiliary lane (third travel lane) in each direction between Lockwood Interchange and Johnson Lane Interchange, extending the new auxiliary lanes currently being designed as part of the I-90 Yellowstone R - Billings project. Widening of I-90 toward the median or to the outside will be evaluated during the alternative analysis. The horizontal alignments and lane configurations of the Lockwood Interchange ramps will also be evaluated as part of the interchange alternative analysis. Configurations that will be evaluated may include diamond, tight diamond, single point urban interchange (SPUI), roundabouts and diverging diamond interchange (DDI). The horizontal alignment for US 87 will generally follow the existing centerline within the project limits.
- Vertical Alignment.** The existing vertical alignment along I-90 and US 87 will be utilized to the extent possible. As-built information for I-90 between Lockwood Interchange and Johnson Lane Interchange is not available so the existing vertical alignment will be reviewed to verify what improvements need to be included to meet current design standards. Alternative development will examine vertical alignment modifications to maintain proper clearance from I-90 to the Lockwood Interchange bridge carrying US 87 traffic. The vertical alignments on the I-

90 ramps will be evaluated during the interchange alternative analysis to meet current design standards.

- d. **Typical Sections and Surfacing.** Existing US 87 consist of two lanes in each direction and left turn lanes at the interchange intersections. The final lane configurations and typical sections will be determined during the interchange alternative analysis. I-90 mainline will consist of three 12' lanes in each direction (2-thru lanes, 1-auxiliary lane), with 10' outside shoulders and 4' inside shoulders. At this time, it is assumed that the I-90 mainline will be widened toward the median to reduce R/W impacts. The existing pavement will receive a mill and overlay treatment, and sawcut 1' inside existing shoulder to accommodate widening for the addition of any auxiliary lanes, with a full depth pavement section.

Depending on the preferred alternative, new concrete barrier may be required throughout the project on I-90, which will replace the existing cable rail to provide positive separation and protection between opposing directions of traffic.

- e. **Geotechnical Considerations.** Geotechnical exploration, analysis and engineering will be required for structure rehabilitation or replacement, interchange modifications, roadway widening, signal foundations, and overhead sign structures. Roadway cores and borings will be performed to determine depth and quality of existing pavements and crushed aggregate base below the existing asphalt. Retaining walls may be necessary for various aspects of the project. The type of wall, if necessary, will be evaluated during the design process.
- f. **Hydraulics.** Existing drainage within the project limits generally flows toward the Yellowstone River. The interchange modifications may include curb, gutter and a larger impervious area on US87, which will likely require installation of a storm drainage system. The addition of an auxiliary lane in both directions of I-90 between the Lockwood and Johnson Lane interchanges will increase the hydraulics compared to existing conditions. Inlet structures may be needed in areas where widening occurs toward the median. The project will be subject to local MS4 requirements. Retention/detention facilities may be required to meet MS4 requirements.
- g. **Bridges.** Interchange improvement alternatives may include reconstruction or rehabilitation of the existing Lockwood Interchange structure. The existing structure will be reviewed to determine suitability as-is, rehabilitated or replaced based on the alternatives identified. Bike/Ped/ADA accommodations will be considered when analyzing the feasibility of the existing structure or in the design of improvements or replacement. For bridge reconstruction alternatives, standard vertical clearance will be provided.
- h. **Traffic.** Traffic analysis will use 2044 as the design year, and 2024 as the letting year for construction. An alternatives analysis for the Lockwood Interchange and I-90 within the project limits will determine what is feasible to improve traffic flow and connectivity. Traffic counts will be obtained for the interstate, interchange, and intersections within the project limits. Growth rate for the project will be developed based on local knowledge of the project location. Intersection improvements will be designed for a WB-67 design vehicle with consideration given for oversized loads. The traffic analysis will include anticipated impacts from the Lockwood High School, One Big Sky District and other adjacent on-going projects/developments. Existing signalized intersections will be analyzed as part of the alternative analysis. VISSIM modeling for alternative interchange improvement options will be included as part of the second tier analysis. The traffic analysis will consider other on-going adjacent MDT projects. The project will include lighting at the interchange to meet current design standard with LED luminaires. Cantilever or overhead sign structures for ITS/VMS are to be considered with this project.
- i. **Pedestrian/Bicycle/ADA.** Currently, pedestrian facilities are located on the east side of the Lockwood Interchange structure over I-90. No other pedestrian facilities exist within the project limits. The Billings Area Bikeways and Trail Master Plan includes a recommendation for a proposed shared used path along US 87. Pedestrian/Bicycle/ADA accommodations will be considered for interchange improvement options. No separate pedestrian/bicycle

