MONTANA
Department of Transportation

Christopher Dorrington, Director

2701 Prospect ▪ PO Box 201001
Helena MT 59620-1001

August 27, 2025

Lucia Olivera, Division Administrator
Federal Highway Administration
585 Shepard Way
Helena, MT 59601-9785

Subject: Request for Concurrence of Continued Validity of FEIS/ROD
BBP – Johnson Lane Interchange
NCDP-MT 56(55)
CN: 4199007

Dear Lucia Olivera,

The Montana Department of Transportation (MDT) is proposing to modify the project limits for the Johnson Lane Interchange segment of the Billings Bypass (4199007) to construct a new truck access approach at the west end of the Flying J/Town Pump gas station property on Old Hardin Road. The Johnson Lane Interchange project limits along Old Hardin Road would be extended west by approximately 250 feet (or approximately 330 feet west of the eastern intersection of Rykken Circle). All other termini would remain consistent with the project limits presented in the 2022 Re-evaluation Environmental Impact Statement (REIS) and revised Record of Decision (ROD). The Johnson Lane Interchange project is the fifth project segment to be constructed as part of Phase I of the Billings Bypass. This segment is located within the community of Lockwood, Yellowstone County, Montana, and is found within Sections 19 and 30 of Township 1 North, Range 27 East.

The Billings Bypass Final Environmental Impact Statement (FEIS) was signed by your agency on March 18, 2014, and the Final ROD was signed by your agency on July 25, 2014. A revised ROD was prepared in 2019 to address design modifications to the proposed Yellowstone River Bridge and changes to lane configurations within the Yellowstone River segment of the Billings Bypass (4199003) and was signed by your agency on December 18, 2019. A second revised ROD was prepared in 2021 to address design modifications to the bridge crossing over the MRL railroad tracks and Coulson Road within the Railroad O'Pass segment of the Billings Bypass (4199005); this revised ROD was signed by your agency on May 13, 2021. A third revised ROD was developed in 2022 to address design changes to further split the Railroad O'Pass segment of the Billings Bypass (4199005 and 4199008); this revised ROD was signed by your agency on July 15, 2022. A REIS and revised ROD were also completed for the Johnson Lane Interchange segment (4199007) in 2022 to capture various design changes including interchange/intersection modifications and refinements and changes to the project limits. The REIS and revised ROD were signed by your agency on September 2, 2022.

MDT Environmental Services Bureau has reviewed the scope of the extended project limits and new access approach on Old Hardin Road, the previously approved FEIS/ROD for the Billings Bypass, the 2022 revised ROD and associated REIS, and current regulatory requirements. Based on this analysis, MDT concludes that the requirements of both the National and Montana Environmental Policy Acts (NEPA and MEPA) are met for the project through a REIS as

described in 23 Code of Federal Regulations (CFR) 771.129(b) rather than a Supplemental Environmental Impact Statement (SEIS) as described in 23 CFR 771.130.

The purpose of this letter is to demonstrate MDT NEPA/MEPA compliance by documenting changes to environmental conditions within the Johnson Lane Interchange project area, as well as any updates to the proposed Johnson Lane Interchange segment since the 2022 REIS was completed. This letter also requests Federal Highway Administration (FHWA) concurrence that the following changes be included as part of the Johnson Lane Interchange segment and that changes in environmental information would not require the preparation of a SEIS.

The following re-evaluation discusses new information or circumstances relating to additional activities under the Johnson Lane Interchange segment and ensures that current environmental requirements are addressed. This re-evaluation focuses on modifications to the project limits and the design on Old Hardin Road and the potential for new impacts that have arisen since approval of Johnson Lane Interchange REIS and revised ROD in 2022.

As described in Chapter 1.3 of the FEIS, the purpose of the Billings Bypass project is to improve access and connectivity between Interstate 90 (I-90) and Old Highway 312 and to improve mobility in the eastern area of Billings. The purpose of and need for the Billings Bypass has not changed since the approval of the FEIS/ROD.

DESCRIPTION OF CHANGED CONDITIONS

Design Modification 1: The project limits along Old Hardin Road would be extended approximately 250 feet further west to Station 23+00 (or approximately 330 feet west of the eastern intersection of Rykken Circle). The project limits are being extended to provide a new, paved truck access approach off Old Hardin Road at the west end of the Flying J/Town Pump gas station property. This new access approach was requested by the Flying J/Town Pump gas station due to the installation of a new, raised center median at the Old Hardin Road and Johnson Lane intersection, which limits truck turning movements to and from existing property access locations. All other design elements along Old Hardin Road would be consistent with what was presented in the 2022 REIS and revised ROD.

The extended project limits and access approach would require approximately 0.062-acre of additional right-of-way from parcel 7-9 on the north side of Old Hardin Road. The extended project limits are depicted in green on Figure 1 (see Attachment 1, Figure 1). The design for the access approach at the west end of the Flying J/Town Pump property is depicted in Figure 2 (see Attachment 1, Figure 2).

Environmental Change 1: Biological Resources Update

Threatened and Endangered Species

The only update to biological resources since the 2022 REIS and revised ROD is a July 2025 Biological Resources Report (BRR)/Biological Assessment (BA) addendum that addresses the status change for monarch butterfly (*Danaus plexippus*) (now listed as proposed threatened) and the addition of the proposed endangered Suckley's cuckoo bumble bee (*Bombus suckleyi*). The July 2025 BRR/BA addendum also reviewed the area of the proposed extended project limits and new access approach as this area is outside that previously reviewed under the Johnson Lane Interchange March 2022 BRR/BA addendum. The current 2025 BRR/BA addendum reviewed the project area for both the monarch butterfly and Suckley's cuckoo bumble bee.

Monarch Butterfly

Monarch butterflies migrate through Montana in the spring and fall as they move between central Mexico and Canada. While monarch butterflies may migrate through the area, suitable foraging and resting habitat is limited within the project footprint. According to the Montana Natural Heritage Program (MTNHP), the closest recorded observation of a monarch butterfly was over 30 miles southwest of the project limits in 2016. Additionally, Montana does not fall within the range of proposed critical habitat for the monarch butterfly, therefore no critical habitat could be destroyed or adversely modified by the project. Due to limited suitable habitat and the heavily disturbed and developed nature of the Johnson Lane Interchange segment, the monarch butterfly is not anticipated to be present. Therefore, the proposed project limits extension and new access approach to be implemented under the Johnson Lane Interchange project would ***not jeopardize the continued existence*** of the monarch butterfly.

Suckley's Cuckoo Bumble Bees

Suckley's cuckoo bumble bees are an obligate social parasite that lacks a mechanism to carry pollen and is unable to produce worker bees. As such, the species is entirely dependent on social bumble bee hosts, such as the western bumble bee (*Bombus occidentalis*), to collect pollen and rear their young. Critical habitat has not been proposed for Suckley's cuckoo bumble bee, therefore no critical habitat could be destroyed or adversely modified. According to the MTNHP, there have been no recorded occurrences of the species within Yellowstone County, and the Johnson Lane Interchange project limits consist of very little suitable habitat for the species. Because the species has not been documented within the county and little to no suitable habitat exists within the project limits, the proposed project limits extension and new access approach to be implemented under the Johnson Lane Interchange project are ***not likely to jeopardize the continued existence of*** Suckley's cuckoo bumble bee.

The change in impacts to Threatened and Endangered species is consistent with the findings in the FEIS/ROD and the 2022 REIS and revised ROD and would not be considered "significant" in terms of context and intensity.

The Johnson Lane Interchange BRR/BA Addendum Report dated July 31, 2025, is included in Attachment 1.

Wetlands and Other Aquatic Resources

A wetland delineation was completed for the Johnson Lane Interchange segment in 2020. To ensure all wetlands and other aquatic resources were identified within the current project limits (i.e., the extended limits along Old Hardin Road), a field survey was completed on June 17, 2025. Lockwood Ditch and its associated fringe wetland parallel Old Hardin Road to the south within the extended project limits. The ditch and wetland were previously delineated during the 2020 field effort. The ditch and wetlands will be piped as part of a separate City of Lockwood sidewalk project, which will occur prior to construction of the Johnson Lane Interchange segment. No other wetlands or aquatic resources were identified during the 2025 field review effort.

Environmental Change 2: Noise Update

A Noise Analysis Update was completed on July 11, 2025, to review the extended project limits along Old Hardin Road and to update the Noise Analysis that was completed in February 2022 for the Johnson Lane Interchange segment. The 2025 Noise Analysis Update analyzed the No Build and Build Alternatives for the extended limits on Old Hardin Road. Five traffic noise impacts are predicted at mobile home and single-family residences due to the No Build Alternative, and eight impacts are predicted to mobile home and single-family residences within Rykken Circle for the Build Alternative Design Year (2042).

The feasibility and reasonableness of barrier walls to shield the impacted residences was evaluated. Noise barriers were not found to be reasonable due to exceedance of the Cost-Effectiveness Index and potential for residential access relocations to construct the wall. Therefore, no feasible and/or reasonable mitigation measures were found for the impacts to sensitive noise receptors adjacent to Old Hardin Road.

The findings of the 2025 Noise Analysis Update are consistent with FEIS/ROD and the 2022 REIS and revised ROD and would not be considered “significant” in terms of context and intensity.

The Noise Analysis Update dated June 27, 2025, is included in Attachment 2.

RE-EVALUATION

The scope of this re-evaluation includes updates to the project limits along Old Hardin Road, implementation of a new Flying J/Town Pump gas station access approach, and the evaluation of both changed conditions and updated environmental information. This re-evaluation includes a review of the 2022 REIS and revised ROD for any changes in previously identified environmental resources impacts, as well as any mitigation commitments associated with the environmental changes.

Resource Category Re-Evaluation

The following resource categories were previously examined in the Billings Bypass FEIS and the 2022 REIS and revised ROD for the Johnson Lane Interchange segment and have been re-evaluated in the context of the Johnson Lane Interchange project as currently proposed and, where applicable, new or updated information is provided. Table 1 provides an overview of the

resource category and whether a change in impact or a change in mitigation has occurred. Resource categories with changed conditions are described in greater detail below.

Table 1. Re-evaluation of Resource Categories

Resource Category	Change in Impact? Yes/No	Change in Mitigation? Yes/No	Discussion
Traffic Operations	Yes	No	Increased truck traffic along Old Hardin Road to enter/exit the new access approach at the west end of the Flying J/Town Pump gas station, may result in some congestion due to trucks turning in and out of the gas station. MDT does not anticipate that the congestion would require traffic control measures such as a turn lane. This change would not alter the conclusion in the FEIS/ROD. No other concerns related to traffic have been identified since the 2022 REIS and revised ROD.
Access	Yes	No	An additional access approach off of Old Hardin Road would be added at the west end of the Flying J/Town Pump gas station to allow truck traffic to turn in and out at a location away from the Johnson Lane/Old Hardin Road intersection. The additional access is not anticipated to result in impacts to access elsewhere in the project vicinity. This change would not alter the conclusion in the FEIS/ROD. No other concerns related to access have been identified since the 2022 REIS and revised ROD.
Safety	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Pedestrian and Bicycle Considerations	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Land Use	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Parks and Recreation	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Social	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Economic	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Right-of-Way	Yes	No	An additional 0.062-acre of right-of-way would be required from parcel 7-9 on the north side of Old Hardin Road to construct a new access approach for the Flying J/Town Pump gas station. This change in ROW impacts would not affect the overall findings and proposed mitigation made in the FEIS/ROD and would not be considered “significant” in terms of context and intensity. No other concerns related to right-of-way have been identified since the 2022 REIS and revised ROD.
Railroad	No	No	No concerns have been identified since the 2022 REIS and revised ROD.

Resource Category	Change in Impact? Yes/No	Change in Mitigation? Yes/No	Discussion
Utilities	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Historic and Cultural Resources	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Section 4(f) and Section 6(f) Resources	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Visual Resources	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Noise	Yes	No	A Noise Analysis Update was completed on July 11, 2025, for the extended project limits and new access approach on Old Hardin Road. Eight noise-sensitive receptors were predicted to receive noise-related impacts; however, noise barriers were not found to be reasonable or feasible. Therefore, no mitigation has been proposed. This change in impacts would not affect the overall findings and proposed mitigation made in the FEIS/ROD and would not be considered "significant" in terms of context and intensity. No other concerns related to noise have been identified since the 2022 REIS and revised ROD.
Farmland	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Irrigation	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Energy	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Air Quality	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Hazardous Materials	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Water Resources and Water Quality	No	No	A field survey was completed on June 17, 2025, within the extended project limits. Lockwood Ditch and its associated fringe wetland parallel Old Hardin Road to the south. The ditch and wetland were previously delineated during the Johnson Lane Interchange 2020 field effort. The ditch and wetlands will be piped as part of a separate City of Lockwood sidewalk project, which will occur prior to construction of the Johnson Lane Interchange segment. No other wetlands or aquatic resources were identified during the 2025 field review effort. No other concerns related to water resources or water quality have been identified since the 2022 REIS and revised ROD.
Wild and Scenic Rivers	No	No	No concerns have been identified since the 2022 REIS and revised ROD.

Resource Category	Change in Impact? Yes/No	Change in Mitigation? Yes/No	Discussion
Waterbody Modifications	No	No	A field survey was completed on June 17, 2025, within the extended project limits. Lockwood Ditch and its associated fringe wetland parallel Old Hardin Road to the south. The ditch and wetland were previously delineated during the Johnson Lane Interchange 2020 field effort. The ditch and wetlands will be piped as part of a separate City of Lockwood sidewalk project, which will occur prior to construction of the Johnson Lane Interchange segment. No other wetlands or aquatic resources were identified during the 2025 field review effort. No other concerns related to waterbody modifications have been identified since the 2022 REIS and revised ROD.
Floodplains	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Wetlands	No	No	A field survey was completed on June 17, 2025, within the extended project limits. Lockwood Ditch and its associated fringe wetland parallel Old Hardin Road to the south. The ditch and wetland were previously delineated during the Johnson Lane Interchange 2020 field effort. The ditch and wetlands will be piped as part of a separate City of Lockwood sidewalk project, which will occur prior to construction of the Johnson Lane Interchange segment. No other wetlands or aquatic resources were identified during the 2025 field review effort. No other concerns related to wetlands have been identified since the 2022 REIS and revised ROD.
Vegetation	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
Wildlife and Aquatic Resources	No	No	No concerns have been identified since the 2022 REIS and revised ROD.
State Species of Concern and Special Status Species	No	No	No concerns have been identified since the 2022 REIS and revised ROD.

