Environmental Engineering Analyses Report

MDT Activity 111 Report

Bitterroot River – West of Missoula

Project No.: BR 9032(65)

Control No: 6296000

Missoula County, MT

October 15, 2019

EXECUTIVE SUMMARY

Missoula County, in cooperation with the Montana Department of Transportation, is proposing to construct a new two-lane bridge across the Bitterroot River at the western terminus of South Avenue to connect with River Pines Road immediately west of the river. The proposed project involves removing Maclay Bridge, a single-lane bridge that connects North Avenue on the east side of the river to River Pines Road on the west side of river, and replacing it with the new South Avenue Bridge at a location approximately 0.4 mile upstream of the existing bridge. The project limits extend between the intersection of South Avenue and Hanson Drive to the east and the intersection of River Pines Road and Blue Heron Road to the west.

Replacing Maclay Bridge has long been a priority of Missoula County. In 1994, Missoula County led development of an Environmental Assessment (EA) examining options to replace Maclay Bridge. The Preferred Alternative identified in the document was a new bridge located at the end of South Avenue. A final decision by the Federal Highway Administration (FHWA) was never issued and the project identified within the EA was not advanced. In 2002, Missoula County nominated the bridge replacement project to receive funding from the MDT Off-System Bridge Program. Instead of initiating the project, in 2010, Missoula County entered into agreement with MDT to conduct a pre-National Environmental Policy Act (NEPA)/Montana Environmental Policy Act (MEPA) planning study. The *Maclay Bridge Planning Study* was completed in 2013 and identified the South 1 Alignment as the preferred alignment. The South 1 Alignment, similar to the 1994 EA Preferred Alternative, included extending the westernmost limits of South Avenue with a new bridge crossing the Bitterroot River and connecting to River Pines Road on the west side of the river.

In accordance with the provisions of Appendix A to 23 CFR 450, *Linking the Transportation Planning and NEPA Processes,* and MDT's *Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews*, the results from the *Maclay Bridge Planning Study* are being used in the NEPA/MEPA process and the South 1 Alignment have been forwarded as the proposed action that best meets the purpose and need for the project.

On April 18, 2013, the Missoula County Board of County Commissioners voted to pursue federal funding through the Off-System Bridge Program for the replacement of Maclay Bridge with a new bridge on the South 1 Alignment as identified by the planning study. On April 22, 2015, the Missoula County Commission further reaffirmed their commitment to the development and management of the South Avenue Bridge Project by passing Resolution #2015-046. Missoula County has been certified by MDT to administer the federal-aid project directly under the Local Agency Guidelines, or LAG, process.

The South Avenue Bridge Project is now being advanced through the NEPA/MEPA process by conducting preliminary design and environmental analyses to consider the environmental effects of the proposed action. The proposed project is being processed as a Categorical Exclusion, which means the project is being analyzed under a category of actions which do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an EA nor an Environmental Impact Statement is required (40 CFR 1508.4).

Alternatives previously dismissed, including Maclay Bridge rehabilitation alternatives, are not evaluated in this document. Beyond the Council on Environmental Quality (CEQ) requirement of evaluating reasonable alternatives, there are other requirements for analyzing alternatives. Because the proposed project involves removal of the National Register of Historic Places-listed Maclay Bridge, the requirements under Section 4(f) of the U.S. Department of Transportation Act (49 USC 303(c)) require an evaluation of alternatives to demonstrate that alternatives to removing Maclay Bridge are not prudent and feasible, as defined in 23 CFR 774.17. This evaluation can be found in the *Nationwide Programmatic Section 4(f) Evaluation and Approval for FHWA Projects that Necessitate the Use of Historic Bridges* appended to the final environmental document.

Project development has included substantial coordination among the public, resource agencies, and project stakeholder group, and has included a project-specific website. Additional public outreach is anticipated as the proposed project advances into final design.

The following Environmental Engineering Analysis Report provides an overview of the social and natural resources present within the Bitterroot River – W of Missoula project area and assesses the proposed project's potential impact on those resources. The purpose of the Environmental Engineering Analysis Report is to identify early in project development which resource areas need to be investigated and which environmental analyses may be triggered by the proposed project. The analysis includes identification of regulatory requirements that may affect implementation of the proposed project as well as identification of necessary avoidance, minimization, and mitigation measures.

Contents

Tables

Figures

1. Introduction

The following Environmental Engineering Analysis Report provides an overview of the social and natural resources present within the Bitterroot River – W of Missoula project area and assesses the proposed project's potential impact on those resources. The purpose of this Environmental Engineering Analysis Report is to identify early in project development which resource areas need to be investigated and which environmental analyses may be triggered by the proposed project. The analysis includes identification of regulatory requirements that may affect implementation of the proposed project as well as identification of necessary avoidance, minimization, and mitigation measures.

This report includes a compilation of information sourced from a variety of reports developed for the project that include:

- Draft Preliminary Field Review Report (September 2010);
- Maclay Bridge Planning Study (November 2012);
- Cultural Resources Assessment for the Proposed South Avenue Bridge Crossing, Missoula, Montana (February 2016);
- Initial Site Assessment Report (July 2016);
- Preliminary Hydraulics Report (July 2016);
- Noise Analysis Report (November 2016);
- Preliminary Roadway and Traffic Report (November 2016);
- Biological Resource Report and Preliminary Biological Assessment (November 2016);
- Biological Assessment of the South Avenue Bridge Project (August 2018); and
- Maclay Bridge Preservation Options Analysis (January 2019)

In general, the level of documentation and analysis included under each section of the report is commensurate with the proposed project's scope, resources present, and the potential for impact to that resource. This report does not include resource categories that have previously been analyzed in one of the existing project technical report listed above (e.g., fish and wildlife are analyzed in the Biological Resource Report; threatened and endangered species are analyzed in the Biological Assessment; etc.). The proposed South Avenue Bridge Project (Bitterroot River – W of Missoula) is being processed as a Categorical Exclusion (CE) under the provisions of 23 CFR 771.117(d)(13) and ARM 18.2.261(3)(j) (Section 75-1-103 and 75-1-201, M.C.A).

The following document is organized to include: a description of the proposed project in Section 2; a description of the existing transportation system in Section 3; an assessment of the environmental impacts and proposed mitigation for the proposed project in Section 4; an analysis of cumulative effects in Section 5; and details on project coordination accomplished to date for the proposed project, including resource agency coordination, public meetings, and additional stakeholder involvement, as well as anticipated regulatory approvals required for the proposed project in Section 6.

2. Description of the Proposed Project

2.1. Project Description

Missoula County, in cooperation with the Montana Department of Transportation (MDT), is proposing to construct a new two-lane bridge (one travel lane in each direction) across the Bitterroot River at the western terminus of South Avenue to connect with River Pines Road immediately west of the river. The proposed project involves replacing Maclay Bridge with the new South Avenue Bridge at a location approximately 0.4 mile upstream of the existing bridge. Maclay Bridge, also known as the North Avenue Bridge, is a single-lane structure that connects North Avenue on the east side of the river to River Pines Road on the west side of river. The project limits extend between the intersection of South Avenue and Hanson Drive to the east and the intersection of River Pines Road and Blue Heron Road to the west.

Maclay Bridge is a 346-foot-long, 14-foot-wide bridge consisting of three separate structural elements: a steel through truss main span, a steel pony truss span, and two concrete tee spans (refer to the Existing Conditions section below for more information on Maclay Bridge). The bridge being proposed for its replacement is a four-span welded plate girder design approximately 746 feet long. The new structure would accommodate two 12-foot travel lanes, two 4-foot shoulders, and a 10-foot shared-use path separated from traffic located on the north side (downstream) of the structure. The proposed bridge structure would be supported by three piers: two located within the active river channel of the Bitterroot River and one located approximately 160 feet landward of the river channel on the east riverbank above the ordinary high-water mark (OHWM). The bridge abutments and associated rip rap would be constructed outside of the river channel at an elevation above the OHWM. The pier type and size are not finalized and the foundations would be determined following final geotechnical recommendations.

The proposed project would construct approximately 0.3 mile of new roadway approaches connecting to the structure on the east and west sides of the Bitterroot River. The roadway approaches would be 32 feet wide including two 12-foot lanes and two 4-foot shoulders to meet the minimum requirements for a Minor Collector route per Missoula County design standards. The typical section for roadway approaches would include a 10-foot wide shared-use path on the north side of the road to match the proposed bridge typical section. The proposed shared-use path would tie into a future shared-use path that Missoula County has committed to constructing using local funds on South Avenue west of Humble Road. See Figure 2-1 for the bridge and roadway typical sections for the proposed project.

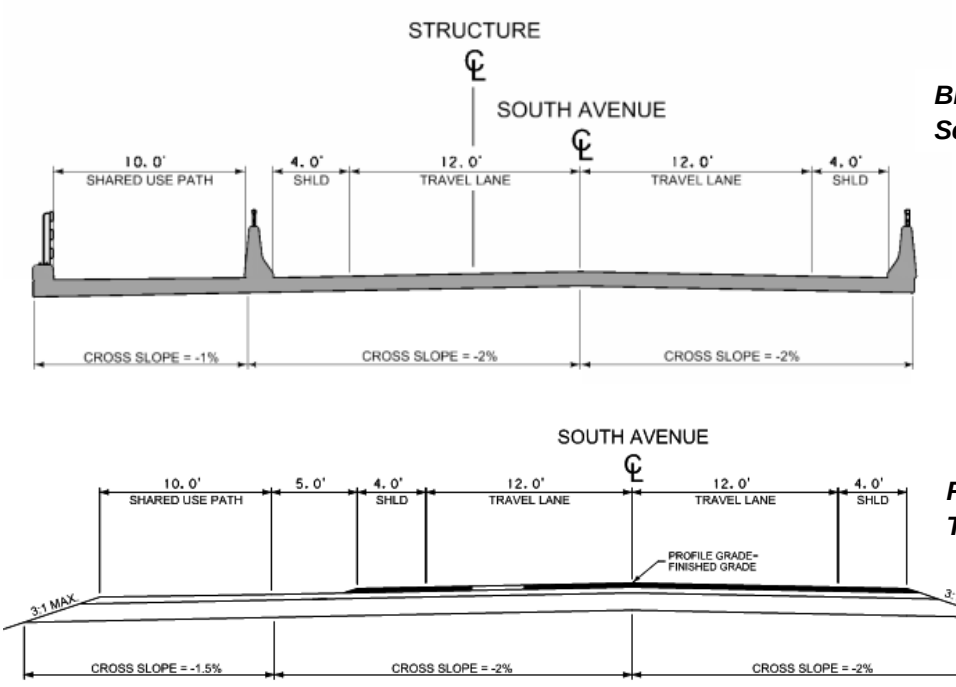

Figure 2-1. Proposed Project Typical Sections

Approximately 620 feet (0.1 mi.) of River Pines Road would be realigned to a new T-intersection tying into the proposed project. The west roadway approach—and the entire bridge alignment in general—would be shifted north away from O'Brien Creek based on recommendation by Montana Fish, Wildlife and Parks (FWP) to provide for a buffer between O'Brien Creek. In areas of the alignment shift, River Pines Road would be obliterated and restored with appropriate vegetation. With the removal of Maclay Bridge on North Avenue, River Pines Road would serve as local access to residences north of the new intersection with no outlet. The proposed surface width for River Pines Road is 24 feet, which perpetuates existing conditions.