accommodations will be included on the I-90 portion of the study. Consideration for maintenance, or agreements for maintenance of pedestrian/bicycle/ADA facilities will be determined during the OT Phase of the project.

- j. **Miscellaneous Features.** Existing guardrail, concrete barrier and end treatments will be evaluated and upgraded with this project. Existing and new traffic control devices will meet current design standards, as applicable. Cable rail is located along the I-90 median between the Lockwood and Johnson Lane Interchange. Widening of I-90 towards the median may require the cable rail to be replaced with concrete barrier. Fencing within the project limits will be replaced following right-of-way boundaries.
- k. **Context Sensitive Design Issues.** The project is located within an entryway corridor of Billings which has been identified by the Big Sky Economic Development for possible visual improvements. Low cost, low maintenance aesthetic features will be considered for the project, where practicable.
- l. **Permanent Erosion and Sediment Control (PESC) Features.** Disturbed areas will be replanted with native grasses. Permanent erosion control measures may be required to accommodate bridge drainage depending on the alternative identified during the OT Phase. No other permanent erosion control features beyond seeding are anticipated for the project.

Other Projects

The following list of adjacent MDT projects are currently in development and may impact this project.

- I-90 Yellowstone R – Billings
- Billings Bypass (Johnson Lane Interchange)
- 1st Ave/Exposition Drive Intersection
- 1st Ave N – Billings
- Airport Rd/Main St intersection improvements

The following non MDT projects and developments will be considered for the alternatives analysis for this project.

- One Big Sky District
- Metra Event Traffic
- Lockwood High School

The Billings Long Range Transportation Plan Update (2018) includes the following recommended projects:

- I-90 from Lockwood Intch to Johnson Lane Intch - Add a third travel lane to I-90
- Lockwood Road & N Frontage Road - Reconfiguration of existing intersection
- Lockwood Interchange - Construct additional EB and WB mainline lanes under and through the Lockwood Interchange and improve pedestrian facilities

Location Hydraulics Study Report

A Location Hydraulics Study Report will be prepared by the Consultant for the project and included with the Preliminary Hydraulics Report and will include irrigation crossings within the project limits.

Design Exceptions

Design exceptions may be required for this project and will be identified as part of the OT Phase of the project.

Right-of-Way

The existing right-of-way on either side of I-90 varies from 110' to 330' from existing centerline, with access control fencing varying from 100' to 300' from existing centerline. Generally, the existing R/W on either side of mainline is 140' from existing centerline. Existing R/W along the interchange ramps is variable. In general, the proposed project will be designed within existing R/W. Retaining walls are anticipated with the design to reduce or eliminate R/W acquisition needs where practicable. Depending on the preferred interchange improvement alternative, R/W acquisition may be necessary to

accommodate the interchange and ramp configurations.

The existing right-of-way for US 87 is generally 90' left and 100' right from the existing centerline.

Access Control

Interstate I-90 is a full access controlled facility. No changes to the existing access control are included with this project. Minor modifications to the access control fence at the Lockwood Interchange may be required.