Resource Category	Change in Impact? Yes/No	Change in Mitigation? Yes/No	Discussion
Threatened and Endangered Species	Yes	No	A BRR/BA Addendum Report was completed for the Johnson Lane Interchange segment on July 31, 2025. Since the 2022 REIS and revised ROD, the USFWS updated the status of the monarch butterfly and Suckley's cuckoo bumble bee to proposed threatened and proposed endangered, respectively. Monarch butterflies migrate through Montana in the spring and fall as they move between central Mexico and Canada. While monarch butterflies may migrate through the area, suitable foraging and resting habitat is limited within the Johnson Lane Interchange project footprint, and the overall Billings Bypass footprint. Suckley's cuckoo bumble bees are an obligate social parasite that lacks a mechanism to carry pollen and is unable to produce worker bees. As such, the species is entirely dependent on social bumble bee hosts, such as the western bumble bee (*Bombus occidentalis*), to collect pollen and rear their young. According to the MTNHP, there have been no recorded occurrences of the species within Yellowstone County, and the project limits consist of very little suitable habitat for the species. The 2025 BRR/BA addendum report determined that the proposed project was ***not likely to jeopardize the continued existence*** of either species. The change in impacts to Threatened and Endangered species is consistent with the findings in the FEIS/ROD and would not be considered "significant" in terms of context and intensity. No other concerns related to Threatened and Endangered species have been identified since the 2022 REIS and revised ROD.

CONCLUSION

Through this re-evaluation, MDT has determined that no substantive changes have occurred since the 2022 REIS and revised ROD. The design and environmental updates described in this re-evaluation would not affect the ability of the Johnson Lane Interchange segment of the Billings Bypass, and the proposed activities under this project, to meet the stated purpose as described in the 2014 FEIS and ROD. Additionally, MDT has determined that the impacts of these design and environmental updates are not, individually or cumulatively, significant nor significantly different from those impacts described in the FEIS and ROD.

MDT has determined that the design and environmental updates would have no effect on the ultimate decision documented in the ROD and that approving this updated NEPA/MEPA evaluation is consistent with 23 CFR 771.

REVIEWED/AUTHORIZED
By Tom Martin at 9:35 am, Aug 27, 2025

Date:

Tom Martin, P.E.
Environmental Services Bureau Chief

LUCIA HAYDEE OLIVERA
Digitally signed by LUCIA HAYDEE OLIVERA
Date: 2025.09.02 11:46:15 -06'00'

Date: 9/2/2025

Federal Highway Administration

Electronic copies:

Mike Taylor	Billings District Administrator
Tom Martin	Environmental Services Bureau Chief
Tom Gocksch	Environmental Services Bureau Engineering Section Supervisor
Dave Holien	Highways Engineer
Bob Heiser	Right-of-Way Bureau Chief
Kelly Williams	Consultant Design Engineer
Fred Bente	EPS Project Manager
Hayden Burnett	Engineering Construction Contracting Section
Katy Callon	Fiscal Programming Section Supervisor
Tommy Griffeth	Billings District Project Development Engineer
Joseph Weigand	FHWA Environmental Specialist
Gene Kaufman	FHWA Program and Project Delivery Engineer
Montana Legislative Branch Environmental Quality Council (EQC)	

copies: Environmental Services Bureau File

Attachment 1: Extended Project Limits, Vicinity, and Proposed Design

Figure 1: Extended Project Limits (depicted in green) along Old Hardin Road

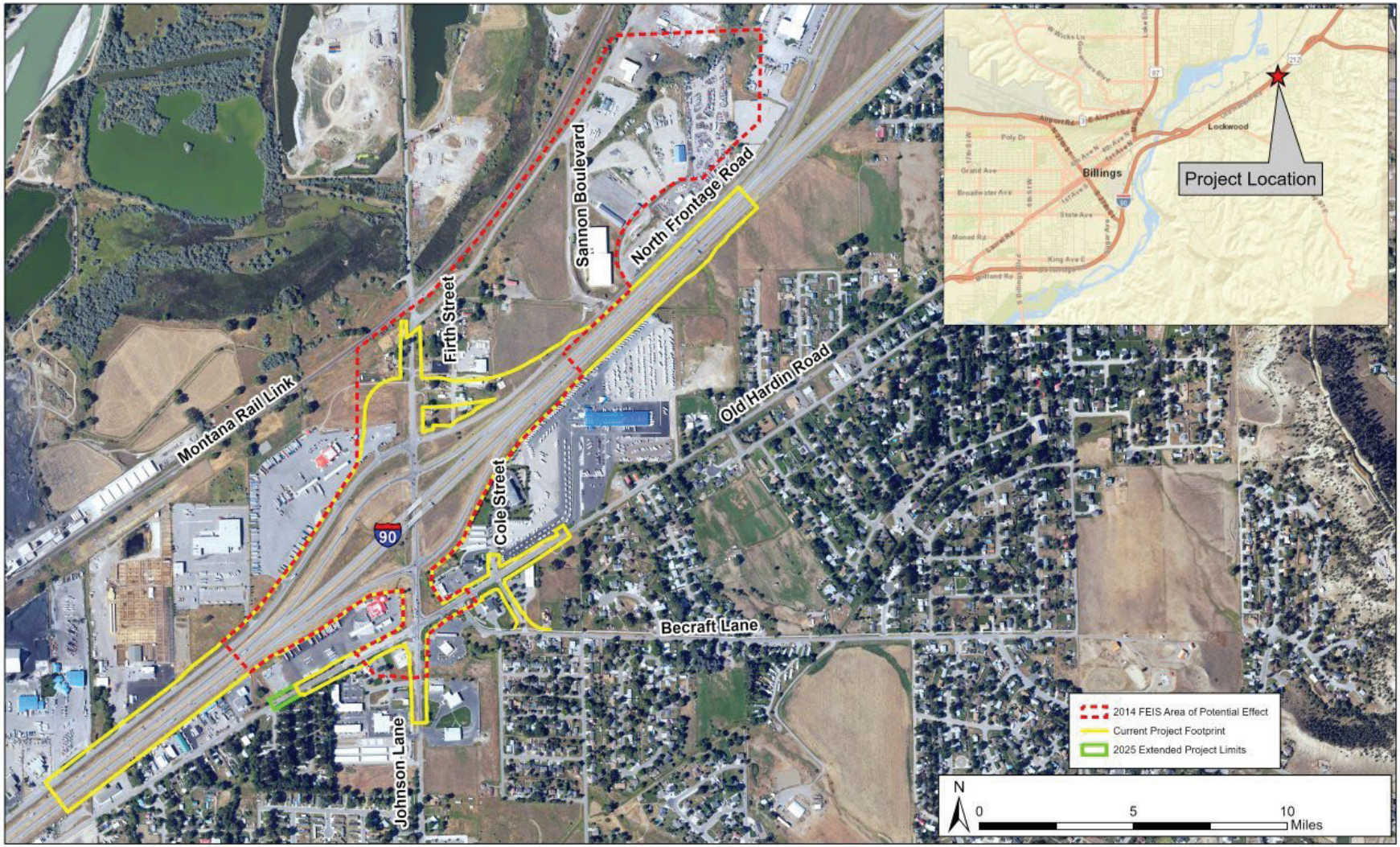

Figure 2: Proposed Design for Old Hardin Road, Including New Flying J Access Approach

Attachment 2: Johnson Lane Interchange 2025 BRR/BA Addendum Report

Johnson Lane Interchange Addendum to Final Biological Resources Report / Biological Assessment

MDT Activity 196

BBP – Johnson Lane Interchange
NCDP-MT 56(55)
CN: 4199007

Prepared for:

MONTANA Department of Transportation

Helena, MT

Prepared by:

DOWL

1300 Cedar Street
Helena, Montana 59601

July 31, 2025

Principal Author: Emily Peterson

Emily Peterson
DOWL Environmental Manager
406.442.0370

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LIST OF ACRONYMS

BA……..Biological Assessment
BMP……..……..Best Management Practices
BRR……..……..……... Biological Resources Report
FEIS……..……..……..……Final Environmental Impact Statement
FWP……..…… Montana Fish, Wildlife, and Parks
MDT……..…Montana Department of Transportation
MTNHP……..……Montana Natural Heritage Program
ROD……..……..…… Record of Decision
USGS……..……United States Geological Service
USFWS……..…United States Fish & Wildlife Service

EXECUTIVE SUMMARY

A Final Biological Resources Report/Biological Assessment (BRR/BA) was completed for the Billings Bypass in November 2011. Two addenda to that report were completed in June 2012 and August 2013. The 2011 BRR/BA Report and the 2012 report addendum served as a basis for informal consultation with the US Fish and Wildlife Service (USFWS) concerning potential effects of future Billings Bypass projects on federally listed species. The August 2013 addendum was completed to confirm there had been no changes to the USFWS Yellowstone County list of threatened and endangered species since the 2012 addendum and confirm the USFWS determination was still current. Impacts to biological resources were also evaluated in the 2014 Billings Bypass Final Environmental Impact Statement (FEIS).

Due to the Billings Bypass project now being split into seven construction projects and the time lapse since the August 2013 addendum and 2014 FEIS, BRR/BA Addendums are being prepared for each project segment as updates to the original BRR/BA, addenda and Billings Bypass FEIS. A BRR/BA addendum for the Johnson Lane Interchange project segment was prepared in March 2022, with a Re-evaluated Environmental Impact Statement (REIS) and amended Record of Decision (ROD) for the Johnson Lane Interchange segment signed in 2022.

This BRR/BA Addendum Report has been prepared as an update to the Johnson Lane Interchange project segment to document any project and/or biological changes from what was presented in the March 2022 BRR/BA addendum. This addendum includes updates to the project description. It also provides general vegetation updates and updated information on federally threatened and endangered species within the Johnson Lane Interchange project vicinity. This addendum will be included as part of the 2025 REIS Re-evaluation for the Johnson Lane project segment.

ADDENDUM SUMMARY

The Johnson Lane Interchange project area, proposed design, existing conditions, avoidance and minimization measures, impacts, and recommended conservation measures described in the 2011 BRR/BA, subsequent 2012, 2013, and 2022 addenda, the 2014 Billings Bypass FEIS, and the Johnson Lane Interchange 2022 REIS and amended ROD are still valid and remain unchanged except as detailed below.

- The project limits along Old Hardin Road would be extended approximately 250 feet further west to Station 23+00 (or approximately 330 feet west of the eastern intersection of Rykken Circle). The project limits are being extended to provide a new, paved truck access approach off of Old Hardin Road at the west end of the Flying J/Town Pump gas station property. All other design elements along Old Hardin Road would be consistent with what was presented in the 2022 BRR addenda, REIS and amended ROD.

  The extended project limits and access approach would require approximately 0.062-acre of additional right-of-way from parcel 7-9 on the north side if Old Hardin Road.

- The status of the monarch butterfly (*Danaus plexippus*) and Suckley's cuckoo bumble bee (*Bombus suckleyi*) were updated by USFWS in December 2024, as proposed threatened and proposed endangered, respectively. The proposed project limits extension and new access approach would ***not jeopardize the continued existence*** of monarch butterfly or the Suckley's cuckoo bumble bee.

1.0 INTRODUCTION

The Montana Department of Transportation (MDT) is proposing to modify the project limits for the Johnson Lane Interchange segment of the Billings Bypass (4199007) to construct a new truck access approach at the west end of the Flying J/Town Pump gas station property on Old Hardin Road. The Johnson Lane Interchange project limits along Old Hardin Road would be extended west by approximately 250 feet (or approximately 330 feet west of the eastern intersection of Rykken Circle). All other termini would remain consistent with the project limits presented in the 2022 Biological Resources Report/Biological Assessment (BRR/BA) addenda, 2022 Revised Environmental Impact Statement (REIS) and amended Record of Decision (ROD).

The Johnson Lane Interchange project is the fifth project segment to be constructed as part of Phase I of the Billings Bypass. This segment is located within the community of Lockwood, Yellowstone County, Montana, and is found within Sections 19 and 30 of Township 1 North, Range 27 East.

This BRR/BA Addendum Report has been prepared as part of BRR/BA re-evaluation of the Johnson Lane Interchange segment of the Billings Bypass project. This report provides general biological resources updates, within the Johnson Lane Interchange project vicinity since the March 2022 BRR/BA addendum, the 2014 Billings Bypass Final Environmental Impact Statement (FEIS), and the 2022 REIS for the Johnson Lane Interchange segment. The report also includes an updated assessment of potential impacts to these resources as a result of the proposed modifications to the Johnson Lane Interchange project.

For the purposes of this document, project limits refer to the limits of potential construction; whereas project vicinity refers to a three-mile radius around the project limits in which specific biological resources are evaluated.

2.0 BRR/BA SECTION 1.1 – PROJECT DESCRIPTION UPDATES

As part of the 2025 REIS, the following modifications have been incorporated into the design of the Johnson Lane Interchange segment of the Billings Bypass:

Design Modification: The project limits along Old Hardin Road would be extended approximately 250 feet further west to Station 23+00 (or approximately 330 feet west of the eastern intersection of Rykken Circle). The project limits are being extended to provide a new, paved truck access approach off of Old Hardin Road at the west end of the Flying J/Town Pump gas station property. The new access approach was requested by the Flying J/Town Pump gas station due to the installation of a new, raised center median at the Old Hardin Road and Johnson Lane intersection, which limits truck turning movements to and from existing property access locations. All other design elements along Old Hardin Road would be consistent with what was presented in the 2022 BRR/BA, 2022 REIS and amended ROD.

The extended project limits and access approach would require approximately 0.062-acre of additional right-of-way from parcel 7-9 on the north side of Old Hardin Road. The extended project limits are depicted in green on Figure 1 below. The design for the access approach at the west end of the Flying J/Town Pump property is depicted on Figure 2.