Additional project components include right-of-way acquisition, utility relocation, a culvert extension on Big Flat Ditch, grading, drainage, signing, and pavement markings. Refer to Figure 2-2 for an illustration of the proposed action.

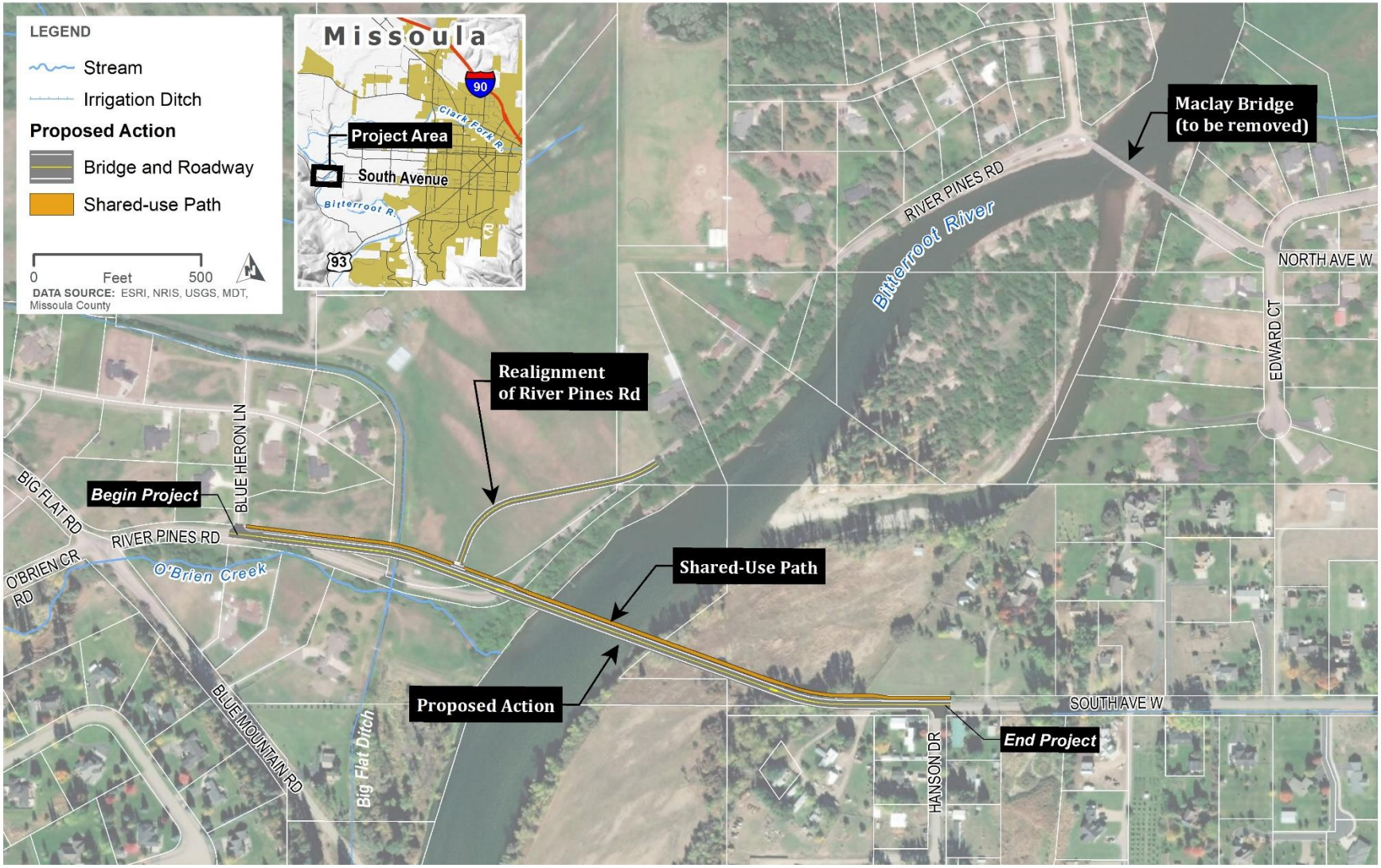

Figure 2-2. Proposed Action

This page left intentionally blank

2.2. Project Location

The proposed South Avenue Bridge Project is located at the existing western terminus of South Avenue West within Missoula County. The Project is located outside of the city limits of Missoula, Montana, approximately 2.8 miles west of Reserve Street. The project is located in Sections 26, 27, 34 and 35 of Township 13 North, Range 20 West, Montana Principle Meridian, and is centered at approximately 46.8491° North latitude and 114.1043° West longitude. The eastern portion of the project area (east of the Bitterroot River) is within the Missoula Urban Area boundary.

2.3. Project Background

Replacing Maclay Bridge has long been a priority of Missoula County dating back as far as 1994, when Missoula County led development of an Environmental Assessment (EA) examining options to replace Maclay Bridge. The Preferred Alternative identified in the document was a new bridge located at the end of South Avenue. A final draft of the EA was approved for circulation by FHWA, however, the assessment was not a final NEPA decision document and a Finding of No Significant Impact (FONSI) on the 1994 EA was never issued, nor was an Environmental Impact Statement (EIS) initiated by FHWA and, subsequently, the project identified within the EA was not advanced. Special project demonstration funds were initially intended to be used to fund the project but Missoula County was not able to obtain the funding. In 2002, Missoula County nominated the bridge replacement project to receive funding from the MDT Off-System Bridge Program.

In 2010, Missoula County decided to delay initiating the project and rather entered into agreement with MDT to conduct a pre-National Environmental Policy Act (NEPA)/Montana Environmental Policy Act (MEPA) planning study. The planning study included an independent alternatives analysis and robust public involvement program and resource agency coordination. The public involvement process included four separate meetings in a variety of formats held between April 2012 and January 2013. In 2013, the Maclay Bridge Planning Study concluded and the results of the study identified the South 1 Alignment (3E.1) as the preferred alignment. The South 1 Alignment (3E.1), similar to the 1994 EA Preferred Alternative, includes extending the westernmost limits of South Avenue with a new bridge crossing the Bitterroot River and connecting to River Pines Road on the west side of the river. The preferred alignment was determined as best able to increase safety and efficiency for the traveling public based on multiple criteria relating to safety, geometric, and environmental concerns.

Major and minor rehabilitation options for Maclay Bridge have been examined as part of the alternatives analysis conducted in the 2013 planning study. It was determined that neither option could be implemented to meet MDT bridge design standards relative to the bridge deck width, i.e., a single-lane structure for two-way traffic unsuitable from a capacity or operational standpoint to handle projected traffic volumes. Furthermore, rehabilitating Maclay Bridge is not eligible for funding under MDT's Off-System Bridge Program because rehabilitation of the bridge alone will not meet current design standards, which would require correcting the deficient load capacity and deficient safety features (i.e., sub-standard deck width for the current traffic

volumes, sub-standard horizontal curves at the approaches, inadequate clear zones, lack of bicycle/pedestrian facilities, etc.) needed to serve the long-term intended use of the facility.

On April 18, 2013, the Missoula County Board of County Commissioners voted unanimously to pursue federal funding through the Off-System Bridge Program for the replacement of Maclay Bridge with a new bridge on the South 1 Alignment as identified by the Maclay Bridge Planning Study. The Missoula County Commission further reaffirmed their commitment to the development and management of the South Avenue Bridge Project by passing Resolution #2015-046 on April 22, 2015. Missoula County has been certified by MDT to administer the federal-aid project directly under the Local Agency Guidelines, or LAG, process.

The current County Commission has not taken a formal position on the project as identified in the Project Specific Agreement between Missoula County and MDT dated June 24, 2014. A meeting was held at MDT Headquarters in Helena, MT, on February 13, 2019 and attended by the Missoula County Commissioners, MDT, and FHWA to discuss the roles and responsibilities of these agencies and, at the request of the County Commissioners, to identify steps required to either terminate the project or elevate the environmental analysis to an EA or EIS. The response as provided by FHWA would generally require these steps: (1) MCC would need to take formal action to cancel the current project (and remove it from the TIP), (2) provide 30-day notice in writing to MDT of the intention to terminated the project, (3) reimburse MDT for any and all costs incurred by the state up to the date of stoppage and, (4) assume financial responsibility to develop the level of environmental document desired by the Commission. As of the date of this writing, the current County Commission has not taken formal action to terminate the proposed project.