Utilities/Railroads

With the Exxon refinery located on the north side of the interstate between the Lockwood Interchange and the Johnson Lane Interchange, there is a probability of buried pipelines within the project limits. It is also likely telephone, fiber optic, power, and natural gas lines existing within the project limits. A Phase I SUE survey will be required to locate both overhead and underground utilities. As the design phases are further developed, a Phase II SUE may be necessary to obtain depths and other additional information of existing utilities. There is no railroad involvement anticipated with this project.

Maintenance Items

Consideration of emergency services median turnarounds on I-90 will be included with this project. Consideration for maintenance, or agreements for maintenance of pedestrian/bicycle/ADA facilities will be determined during the OT Phase of the project. Other maintenance items may be identified during the OT Phase of the project.

Intelligent Transportation Systems (ITS) Features

ITS will be considered with the project, including variable message boards to identify road closures, event traffic or other related items.

Experimental Features

There are no experimental features planned with this project.

Survey

A full control, cadastral and engineering survey is planned for this project. Aerial lidar/photogrammetry is proposed for topographic survey of major features including the existing pavement, existing top of bridge, and ramp survey. Ground-based conventional survey will be utilized for control, cadastral, and engineering survey to ground truth, and supplement the aerial survey data. Additional ground survey of the existing bridge will be required. Ground based lidar is proposed to be utilized to provide a comprehensive scan and point cloud underneath the existing structure.

Public Involvement

The project Level of Impact (LOI) has been determined to be Substantial and level of public involvement C, as defined by MDT's Public Involvement Plan. The substantial impact designation was made by MDT. A Public Involvement Plan has not been developed at this stage of the project. A public relations consultant will not be utilized for this project.

Specific strategies identified in the project-specific Public Involvement Plan (as described in the Engineering Project Communication Process Guide) include:

Level C (Substantial Impact)

1. News release explaining the project and including a department point of contact.
2. Project information, including public summary, posted to MDT website (GIS map).
3. Personal contacts with local government officials, interest groups, and other organizations. Key stakeholders include the City of Billings, Yellowstone County, Metra Park, Lockwood Advisory Committee, Lockwood Irrigation District, Big Sky Economic Development, Montana Rail Link/BNSF, Exxon Refinery, TrailNet, and Motor Carrier Services.
4. Personal contacts with adjacent landowners explaining the project.
5. A public open house will be conducted prior to completion of AGR, after alternatives have been developed. The public will be given the opportunity to provide feedback on the preferred alternative. A decision matrix for each alternative analyzed will be developed to document the process utilized to select the preferred alternative.

- a. Use of electronic social media will be considered to provide information to the public regarding the status of the project and to inform the public of the open house.
6. Construction notification and information during construction.

Environmental Considerations

A Narrative Categorical Exclusion (CATEX) Document is anticipated for this project, if the PE Phase of the project is programmed.

A cultural resource inventory will be performed to identify cultural resources within the project corridor. Wetlands in the project area will need to be delineated and impacts will need to be assessed. Biological review for this project will require a Biological Assessment to review species protected under the Endangered Species Act to comply with USFWS requirements. In order to comply with the requirements of the Migratory Bird Treaty Act, timing restrictions or nesting deterrents for migratory birds will be likely be required for any bridge work and any clearing and grubbing of trees and shrubs. Other Status Species (Bald and Golden Eagles, and Species of Concern) in the project area will also need to be addressed.

A Section 4(f) analysis will be required to determine if Section 4(f) resources (historic, cultural, park, recreational, and wildlife and waterfowl refuges) are present within the project area, and if the project would result in a "use" of those resources. The Billings Area I-90 Corridor Planning Study identified the Grey Eagle Ditch, Coulson Park, Coulson Town Site, Lockwood Ditch, and Four Dances Natural Area as potential 4(f) resources within project limits. The Bureau of Land Management manages the Four Dances Natural Area located to the southwest of the US87 Interchange. Four Dances is designated a Special Recreation Management Area and Area of Critical Environmental Concern (ACEC). BLM's objectives for the site are the protection of open space and natural and cultural resources, while providing dispersed public recreation in Billings. A map of the area can be found here: http://www.blm.gov/style/medialib/blm/mt/field_offices/billings/maps.Par.60351.File.dat/fourdances.pdf

A Section 6(f) analysis will be required to determine if Land and Water Conservation Funds Act (LWCF) funds were used to purchase or improve any of the properties within the project corridor. The use of such Section 6(f) sites would be documented and compensated with the appropriate agencies.