Figure 1: Extended Project Limits (depicted in green) along Old Hardin Road

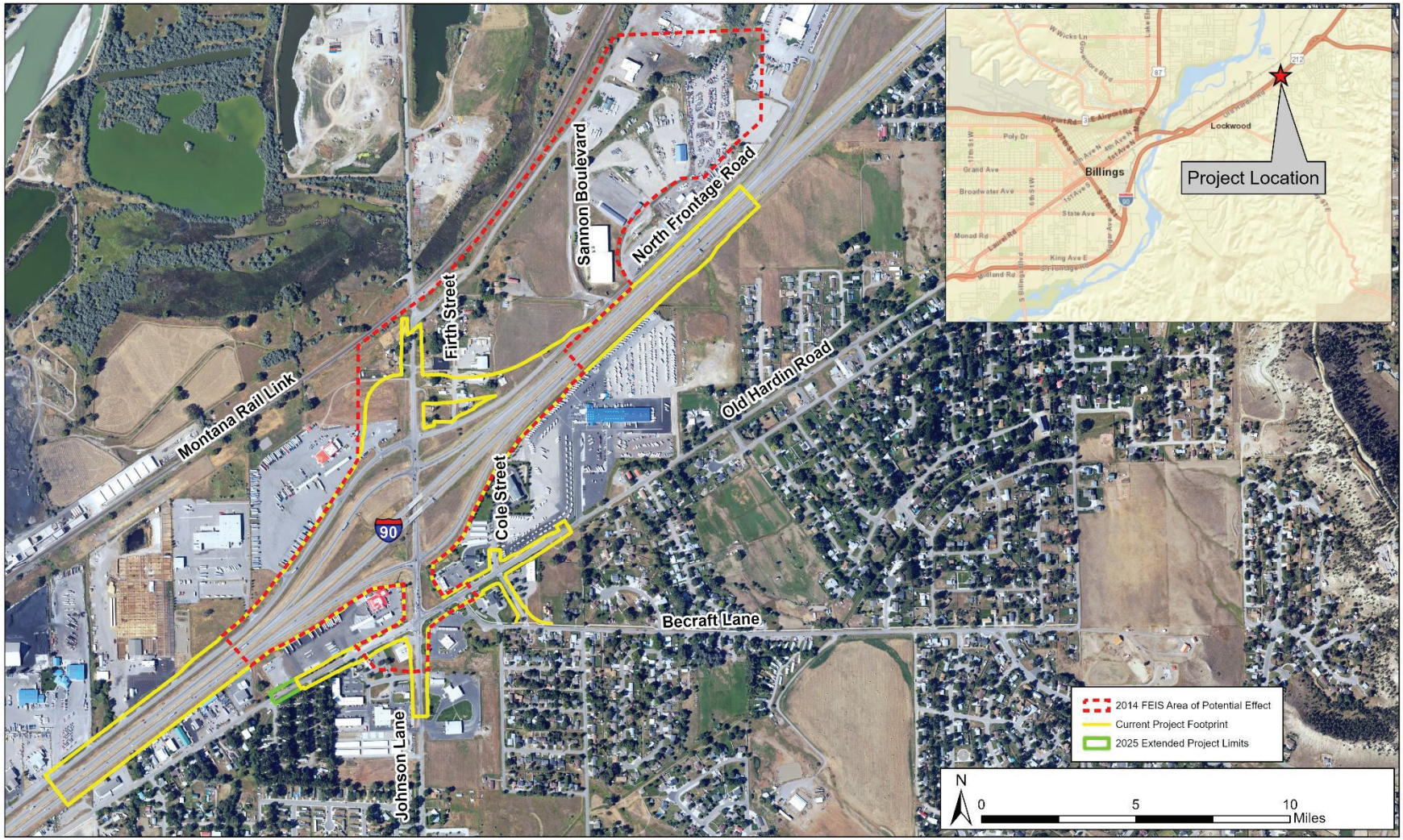


Figure 2: Proposed Design for Old Hardin Road, Including New Flying J Access Approach

3.0 BRR/BA Section 3.0 – General Vegetation, Wetlands, and Wildlife

The existing general vegetation, aquatic resources, general wildlife conditions, state species of concern, avoidance and minimization measures, impacts, and recommended conservation measures described in the 2011 BRR/BA, subsequent 2012, 2013, and 2022 addenda, the 2014 Billings Bypass FEIS, and 2022 Johnson Lane Interchange REIS are still valid and remain unchanged.

A wetland delineation was completed for the Johnson Lane Interchange segment in 2020. To ensure all wetlands and other aquatic resources were identified within the current project limits (i.e., the extended limits along Old Hardin Road), a field survey was completed on June 17, 2025. Lockwood Ditch and its associated fringe wetland parallel Old Hardin Road to the south within the extended project limits. The ditch and wetland were previously delineated during the 2020 field effort. The ditch and wetlands will be piped as part of a separate City of Lockwood sidewalk project, which will occur prior to construction of the Johnson Lane Interchange segment. No other wetlands or aquatic resources were identified during the 2025 field review effort.

Based on the June/July 2025 review of the extended project limits, the updated project design is not anticipated to increase or reduce impacts to these resources and will not be addressed further in this addendum report.

4.0 BRR/BA SECTION 6 – THREATENED AND ENDANGERED SPECIES - BIOLOGICAL ASSESSMENT

Methods

The July 2025 USFWS Endangered, Threatened, Proposed, and Candidate Species list for Yellowstone County was reviewed to determine if there were any changes in federally listed species in or near the Johnson Lane Interchange project vicinity since the 2011 BRR/BA, subsequent 2012, 2013, and 2022 addenda, the 2014 Billings Bypass FEIS, and 2022 FEIS Re-evaluation (USFWS, 2025a). The Montana Natural Heritage Program (MTNHP) database for threatened or endangered species was also reviewed for occurrences within and adjacent to the project limits (MTNHP, 2025).

Results

Since the 2011 BRR/BA, subsequent addenda, the 2014 FEIS, and 2022 REIS and amended ROD, the federal status for the monarch butterfly (*Danaus plexippus*) has been changed to proposed threatened (December 12, 2024) and the Suckley's cuckoo bumble bee (*Bombus suckleyi*) has been added as a proposed endangered species (December 16, 2024) on the list of Endangered, Threatened, Proposed, and Candidate species for Yellowstone County. The USFWS determined that the threat level to both the monarch butterfly and Suckley's cuckoo bumble bee had increased and now qualify to be listed as proposed threatened and proposed endangered, respectively. The current USFWS list by county shows both monarch butterfly and Suckley's cuckoo bumble bee as potentially occurring in Yellowstone County (Appendix A).

The following information is provided in this BRR/BA Addendum Report to supplement the effects analysis for monarch butterfly and Suckley's cuckoo bumble bee.

Monarch Butterfly

Species Description

Adult monarch butterflies are large butterflies with orange wings. The wings have black borders and black veins, as well as white speckling. Larvae emerge from their eggs on obligate milkweed host plants after two to five days. The larvae transition through five larval instars over the course of 9 to 18 days. Lastly, they pupate into a chrysalis before emerging 6 to 14 days later as an adult Monarch Butterfly (USFWS, 2025b).

Monarchs prefer open places, native prairie, foothills, open valley bottoms, roadsides, open weedy fields, pastures, and marshes. During migration, monarchs need nighttime roosting sites. Roosting generally occurs in both native and nonnative deciduous and evergreen trees. Monarchs have been observed using narrow-leaved tree species such as willows, Russian olives, locusts, pines, and eucalyptus as roosting sites (USFWS, 2025c). Monarch butterflies living east of the Rocky Mountains migrate from Canada to central Mexico where they overwinter. Monarchs typically do not arrive in Montana until June or July and migrate south between September and October (FWP, 2025).

Reason for Decline and Federal Status

The monarch butterfly was designated as a Candidate Species on December 15, 2020, (Federal Register 85(243):81813-81822). Subsequently, the monarch butterfly's listing status was updated to proposed threatened on December 12, 2024, due to the ongoing impacts from loss and degradation of breeding, migratory, and overwintering habitat (from past conversion of grasslands and shrublands to agriculture and widespread use of herbicides; logging/thinning at overwintering sites in Mexico; urban development, senescence (i.e., deterioration with age), and incompatible management of overwintering sites in California; and drought); exposure to insecticides, and effects of climate change (Federal Register 89 (239):100662-100715).

Occurrence in Project Limits

Monarch butterflies migrate through Montana in the spring and fall as they move between central Mexico and Canada. While monarch butterflies may migrate through the area, suitable foraging and resting habitat is limited within the project footprint, as most of the area consists primarily of the commercial and residential developed area of Lockwood. According to MTNHP, the closest recorded observation of a monarch butterfly was over 30 miles southwest of the project limits in 2016 (MTNHP, 2025a). Additionally, Montana does not fall within the range of proposed critical habitat for the monarch butterfly, therefore no critical habitat could be destroyed or adversely modified by the project.

Suckley's Cuckoo Bumble Bee

Species Description

The Suckley's cuckoo bumble bee is an obligate social parasite that lacks a mechanism to carry pollen and is unable to produce worker bees. As such, the species is entirely

dependent on social bumble bee hosts, such as the western bumble bee (*Bombus occidentalis*), to collect pollen and rear their young. The historical distribution of Suckley's cuckoo bumble bee has been found in prairies, grasslands, meadows, urban and agricultural areas, and woodlands (Federal Register, 2024). Regardless of habitat type, this species cannot successfully reproduce without suitable host colonies and requires a diversity of native floral species for nutrition (USFWS, 2025d).

Reason for Decline and Federal Status

Suckley's cuckoo bumble bee was listed as a proposed endangered species in December 2024 due to host species decline, pathogens, pesticides, habitat fragmentation and conversion, and climate change (Federal Register, 2024).

Potential for Occurrence

Suckley's cuckoo bumble bee has not been documented in Yellowstone County (MTNHP, 2025b). Within the project limits, the diversity of nectar and pollen-bearing floral resources is limited by mowing and spraying. Habitat is also limited, as most of the area consists primarily of the commercial and residential developed area of Lockwood. Critical habitat has not been proposed for Suckley's cuckoo bumble bee, therefore no critical habitat could be destroyed or adversely modified.

Potential Impacts, Avoidance, Minimization, and Recommended Conservation Measures

The monarch butterfly and Suckley's cuckoo bumble bee are not anticipated within the updated project limits due to limited suitable habitat and the heavily disturbed and developed nature of the Johnson Lane Interchange segment. Therefore, the proposed project limits extension and new access approach to be implemented under the Johnson Lane Interchange project would ***not jeopardize the continued existence*** of the monarch butterfly or the Suckley's cuckoo bumble bee.

5.0 REFERENCES

Federal Register. 2024. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Suckley's Cuckoo Bumble Bee. *50 CFR Part 17, 89*(242), 102074-102091. Retrieved January 2025, from https://www.govinfo.gov/content/pkg/FR-2024-12-17/pdf/2024-28729.pdf#page=1

FWP. 2025. Montana Field Guide. Accessed March 2025. http://fieldguide.mt.gov

MTNHP. 2025a. Montana Natural Heritage Program. Species of Concern Report. Provided by MTNHP in July 2025.

MTNHP. 2025b. *Suckley's Cuckoo Bumble Bee - Bombus suckleyi*. Retrieved January 2025, from Montana Field Guides: https://fieldguide.mt.gov/speciesDetail.aspx?elcode=IIHYM24350

USFWS. 2025a. US Fish and Wildlife Service Ecological Services Montana Field Office. Endangered, Threatened, Proposed, and Candidate Species for Montana Counties. Accessed July 2025.

USFWS. 2025b. Environmental Conservation Online System. Monarch Butterfly. https://ecos.fws.gov/ecp/. Accessed July 2025.

USFWS. 2025c. Monarch Butterflies – Pollinators. https:// www.fws.gov/pollinators/features/Monarch_Butterfly.html#:~:text=Monarchs%20need%20nighttime%20roosting%20sites,and%20eucalyptus%20as%20roosting%20sites. Accessed July 2025.

USFWS. 2025d. *Suckley's Cuckoo Bumble Bee (Bombus suckleyi) Species Status Assessment (Version 1.0).* Retrieved January 2025, from https://iris.fws.gov/APPS/ServCat/DownloadFile/263505

APPENDIX A

US FISH AND WILDLIFE SPECIES LIST FOR YELLOWSTONE COUNTY, MONTANA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Montana Ecological Services Field Office
585 Shephard Way, Suite 1
Helena, MT 59601-6287
Phone: (406) 449-5225 Fax: (406) 449-5339

In Reply Refer To: 07/07/2025 22:49:56 UTC
Project Code: 2025-0118591
Project Name: Johnson Lane Interchange - Billings Bypass Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

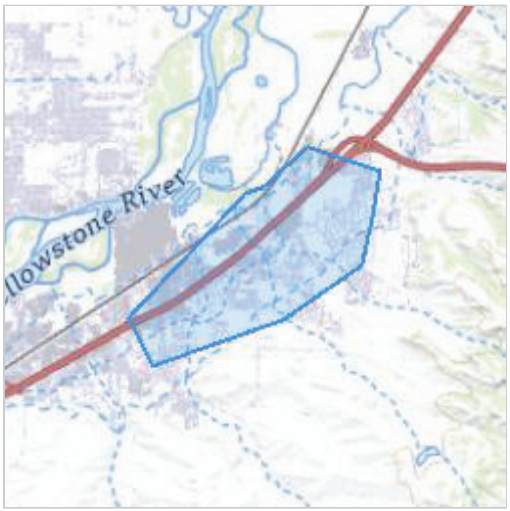
This species list is provided by:

Montana Ecological Services Field Office
585 Shephard Way, Suite 1
Helena, MT 59601-6287
(406) 449-5225

PROJECT SUMMARY

Project Code: 2025-0118591
Project Name: Johnson Lane Interchange - Billings Bypass Project
Project Type: Road/Hwy - Maintenance/Modification
Project Description: Interchange and roadway improvements
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@45.814488499999996,-108.40929879143832,14z



Counties: Yellowstone County, Montana

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Hope Weaver
Address: 5 Centerpointe Dr
City: Lake Oswego
State: OR
Zip: 97035
Email hweaver@dowl.com
Phone: 9716342003

Attachment 3: Johnson Lane Interchange 2025 Noise Analysis Update

Big Sky Acoustics
PO Box 27 Helena, Montana 59624
406.457.0407 www.bigskyacoustics.com

July 11, 2025

Ms. Emily Peterson
DOWL, Inc.
1300 Cedar Street
Helena, Montana 59601

Re: Billings Bypass-Johnson Lane Interchange
Detailed Noise Analysis - Update
REVISED FINAL REPORT
NCDP-MT 56(55), UPN 4199007
BSA Project #20142A

Dear Emily:

Big Sky Acoustics, LLC (BSA) has updated the Detailed Noise Analysis (Activity 185) for the Billings Bypass-Johnson Lane Interchange project. The attached *revised final report* summarizes the results of the noise analysis, including the noise level measurements, modeling, results and mitigation, and includes *Addendum A* for the 2025 redesign of the *Old Hardin Road-West portion of the project.*

Thank you for the opportunity to work with you again. If you have any questions concerning this report, please do not hesitate to call me at (406) 457-0407, or email me at sean@bigskyacoustics.com.