The Maclay Bridge Alliance, a citizen group advocating for the preservation and rehabilitation of the historic Maclay Bridge, brought forward several options to rehabilitate and preserve the existing Maclay Bridge that were presented to the public on September 20, 2016. These options focused on the structure alone and did not address the safety deficiencies or identify the potential costs or environmental impacts associated with the roadway approaches. In response to rehabilitation options brought forth by the Maclay Bridge Alliance, a more comprehensive review of rehabilitation alternatives that meet the proposed project's purpose and need was conducted in 2018. The resulting *Maclay Bridge Preservation Options Analysis* examined the feasibility and cost in greater detail for rehabilitation alternatives that meet the project purpose and need. A review of the rehabilitation options demonstrated that, although construction costs were slightly lower than the proposed South Avenue Bridge, the rehabilitation options resulted in severe disruption to established communities requiring between 5 and 6 residential relocations in order to construct the bridge approaches to meet current design standards. In addition, right-of-way costs associated with the rehabilitation options were substantially greater than the proposed South Avenue Bridge alignment and cost estimates did not capture relocation costs. The major rehabilitation options resulted in a reduced service life (as compared to a new structure) since many of the existing structure components would be reused. Impacts on the 100-year floodplain were expected to be greater than the proposed project. The rehabilitation options were determined as not feasible or prudent for these reasons.

2.4. Project Funding

The proposed project is being funded through the Surface Transportation Block Grant Program (STBG) Off-System Bridge Program. STP funds are federally apportioned to Montana and allocated by the Montana Transportation Commission (Commission) to a variety of programs. The Off-System Bridge Program is funded through the federal gas tax, which is outside federal general revenue sources and doesn't impact or contribute to the Federal deficit. Funds are federally apportioned to Montana under the provisions of the current highway bill, FAST Act. The Commission distributes off-system bridge funds statewide based on off-system bridge inspections, need, and County priorities. Of the funding available, 86.58 percent is Federal and the State is responsible for the remaining 13.42 percent. The State share is funded through the Highway State Special Revenue Account.

2.4.1. Funding Eligibility

MDT's Off-System Bridge Program has the objective of addressing safety. Several safety concerns have been identified related to Maclay Bridge: traffic levels exceeding capacity for a single-lane bridge; access for Emergency Services west of the river; and crash trends at the roadway approaches. The proposed project must address the safety issues to be eligible for Off-System Bridge Program funds. Rehabilitating the existing Maclay Bridge has been determined ineligible for MDT's Off-System Bridge Program because it would not correct the deficient safety features needed to serve the long-term intended use of the facility.

Although Title 23 United States Code (USC) does allow rehabilitation (§Section 144(o)), other provisions are needed to gain a complete understanding of when it would be prudent to rehabilitate a historic structure. Title 23 USC §144(o)(1) does encourage the "inventory, retention, rehabilitation, and adaptive re-use, and future study of historic bridges" and §144(o)(3) further defines that reasonable costs to preserve or reduce the impacts of a project on a historic bridge are eligible, provided the load capacity and safety features of the bridge are adequate to serve the intended use for the life of the bridge, which is not the case with Maclay Bridge. Title 23 USC §144(o)(p) further directs that "a project not on a Federal-aid highway under this section shall be designed, constructed, operated, and maintained in accordance with State laws, regulations, directives, safety standards, design standards and construction standards". As such, MDT would not contribute off-system bridge funds for an alternative that does not address safety and deficient standards including approaches.

3. Transportation System

3.1. Existing Roadway Conditions

The project begins on the west side of the river, approximately 430 feet east of the River Pines Road/Blue Mountain Road/Big Flat Road/O'Brien Creek Road intersection. The project ends at the intersection of South Avenue and Hanson Drive. South Avenue is currently functionally classified as a Local Route from the existing west terminus to the intersection with Humble Road. Beyond the project limits, between Humble Road and Clements Road, South Avenue is

classified as an Urban (Major) Collector. River Pines Road is currently classified as a Local Route. Information on project area roads is provided in Table 3-1.

Table 3-1. Existing Roadway Conditions in Project Area

Roadway	Location	# of Lanes[1]	Roadway Surface Width (ft)[1]	Functional Class-ification[1]	Road Shoulder or Pathway?[2]	2017 Annual Average Daily Traffic (AADT)[3]
North Avenue	Between Clements Rd and Humble Rd	2	20	Major Collector	8-10ft shoulder path on south side only	1,998
North Avenue	West of Humble Rd	2	20	Major Collector	8-10ft shoulder path on south side only	1,998
River Pines Road	Entire segment	2	20	Local	None	1,946
South Avenue	Between Clements and west of Gunsight Ct.	2	40	Major Collector	3-4ft shoulder (north side); separated 10ft shared use path (south side)	2,038
South Avenue	Between east of Gunsight Ct. and Woodlawn Ave.	2	29	Local	3-4ft shoulder (north side); separated 10ft shared use path (south side)	2,038
South Avenue	Between Woodlawn Ave. and Humble Rd	2	29	Local	3-4ft shoulder (north side); separated 10ft shared use path (south side)	1,657
South Avenue	West of Humble Rd	2	29	Local	None	290

Sources: [1] MDT Spatial Data Map, 2018; [2] Google Earth (observation), 2018; [3] MDT Montana Traffic Map, 2018

The topographic survey results for existing road widths differs slightly from the information presented in the table above. Based on existing topographic survey, the existing top width of River Pines Road is approximately 23 feet, consisting of two 11.5-foot travel lanes with no shoulders. The existing top width of South Avenue within the project limits is approximately 24 feet, consisting of two 12-foot lanes and no shoulder.

The existing right-of-way along River Pines Road is 60 feet wide and narrows to 30 feet wide at approximately where the Big Flat Ditch crosses underneath the roadway. Right-of-way widens to a maximum width of 83.5 feet as the roadway veers to the northeast. Right-of-way on South Avenue at the eastern end of the project area is generally 60 feet wide up to the existing cul-de-sac. West of the cul-de-sac, existing right-of-way width reduces to 30 feet and extends 328 feet westward towards the Bitterroot River. From this location, an 80-foot wide strip of Missoula County-owned right-of-way extends westward to the Bitterroot River. There is an 80-foot wide public easement that extends from River Pines Road to the Bitterroot River that runs roughly parallel to O'Brien Creek.

There is one simple horizontal curve within the project limits on River Pines Road that matches the minimum horizontal curve radius for a local street based on the Missoula County Public Works Manual, revised 2010. There are no existing vertical curves within the roadway approach limits of the project. The existing grade on River Pines Road and South Avenue are approximately 2.5% and 0.2%, respectively. These vertical grades meet current design standard for local roads and an urban collector. Table 3-2 lists the posted speed limits within the project limits.

Table 3-2. Posted Speed Limits in the Project Area

Roadway	Speed Limit
River Pines Road	35 mph
South Avenue (west terminus to Humble Road)	25 mph
South Avenue (Humble Road to the east)	30 mph

3.2. Maclay Bridge

The existing Maclay Bridge crosses the Bitterroot River, connecting the west end of North Avenue West with the east end of River Pines Road. Maclay Bridge is located approximately 0.4 mile downstream from the proposed South Avenue Bridge crossing. The existing bridge is 346 feet long comprised of a 180-foot through truss main span, a 39-foot pony truss span, and two 61-foot pre-stressed concrete T-beam approach spans. The approach spans are supported on precast concrete piles and the truss spans on cast-in-place concrete wall piers founded on piles of unknown material. The bridge is currently posted at 11-tons. Information on Maclay Bridge is provided in Table 3-3.

Table 3-3. Maclay Bridge Existing Conditions

Bridge Item	Result
Bridge Inventory No.	L32101000+01001
Route	Off System

Bridge Item	Result
Length	61.2'-61.2'-39.25'-180' = 346'
Deck Roadway Width	14-ft (single lane)
Year Built	1935[a] reconstructed in 1965
Out to Out Deck Width	16-ft
Sufficiency Rating	27.3
Posting	11 tons
Structure Status	Functionally Obsolete – Eligible Replacement
Source: MDT Bridge Management System, 2015 *[a] The Parker through truss was relocated in 1953 to its current location.*	

As previously noted, Maclay Bridge has a Structure Status of *functionally obsolete* due to its inadequate roadway width to accommodate current traffic volumes and substandard roadway approach curves and is eligible to receive funding for replacement.

4. Environmental Impacts and Proposed Mitigation

The following section evaluates the proposed project's potential effects on select resource categories that have not been previously assessed in existing project technical reports. The resource categories included in this section include: prime farmland; floodplains; visual resources; land use, right-of-way, and relocations; social and environmental justice; traffic and access; pedestrian and bicycle facilities; and economic. The following sections discuss existing conditions; direct and indirect (secondary) impacts; and proposed mitigation for proposed project. The resource categories are organized in no particular order.

4.1. Prime Farmland

4.1.1. Existing Conditions

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) has issued regulations in 7 CFR 658 that implement the provisions of the *Farmland Protection Policy Act* (FPPA) (7 USC 4201, et seq.), which requires federal agencies to take into account the effect their programs have on the preservation of farmland. Farmland subject to the requirements of the FPPA includes only prime or unique farmland or farmland of statewide or local importance.

A review of the NRCS soil survey database identified two soil types within the project limits classified as "Prime Farmland If Irrigated." Theses soil types are designated as *Farmland of Statewide Importance* and include map units Bigarm gravelly loam (Map unit no. 16, located on

the west side of the Bitterroot River) and Grantsdale loam (Map unit no. 44, located on both sides of the Bitterroot River).

4.1.2. Impacts

The proposed project would directly convert an estimated 5.27 acres of soil classified as "Prime Farmland If Irrigated" to new transportation right-of-way. Only one parcel affected by the proposed project is identified by Missoula County tax assessment records as an agricultural property currently producing hay. This parcel is located on the west side of the river at the curve on River Pines Road (Geocode #04-2199-27-1-02-34-0000). Approximately 2.74-ac. of the 20.3-ac. property would be acquired as new right-of-way. The other 2.53 acres of prime farmland are not actively farmed; however, because they are an important soil type per NRCS classification, they are considered in the overall impact analysis.

A Farmland Conversion Impact Rating for Corridor Type Projects Form (NRCS-CPA-106) was processed for the proposed project in accordance with the FPPA and in consultation with the NRCS. The form was approved by the NRCS on November 10, 2016. The *Total Points* for the Project's Site Assessment Criteria is 124 points, out of 260 points. Since the point total was less than 160, no further consideration is required.