This project is located in the City of Billings/Yellowstone County Municipal Separate Storm Sewer System (MS4) area. Additionally, the project scope is classified as "Development or Redevelopment". As a result, Permanent Erosion and Sediment Controls (PESC), including Low Impact Development (LID) practices, are required to be evaluated for practicability.

The Lockwood Solvent Ground Water Plume NPL Site exists within the project vicinity, in particular east of the Yellowstone River bridges, on the north side of the interstate. The solvent plume is within existing MDT R/W and will be mitigated appropriately if impacted by the project.

A noise analysis will be completed with the project.

If the PE Phase is programmed, it is anticipated this project will require a Clean Water Act 404 permit and Section 10 permit from the US Army Corps of Engineers, an SPA 124 Authorization, and a floodplain permit.

This project will require a Montana Pollutant Discharge Elimination System (MPDES) permit during construction.

Environmental Services will provide the necessary environmental related special provisions.

Energy Savings/Eco-Friendly Considerations

LED lighting will be included for the proposed interchange. Lighting along I-90 will not be included with this project. Lighting will be designed to meet current design standards and lighting requirements.

Traffic Control

Traffic and access will be maintained throughout the project during construction. Work on the I-90 portion

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and overpass structure may require median crossovers, lane closures, and closing EB or WB roadway to traffic. Lane shifting and reductions during construction will likely be required on US87 and the on and off ramps for interchange improvements. Innovative traffic control and construction sequencing techniques will be considered to reduce the total duration of lane reductions to maintain safety and mobility throughout the project corridor.

Project specific detailed traffic control plans will be developed to identify the construction phasing methods assumed for the project.

A Transportation Management Plan (TMP) consisting of a Traffic Control Plan (TCP), a limited Transportation Operations (TO) component and a limited Public Information (PI) component is appropriate for this project.

Wide loads will be detoured where practicable, or if necessary a plan to stage and pilot wide loads through the project construction site at specific times will be developed.

Certain work requiring ramp closures, or other lane closures will be considered for off-peak hours, or during night time work. Advanced signage will be utilized to inform the traveling public of the construction activities and potential delays.

Preliminary Construction Cost Estimate

The preliminary cost estimate below was developed with MDT's Preliminary Estimate Tool (PET).

	Estimated cost	Inflation (INF) (from PPMS)	TOTAL costs w/INF + IDC (from PPMS)
I-90 Road Work	\$14,000,000		
Interchange Modifications	\$14,000,000		
TOTAL CN	\$28,000,000	\$ 3,300,000	\$ 35,000,000
CE (10%)	\$2,800,000	\$300,000	\$ 3,500,000
<i>Project TOTAL from all of the funding types above:</i>			
Project TOTAL CN+CE	\$31,000,000	\$3,600,000	\$ 39,000,000

The estimate above includes \$1,130,702 for traffic control, 25% allowance for contingency, and 10% for mobilization.

Note: Inflation is calculated in PPMS to the letting date. If there is no letting date, the project is assumed to be inside the current TCP and is given a maximum of 5 years until letting. IDC is calculated at 10.49% for FY 2019.

Preliminary Engineering

The alternative analysis and feasibility of the project will be developed for the OT Phase of the project. The preferred alternative will be developed through AGR as part of the OT Phase of the project. Depending on the viability of the preferred alternative, the PE Phase will be completed following the standard consultant design flowchart and activity descriptions. The estimated OT Project End Date = December 31, 2021, with a total cost of \$300,000.