Sincerely,

Sean Connolly

Sean Connolly, INCE Bd. Cert.
BIG SKY ACOUSTICS

Attachment

BILLINGS BYPASS-JOHNSON LANE INTERCHANGE
NCDP-MT 56(55), UPN 4199007
DETAILED NOISE ANALYSIS - UPDATE

Prepared for:

MONTANA MDT DEPARTMENT OF TRANSPORTATION

and

DOWL, Inc.

Completed by:

Big Sky Acoustics

July 11, 2025

BILLINGS BYPASS-JOHNSON LANE INTERCHANGE
NCDP-MT 56(55), UPN 4199007
DETAILED NOISE ANALYSIS - UPDATE

EXECUTIVE SUMMARY

The Montana Department of Transportation (MDT) is planning to develop the 4th segment of the Billings Bypass (BBP), by reconstructing the Interstate 90 (I-90) Johnson Lane Interchange and associated roadways (i.e., I-90 on/off ramps, Johnson Lane, Old Hardin Road, Cole Street, Becraft Lane, North Frontage Road and Sannon Boulevard) in Lockwood, Montana (**Figure 1**, attached). The BBP-Johnson Lane Interchange Project is bisected by I-90 (west/east) and Johnson Lane (north/south), and will include a new Diverging Diamond interchange, alignment shifts, additional travel lanes, modified intersections, new and upgraded traffic signals, etc. (DOWL 2021a).

This Detailed Noise Analysis for the BBP-Johnson Lane Interchange Project was completed by Big Sky Acoustics (BSA) according to the U.S. Code of Federal Regulations Part 772 (23 CFR 772) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (2011), and MDT's *Traffic Noise Analysis and Abatement Policy* (MDT 2017). The intent of the noise study was to evaluate existing traffic noise levels at noise-sensitive receptors, and predict noise levels due to vehicles traveling on the reconstructed roadways (**Figure 1**). The Record of Decision and Final Environmental Impact Statement (EIS) for the complete BBP project (Segments 1 through 6) were finalized in 2014, and sections have been updated subsequently (MDT 2014a, MDT 2014b). The attached report revises BSA's 2012 BBP *Traffic Noise Impact Assessment* (BSA 2012) (used in the EIS analysis) for this Segment 4-Johnson Lane Interchange section only, and includes traffic noise analyses for the additional roadways located north and south of I-90 that were not included in BSA's 2012 analysis.

The BBP-Johnson Lane Interchange Project is located within a suburban area, with agriculture/farm, commercial, hotel, industrial, medical facilities, offices, residential, restaurant/bar, and retail land uses located within 500 feet of the edge of the closest travel lane. The Project was evaluated as a Type I project per 23 CFR 772 due the major modifications of the Johnson Lane Interchange, the significant horizontal alignment shift and construction of the North Frontage Road in a new location, and the addition of through-traffic lanes (MDT 2017). For the noise analysis, BSA evaluated traffic noise level impacts for the No Build Alternative (i.e., not reconstructing the interchange or roads) and for the Build Alternative.

For traffic noise studies, the equivalent noise level during a one-hour period, $L_{eq}(h)$ is used. The units of the $L_{eq}(h)$ are A-weighted decibels (dBA). The equivalent noise level is defined as the steady state noise level that has the same acoustical energy as the actual, time-varying noise signal during the same time period. The $L_{eq}(h)$ metric is useful for traffic noise studies because it uses a single number to describe the constantly fluctuating noise levels at a receptor location as vehicles pass by during a one-hour period.

The Federal Highway Administration (FHWA) and MDT identify traffic noise impacts according to Noise Abatement Criteria (NAC) for various land uses and zoning (FHWA 2010, MDT 2017). For Activity Category B and C land uses, such as residences, churches, medical facilities, recreation areas, etc., the exterior NAC is 67 dBA. Therefore, traffic noise impacts occur if the

predicted traffic noise levels are 66 dBA or greater in the Design Year of a project, or if the predicted traffic noise levels are 13 dBA higher than the Present Year noise levels. Activity Category C land uses, such as churches and medical facilities, also have an interior NAC of 52 dBA that is used when no exterior uses are present. For Activity Category E land uses, such as hotels, offices, and restaurants/bars, the exterior NAC is 72 dBA. Activity Category F land uses, such as agriculture, industrial and retail facilities, as well as undeveloped lands that are not currently permitted for development (Activity Category G), do not have a NAC and were not evaluated for this noise analysis (**Table 3-1**).

BSA evaluated traffic noise level impacts for both the No Build and Build Alternatives for this Segment 4 BBP-Johnson Lane Interchange Project (**Figure 1**). BSA completed six noise level measurements in July 2021 to determine the existing ambient noise levels within the project limits (**Section 4.1**), and to verify that the TNM computer models used to predict the traffic noise levels were reasonably accurate (**Section 4.2**). Noise-sensitive receptors were identified within approximately 500 feet of the edge of the closest travel lane. A total of 51 noise-sensitive receptors are depicted on **Figures 2 and 3** (attached), including 35 single-family and mobile home residences, three medical offices, one hotel, two offices, and 10 restaurants/bars.

The TNM-predicted traffic noise levels for both the No Build and Build Alternatives are summarized in **Table 5-1**. Three traffic noise impacts are predicted due to the No Build Alternative in the Present Year (2019) and six impacts in the Design Year (2042). For the Build Alternative, 10 traffic noise impacts are predicted in the Design Year. As shown on **Figure 2**, the Firth Street neighborhood will be bisected by the new North Frontage Road alignment. Subsequently, five residences (Receptors J2, J3, J10, J11 and J13) are planned to be relocated for this Project, and four of these relocated residences are also predicted to be noise-impacted (**Table 5-1**). However, the highest Build Alternative Design Year traffic noise level (L_{eq}(h) 69 dBA) is predicted for the remaining Receptor J1 that may also need to be relocated due to right-of-way (ROW) and/or property access issues.

As shown on **Figure 3** and in **Table 5-1**, three residences (Receptors H1, H3 and H4) located adjacent to Old Hardin Road and west of the intersection with Johnson Lane are noise-impacted, and currently experiencing high traffic noise levels (No Build Alternative-Present Year). Traffic noise impacts are also predicted for these same residences plus an additional two mobile homes (Receptors H1-2 and H2) for the No Build and Build Alternatives in the Design Year (2042).

Because traffic noise impacts were predicted, BSA evaluated traffic noise mitigation measures and determined if the measures are reasonable or feasible (**Section 6.0**), including the construction of noise barriers, modifying the proposed build alternatives, acquisition of real property, and traffic management measures. Five Firth Street noise-impacted receptors located adjacent to Receptor J1 are currently planned to be relocated for this Project (**Figure 2**), and therefore, a barrier is not feasible for one receptor (J1). BSA evaluated the reasonableness for a barrier for the mobile home park and residences located adjacent to Old Hardin Road and/or Rykken Circle (**Addendum A, Figure A-1**). The CEI results are summarized in **Table 6-1 and Addendum A**, however, a barrier wall would not meet MDT's noise reduction design goal, and the CEI values are above MDT's reasonableness criteria. Therefore, barriers are not reasonable for traffic noise mitigation of the Build Alternative.

In order to eliminate the noise-impact at Receptor J1 (**Figure 2**), the Johnson Lane alignment north of I-90 would need to shift 150 feet west, which is not feasible. Additionally, the mobile home park at Old Hardin Road and Rykken Circle (**Figure 3**) is located at the west end of the project limits, and moving the alignment north is not feasible when realigning to the existing configuration.

Traffic control devices are already included in the Project design (DOWL 2021a). Restricting certain vehicle types, limiting the time of day that certain vehicles may use the roads, exclusive lane designations or changing the speed limits are also not reasonable mitigation measures for the connectivity of the BBP and the functionality of the Project. However, to avoid future traffic noise impacts in Activity Category G undeveloped lands, BSA determined the minimum setback distances from the nearest Build Alternative centerline to where the Design Year L_{eq}(h) 60 and 64 dBA noise levels are predicted to occur (**Table 7-1**). Local officials should strongly encourage developers to incorporate noise-compatible planning measures to avoid traffic noise problems in the future (MDT 2008).

TABLE OF CONTENTS

1.0 INTRODUCTION

The Montana Department of Transportation (MDT) is planning to develop the 4th segment of the Billings Bypass (BBP), by reconstructing the Interstate 90 (I-90) Johnson Lane Interchange and associated roadways (i.e., I-90 on/off ramps, Johnson Lane, Old Hardin Road, Cole Street, Becraft Lane, North Frontage Road and Sannon Boulevard) in Lockwood, Montana (**Figure 1**, attached). The BBP-Johnson Lane Interchange Project is bisected by I-90 (west/east) and Johnson Lane (north/south), and will include a new Diverging Diamond interchange, alignment shifts, additional travel lanes, modified intersections, new and upgraded traffic signals, etc. (DOWL 2021a).

This Detailed Noise Analysis for the BBP-Johnson Lane Interchange Project was completed by Big Sky Acoustics (BSA) according to the U.S. Code of Federal Regulations Part 772 (23 CFR 772) *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (2011), and MDT's *Traffic Noise Analysis and Abatement Policy* (MDT 2017). The intent of the noise study was to evaluate existing traffic noise levels at noise-sensitive receptors, and predict noise levels due to vehicles traveling on the reconstructed roadways (**Figure 1**). The Record of Decision and Final Environmental Impact Statement (EIS) for the complete BBP project (Segments 1 through 6) were finalized in 2014, and sections have been updated subsequently (MDT 2014a, MDT 2014b). The attached report revises BSA's 2012 BBP *Traffic Noise Impact Assessment* (BSA 2012) (used in the EIS analysis) for this Segment 4-Johnson Lane Interchange section only, and includes traffic noise analyses for the additional roadways located north and south of I-90 that were not included in BSA's 2012 analysis.

The Project is located in Yellowstone County and within the City of Lockwood. As shown on **Figure 1**, in the northern section of the Project, the east and west sections of the North Frontage Road will be realigned, creating a 4-way signalized intersection with Johnson Lane, and the existing alignment will shift approximately 410 feet north. This intersection portion of the new North Frontage Road alignment will be constructed on undeveloped land and on the eastern portion of the Town Pump parking lot west of Johnson Lane, and through portions of the neighborhood located along Firth Street east of Johnson Lane. The eastern segment of the North Frontage Road will intersect with Sannon Boulevard approximately 0.3 miles east of Johnson Lane. Sannon Boulevard will be realigned with an "S" configuration extending north from the North Frontage Road and intersecting with Coulson Road (DOWL 2021a). Modifications to Coulson Road and the intersection with Johnson Lane are planned for the Segment 5 BBP-Johnson Lane Interchange-Railroad Overpass project, that is scheduled to be constructed after this Project (DOWL 2021b, MDT 2021).

Johnson Lane will be reconstructed with a new Diverging Diamond interchange, traffic signals, and modified I-90 on/off ramps (**Figure 1**). The Johnson Lane improvements will begin about 760 feet south of Old Hardin Road, extend under I-90 and 0.6 miles north where it will terminate at the existing intersection with Coulson Road. The Johnson Lane/Old Hardin Road intersection will be widened to accommodate the additional travel lanes, turn lanes and an updated traffic signal. The Old Hardin Road improvements, which includes a shift in alignment to accommodate the new lane configuration, will extend approximately 0.2 miles west and 0.27 miles east of the intersection with Johnson Lane. A traffic signal will be constructed to accommodate the new traffic and turn lanes at the intersection of Old Hardin Road and Cole Street. Cole Street will be improved north and south of Old Hardin Road, and the south leg will extend nearly 500 feet and tie into a modified intersection with Becraft Lane (DOWL 2021a).

The BBP-Johnson Lane Interchange Project is located within a suburban area, with agriculture/farm, commercial, hotel, industrial, medical facilities, offices, residential, restaurant/bar, and retail land uses located within 500 feet of the edge of the closest travel lane. The Project was evaluated as a Type I project per 23 CFR 772 due the major modifications of the Johnson Lane Interchange, the significant horizontal alignment shift and construction of the North Frontage Road in a new location, and the addition of through-traffic lanes (MDT 2017). For the noise analysis, BSA evaluated traffic noise level impacts for the No Build Alternative (i.e., not reconstructing the interchange or roads) and for the proposed Build Alternative. Based on MDT's traffic and design data provided, BSA evaluated the Project with a Present Year of 2019 and Design Year of 2042 (MDT 2019, DOWL 2021a).

2.0 TERMINOLOGY

Noise levels are quantified using units of decibels (dB). Noise levels can also be expressed as A-weighted decibels (dBA). Humans typically have reduced hearing sensitivity at low frequencies compared with their response at high frequencies, and the A-weighting of noise levels closely correlates to the frequency response of normal human hearing. By utilizing A-weighted noise levels in a study, a person's response to noise can be assessed. Decibels are logarithmic values, and cannot be combined using normal algebraic addition. For example, the combined noise level of two 50-dBA noise sources would be 53 dBA, not 100 dBA.