4.1.3. Proposed Mitigation

Per regulation at 7 CFR 658.4(c)(2), sites of farmland conversion receiving a total score of less than 160 points need not be given further consideration for protection. Because the score was less than 160 points on Form NRCS-CPA-106, no mitigation is required by the NRCS for farmland impacts. Additionally, Missoula County is not required to mitigate for indirect impacts to farmland.

4.2. Water Resources and Water Quality

4.2.1. Existing Conditions

The Bitterroot River is the dominant waterbody located within the project area. Other water bodies located within the project area include O'Brien Creek, a left (west) bank tributary to Bitterroot River that parallels River Pines Road, and the Big Flat Ditch, an irrigation ditch that flows perpendicular to and underneath both O'Brien Creek and River Pines Road through a 125-foot long culvert.

The reach of the Bitterroot River in the project vicinity (Eightmile Creek to Clark Fork River mouth; Assessment Unit MT76H001_030) is on the DEQ 303(d) list of impaired waters.[5] This water body is a Category 4A, defined as waters where all total maximum daily loads (TMDLs) required to rectify all identified threats or impairments have been completed and approved. Lead (source unknown), elevated instream temperature, and alteration in stream-side or littoral vegetative covers are the causes of impairment to this reach. Wet weather discharges (both point and non-point source), agriculture, and rangeland grazing in the contributing basin are the

[5] DEQ (Montana Department of Environmental Quality). 2016. Clean Water Act Information Center (CWAIC). Accessed at < http://svc.mt.gov/deq/dst/#/app/cwaic>. Accessed on June 23, 2016.

probable sources of impairment. A TMDL has been completed for lead and temperature on this reach of the Bitterroot River.[6]

The DEQ administers a permit program for regulating storm water discharges associated with small municipal separate storm sewer systems (MS4). The permit is required for urban areas within Montana that serve a population of at least 10,000 people and includes the Missoula Urbanized Area. The Missoula MS4 boundary includes the project area east of the Bitterroot River and, as such, the proposed project would be evaluated for the applicability of the requirement to incorporate Low Impact Development (LID) practices to comply with post-construction storm water management controls. According to the current MS4 permit, those LID practices will need to infiltrate, evapo-transpire, and/or capture for reuse, the post-construction runoff generated from the first 0.5 inches of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation, when practicable.

A review of the Montana Bureau of Mines and Geology Groundwater Information Center was reviewed to identify wells located on or adjacent to the proposed project. A single well (MISSOULA COUNTY WQD WELL U132035B, GWIC ID: 151188) was identified adjacent to the east bridge approach and outside of the project footprint. This well is identified in the database as a monitoring well and is not a public water supply well.

4.2.2. Impacts

The proposed project would result in permanent impacts to the riverbed of the Bitterroot River due to installation of the two bridge piers located in the active channel. Preliminary design includes two pier foundations approximately 830 square feet each, which would directly impact 1,660 square feet of total river substrate for both pier footings. The in-river piers would be designed for the anticipated scour and therefore no rip rap would be necessary within the Bitterroot River surrounding the piers. Due to the setback of the abutments from the river, protective rip rap at the abutments would be outside the river channel and above the OHWM. The proposed project would have no direct impact on O'Brien Creek.

Construction of the proposed project would result in an increase of impervious surface area by approximately 96,430 square feet (2.2 ac.). The removal of segments of River Pines Road and Maclay Bridge would remove approximately 30,895 square feet (0.7 ac.) of impervious surface. The net increase of impervious surface as a result of the proposed project would be 65,535 square feet (1.5 ac.). Impacts due to long-term operation of the new bridge would generally be negligible because storm water would be conveyed off the bridge (i.e., away from the river) and dispensed onto adjacent upland areas at either bridge end. This would substantially minimize potential for roadway pollutants, including winter de-icing chemicals from entering the river. Storm water detention/retention ponds are not anticipated. The roadside ditches would be sized appropriately to handle bridge and roadway runoff.

A minor impact on Big Flat Ditch would occur where a portion of the existing ditch would be modified and the existing culvert extended to the north to accommodate the reconfiguration of River Pines Road. The ditch alignment would not be modified and the culvert would be designed

[6] Ibid.

and sized to meet hydraulic requirements. The U.S. Department of Interior Bureau of Reclamation (BOR) owns the ditch. Missoula County would coordinate with the BOR to obtain the necessary right-of-way authorization to accommodate roadway widening in this location.

4.2.3. Construction Impacts

Pier and abutment construction of the new bridge and removal of the instream piers and abutments of Maclay Bridge would result in short-term adverse impact on surface waters due to the potential for erosion and sedimentation and increased turbidity. Potential temporary structures within the river could include work bridges, cofferdams for pier construction, diversion blocks, or work barge. All temporary structures within the river would be completely removed following construction of the new bridge. Impacts on water quality of surface waters could occur during highway construction from earth-moving activities, temporary increases in nonpoint source pollutant runoff, reduced slope stability, and debris generation.

4.2.4. Proposed Mitigation

Water quality impacts from all construction activities will be minimized by the use of best management practices (BMPs) and the implementation of an approved Storm Water Pollution Prevention Plan (SWPPP), as required under Section 402 of the Clean Water Act (CWA). In accordance with MDT Standard Specifications 107 and 208, the contractor will be required to adhere to applicable water quality rules, regulations, and permit conditions, including applicable conditions of the CWA Section 404 Permit, CWA 401 Certification requirements, and Montana Pollutant Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Construction Activity. More information on permit requirements is included in Section 6.4.

The Contractor will be required to revegetate disturbed areas upon completion of the Project and as required by the MPDES. Silt fences, or other appropriate erosion and sediment control measures, shall be used on adjacent ground to minimize silt run-offs during storm events. The contractor will be responsible for conducting routine site monitoring of BMPs to ensure all pollution control measures are installed, maintained, and functioning correctly. The contractor will be required to secure a Section 318 Authorization from DEQ to address short-term water quality impacts.

4.3. Floodplains

4.3.1. Existing Conditions

Executive Order 11988, "*Floodplain Management*," and FHWA regulations (23 CFR 650, Subpart A) require that the proposed project follow established procedures for assessing and avoiding potential encroachments on the regulated 100-year floodplain. The project area lies within the 100-year floodplain (below the base flood elevation) of the Bitterroot River delineated by the Federal Emergency Management Agency (FEMA). The initial flood study within this reach of the Bitterroot River was conducted by the USACE in 1974 and the results of the study were later remapped utilizing LiDAR data. The project area is located within the effective FEMA Flood Insurance Rate Map (FIRM), Panel 30063C1455E (revised July 6, 2015). Throughout the project reach, the Bitterroot River is effectively mapped as a detailed Zone AE with a floodway.

A detailed hydraulic analysis was developed using Hydrologic Engineering Center's River Analysis System (HEC-RAS) software for several preliminary alignments to predict water surface elevations of the 100-year flood event under proposed conditions and provide recommendations on bridge span configurations. The scenarios developed all include the assumed removal of the existing Maclay Bridge. During development of the HEC-RAS hydraulic model, errors were identified in the current effective model depicting the regulatory floodway boundary. Through consultation with Montana Department of Natural Resources and Conservation (DNRC) and FEMA, it was determined that the errors would be corrected and the revised floodplain and floodway limits would be utilized as the existing conditions model in the hydraulic analysis. Based upon the existing conditions model, the river floodway and floodplain are approximately 720-ft and 2100-ft wide, respectively, at the proposed bridge site. Once the final bridge configuration is selected, the corrected floodway alignment and proposed bridge analysis will be submitted for review by DNRC and FEMA.

The current effective model shows the entire length of River Pines Road within the 100-year floodplain. Preliminary analysis for O'Brien Creek shows that this creek overtops River Pines Road during extreme events from the approximate location of the irrigation crossing east to nearly the bend in the road.

4.3.2. Impacts

The proposed bridge is being designed to span the approximate 720-foot-wide regulatory floodway to the extent practicable and minimize the structure footprint within the 100-year floodplain. The proposed project would involve an unavoidable transverse encroachment on the 100-year floodplain of the Bitterroot River. The entire east approach and a portion of the west approach to the proposed bridge would also encroach on the 100-year floodplain of the Bitterroot River. In addition, construction of the west approach and reconfiguration of River Pines Road would occur within the 100-year floodplain associated with O'Brien Creek. Despite the encroachment, the preliminary hydraulic analysis has indicated that construction of the proposed project would have negligible effect on the water surface elevations over existing conditions for the 100-year flood event. It is estimated that the proposed project would increase the water surface elevation of the 100-year event by 0.03 feet upstream of the proposed structure over existing conditions, assuming removal of Maclay Bridge. This result is not anticipated to impact flooding conditions because the proposed bridge would be sited at an elevation to pass the 100-year flow event and bridge piers aligned to the flow direction. The proposed bridge would be constructed at an elevation that exceeds Missoula County's 2-foot freeboard requirement.

Removal of the Maclay Bridge, including bridge piers and abutments, would alter the stream morphology at this location by removing the current channel restriction caused by the bridge and restoring a normal cross-sectional width for this reach. Accordingly, removal of Maclay Bridge results in an increase in the water surface elevation of approximately 0.39 feet immediately downstream (approximately 1,800 feet) due to the removal of this constriction and more water staying in the main channel. The increase in local water surface elevations does not put additional residences or structures in the floodplain. The proposed project would not promote or encourage development within this delineated floodplain or substantially increase water surface elevations over existing conditions for the 100-year flood event.

Additional hydraulic modeling has been conducted to determine the proposed project's effect on existing conditions at O'Brien Creek and the Big Flat Ditch as a result of the reconstruction of the west approach on River Pines Road. The proposed design focuses on avoiding placing additional fill on the O'Brien Creek side of the roadway prism. Reconstruction of River Pines Road will shift the roadway prism to the north away from O'Brien Creek. Preliminary analysis indicates the proposed grade for the west bridge approach would restrict overtopping of River Pines Road, forcing the flood discharges to remain on the O'Brien Creek side of the road. This causes a slight increase in the water surface elevation, but does not impact any residences or insurable structures.