The project will be developed in OpenRoads (3D).

Project and Risk Management

This will be a consultant designed project. The MDT consultant project engineer administering this project will be Mark Studt, P.E. of the Consultant Design Bureau. The consulting firm for this project will be HDR. The project manager for this project will be:

HDR Engineering, Inc.
Tim Erickson, PE

Preliminary Field Review Report

STPX 90-8(191)450, Lockwood Interchange - Billings, UPN 9588000
Project Manager: Mark Studt

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970 S 29th St W
Billings, MT 59102
406.651.6656
tim.erickson@hdrinc.com

A risk analysis and project feasibility study report will be completed during the OT Phase of the project. This project is not a Project of Division Interest (PoDI) by FHWA.

Ready Date

The tentative project ready date for the project is Fall of 2023. The tentative letting year for the project is 2024.

Site Map

The project site map is attached.

Preliminary Field Review Report

STPX 90-8(191)450, Lockwood Interchange - Billings, UPN 9588000

Project Manager: Mark Studt

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e-copies:

Dustin Rouse, Preconstruction Engineer
Damian Krings, Acting Highways Design Engineer
Dave Hedstrom, Hydraulics Engineer
Bill Weber, Acting Supervisor, Photogrammetry & Survey
Stan Brelin, Traffic Operations Engineer
Ivan Ulberg, Traffic Design Engineer
Patricia Burke, Safety Engineer
Chad Richards, Engineering Cost Analyst
Lisa Durbin, Engineering Information Services
Lori Ryan, Acting Public Involvement Officer
Sue Sillick, Research Section Supervisor
Lisa Hurley, Fiscal Programming Section
Kurtis Miros, Engineering Division
Jeff Nehring, Engineering Division
Andy White, Secondary Roads Engineer
Sheila Ludlow, Bicycle/Pedestrian Coordinator
Tom Martin, Environmental Services Bureau Chief
Joe Radonich, Remediation and Assessment
Darin Reynolds, Construction Bureau – VA Engineer

Gabe Priebe, Utilities Engineering Manager
David Hoerning, Lands Section Supervisor
Jerilee Weibel, Acquisition Section Supervisor
Joe Zody, R/W Access Management Section Manager
Jeff Jackson, Pavement Analysis / Geotechnical Engineer
Miles Yerger, Surfacing Design Supervisor
Nathan Haddick, Bridge Design Engineer
Paul Johnson, Project Analysis Bureau
Jean Riley, Planner
Tom Gocksch, ESB, Engineering Section Supervisor
Dawn Stratton, Fiscal Programming Section
Amanda Jackson, Eng. Manager, Bridge Management System
Damian Krings, Road Design Engineer (if involved)
Becky Duke, Traffic Data Collection Section Supervisor (WIM)
Doug McBroom, Maintenance Division Operations Mgr (RWIS)
Matt Maze, ADA Coordinator
Bill Semmens, Environmental Resources Section Supervisor
Jon Axline, Historian
Vacant, Reclamation Specialist

Mike Taylor, District Engineering Services Engineer
Steven Helms, Materials Lab
Celia Clearwood, Right of Way Supervisor
Ted Thronson, Construction Engineer
Jennifer Davis, Hydraulics Engineer
LeRoy Wosoba, Traffic Project Engineer
Susan Lenard, Biologist
Kurtis Schnieber, Billings District Projects Engineer
Andrew Harmon, District Utility Agent

Tom Tilzey; Ron "Bud" Pederson, Maintenance Chief
Aaron Eschler, Right of Way Design Supervisor
Vacant, Construction Ops Engineer
Tracy Stoner, Bridge Area Engineer
Cameron Kloberdanz, Geotechnical Manager
Tommy Griffeth, Project Development Engineer
Russell Christoferson, District MCS Captain
Greg Zeihen, Surfacing Design
TJ Ramaeker, Constructability Reviewer