When traveling from a noise source to a receptor in an outdoor environment, noise levels decrease with increasing distance between the source and receptor. Traffic noise levels typically decrease between 3 and 4.5 dBA every time the distance between the road and receptor is doubled, depending on the characteristics of the source and the conditions over the path that the noise travels. The reduction in noise levels can be increased if a solid barrier, such as a man-made wall, or natural topography is located between the source and receptor.

The ambient noise at a receptor location in a given environment is the all-encompassing sound associated with that environment, and is due to the combination of noise sources from many directions, near and far, including the noise source of interest. The background noise at a given location is due to any sources that are not associated with the noise source of interest.

For environmental noise studies, ambient noise levels and noise impact criteria are typically based on A-weighted equivalent noise levels, L_{eq}, during a certain time period. The equivalent noise level during a one-hour period is represented as $L_{eq}(h)$ and is the metric used by Federal Highway Administration (FHWA) and MDT for traffic noise studies. The equivalent noise level is defined as the steady state noise level that has the same acoustical energy as the actual, time-varying noise signal during the same time period. The $L_{eq}(h)$ metric is useful for traffic noise studies because it uses a single number to describe the constantly fluctuating ambient noise levels at a receptor location during one hour of time.

3.0 ACTIVITY CATEGORIES AND NOISE ABATEMENT CRITERIA

23 CFR 772 outlines the procedures to determine if traffic noise impacts will occur for a project and when traffic noise abatement measures will be considered. FHWA and MDT identify traffic noise impacts according to Noise Abatement Criteria (NAC) for various land uses and zoning (FHWA 2010, MDT 2017). MDT's Noise Policy (2017) and 23 CFR 772 (2011) state that traffic

noise impacts occur for highway projects when the predicted $L_{eq}(h)$ noise level at a receptor location in a project's Design Year approaches or exceeds the NAC values listed in **Table 3-1**, or when the predicted traffic noise levels in the Design Year substantially exceed the existing ambient noise levels at a receptor. In determining and abating traffic noise impacts, 23 CFR 772, Section 772.11–*Noise Abatement*, gives primary consideration to receptor locations that represent exterior areas where frequent human use occurs and a lowered noise level would be of benefit. MDT defines "approach" as 1 dBA, and "substantially exceed" as 13 dBA (MDT 2017).

For Activity Category B and C land uses, such as residences, churches, medical facilities, recreation areas, etc., the exterior NAC is 67 dBA. Therefore, traffic noise impacts occur if the predicted traffic noise levels are 66 dBA or greater in the Design Year of a project, or if the predicted traffic noise levels are 13 dBA higher than the Present Year noise levels. Activity Category C land uses, such as churches and medical facilities, also have an interior NAC of 52 dBA that is used when no exterior uses are present. For Activity Category E land uses, such as hotels, offices, and restaurants/bars, the exterior NAC is 72 dBA. Activity Category F land uses, such as agriculture, industrial and retail facilities, as well as undeveloped lands that are not currently permitted for development (Activity Category G) and are located within the project limits, do not have a NAC and were not evaluated for this noise analysis (**Table 3-1**). When traffic noise impacts are identified at noise-sensitive receptor locations, MDT considers reasonable and feasible noise abatement measures to reduce traffic noise levels at a receptor (MDT 2017).

Table 3-1: Noise Abatement Criteria

Activity Category	Activity Criteria[1] $L_{eq}(h)$ dBA	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67	Exterior	Residential
C[2]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[2]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.
F	---	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities, (water resources, water treatment, electrical), and warehousing.
G	---	---	Undeveloped lands that are not permitted.

Source: MDT 2017

Notes:

[1] The $L_{eq}(h)$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] Includes undeveloped lands permitted for this Activity Category.

Underlined designates receptors identified within 500 feet of the edge of the closest travel lane in the project limits.

4.0 AFFECTED ENVIRONMENT

4.1 Ambient Noise Measurements

BSA completed six noise level measurements on July 26–27, 2021 to determine the existing ambient noise levels at representative locations near receptors. The measurements were 30 to 60 minutes in duration, and the $L_{eq}(h)$ for each one-hour period was calculated from the measurement data. The measurement locations are depicted on **Figures 2 and 3**, attached.

BSA conducted the ambient noise level measurements using Larson Davis Model 831 and CEL Instruments Model 593 Type I Sound Level Meters with preamplifiers and 0.5-inch diameter microphones. The meters were calibrated using a CEL Instruments Model 284/2 Acoustical Calibrator prior to and checked after each measurement. The sound level meters were set to "slow" response per FHWA requirements (FHWA 2010). The sound level meters were mounted on tripods such that the microphones were approximately 5 feet above the ground surface, and windscreens were used over the microphones. Temperature, relative humidity and wind speed were measured using a Kestrel 3000 meter. **Table 4-1** summarizes the measured ambient $L_{eq}(h)$ noise levels, and **Table 4-2**, on the next page, summarizes the atmospheric conditions during the field measurements.

Table 4-1: Outdoor Ambient Noise Level Measurements

Meas. Location (Figures 2 & 3)	Date & Time (hours)	Description	Approx. Distance & Direction from Nearest Centerline	Measured $L_{eq}(h)$ (dBA)	Dominant Noise Sources during Measurements[3]
1	7/26/21 1622 to 1722	Northwest corner of intersection of Becraft Lane & Cole Street, across from residences	42 feet north of Becraft Lane	62 dBA	Rush hour traffic on Becraft Lane, and diesel pick-up trucks pulling trailers
2	7/26/21 1636 to 1706	Southwest corner of intersection of Old Hardin Road & Rykken Circle (west) in mobile home park	55 feet south of Old Hardin Road	63 dBA[1]	Rush hour traffic & heavy trucks on Old Hardin Road, and an idling truck in trailer park
3	7/26/21 1733 to 1803	North side of Old Hardin Road, south of Holiday Inn Express, west of residences, and north of the Cole Street shopping center	67 feet north of Old Hardin Road	61 dBA[1]	Rush hour traffic on Old Hardin Road
4	7/27/21 0859 to 0929	East side of Johnson Lane, and west of Firth Street residences	70 feet east of Johnson Lane	62 dBA[1]	Steady traffic & heavy trucks on Johnson Lane, Coulson Road, North Frontage Road & I-90, passing train (and horn), and barking dogs
5	7/27/21 1005 to 1035	West side of Firth Street at the driveway and mailbox of the 1044 Firth Street residence	25 feet west of Firth Street	57 dBA[1]	Steady traffic & heavy trucks on Johnson Lane, Coulson Road, North Frontage Road & I-90, passing train (and horn), and aircraft
6	7/27/21 1104 to 1204	North side of Coulson Road (south of railroad tracks) and across from residences	64 feet north of Coulson Road	60 dBA[2]	Steady traffic & heavy trucks on Coulson Road, three passing trains (and horns), and aircraft

Notes:

[1] The $L_{eq}(h)$ noise level was calculated from the 30-minute measurement data.

[2] The measured noise level at Location 6 (72 dBA) was heavily influenced by three passing trains and horns at the at-grade railroad crossing at Johnson Lane. Therefore, the train data was removed to calculate the $L_{eq}(h)$ noise level due to traffic.

[3] Traffic on I-90 was audible from all measurement locations, especially during low traffic periods on the adjacent roads.

Table 4-2: Atmospheric Conditions during the Noise Level Measurements

Measurement Locations	Date & Time (hours)	Temperature	Relative Humidity	Conditions & Wind Speed/Direction
1, 2 & 3	7/26/21 1620 to 1800	100.5 to 102°F	16%	Hazy from wildfire smoke and calm
4 & 5	7/27/21 0900 to 1030	76°F	30%	Hazy and 3 to 9 mph from south
6	7/27/21 1100 to 1200	93 to 95°F	18 to 20%	Hazy and calm

4.2 Creating and Verifying the Traffic Noise Model

BSA predicted traffic noise levels at the receptors for the No Build and Build Alternatives using the FHWA-approved Traffic Noise Model (TNM), Version 2.5 software (FHWA 2010). This section describes the information and assumptions that were used to create the TNM models which predicts the noise due to moving vehicles. The ambient noise level measurements taken by BSA (**Table 4-1**) were used to verify that the TNM models were reasonably accurate for the No Build and Build Alternatives.

TNM 2.5 uses a three-dimensional coordinate system (x, y, and z) to define the location of the roads, receptor locations and terrain elevations. The number and type of vehicles traveling on the roads that were tallied during the measurements, the approximate speed of the traffic, the location of the centerlines of the driving lanes, the ground elevations between the measurement locations and the roads, and the measurement locations were entered into the models. Topographic elevations of the receptor locations, the roadway conditions, and the location of the proposed Build Alternative were based on Preliminary Plan in Hand Road Plans and updated line work (DOWL 2021a, DOWL 2021b).

Table 4-3 on the next page lists the traffic data BSA counted during the field measurements, and the measured ambient and TNM-predicted noise levels. BSA counted the traffic on the road(s) closest to and with a clear line of sight from the measurement locations. The traffic count data were used to compare the field-measured noise levels to the traffic noise levels predicted by the TNM models at the measurement locations. Measurement Location 6 was heavily influenced by three passing trains and horns at the at-grade railroad crossing at Johnson Lane, and therefore, the train data was removed to calculate the $L_{eq}(h)$ noise level due to traffic.

For all measurements, the calculated difference between each field-measured $L_{eq}(h)$ noise level and the level predicted by the TNM models for the traffic conditions during each measurement period was 1 to 2 dBA. A difference of +/- 3 dBA between measured and predicted traffic noise levels indicates that the TNM models are reasonably accurate (MDT 2017). Therefore, the TNM models are reasonably accurate and acceptable for traffic noise level predictions at the receptor locations (**Table 4-3**).

Table 4-3: Measured Ambient vs. Predicted Noise Levels

Meas. Location (Figures 2 & 3)	Date & Time (hours)	Approx. Distance & Direction from Nearest Centerline	Road and Directional Traffic Tallied During Measurement	Road and Directional Traffic Tallied During Measurement[1]	Measured $L_{eq}(h)$	Predicted $L_{eq}(h)$ by TNM Model
1	7/26/21 1622 to 1722	42 feet north of Becraft Lane	**Becraft Lane Eastbound** Autos: 227 MT: 14 HT: 0	**Becraft Lane Westbound** Autos: 120 MT: 3 HT: 1	62 dBA	61 dBA
			Cole Street Northbound Autos: 6 MT: 0 HT: 0	**Cole Street Southbound** Autos: 3 MT: 1 HT: 0		
2	7/26/21 1636 to 1706	55 feet south of Old Hardin Road	**Old Hardin Road Eastbound[1]** Autos: 198 MT: 8 HT: 4	**Old Hardin Road Westbound[1]** Autos: 156 MT: 12 HT: 2	63 dBA[2]	61 dBA
3	7/26/21 1733 to 1803	67 feet north of Old Hardin Road	**Old Hardin Road Eastbound[1]** Autos: 318 MT: 8 HT: 6	**Old Hardin Road Westbound[1]** Autos: 160 MT: 6 HT: 2	61 dBA[2]	60 dBA
4	7/27/21 0859 to 0929	70 feet east of Johnson Lane	**Johnson Lane Northbound[1]** Autos: 28 MT: 10 HT: 14	**Johnson Lane Southbound[1]** Autos: 38 MT: 6 HT: 28	62 dBA[2]	61 dBA
5	7/27/21 1005 to 1035	25 feet west of Firth Street	**I-90 Eastbound[3]** Autos: NA MT: NA HT: NA **I-90 Eastbound Offramp[3]** Autos: NA MT: NA HT: NA **North Frontage Road Eastbound[1]** Autos: 16 MT: 2 HT: 2 **Firth Street Northbound[1]** Autos: 4 MT: 2 HT: 2 **Johnson Lane Northbound[1]** Autos: 14 MT: 6 HT: 24	**I-90 Westbound[1]** Autos: 430 MT: 56 HT: 60 **I-90 Westbound Offramp[1]** Autos: 34 MT: 6 HT: 30 **North Frontage Road Westbound[1]** Autos: 12 MT: 4 HT: 6 **Firth Street Southbound[1]** Autos: 0 MT: 0 HT: 0 **Johnson Lane Southbound[1]** Autos: 14 MT: 8 HT: 22	57 dBA[2]	56 dBA
6	7/27/21 1104 to 1204	64 feet north of Coulson Road	**Coulson Road Eastbound** Autos: 48 MT: 10 HT: 20	**Coulson Road Westbound** Autos: 48 MT: 7 HT: 24	60 dBA[4]	62 dBA

Notes:

Autos Automobiles – 2-axle, 4-wheel vehicles including pickup trucks (FHWA Vehicle Classes 1 – 3)

MT Medium trucks – 2-axle, 6-wheel vehicles, plus automobiles pulling trailers (FHWA Vehicle Classes 4 – 5)

HT Heavy trucks – 3 or more axles (FHWA Vehicle Classes 6 – 16)

1 Traffic tallied during the 30-minute measurement periods was doubled to estimate 1-hour total traffic counts.

2 The $L_{eq}(h)$ was calculated from the 30-minute measurement data.

3 I-90 eastbound traffic was not visible from Measurement Location 5.

4 The measured noise level at Location 6 ($L_{eq}(h)$ 72 dBA) was heavily influenced by three passing trains and horns at the at-grade railroad crossing at Johnson Lane. Therefore, the train data was removed to calculate the $L_{eq}(h)$ noise level due to traffic.

4.3 Traffic Data Used for the Traffic Noise Predictions

BSA calculated the traffic noise levels for the No Build and Build Alternatives for the Project using TNM modeling (**Section 5.0**). BSA used three sources of traffic data for the noise analysis, including MDT's Traffic Data Collection and Analysis Section data (MDT 2019), MDT's online Arc-GIS Montana Traffic Data (MDT 2021b), and DOWL's updated traffic data for the modified alignments (DOWL 2021b). BSA calculated the traffic data for a Present Year of 2019, a projected Design Year of 2042, an Average Annual Daily Traffic (AADT), and Design Hourly Volume (DHV) per vehicle class for the Project roads. **Table 4-4** shows the traffic data BSA used for the TNM noise level predictions.