4.3.3. Construction Impacts

An interim construction model was developed in HEC-RAS to analyze the temporary condition where both the new South Avenue Bridge and Maclay Bridge are in the river channel at the same time. This temporary condition would occur following completion of the proposed project and prior to the removal of Maclay Bridge. The hydraulic model for the temporary condition shows that the water surface elevation for the 100-year event would increase by 0.15 feet.

4.3.4. Proposed Mitigation

The proposed project will be implemented in compliance with 23 CFR 650 and will require a floodplain permit from Missoula County. At the request of the Missoula County Community and Planning Services (CAPS) Floodplain Administrator and consistent with Missoula County Floodplain regulations, a Conditional Letter of Map Revision (CLOMR) will be submitted to DNRC and FEMA during the floodplain permit application process followed by a LOMR to officially amend the boundaries of flood zones and elevations on the FIRM once construction has been completed.

The proposed project will include removing Maclay Bridge, which would have a beneficial impact on the 100-year floodplain. The removal of Maclay Bridge, including piers and abutments, would allow for the channel width to be restored to maintain or potentially lower flood elevations upstream at the proposed bridge location. Removal of Maclay Bridge would allow for the encroachment at current abutment locations to be graded back to increase the hydraulic opening of the river channel. This removal of the encroaching abutments should decrease the contraction at the existing bridge location as well as the scour potential to downstream properties.

4.4. Visual Resources

4.4.1. Existing Conditions

The project area contains a range of natural and human-made features influencing the visual environment. The Bitterroot River is the primary visual resource in the project area. In the vicinity of the proposed project, the Target Range neighborhood is substantially developed and largely within the Missoula Urban Area (area east of the Bitterroot River); however, it possesses a rural character due to its larger lot sizes, lack of commercial development, and interspersed agricultural properties. The primary user groups include recreational anglers and floaters directly on the river or its banks, and vehicles or bicyclists traveling along Blue Mountain Road south of the proposed project. To a much smaller degree, some residences are located near the river and have unobstructed views of the Bitterroot River.

River bridges are a common sight (and obstacle) for river users in the Missoula area. Within the project area vicinity, Maclay Bridge is located 0.4 mile downstream; Buckhouse Bridge (Highway US 93) spanning the Bitterroot River is less than four river miles upstream; Kona Bridge (E. Kona Rapids Road) spanning the Clark Fork River is approximately five river miles downstream. Views from the Bitterroot River as seen by anglers and floaters traveling downstream through the project area consist of undeveloped floodplains, as well as frequent and prolonged views of the adjacent Blue Mountain Road and River Pines Road and interspersed residential development.

4.4.2. Impacts

Visual impacts were assessed in accordance with the FHWA 2015 publication *Guidelines for the Visual Impact Assessment of Highway Projects*. The FHWA guidance requires analysis of contrast with the existing environment and whether or not the change is compatible. The construction of the proposed bridge and approaches would result in new, permanent impact on the Bitterroot River as a visual resource. Recreational anglers and floaters using the river would be most affected by the presence of the new bridge. The views of the Bitterroot River as seen from Blue Mountain Road would be affected predominantly for northbound vehicles in the vicinity of the new bridge. Views from private residences located in close proximity and with line of sight to the proposed new bridge would be affected by the presence of the bridge and approaches. The views from these viewers would be of a new two-lane bridge structure and associated road approaches, which, when taken in context with the immediate river corridor, is not compatible with the existing views and would contrast noticeably. The proposed bridge would tie into existing infrastructure (River Pines Road) that is currently visible from the river corridor in an area with multiple bridges and, when taken in context with the broader river corridor and surrounding built environment, would not be a substantial contrast.

Based on a spatial analysis conducted using GIS, there are 70 single-family dwellings and 14 mobile homes within a quarter-mile radius of the proposed project whose views may potentially be affected by the new bridge. Similarly, 72 single-family dwellings were identified within a quarter-mile radius of the existing Maclay Bridge whose views may be potentially affected by removing the existing structure. Thirteen residences are located within both quarter-mile radii of the proposed project and Maclay Bridge.

4.4.3. Construction Impacts

Short-term, localized visual impacts are anticipated as a result of construction activities associated with construction of the new bridge and removal of Maclay Bridge. This would include the operation of equipment, which may include bulldozers, backhoes, cranes, etc., temporary staging of building materials and stockpiles, and any potential instream work bridges or structures. All temporary, construction-related visual impacts would be limited to the time required to construct the project.

4.4.4. Proposed Mitigation

A context sensitive design approach is being employed through attention to design quality and soliciting input from the public on bridge aesthetics to mitigate the potential adverse effects to the visual environment. A public meeting held on August 16, 2016 offered an opportunity for the public to provide input on bridge aesthetics. Additional opportunities will exist during final design for project stakeholders and the public to provide input on aesthetics of the proposed project. All

final decisions will need to ensure cost-effectiveness and practicability. In addition, restoration of disturbed areas adjacent the Bitterroot River with appropriate species would improve the long-term visual character of the surrounding environment.

4.5. Land Use, Right-of-Way, and Relocations

4.5.1. Existing Conditions

The project area is situated west and outside of Missoula's city limits and is located within the area identified in the Missoula Urban Fringe Development Area Project (UFDA) as Target Range-Orchard Homes planning area. Land use planning within the project area vicinity is guided by several plans including the Target Range Neighborhood Plan, the Missoula Urban Area Comprehensive Plan: 1998 Update, and Missoula County Growth Policy (adopted June 2016). Land use designations in the project area vicinity include residential uses (1 to 2 dwelling units per acre) and parks and open space, with developed parcels ranging in size from one-half acre and larger. Low- to medium-density residential development exists on both sides of the Bitterroot River. A small, approximately 4-unit mobile home park is located at the western terminus of South Avenue. The project vicinity includes open space primarily within the Bitterroot River floodplain. This includes an approximately 8.5-acre undeveloped island located between the proposed bridge location and Maclay Bridge, containing a 1.0-acre conservation easement identified as Dinsmore #4 and owned by Missoula County. Agricultural uses consisting of mostly hay production also exist within the project area on the west side of the river.

Land ownership is predominantly private in the project area. Missoula County owns the right-of-way that includes South Avenue. River Pines Road is located within public road easement granted to Missoula County. Per Montana Code Annotated (MCA 70-16-201) the State of Montana owns the riverbed of the Bitterroot River (and all other navigable rivers) from low water mark to low water mark.

Zoning within the project area vicinity includes the designations Target Range-West End Rural Z.D. for areas east of the Bitterroot River and C-RR1 for area west of the river, both of which have 1 dwelling per acre as the minimum lot size.

According to the 2016 Missoula County Growth Policy, the county is anticipated to grow by 20,979 people in both the city and unincorporated areas over the next 20 years and growth trends suggest as many as 15,000 new residential units are required to accommodate the growth. According to the Residential Development Allocation Map (2014) of the UFDA Project, the Target Range-Orchard Homes area has an allocated 1000 new units by the year 2030 with approximately 400 new residential units in the Target Range neighborhood.

4.5.2. Impacts

The proposed project has been designed to use existing rights-of-way and easements to the extent practicable. However, new right-of-way is required to construct the proposed project. An estimated 5.37 acres of new right-of-way is required from adjacent private properties. The new right-of-way corridor ranges from a maximum of approximately 190 feet wide to accommodate the new bridge abutment fill slopes to 70 feet of right-of-way for the bridge structure over the river channel. In general, the new right-of-way boundary extends 10 feet from the proposed

construction limits. These estimates are based on preliminary design and may change slightly as final design of the project progresses.

The proposed project would not result in any residential or business relocations. The proposed project would require a permanent easement from DNRC across the Bitterroot River. The proposed project would result in a minor change in access to residential properties and recreational lands west of the Bitterroot River. Under the proposed project, the new bridge at the extension of South Avenue would provide access to areas west of the river and access across Maclay Bridge would be removed.

No impact on the NorthWestern Energy gas substation located on the east side of Maclay Bridge would occur. Maclay Bridge has an 8-inch natural gas line (owned by NorthWestern Energy), fiber optic line, and telephone line attached. Utilities currently attached to Maclay Bridge would need to be relocated prior to demolition of the bridge.

4.5.3. Construction Impacts

Construction easements may be required for temporary occupations of adjacent private lands for equipment access and staging. All temporary right-of-way requirements would be identified in the final right-of-way plans during final design.

4.5.4. Proposed Mitigation

All right-of-way acquisition will be developed in accordance with both the *Uniform Relocation Assistance and Real Property Acquisition Act* of 1970, and the *Uniform Relocation Act Amendments* of 1987. In accordance with federal laws and regulations, affected landowners are entitled to fair market value for any land or structures acquired to construct the proposed project.

4.6. Publicly owned Parklands and Recreation Areas, including Section 4(f) and Section 6(f) Properties

4.6.1. Existing Conditions

Section 4(f) of the U.S. Department of Transportation Act (49 USC 303(c)) protects significant publicly owned public parks, recreation areas, and wildlife and waterfowl refuges. There are no publicly owned parks, recreation areas, or wildlife refuges within the project limits that would be affected, either directly or indirectly, by the proposed project. Other recreation areas and parks exist in the project area vicinity beyond the project limits. Lolo National Forest and the Blue Mountain Recreation Area (both owned by the USFS) are located to the south and Kelly Island (owned by FWP) is located to the north of the project area. The Target Range neighborhood has several public parks as well. None of these recreational resources would be affected by the proposed project.

Section 4(f) protects significant historic sites, whether they are publicly or privately owned. Historic sites are discussed in the Cultural and Historic Sites section below. No Section 6(f) properties have been identified within the immediate project area.

The Bitterroot River is an important regional recreational resource used for fishing and floating. Access to the Bitterroot River within the vicinity of the proposed project is provided at Maclay

Flat (Lolo National Forest), Buckhouse Bridge (US 93) and Maclay Bridge. The Maclay Bridge site provides informal recreational access to the river; however, no formal access provided and parking restrictions are enforced in the vicinity of the existing bridge. There is no FWP-managed Fishing Access Site (FAS) on the Bitterroot River within the immediate project vicinity. Kelly Island FAS on the Clark Fork River is the nearest FAS and is located downstream from the project.