Table 4-4: Traffic Data Used for Noise Level Predictions

Road	Posted Speed	Design Condition	Year	AADT	DHV	Autos	MT	HT
Becraft Lane-East[2, 4]	35 mph	No Build	2019	5410	490	97.2%	2.2%	0.6%
			2042	6800	610			
		Build Alternative	2042					
Becraft Lane-West[2, 4]	35 mph	No Build	2019	1130	100	97.2%	2.2%	0.6%
			2042	1420	130			
		Build Alternative	2042					
Cole Street[1, 2, 4]	25 mph	No Build	2019	5630	510	97.2%	2.2%	0.6%
			2042	7080	640			
		Build Alternative	2042					
Old Hardin Road-East	35 mph	No Build	2019	6430	740	97.2%	2.2%	0.6%
			2042	8080	930			
		Build Alternative	2042					
Old Hardin Road-West	35 mph	No Build	2019	4480	500	83.8%	3.9%	12.3%
			2042	5630	630			
		Build Alternative	2042					
Johnson Lane (South of Old Hardin Rd)	35 mph	No Build	2019	2070	290	91.6%	5.1%	3.3%
			2042	3820	540			
		Build Alternative	2042					
Johnson Lane (Between Old Hardin & I-90)	35 mph	No Build	2019	13460	1472	89.3%	3.4%	7.3%
			2042	16920	1850			
		Build Alternative	2042					
I-90 (Eastbound & Westbound)	65 mph	No Build	2019	22460	2380	80.7%	2%	17.3%
			2042	33850	3590			
		Build Alternative	2042					
I-90 Eastbound Offramp[3]	decelerating	No Build	2019	5140	545	80.7%	2%	17.3%
			2042	6460	685			
		Build Alternative	2042					
I-90 Eastbound Onramp[3]	accelerating	No Build	2019	2200	233	80.7%	2%	17.3%
			2042	2780	295			
		Build Alternative	2042					
I-90 Westbound Offramp[3]	decelerating	No Build	2019	1960	208	80.7%	2%	17.3%
			2042	2464	261			
		Build Alternative	2042					
I-90 Westbound Onramp[3]	accelerating	No Build	2019	5210	552	80.7%	2%	17.3%
			2042	6550	694			
		Build Alternative	2042					
Johnson Lane (Between I-90 & N. Frontage Rd)	35 mph	No Build	2019	13460	1550	89.3%	2.3%	8.4%
			2042	16920	1950			
		Build Alternative	2042					

Table 4-4: Traffic Data Used for Noise Level Predictions

Road	Posted Speed	Design Condition	Year	AADT	DHV	Autos	MT	HT
Johnson Lane (North of N. Frontage Rd)	35 mph	No Build	2019	2120	246	84.4%	3.7%	11.9%
			2042	2670	310			
		Build Alternative	2042					
North Frontage Road-East	45 mph	No Build	2019	1060	96	82.1%	3.9%	14%
			2042	1330	120			
		Build Alternative	2042					
North Frontage Road-West	45 mph	No Build	2019	8180	740	82.1%	3.9%	14%
			2042	10280	930			
		Build Alternative	2042					
Sannon Boulevard[1, 2, 5]	30 mph	No Build	2019	860	80	82.1%	3.9%	14%
			2042	1080	100			
		Build Alternative	2042					
Coulson Road[1, 6]	50 mph	No Build	2019	2120	246	84.4%	3.7%	11.9%
			2042	2670	310			
		Build Alternative	2042					

Sources: MDT 2019, MDT 2021b, DOWL 2021b

Notes:

[1] BSA assumed traffic data would be divided equally in both directions.

[2] AADT was provide as a range, so BSA used the highest range data for a worst-case scenario (DOWL 2021b).

[3] For the I-90 ramps, BSA used the same vehicle class mix as the I-90 main line.

[4] For Becraft Lane and Cole Street, BSA used the same vehicle class mix as Old Hardin Road-East.

[5] For Sannon Boulevard, BSA used the same vehicle class mix as North Frontage Road-East.

[6] For Coulson Road, BSA used the same traffic volume and vehicle class mix as Johnson Lane north of the North Frontage Road.

AADT Average Annual Daily Traffic

DHV Design Hourly Volume

Autos Automobiles – 2-axle, 4-wheel vehicles including pickup trucks (FHWA Vehicle Classes 1 – 3)

MT Medium trucks – 2-axle, 6-wheel vehicles, plus automobiles pulling trailers (FHWA Vehicle Classes 4 – 5)

HT Heavy trucks – 3 or more axles (FHWA Vehicle Classes 6 – 16)

5.0 ENVIRONMENTAL CONSEQUENCES

The purpose of the traffic noise level predictions is to determine if traffic noise impacts will occur at noise-sensitive receptor locations in the Design Year (2042). Noise-sensitive receptors were identified within approximately 500 feet of the edge of the closest travel lane using aerial photographs and BSA's fieldwork observations in July 2021. A total of 51 noise-sensitive receptors are depicted on **Figures 2 and 3**. As categorized in **Table 3-1**, the receptors evaluated included 35 single-family and mobile home residences (i.e., 32 first-row and three second-row) (Activity Category B), three medical offices (Activity Categories C/D), one hotel, two offices (i.e., banks) and 10 restaurants/bars (Activity Category E). Some agriculture/farm uses and numerous industrial and retail facilities are also located within 500 feet of the project limits. However, these Activity Category F uses, and undeveloped lands that are not currently permitted (Activity Category G), do not have an NAC and were not evaluated for this noise analysis (MDT 2017). No planned or proposed subdivisions or new developments were identified adjacent to the project limits (Yellowstone County 2021).

5.1 Results and Discussion – No Build vs. Build Alternatives

The TNM-predicted traffic noise levels for both the No Build and Build Alternatives are summarized in **Table 5-1**. As shown, for the noise-sensitive receptors located adjacent to the Project roads, three traffic noise impacts are predicted due to the No Build Alternative in 2019 (i.e., not building the Project in the Present Year), and six impacts in the Year 2042 (i.e., not building the Project in the Design Year). For the Build Alternative (i.e., constructing the proposed BBP-Johnson Lane Interchange Project), 10 traffic noise impacts are predicted in the Design Year (2042) as discussed after **Table 5-1**. Because traffic noise impacts were predicted for the Project, BSA evaluated noise mitigation measures (**Section 6.0**).

Table 5-1: Predicted Traffic Noise Levels

Receptor Number (Figures 2–3)	Description	Land Use Category (Table 3-1)	Impact Criteria[a] (Table 3-1)	No Build Alternative Present Year 2019 L_{eq}(h) (dBA)	No Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alt Design Year minus No Build Alt Present Year[a]
J1[f]	Mobile home	B	66	63	64	69	6
J2[d]	Mobile home	B	66	61	62	67	Relocate
J3[d]	Single-family residence	B	66	59	60	64	Relocate
J5	Mobile home	B	66	61	62	65	4
J6[e, f]	Mobile home	B	66	57	59	60	3
J7[e, f]	Mobile home	B	66	60	61	62	2
J8[f]	Mobile home	B	66	56	58	58	2
J9[f]	Single-family residence	B	66	56	58	58	2
J10[d]	Single-family residence	B	66	62	64	66	Relocate
J11[d]	Single-family residence	B	66	61	63	NC	Relocate
J12[f]	Mobile home	B	66	57	58	59	2
J13[d]	Single-family residence	B	66	64	66	66	Relocate
J14	McDonald's / MT Lil's Casino/bar	E	71	60	61	63	3
H1	Mobile home	B	66	66	68	68	2
H1-2[b]	Mobile home (second-row)	B	66	64	66	66	2
H2	Mobile home	B	66	65	66	66	1
H2-2[b]	Mobile home (second-row)	B	66	64	65	65	1
H3	Mobile home	B	66	66	67	67	1
H4	Mobile home	B	66	66	67	67	1
H4-2[b]	Mobile home (second-row)	B	66	64	65	65	1
H5	Jin's Buffet Chinese Restaurant	E	71	65	66	66	1
H6	Dairy Queen Restaurant	E	71	63	64	64	1
H7	Subway Restaurant	E	71	62	63	63	1
H8	Magic Diamond Casino/bar	E	71	67	68	68	1
H9	Burger King Restaurant	E	71	66	67	68	2
H10	Western Security Bank	E	71	64	66	66	2
H11	First Security Bank	E	71	63	65	65	2
H12[c]	Lockwood Dental office (interior)	D	51[c]	44	45	46	2
H13[c]	Jenkins Chiropractor (interior)	D	51[c]	43	44	45	2
H14	Oscars Casino/bar	E	71	62	64	64	2
H15[c]	Holistic Releaf by Design (interior)	D	51[c]	41	43	44	3
H16	Yellowstone Coffee & Canvas	E	71	62	63	63	1
H17	Single-family residence	B	66	64	65	65	1
H18	Single-family residence	B	66	64	65	65	1
H19	Single-family residence	B	66	62	63	63	1
H20	Single-family residence	B	66	62	64	64	2
H21	Single-family residence	B	66	60	61	61	1
H22	Single-family residence	B	66	59	60	60	1

Table 5-1: Predicted Traffic Noise Levels

Receptor Number (Figures 2–3)	Description	Land Use Category (Table 3-1)	Impact Criteria[a] (Table 3-1)	No Build Alternative Present Year 2019 L_{eq}(h) (dBA)	No Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alt Design Year minus No Build Alt Present Year[a]
H23	Jackrabbit Red's Casino/bar	E	71	67	68	68	1
H24	Sandees Restaurant	E	71	63	64	64	1
C1	Holiday Inn Express Hotel	E	71	66	68	68	2
B1	Single-family residence	B	66	62	64	62	0
B2	Single-family residence	B	66	62	63	62	0
B3	Single-family residence	B	66	62	63	63	1
B4	Single-family residence	B	66	61	62	62	1
B5	Single-family residence	B	66	63	64	64	1
B6	Single-family residence	B	66	62	64	64	2
B7	Single-family residence	B	66	63	64	64	1
B8	Single-family residence	B	66	60	61	61	1
B9	Single-family residence	B	66	62	63	63	1
B10	Single-family residence	B	66	58	60	60	2

Notes:

[a] MDT defines "approach" as 1 dBA less than NAC value (**Table 3-1**) and "substantially exceed" as at least 13 dBA greater than Present Year noise level (**Section 3.0**).

[b] Represents a second-row receptor evaluated for noise mitigation (**Section 6.0**).

[c] Due to no identified areas of outdoor use, the interior NAC was evaluated (**Section 3.0**).

[d] Receptor planned to be relocated for this Project.

[e] Receptor planned to be relocated for the Segment 5 BBP-Johnson Lane Railroad Overpass project (MDT 2014b).

[f] Receptor predicted to be noise-impacted by the Segment 5 BBP-Johnson Lane Railroad Overpass project (BSA 2012).

NC The L_{eq}(h) could not be calculated by the TNM noise model due to the location of the alignment overlapping the receptor.

Relocate Receptor planned to be relocated for this Project due to the proposed alignment and/or ROW.

Shading Indicates that the predicted traffic noise level meets or exceeds the traffic noise impact criteria (**Section 3.0**).

Figure 2 shows the noise-sensitive receptors identified north of I-90. BSA used the same numbering system for these receptors identified in the original BBP *Traffic Noise Impact Assessment* (BSA 2012) and used in the Final BBP EIS (MDT 2014a). (Note that mobile home Receptor J4 has been relocated since 2014, and was not used for this Project.) The Firth Street neighborhood, which includes single-family residences, mobile home residences and industrial business uses, will be bisected by the new North Frontage Road alignment. Subsequently, five residences (Receptors J2, J3, J10, J11 and J13) are currently planned to be relocated for this Project, and four of these relocated residences are also predicted to be noise-impacted (**Table 5-1**). However, the highest Build Alternative Design Year traffic noise level (L_{eq}(h) 69 dBA) is predicted for remaining Receptor J1, located adjacent to the southeast corner of the new North Frontage Road/Johnson Lane intersection (**Figure 2**). Based on the proposed alignment, this receptor may also need to be relocated due to right-of-way (ROW) and/or property access issues.

Future modifications to the Johnson Lane/Coulson Road intersection are planned for the Segment 5 BBP-Johnson Lane Interchange-Railroad Overpass project (DOWL 2021b, MDT 2021). As shown on **Figure 2** and in **Table 5-1**, Receptors J6 and J7 are planned to be relocated for the Segment 5 project, and four out of five remaining residences (Receptors J1, J8, J9 and J12) are predicted to be noise-impacted by the Segment 5 Preferred Alternative (i.e., Mary Street Option 2) (BSA 2012, MDT 2014a, MDT 2014b). Therefore, cumulatively 11 of the 12 existing residences located in this area, adjacent to Johnson Lane, Firth Street and/or Coulson Road

(i.e., Receptors J1– J3 and J6–J13), are predicted to be noise-impacted and/or will be relocated by the BBP Segment 4 and/or Segment 5 projects (**Figure 2**).

Figure 3 shows the noise-sensitive receptors located south of I-90. Restaurant/bar businesses and a mobile home park are located adjacent to Old Hardin Road and west of the intersection with Johnson Lane. BSA evaluated both first-row and second-row receptors in the mobile home park located on Rykken Circle at the end of the project limits. As identified in **Table 5-1**, three residences (Receptors H1, H3 and H4) are noise-impacted, and currently experiencing high traffic noise levels (No Build Alternative-Present Year). Traffic noise impacts are also predicted for these same residences plus an additional two mobile homes (Receptors H1-2 and H2) for the No Build and Build Alternatives in the Design Year (2042).

As shown on **Figure 3** and in **Table 5-1**, receptors located east of the Old Hardin Road/Johnson Lane intersection include restaurants/bars, bank offices, medical facilities, a hotel, and single-family residences, located adjacent to Old Hardin Road, Cole Street, and/or Becraft Lane. No traffic noise impacts were predicted for these receptors.