4.6.2. Impacts

The proposed project would have no effect on any publicly owned parks, recreation areas, or wildlife refuges that are protected by Section 4(f). The Missoula County-owned Dinsmore #4 conservation easement has not been evaluated for Section 4(f) applicability; however, no use of this property would occur under the proposed project.

4.6.1. Construction Impacts

Temporary river closures may be necessary during construction activities occurring in or over the Bitterroot River during construction of the new bridge and removal of Maclay Bridge. No temporary impact on access to other recreational areas is expected to occur. It is anticipated that FWP would assist in posting information at the appropriate Fishing Access Sites under their jurisdiction informing the public of construction activities, including notices of planned river closures that may affect river access.

4.6.2. Proposed Mitigation

No mitigation is proposed or necessary.

4.7. Cultural and Historic Sites, including Section 4(f) Properties

4.7.1. Existing Conditions

Section 106 of the *National Historic Preservation Act* (NHPA) establishes requirements for taking into account the effects of proposed Federal, Federally assisted or Federally licensed undertakings on any district, site, building, structure or object included in or eligible for inclusion in the National Register of Historic Places (NRHP).

A cultural resources report was completed for the proposed project in February 2016 focusing on above-ground historical features within the proposed project's Area of Potential Effect (APE). The survey identified two NRHP-eligible properties within or near the APE: the Maclay House (24MO0519) and the Big Flat Ditch (24MO0587). The Montana State Historic Preservation Office (SHPO) concurred on March 30, 2016 with the determination that the Maclay House is NRHP-eligible. The Maclay Bridge (24MO0521) was also included in the cultural resource survey as a previously recorded historic property. Maclay Bridge was determined eligible in 2012 and was recently listed in the NRHP on December 20, 2016.

An archaeological survey on the privately-owned properties affected by the proposed project was not completed due to access restrictions. Once the proposed project right-of-way is acquired by Missoula County and prior to construction, the archaeological survey will be completed and results will be presented as an addendum to the cultural resources report at which point MDT will coordinate the findings with SHPO and interested Indian Tribes. Given the

small project area and the level of recent development and disturbance, the probability of identifying undocumented cultural resources is anticipated to be low.

Under Section 106 of the NHPA, certain individuals and organizations with demonstrated interest in the project may participate as a Consulting Party because of their relationship to the project or affected properties or their concern with the project's effects on historic properties. The Maclay Bridge Alliance and the Historic Bridge Foundation have been approved by FHWA as a consulting parties in the Section 106 process. Consulting party status entitles these groups to share their views, receive and review pertinent information, and, in general, work collaboratively to consider possible solutions along with FHWA.

Section 4(f) provides for the protection of significant historical sites, regardless of whether they are publically or privately owned. Historic sites affected by the proposed action are required to be evaluated in compliance with Section 4(f). The regulation allows the Secretary of USDOT to approve a program or project requiring the use of Section 4(f) resource only if (1) there is no prudent and feasible alternative to using the resource, and (2) the program or project includes all possible planning to minimize harm to the Section 4(f) resource resulting from the use.

4.7.2. Impacts

The proposed project would have **No Effect** to the NRHP-eligible Maclay House (24MO0519). The proposed project would have **No Adverse Effect** to the NRHP-eligible Big Flat Ditch (24MO0587). The proposed project would have an **Adverse Effect** to the NRHP-listed Maclay Bridge due to the removal of the historic structure.

The determinations of No Adverse Effect to the Big Flat Ditch and the Adverse Effect to Maclay Bridge require additional documentation to comply with the requirements of Section 4(f). Because SHPO has concurred with the No Adverse Effect determination to Big Flat Ditch in a letter dated November 1, 2016, the action meets the criteria for a *de minimis* impact finding per FHWA and SHPO procedures.

4.7.3. Proposed Mitigation

The adverse effect to Maclay Bridge will be mitigated through the terms and stipulations as specified by MDT's Historic Roads and Bridges Programmatic Agreement (PA). Maclay Bridge will be documented according to the National Park Service's Historic American Engineering Record (HAER) standards. Additionally, Maclay Bridge will be offered for adoption according to Stipulation 3(C)(E) of the PA. If a second party owner is identified to take ownership of and relocate Maclay Bridge, the cost of demolition will be made available to the third party as reimbursement for relocating the bridge. No mitigation is currently proposed or required for the effect on the Big Flat Ditch.

In the unlikely event that cultural resources are identified within the project limits following right-of-way acquisition, MDT standard compliance process will be followed to assess effects and resolve any adverse effects in consultation with SHPO. The proposed project will also include in the final contract bid documents MDT's Standard Specification 107.22, Protection of Archeological and Historical Findings, which further define the contractor's responsibilities relative to protection of archaeological and/or historical artifacts encountered during construction.

4.8. Social and Environmental Justice

4.8.1. Existing Conditions

Socioeconomic information for the census tract comprising the Target Range-Orchard Homes area (Census Tract 9.01) was examined and compared to the City of Missoula, Missoula County, and the state of Montana to identify the presence of low income or minority populations within the vicinity of the proposed project. Census tract 9.01 is a 7.75 square mile area bound by Reserve Street and US93, the Clark Fork River and the Bitterroot River. Census tract 9.02, which includes the area immediately west of the Bitterroot River in the project area vicinity, was not examined in detail because it encompasses an immense region (433 sq. mi.) including portions of Lolo National Forest and many surrounding communities not representative of the project area. Table 4-1 presents information on the median household incomes reported by the American Community Survey (ACS) for the project area vicinity, county, and state.

Table 4-1. Median Household Income ($)
For the Project Area, City, County and State, 2012-2016

Geography	Median Household Income ($)
Census Tract 9.01	50,000
City of Missoula CCD[1]	44,225
Missoula County	46,371
State of Montana	48,380

Source: U.S. Census Bureau, American Community Survey (ACS) 2012-2016 5-Yr Estimate, 2018
[1] CCD = A Census County Division is a subdivision of a county used by the US Census Bureau for the purpose of presenting statistical data.

Missoula County has 2.33 persons per household on average. According to the Department of Health and Human Services poverty guidelines (2015), the poverty threshold for a household with three persons is $20,090 and the threshold increases by approximately $4,100 per additional person. Information obtained from the ACS on poverty levels and race and ethnicity for Tract 9.01 were compared to similar statistics for the City of Missoula, Missoula County, and the state of Montana and is presented in Table 4-2.

Table 4-2. Low-Income and Minority Percentages
For the Project Area, County and State, 2011-2015

Geography	Percentage (%) of People Whose Income in the Past 12 Months is Below the Poverty Level	Percentage (%) of Minority Population (Non-White)
Census Tract 9.01	17.8	4.8
City of Missoula CCD	17.6	8.3
Missoula County	16.1	7.9

Geography	Percentage (%) of People Whose Income in the Past 12 Months is Below the Poverty Level	Percentage (%) of Minority Population (Non-White)
State of Montana	14.9	10.9
Source: U.S. Census Bureau, American Community Survey (ACS) 2012-2016 5-Yr Estimate, 2018		

According to the ACS, the percentage of population below the poverty level for Census Tract 9.01 is higher than the County and State, and very close to the City as a whole. The percentage of minority population, conversely, for Census Tract 9.01 is lower than the other geographies examined.

The *Target Range Neighborhood Plan* was adopted by Missoula County in June 2010. The Plan identifies neighborhood values, interests, and goals and provides recommendations toward guiding future development to be consistent with established goals and priorities. Specific to transportation infrastructure, the plan recommends mitigating growth in motorized traffic while enhancing the traditional lifestyle and safety of area residents. The plan recommends transportation alternatives that offset potential negative impacts associated with future development, including expansion of the pedestrian/bicycling paths to reduce the number of miles traveled [in vehicles] to improve air quality. In addition, the plan recommends continued participation by Missoula County Public Works to maintain Maclay Bridge to provide access to recreational lands west of the Bitterroot River. The plan does not identify the need for a new bridge.

The City of Missoula is planning to improve South Avenue between Reserve Street and 36th Avenue into a complete city street, including curbs and sidewalks, pedestrian and bicycle facilities, and boulevards. The first phase will include improvements along South Avenue fronting the new FMRP and the second phase would include the segment fronting Community Hospital. Design has not been completed for this project and a construction date has not been identified.

4.8.2. Impacts

The Census data suggest that minority and/or low-income populations are not present within the project area and, as such, no impact on any low-income or minority population is anticipated. The proposed project is not anticipated to result in disproportionately high or adverse human health and environmental effects on low-income or minority populations.

The proposed project has not been identified as inconsistent with the current adopted 2016 county growth policy. The proposed project has not been identified as inconsistent with current zoning regulation because it would have no effect on population growth or exacerbate land use changes in the Target Range area. Because the proposed project involves removal of Maclay Bridge, it is inconsistent with the bridge recommendations identified by the Target Range Neighborhood Plan.

Predicted traffic increases on South Avenue in the vicinity of the proposed project would indirectly impact residents located on these segments due to the increase in traffic noise and vehicle emissions. Conversely, the shift of traffic off of North Avenue would have beneficial impacts on residents located on road segments where traffic volumes are projected to decrease. The change in traffic patterns would be localized primarily to South Avenue west of Clements Road and would neither sever access to community resources nor substantially affect the community character of the larger Target Range Area.

The proposed project would improve emergency vehicle access and response times to residences located west of the river by removing load limitations on the river crossing and expanding capacity of the bridge crossing to two lanes, thus eliminating potential delay in emergency response times. With the proposed project, the vehicle mix of traffic may change slightly as a result of having no load limitations on the new bridge (i.e., oversized vehicles now being able to safely use the bridge crossing).