5.2 Construction Noise

Road construction causes localized, intermittent, short-duration noise impacts, which may cause annoyance to people living in the area. Construction noise will vary by construction phase, types of equipment used, and distance between activities and a listener location. During construction of the BBP-Johnson Lane Interchange project, the contractor should comply with all Federal, State, County and City applicable regulations governing equipment source levels. The contractor should consider using the following techniques to reduce construction noise impacts at the identified receptors:

1. Place stationary noise sources away from noise-sensitive receptors, including residences.
2. Use portable noise barriers or use natural terrain to provide shielding between equipment and receptors.
3. Turn idling equipment off.
4. Drive equipment forward instead of backward; lift instead of drag materials; and avoid scraping or banging activities.
5. Confine work to between the hours of 7:00 a.m. to 7:00 p.m.
6. Use quieter equipment with properly sized and maintained mufflers, engine intake silencers, less obtrusive backup alarms (such as manually adjustable, self-adjusting or broadband alarms, instead of traditional “beep-beep-beep” alarms), engine enclosures, noise blankets, rubber truck bed linings, etc.

6.0 MITIGATION CONSIDERATIONS

When traffic noise impacts are predicted, possible abatement measures for the mitigation of traffic noise needs to be considered, and the measures are assessed to determine if they are feasible and reasonable (MDT 2017). Possible abatement measures may include construction of noise barriers, modifying the proposed build alternatives, acquisition of real property, traffic management measures, or building modifications for Activity Category D public use or institutional structures. Barriers typically provide the highest level of noise reduction of these mitigation measures.

According to MDT's Noise Policy, to determine if a mitigation measure is feasible, the measure must provide a minimum 5-dBA reduction in noise levels for at least three first-row impacted receptors, and must not cause safety hazards or maintenance, utility or access limitations. To determine if a mitigation measure is reasonable involves an examination of costs, public support, and whether a noise reduction design goal of 7 dBA can be achieved for 60% of the first-row benefited receptors (MDT 2017).

6.1 Noise Barriers

A barrier is most effective when it is continuous and solid, and it blocks the direct line-of-sight between the road and a receptor. Barriers can be constructed using built up dirt to create a berm, using concrete, concrete block, other similar masonry materials, metal panels, or thick wood to create a wall, or a combination of a berm or Jersey barrier with a shorter wall on top. An earthen berm typically has a very large base for support and may also require additional ROW to accommodate construction. To be effective, the barrier wall must be continuous and solid with no gaps, holes or openings in it, including between the bottom edge of the barrier wall and the ground surface (MDT 2017).

As shown on **Figures 2 and 3** and in **Table 5-1**, the predicted noise-impacted receptors that are not currently planned to be relocated for the Project include Receptor J1, located southeast of the new Johnson Lane/North Frontage Road intersection, and the mobile home park (Receptors H1, H1-2, H2, H3 and H4) located south of Old Hardin Road at Rykken Circle. Because the other Firth Street noise-impacted receptors located adjacent to Receptor J1 are planned to be relocated for this Project, a barrier is not feasible for one isolated receptor (J1) (**Section 6.0**). However, the five noise-impacted Rykken Circle mobile home receptors are grouped together, and a barrier is feasible per MDT's Noise Policy (MDT 2017).

MDT uses a Cost-Effectiveness Index (CEI) to determine if a barrier is reasonable. The CEI takes into consideration the noise reduction the barrier will provide and the number of benefited receptors. The CEI is calculated for each barrier configuration. MDT currently uses a planning cost \$40/ft^2 for noise barriers, which includes wall and foundation construction. A CEI that exceeds \$5,600 is not considered reasonable (MDT 2017). Barriers are more likely to be cost-effective for areas with a high density of receptors.

BSA evaluated the reasonableness for a barrier for the mobile home park first-row and second-row residences located adjacent to Old Hardin Road along Rykken Circle as shown on **Figure 3**. For access, a barrier would not be continuous at the Old Hardin Road/Rykken Circle intersections, which reduces the barrier effectiveness. The CEI results for four different height barriers are summarized in **Table 6-1** on the next page. As shown, an 8- to 14-foot-tall barrier wall would not

meet a noise reduction design goal of 7 dBA for 60% of the first-row benefited receptors (**Section 6.0**), and the CEI values are above MDT's $5,600 reasonableness criteria. Therefore, barriers are not reasonable for traffic noise mitigation for the Build Alternative.

Table 6-1: Summary of Estimated CEI Values

Receptors (Figure 3)	Barrier Location	Barrier Length	Barrier Height (feet)	Number of Benefited Receptors	Average Noise Reduction for Benefited Receptors (dBA)	Estimated CEI
H1, H2, H3, H4, H1-2, H2-2, H4-2	On ROW south of Old Hardin Road, adjacent to the mobile home park, with an opening an at Rykken Circle	440 feet	8	0	NA	NA
			10	4	5.8	$7,619
			12	4	6.3	$8,348
			14	4	6.7	$9,226

6.2 Design Modifications

Shifting the horizontal and/or vertical alignments of the Build Alternative to reduce traffic noise impacts can provide more distance between a road and a receptor, resulting in lower noise levels. Many alignment alternatives have been evaluated by the Design Team, and only the preferred alignments were evaluated for this noise analysis (DOWL 2021a, 2021b). As shown on **Figure 2**, in order to eliminate the noise-impact at Receptor J1, the Johnson Lane alignment north of I-90 would need to shift 150 feet west, which may alter the geometry of the Diverging Diamond interchange, create a noise-impact at Receptor J5, and/or alter the future alignment of the Johnson Lane/Coulson Road intersection to be constructed as part of the BBP Segment 5 project (DOWL 2021b, MDT 2021). Therefore, shifting the Johnson Lane alignment is not feasible. As shown on **Figure 3**, mobile home park at Rykken Circle is located at the west end of the project limits on Old Hardin Road. Therefore, moving the alignment of Old Hardin Road north is not feasible when realigning to the existing configuration.

6.3 Acquisition of Real Property

Acquisition of Real Property or interests therein (predominantly unimproved property) is evaluated as a noise mitigation measure to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise (MDT 2017). Referring to **Figure 1**, for future developments additional ROW could be acquired in various undeveloped areas within the project limits to reduce traffic noise impacts, based on the setback distances shown in **Section 7.0**, **Table 7-1**.

Also, as shown on **Figure 2** and in **Table 5-1**, MDT is currently planning to relocate five Firth Street neighborhood homes for the east leg of North Frontage Road, which eliminates noise-impacts at four receptors (i.e., J2, J10, J11 and J13). However, the highest Project noise level is predicted for Receptor J1, located directly southeast of the Johnson Lane/North Frontage Road intersection, and MDT may want to consider relocating this mobile home due to ROW and/or property access issues.

6.4 Traffic Management Measures

Traffic management measures include traffic control devices, signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modifying speed limits, and exclusive lane designations (MDT 2017). Traffic control devices are already included in the Project design (DOWL 2021a). Signalized intersections are designed at the Johnson Lane/North Frontage Road intersection, within the Diverging Diamond Johnson Lane Interchange, and at the Johnson Lane/Old Hardin Road and Old Hardin Road/Cole Street intersections. Stop-controlled intersections are also planned for Sannon Boulevard at North Frontage Road and Coulson Road.

Due to the heavy industrial and truck uses in the project limits, restricting certain vehicle types, limiting the time of day that certain vehicles may use the roads, or exclusive lane designations are not reasonable mitigation measures for the connectivity of the BBP and the functionality of the Project. Modifying speed limits is a potential noise mitigation measure if it does not hinder the function of the roadways, and the current posted speed limits are listed in **Table 4-4**. However, speed limits are generally set by the Transportation Commission, and are usually reduced for safety concerns rather than noise impacts (MDT 2017), and therefore, were not evaluated.

7.0 COORDINATION WITH LOCAL OFFICIALS

Traffic noise can significantly affect the value and usefulness of property near highways. Traffic noise at future areas of frequent residential outdoor use can be annoying, distracting and hinder communication. In March 2008, MDT published *Growing Neighborhoods in Growing Corridors: Land Use Planning for Traffic Noise*, and recommended that traffic noise levels of $L_{eq}(h)$ 60 dBA be used to determine the location of outdoor use areas and the location of residential building façades closest to the road, and to avoid traffic noise problems in the future (MDT 2008). For comparison, 60 dBA represents the typical exterior background noise levels of a large urban area and the background noise levels inside large busy offices. If the 60 dBA criteria can be met by planning a site accordingly, then the need for traffic noise control measures, such as barrier walls, earthen berms, improved window configurations, etc., can be avoided.

Although, no new subdivisions or developments are currently planned or proposed within the project limits (Yellowstone County 2021), to avoid traffic noise impacts at future developments (**Figure 1**) BSA determined the minimum setback distances from the Build Alternative centerlines to where the Design Year $L_{eq}(h)$ 60 and 64 dBA noise levels are predicted to occur (MDT 2008). **Table 7-1** lists the setback distances for the modeled 60 and 64 dBA contour lines.

Table 7-1: Traffic Noise Level vs. Minimum Setback Distances from the Build Alternative Centerlines

Road	60 dBA Contour Line	64 dBA Contour Line
Johnson Lane – North of I-90	310 ft	170 ft
Johnson Lane – North of North Frontage Road	90 ft	< 50 ft
North Frontage Road – East	70 ft	< 50 ft
North Frontage Road – West	250 ft	170 ft
Sannon Boulevard	< 50 ft	< 50 ft
I-90 & On/Off Ramps	450 ft	300 ft
Old Hardin Road – East	110 ft	50 ft
Cole Street/Becraft Lane – East	75 ft	< 50 ft

Local officials should strongly encourage developers to incorporate noise-compatible development on their planned/proposed properties. Examples of noise-compatible development include providing greenbelts, open space, or parkland between the residents and the highway. Garages, carports or storage sheds should front the road rather than residences. If residential buildings must be located along the highway, the homes should be designed so that less-sensitive rooms, such as kitchens, laundry rooms, utility rooms, and storage spaces face the road rather than bedrooms or living rooms. Windows in the road-side of the building should be avoided. Strategies that incorporate noise-compatible development concepts are proactive and preventative in nature and can avoid traffic noise impact problems in the future.

8.0 CONCLUSION

BSA evaluated traffic noise level impacts for both the No Build and Build Alternatives for this Segment 4 BBP-Johnson Lane Interchange Project (**Figure 1**). BSA completed six noise level measurements in July 2021 to determine the existing ambient noise levels within the project limits (**Section 4.1**), and to verify that the TNM computer models used to predict the traffic noise levels were reasonably accurate (**Section 4.2**).

Noise-sensitive receptors were identified within approximately 500 feet of the edge of the closest travel lane using aerial photographs and BSA's fieldwork observations in July 2021. A total of 51 noise-sensitive receptors are depicted on **Figures 2 and 3**. As categorized in **Table 3-1**, the receptors evaluated include 35 single-family and mobile home residences (Activity Category B), three medical offices (Activity Category D), one hotel, two offices, and 10 restaurants/bars (Activity Category E).

The TNM-predicted traffic noise levels for both the No Build and Build Alternatives are summarized in **Table 5-1**. For the noise-sensitive receptors located adjacent to the Project roads, three traffic noise impacts are predicted due to the No Build Alternative in the Present Year (2019) and six impacts in the Design Year (2042). For the Build Alternative, 10 traffic noise impacts are predicted in the Design Year.

Figure 2 shows the noise-sensitive receptors identified north of I-90. The Firth Street neighborhood, which includes single-family residences, mobile home residences and industrial business uses, will be bisected by the new North Frontage Road alignment. Subsequently, five residences (Receptors J2, J3, J10, J11 and J13) are currently planned to be relocated for this Project, and four of these relocated residences are also predicted to be noise-impacted (**Table 5-1**). However, the highest Build Alternative Design Year traffic noise level (L_{eq}(h) 69 dBA) is predicted for remaining Receptor J1, located adjacent to the southeast corner of the new North Frontage Road/Johnson Lane intersection (**Figure 2**). Based on the proposed alignment, this receptor may also need to be relocated due to right-of-way (ROW) and/or property access issues.

Future modifications to the Johnson Lane/Coulson Road intersection are planned for the Segment 5 BBP-Johnson Lane Interchange-Railroad Overpass project (DOWL 2021b, MDT 2021). As shown on **Figure 2** and in **Table 5-1**, Receptors J6 and J7 are planned to be relocated for the Segment 5 project, and four out of five remaining residences (Receptors J1, J8, J9 and J12) are predicted to be noise-impacted by the Segment 5 Preferred Alternative (i.e., Mary Street Option 2) (BSA 2012, MDT 2014a, MDT 2014b). Therefore, cumulatively 11 of the 12 existing residences located in this area adjacent to Johnson Lane, Firth Street and/or Coulson Road

(i.e., Receptors J1– J3 and J6–J13) are predicted to be noise-impacted and/or will be relocated by the BBP Segment 4 and/or Segment 5 projects (Figure 2).

Figure 3 shows the noise-sensitive receptors located south of I-90. Restaurant/bar businesses and a mobile home park are located adjacent to Old Hardin Road and west of the intersection with Johnson Lane. As identified in **Table 5-1**, three residences (Receptors H1, H3 and H4) are noise-impacted, and currently experiencing high traffic noise levels (No Build Alternative-Present Year). Traffic noise impacts are also predicted for these same residences plus an additional two mobile homes (Receptors H1-2 and H2) for the No Build and Build Alternatives in the Design Year. No traffic noise impacts were predicted for receptors located east of the Old Hardin Road/Johnson Lane intersection.

Because traffic noise impacts were predicted, BSA evaluated traffic noise mitigation measures and determined if the measures are reasonable or feasible (**Section 6.0**), including the construction of noise barriers, modifying the proposed build alternatives, acquisition of real property, and traffic management measures. Five Firth Street noise-impacted receptors located adjacent to Receptor J1 are currently planned to be relocated for this Project (**Figure 2**), and therefore, a barrier is not feasible for one receptor (J1). BSA evaluated the reasonableness for a barrier for the mobile home park and residences located adjacent to Old Hardin Road and/or Rykken Circle (**Addendum A, Figure A-1**). The CEI results are summarized in **Table 6-1 and Addendum A**, however, a barrier wall would not meet MDT's noise reduction design goal, and the CEI values are above MDT's reasonableness criteria. Therefore, barriers are not reasonable for traffic noise mitigation of the Build Alternative.

Shifting the horizontal and/or vertical alignments of the Build Alternative to reduce traffic noise impacts can provide more distance between a road and a receptor, resulting in lower noise levels. Many alignment alternatives have been evaluated by the Design Team, and only the preferred alignments were evaluated for this noise analysis. In order to eliminate the noise-impact at Receptor J1 (**Figure 2**), the Johnson Lane alignment north of I-90 would need to shift 150 feet west, which is not feasible. Additionally, the mobile home park at Old Hardin Road and Rykken Circle (**Figure 3**) is located at the west end of the project limits, and moving the alignment north is not feasible when realigning to the existing configuration.

The acquisition of Real Property or interests therein (predominantly unimproved property) is evaluated as a noise mitigation measure to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise (MDT 2017). For the existing properties, the highest Project noise level is predicted for Receptor J1, and MDT may want to consider relocating this mobile home due to ROW and/or property access issues (**Figure 2** and **Table 5-1**).

Traffic management measures include traffic control devices, signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modifying speed limits, and exclusive lane designations (MDT 2017). Traffic control devices are already included in the Project design (DOWL 2021a). Due to the heavy industrial and truck uses in the project limits, restricting certain vehicle types, limiting the time of day that certain vehicles may use the roads, or exclusive lane designations are not reasonable mitigation measures for the connectivity of the BBP and the functionality of the Project. Speed limits are generally set by the Transportation Commission, and are usually reduced for safety concerns rather than noise impacts (MDT 2017).

To avoid future traffic noise impacts in Activity Category G undeveloped lands, BSA determined the minimum setback distances from the nearest Build Alternative centerline to where the Design Year $L_{eq}(h)$ 60 and 64 dBA noise levels are predicted to occur (**Table 7-1**). Local officials should strongly encourage developers to incorporate noise-compatible planning measures to avoid traffic noise problems in the future (MDT 2008).

9.0 REFERENCES

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10.0 STANDARD OF CARE

To complete this report, BSA has endeavored to perform its services consistent with the professional skill and care ordinarily provided by acoustical consultants practicing in similar markets and under similar project conditions. BSA is fully experienced and properly qualified to perform acoustical consulting services. However, BSA makes no warranty, either expressed or implied, as to the professional services it has rendered to complete this report. For the completion of this report, BSA has used data provided by DOWL, Inc. and MDT in performing its services and is entitled to rely upon the accuracy and completeness thereof. Therefore, if the information and assumptions used to create this report change (i.e., traffic data, location of the travel lanes, modification of the Build Alternative alignments, etc.) then the noise analysis and the recommended noise control measures will need to be reevaluated.

FIGURE 1

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Project Overview

Billings Bypass - Johnson Lane Interchange

NCPD-MT 56(55), UPN 4199007

Not-to-scale

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FIGURE 2

Receptor and Measurement Locations: North of I-90

Billings Bypass - Johnson Lane Interchange

NCPD-MT 56(55), UPN 4199007

Scale: 1" = 300 ft (8.5 x 11)

FIGURE 3

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Receptor and Measurement Locations: South of I-90

Billings Bypass - Johnson Lane Interchange

NCPD-MT 56(55), UPN 4199007

Scale: 1" = 300 ft (8.5 x 11)

ADDENDUM A
BILLINGS BYPASS-JOHNSON LANE INTERCHANGE
OLD HARDIN ROAD-WEST
DETAILED NOISE ANALYSIS - UPDATE

Montana Department of Transportation (MDT) has updated the design of the Old Hardin Road-West portion of the Billings Bypass-Johnson Lane Interchange segment. As shown on **Figure A-1** (attached), 2025 design modifications include center medians and a new truck entrance at the west end of the Flying J/Town Pump Travel Plaza, located at the northwest corner of the Johnson Lane/Old Hardin Road intersection, and the project limits have been extended further west to accommodate these revisions.

Big Sky Acoustics (BSA) reevaluated the modeled No Build and Build Alternative traffic noise levels at the noise-sensitive receptors identified adjacent to Old Hardin Road and within 500 feet of the end of the project limits (**Figure A-1**), using the traffic data in **Section 4.3, Table 4-4**. The additional receptors analyzed include two mobile homes and three single-family residences located west of Rykken Circle (**Receptors H25, H26, H27, H28 and H28-1**).

The following includes modifications and additions to the Old Hardin Road-West analysis for the Detailed Noise Analysis report subsections listed below.

5.1 Results and Discussion – No Build vs. Build Alternatives

The TNM-predicted traffic noise levels for both the No Build Alternative and new Build Alternative for Old Hardin Road-West are summarized in **Table 5-1** and shown on **Figure A-1**. Five traffic noise impacts are predicted at mobile home and single-family residences due to the No Build Alternative in the Present Year (2019) and eight impacts are predicted in the Design Year (2042). For the Build Alternative, the same eight traffic noise impacts are predicted in the Design Year.

Table 5-1: Predicted Traffic Noise Levels

Receptor Number (Figures 2–3)	Description	Land Use Category (Table 3-1)	Impact Criteria[a] (Table 3-1)	No Build Alternative Present Year 2019 L_{eq}(h) (dBA)	No Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alt Design Year minus No Build Alt Present Year[a]
H1	Mobile home	B	66	66	68	68	2
H1-2[b]	Mobile home (second row)	B	66	64	66	66	2
H2	Mobile home	B	66	65	66	66	1
H2-2[b]	Mobile home (second row)	B	66	64	65	65	1
H3	Mobile home	B	66	66	67	67	1
H4	Mobile home	B	66	66	67	67	1
H4-2[b]	Mobile home (second row)	B	66	64	65	65	1
H5	Jins Chinese restaurant	E	71	65	66	66	1
H6	Dairy Queen restaurant	E	71	63	64	64	1

Table 5-1: Predicted Traffic Noise Levels

Receptor Number (Figures 2–3)	Description	Land Use Category (Table 3-1)	Impact Criteria[a] (Table 3-1)	No Build Alternative Present Year 2019 L_{eq}(h) (dBA)	No Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alternative Design Year 2042 L_{eq}(h) (dBA)	Build Alt Design Year minus No Build Alt Present Year[a]
H7	Subway restaurant	E	71	62	63	63	1
H8	Magic Diamond Casino and bar	E	71	67	68	68	1
H25	Single family residence	B	66	66	68	68	2
H26	Single family residence	B	66	65	66	67	2
H27	Single family residence	B	66	66	67	67	1
H28	Mobile home	B	66	63	64	64	1
H28-2	Mobile home (second row)	B	66	62	64	64	2

Notes:

[a] MDT defines "approach" as 1 dBA less than NAC value (**Table 3-1**) and "substantially exceed" as at least 13 dBA greater than Present Year noise level (**Section 3.0**).

[b] Represents a second-row receptor evaluated for noise mitigation (**Section 6.0**).

Shading Indicates that the predicted traffic noise level meets or exceeds the traffic noise impact criteria (**Section 3.0**).

6.1 Noise Barriers

BSA reevaluated the feasibility and reasonableness of barrier walls to shield the impacted mobile home park **Receptors H1, H1-2, H2, H3 and H4**, and single-family residence **Receptors H25, H26 and H27** located south of Old Hardin Road-West and near the new truck entrance (**Figure A-1**). For the Cost-Effectiveness Index (CEI) to determine if a barrier is reasonable, MDT has updated the planning cost to \$45/ft^2 for noise barriers, and a CEI that exceeds \$6,300.00 is not considered reasonable (MDT 2021).

Barriers were analyzed for groups of receptors, including the mobile home park first-row and second-row residences along Rykken Circle, and the three single-family residences located to the west (**Figure A-1**). For access, the mobile home park barrier would not be continuous at the Rykken Circle intersections and split into 300-foot and 175-foot sections, which reduces the barrier effectiveness. A continuous 440-foot barrier was modeled for the three single-family residences, and the driveway/entrances would have to be relocated, which may not be reasonable.

The CEI results for three different barrier heights are summarized in **Table 6-1** on the next page. As shown, 11- to 13-foot-tall barrier walls would meet MDT's noise reduction design goal of 7 dBA for at least 60% of the first row benefited receptors, but the CEI values are above the \$6,300 reasonableness criteria. Therefore, traffic noise barrier walls adjacent to Old Hardin Road-West are not reasonable for traffic noise mitigation of the updated Build Alternative per the MDT Noise Policy (MDT 2021).

Table 6-1: Barrier Benefited Receptors and Calculated CEI Values

Barrier Height/sf:			11 feet (10,065 sf)		12 feet (10,980 sf)		13 feet (11,895 sf)	
Receptor Location (Figure A-1)	Receptor (Figure A-1)	Without Barrier (dBA)	With Barrier (dBA)	Barrier Noise Reduction	With Barrier (dBA)	Barrier Noise Reduction	With Barrier (dBA)	Barrier Noise Reduction
First Row	H1	67.7	63.9	4	63.9	4	63.9	4
	H2	66.3	59.3	7	59.0	7	58.7	8
	H3	67.1	59.2	8	58.9	8	58.6	8
	H4	67.0	60.9	6	60.7	6	60.5	7
	H25	67.9	60.2	8	59.8	8	59.6	8
	H26	66.5	58.5	8	58.0	9	57.6	9
	H27	67.1	59.0	8	58.5	9	58.2	9
	H28	64.0	59.9	4	59.2	5	59.0	5
Second Row	H1-2	65.6	62.1	3	62.0	4	61.9	4
	H2-2	64.7	59.9	5	59.6	5	59.4	5
	H4-2	65.1	60.7	4	60.5	5	60.3	5
	H28-2	63.5	59.4	4	58.6	5	58.3	5
Number of Benefited Receptors (>5 dBA):				**7**		**10**		**10**
Number of Front Row Receptors (and % of total) that meet minimum Noise Reduction Design Goal of 7 dBA:				**5 63%**		**5 63%**		**6 75%**
Calculated CEI at $45/sf:				**$9,059**		**$7,345**		**$7,758**

Updated Reference:

Montana Department of Transportation (MDT). 2021. *Traffic Noise Analysis and Abatement Policy.* August.

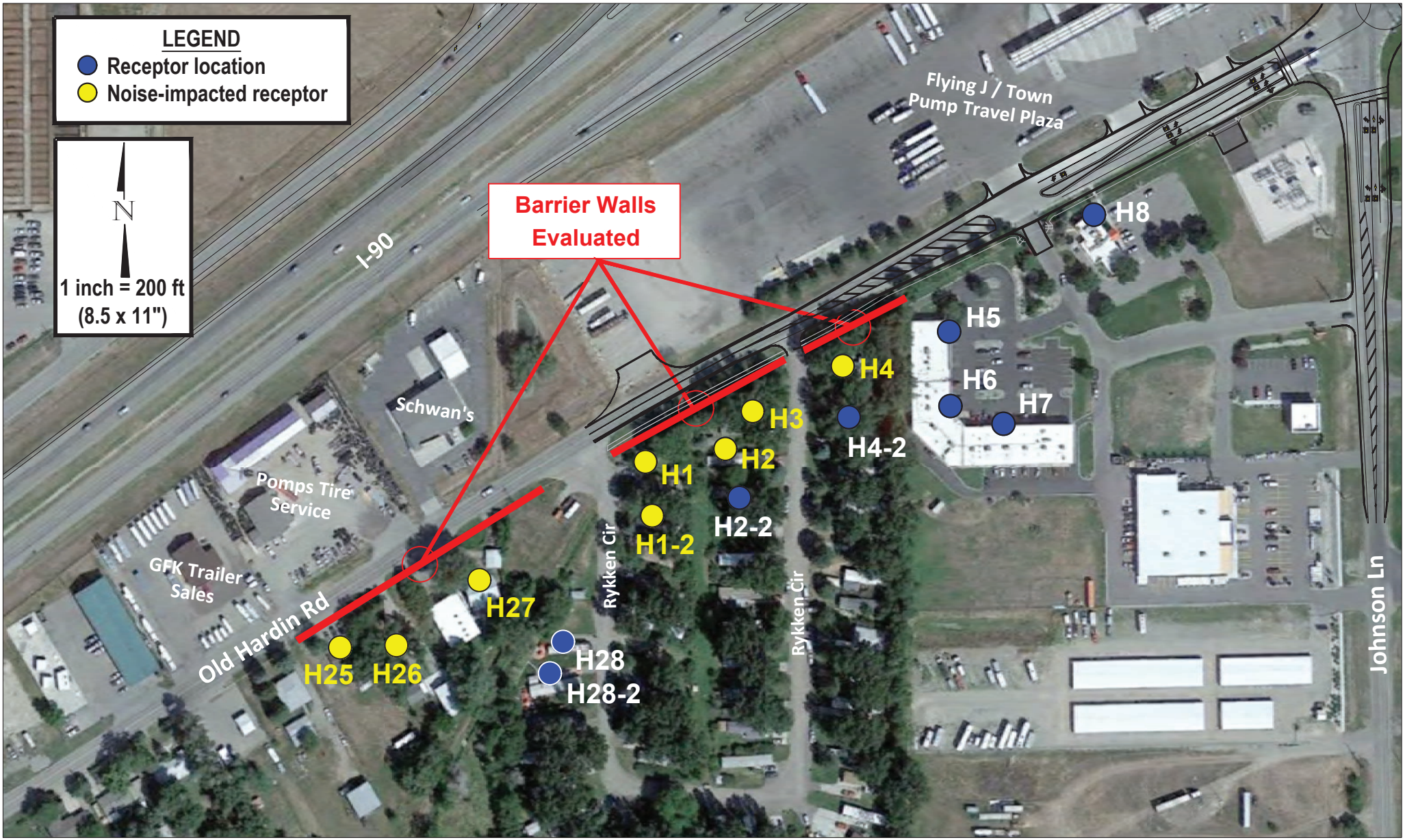

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FIGURE A-1

Receptor and Barrier Wall Locations: Old Hardin Road - West

Billings Bypass - Johnson Lane Interchange - 2025 Update

NCPD-MT 56(55), UPN 4199007