4.8.3. Proposed Mitigation

The proposed improvements along South Avenue, and in particular, west of Humble Road has potential to change the character of the roadway as it is currently a dead end cul-de-sac. Missoula County is committed to and is actively working with neighborhood representatives to address the potential impacts as a result of shifting traffic from North Avenue onto South Avenue. Preliminary strategies are congruent with the Target Range Neighborhood Plan.

4.9. Traffic and Access

4.9.1. Existing Conditions

In general, project area traffic volumes are low and existing levels of service (LOS), as reported in the 2016 Activate Missoula LRTP, show uncongested roadways throughout the project area vicinity operating at a LOS C or better. Existing traffic volumes (2017 AADT) for the project area are shown in Figure 4-1. On South Avenue, west of Humble Road, volumes are very low (AADT of 290) due to South Avenue currently being a cul-de-sac with only residential traffic.

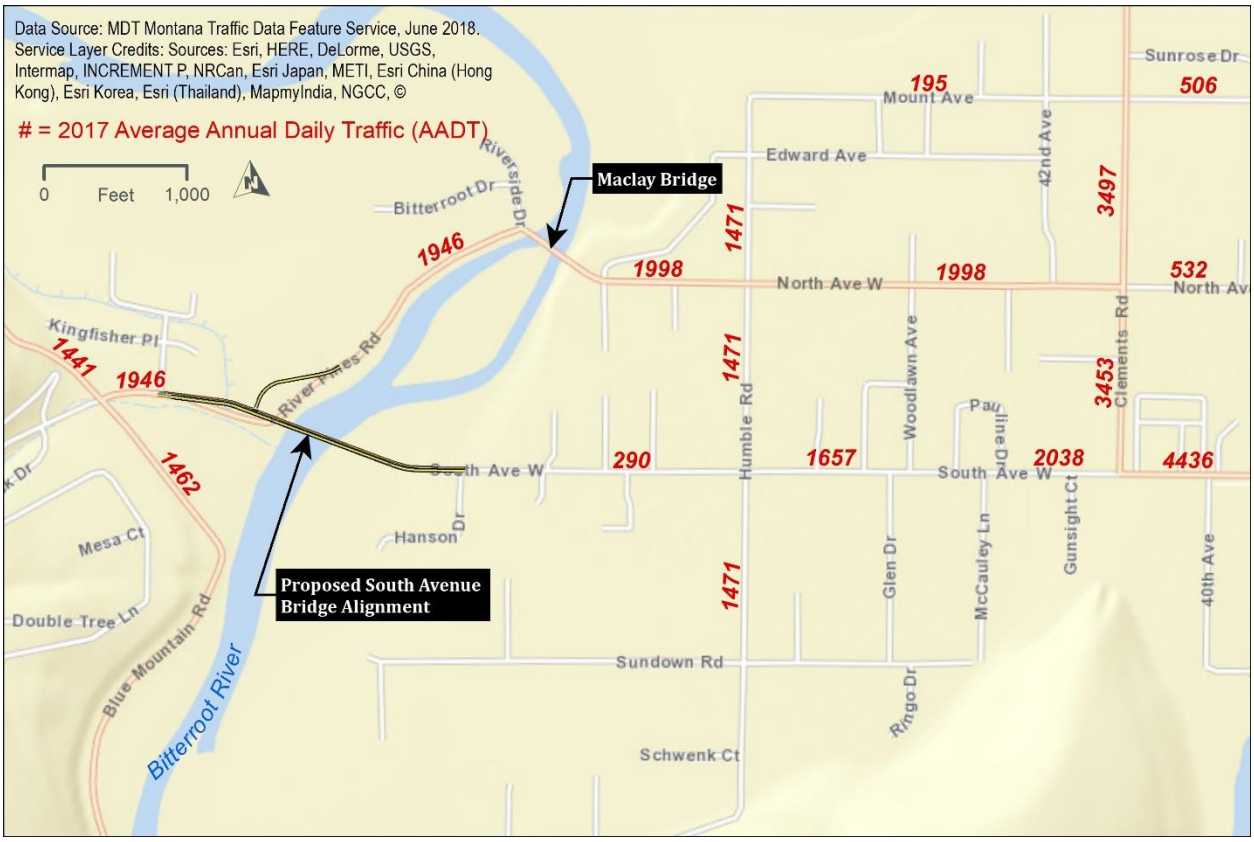

Figure 4-1: 2017 Average Annual Daily Traffic (AADT)

Traffic volumes using Maclay Bridge currently exceed the capacity of the single-lane bridge as recommended by AASHTO. The sub-standard capacity and load limitations (that necessitate speed restrictions for oversized vehicles) restrict traffic flows on this facility. At times, traffic is delayed on either side of the bridge while allowing for an opposing vehicle to pass.

Traffic control at the South Avenue/Humble Road intersection is a 2-way stop on Humble Road and the Big Flat Road/River Pines Road/Blue Mountain Road/O'Brien Creek Road intersection is controlled by a 2-way stop on River Pines Road and O'Brien Creek Road. Traffic control at the South Avenue/Clements Road intersection (adjacent Target Range School) currently consists of a stop sign on the north leg of Clements Road, and no controls on the east and west legs of South Avenue.

4.9.2. Impacts

The *Maclay Bridge Planning Study* included an assessment of potential future traffic impacts resulting from a new bridge crossing at a South Avenue extension. The Missoula Travel Demand Model (TDM) traffic modeling software was used to quantify potential traffic volume changes between a future condition without a new bridge and one with a new South Avenue crossing in place for the year 2040. Because the TDM model is updated frequently to reflect land use planning updates and socio-economic projections and due to the time that has lapsed since the planning study, revised results from the current TDM were requested from the Missoula Metropolitan Planning Organization (MPO). Table 4-3 shows the results from the TDM projections reported in the planning study and the current TDM results and provides the percent change between the respective models comparing traffic volumes under a No Action condition

versus the proposed project with a South Avenue Bridge. Although the TDM results from the planning study are provided in Table 4-3, only the current 2019 TDM results are discussed within this section.

In general, the TDM results indicate that the proposed project would increase traffic in some locations and decrease traffic in other locations. Under the No Action and proposed project scenarios, traffic volumes are generally projected to increase over existing conditions (i.e., 2014 AADT used in the TDM) along Clements Road, Mullan Road, Brooks Street (at Buckhouse Bridge), and Reserve Street. The exception on Clements Road is at the location 300 ft. south of North Avenue, which projects a decrease in traffic for the South Avenue Bridge scenario as compared to existing volumes. The 2045 TDM projects a decrease in traffic over existing conditions for almost every other site location in the modeled vicinity.

Based on the updated TDM results, the traffic volumes on South Avenue in the vicinity of the proposed project would generally see a reduction in traffic volumes over existing conditions following completion of the proposed project. The exception to this is at the location immediately west of the South Avenue/Clements Road intersection where there is an increase of approximately 900 vehicles per day (vpd). The location on South Avenue nearest the proposed project between Humble and Pleasant is projected to see a decrease of approximately 400 vpd following completion of the proposed project.

The 2045 TDM results show comparatively minor differences in projected traffic volumes between the No Action condition and the proposed project. When comparing the percent differences of projected traffic volumes between the scenarios, the majority of the sites modeled (18 of the 25, or 72 percent) show a change less than 5 percent. Notable locations where traffic is projected to increase under the proposed project versus the No Action scenario include Big Flat Road at the intersection with River Pines Road/O'Brien Creek Road (8.4 percent increase), South Avenue just west of Clements Road (37.2 percent increase), and, most notably, on South Avenue between Humble and Pleasant (1,177 percent increase). Despite this high increase, the 2045 AADT is projected to be relatively low at 1,124 vpd at this location. Conversely, North Avenue just west of Clements Road is projected to decrease by 677 vpd (a -28.8 percent change) as well as on Clements Road near North Avenue where a decrease of 686 vpd is projected (a -27.8 percent change). The 2045 predicted volume on the South Avenue Bridge is 1,792 vpd based on a theoretical TDM volume as no actual physical traffic counts are available to adjust the model.

Table 4-3. Traffic Volume Projections and Comparisons for the Project Area in 2040 and 2045

Street	Location	*Results from 2013 Maclay Bridge Planning Study[(a)]*						*2019 TDM Update*			
		2010 AADT	2010 TDM	2040 TDM	Projected 2040 AADT (No Action)	Projected 2040 AADT w/ South Ave Bridge	% Change (2040 No Action vs 2040 South Ave Bridge)	2014 AADT	Projected 2045 Existing (w/ Maclay Bridge)	Projected 2045 South Ave Bridge	% Change (2045 No Action vs 2045 South Ave Bridge)
Big Flat Rd	100 ft W of O'Brien Ck Rd	1,870	2,199	7,691	6,550	6,850	4.6%	1,945	1,796	1,946	8.4%
Blue Mountain Rd	500 ft N of Hwy 93	2,360	2,628	6,091	5,450	5,050	-7.3%	1,830	1,564	1,580	1.0%
Blue Mountain Rd	S of South Side Rd	1,370	1,674	5,346	4,400	4,050	-8.0%	(a)	(a)	(a)	(a)
Brooks St	Bitterroot River Bridge	26,530	26,157	45,368	46,000	4,5350	-1.4%	25,530	33,831	33,648	-0.5%
Clements Rd	300 ft N of North Av	3,140	2,615	4,914	5,900	5,700	-3.4%	2,830	3,070	2,970	-3.3%
Clements Rd	300 ft S of North Av	2,750	1,811	2,549	3,850	5,950	54.5%	2,230	2,464	1,778	-27.8%
Clements Rd	500 ft S of S 3rd W	2,350	1,914	3,677	4,500	4,400	-2.2%	2,560	2,803	2,780	-0.8%
Kona Ranch Rd	Kona Ranch Bridge	(a)	1,723	6,471	(a)	6,750	(a)	(a)	1,796	1,753	-2.4%
Mullan Rd	E of Snowdrift Ln	3,950	4,284	9,870	9,100	9,350	2.7%	3,470	3,908	3,877	-0.8%
North Av	300 ft W of Clements Rd	2,000	1,318	3,118	4,750	1,250	-73.7%	1,940	2,352	1,675	-28.8%
Reserve St	Between Dearborn & South Av	33,580	32,617	45,425	46,750	47,000	0.5%	30,890	35,362	35,483	0.3%
Reserve St	Between Olofson Dr & S 3rd W	38,010	38,985	51,443	50,150	50,000	-0.3%	34,450	42,153	42,145	0.0%

Street	Location	*Results from 2013 Maclay Bridge Planning Study[(a)]*						*2019 TDM Update*			
		2010 AADT	2010 TDM	2040 TDM	Projected 2040 AADT (No Action)	Projected 2040 AADT w/ South Ave Bridge	% Change (2040 No Action vs 2040 South Ave Bridge)	2014 AADT	Projected 2045 Existing (w/ Maclay Bridge)	Projected 2045 South Ave Bridge	% Change (2045 No Action vs 2045 South Ave Bridge)
Reserve St	Between South Av & Central Av	36,740	36,953	47,510	47,250	47,350	0.2%	33,890	38,301	38,374	0.2%
Reserve St	S of Larkinwood Dr	37,930	39,255	52,411	50,650	50,400	-0.5%	35,980	39,301	39,363	0.2%
River Pines Rd	300 ft W of Maclay Bridge	2,610	2,779	6,039	5,650	0	-100.0%	1,890	1,429	0	-100.0%
S 3rd W	W of Reserve	7,620	6,690	11,596	13,200	13,150	-0.4%	7,960	7,179	7,213	0.5%
S 7th W	150 ft W of Reserve	1,320	1,901	4,664	3,250	3,300	1.5%	1,350	5,930	5,992	1.0%
S 7th W	300 ft E of Clements Rd	350	345	699	700	700	0.0%	340	265	253	-4.5%
South Av	Between 31st and 33rd	6,610	6,491	8,187	8,350	9,150	9.6%	6,880	4,396	4,363	-0.8%
South Av	Between Humble & Pleasant	1,770	2,210	3,638	2,900	5,150	77.6%	1,500	88	1,124	1177.3%
South Av	Between Reserve & 26th	15,010	14,914	16,255	16,350	16,850	3.1%	12,230	11,876	11,811	-0.5%
South Av	E of Clements Rd	4,350	4,952	6,141	5,400	6,350	17.6%	4,190	2,703	2,749	1.7%
South Av	W of Clements Rd	4,710	5,379	7, 453	6,550	9,250	41.2%	2,050	2,156	2,958	37.2%
South Av	New Bridge	(a)	(a)	(a)	(a)	7,200	(a)	(a)	(a)	1,792	(a)
Spurgin Rd	250 ft W of Reserve	2,000	2,401	3,086	2,550	2,550	0.0%	1,960	4,594	4,618	0.5%
Spurgin Rd	300 ft E of Clements Rd	980	1,033	1,285	1,200	1,200	0.0%	860	517	534	3.3%

Source: MDT Multi Modal Planning Bureau, Statewide & Urban Planning Section, 2012; Missoula Office of Planning and Grants, Transportation Division, 2012; Missoula MPO 2019.
(a) Data unavailable

The TDM also identified negligible differences in traffic on Buckhouse Bridge (US93/Brooks Street) in 2045 for both scenarios. The TDM results imply that with a new South Avenue Bridge, approximately 183 vpd may use the new crossing instead of the Buckhouse Bridge crossing. Similarly, negligible change was measured at the Kona Ranch Road Bridge crossing. At this location, approximately 43 vpd may use the new crossing instead of the Kona Ranch Road Bridge crossing. These results indicate the proposed project would not result in a bypass effect around the Missoula urban area.

As described in Table 3-1, the existing roadway surface width of South Avenue is equal or greater than North Avenue suggesting the existing roadway characteristics of South Avenue between Clements Road and the proposed bridge location are adequate to handle the predicted traffic without substantial modifications. South Avenue west of Humble Road currently lacks pavement markings.

The proposed project is anticipated to have negligible effect on travel patterns and accessibility on the west side of the river because the new bridge, similar to Maclay Bridge, would connect to River Pines Road. When examined relative to grid connectivity to the major road network, the proposed project results in a more efficient east-west connection across the river than the existing Maclay Bridge crossing. The *Maclay Bridge Planning Study* provided a comparison of travel lengths between the intersections of South Avenue/Clements Road and Big Flat Road/River Pines Road/Blue Mountain Road/O'Brien Creek Road. The proposed project would have a total travel length (eastbound and westbound directions) of 14,450 feet versus 18,600 feet for the Maclay Bridge crossing. The reduction in out-of-direction travel would indirectly reduce travel time, travel costs, and emissions.

Design elements of the proposed project to include enhanced roadside clear zones, traffic safety barriers, proper roadway and intersection striping, and increased width and improved geometry of the new bridge will improve safety over existing conditions and may help reduce driver error fixed object crashes, a common cause for crashes in the vicinity of the existing Maclay Bridge. The posted speed on the new bridge would be greater than the currently posted 15 mph on Maclay Bridge due to the proposed project being designed to meet current standards. A design speed of 35 mph is proposed for the project because it meets both current MDT and Missoula County design standards. Note that the design speed does not necessarily equate to the posted speed limit. The posted speed on the new bridge and approaches may be less than the design speed and will be determined by Missoula County.

4.9.3. Construction Impacts

Temporary impact on traffic patterns during construction is anticipated to be minor. Because the proposed project is on a new alignment, a substantial portion of the project including the east roadway approach and the new bridge would be completed without disrupting existing traffic patterns. Maclay Bridge would remain in operation during construction of the proposed project. Construction activities west of the river would affect traffic on River Pines Road and a detour would be necessary to maintain flow of traffic. A traffic control plan would be developed to mitigate construction impacts to local and regional traffic. Traffic control plans would be developed in accordance to *The Manual on Uniform Traffic Control Devices* (MUTCD).

4.9.4. Proposed Mitigation

The proposed South Avenue Bridge is located on a tangent or straight alignment with vertical curves on each approach section. To discourage vehicles from driving at increased speeds through this section, traffic calming measures at either end of the bridge have been proposed to reduce travel speeds. The proposed design includes using raised medians for center island narrowing. The typical section in Figure 4-2 shows the proposed configuration of South Avenue where the center islands are located. In order to reduce speeds at both bridge approaches, medians are recommended on the east and west bridge approaches. Final details for traffic calming options will be determined during the final design.

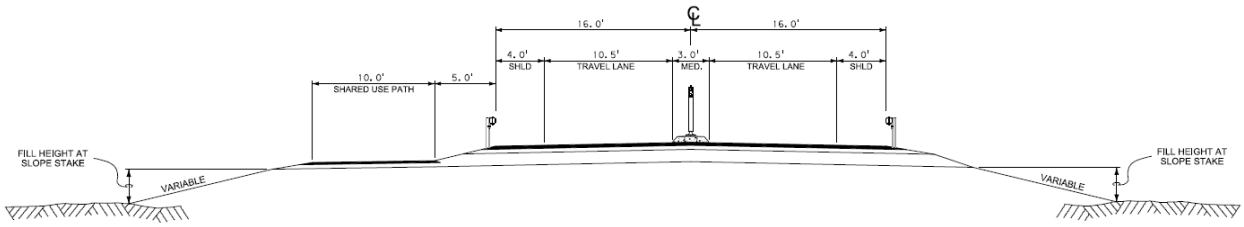

Figure 4-2: South Avenue Typical Section with Center Island Narrowing

4.10. Pedestrian and Bicycle Facilities

4.10.1. Existing Conditions

There are no dedicated pedestrian or bicycle facilities within the immediate vicinity of the proposed bridge on South Avenue (west of Humble Road) or River Pines Road. Pedestrian and bicycle facilities outside the project limits consist of a paved shared-use trail on the south side of South Avenue extending from Fort Missoula Regional Park to Humble Road. A paved shared-use trail consisting of a wide shoulder on one side of the roadway also extends along Clements Road between South Avenue and 3rd Street, on Humble Road between South and North avenues, and along North Avenue west of Clements Road to Maclay Bridge. Maclay Bridge does not have dedicated bicycle or pedestrian facilities.

On the west side of the Bitterroot River, River Pines Road consists of two 12’ travel lanes with no shoulders. Sidewalks exist within a few new subdivisions within the vicinity of the project; however, in general, sidewalks are infrequent throughout the Target Range area.

At the South Avenue/Clements Road intersection adjacent to Target Range School, a high visibility ladder crosswalk exists on the west leg of South Avenue and the north leg of Clements Road. School area signage and school speed limit zone exist on all intersection approaches, and a flashing beacon exists on the west approach of South Avenue.

4.10.2. Impacts

The proposed project would improve safety for pedestrians and bicyclists crossing the Bitterroot River by providing a 10-foot shared-use path separated from traffic throughout the project limits. The path would be located on the north side of the proposed project. A concrete barrier would separate the path from traffic on the proposed bridge. At the bridge approaches, the shared-use

path would be separated from the road by a 5-foot buffer and no concrete barrier would be required.

Traffic on South Avenue in the vicinity of Target Range School is projected to increase by approximately 900 vpd in 2045 (a 37.2% change) as compared to the predicted 2045 traffic conditions without a new bridge. East- and westbound through movements on South Avenue would increase as a result of the proposed project. This predicted minor increase in vpd on what is predicted to be a moderate to low volume two-lane road (2,958 AADT in 2045) does not warrant additional pedestrian safety mitigation per MDT Traffic Control Manual.

4.10.3. Proposed Mitigation

Missoula County intends to provide a connection along South Avenue from the westernmost end of the existing shared-use path at Humble Road to the proposed project. The preliminary concept includes a pedestrian/bicycle crosswalk across South Avenue at the South Avenue/Humble Road intersection and construction of a paved shared-use facility along the north side of South Avenue to connect to the proposed project. Missoula County will fund the improvement through its general maintenance fund.

4.11. Economic

4.11.1. Existing Conditions

The land uses in project area vicinity are predominantly residential and agricultural with minimal commercial businesses. One commercial area fronts Clements Road between North Avenue and South Avenue and includes the Olde Dairy Conoco gas station, The Trough restaurant, and mini-warehouse storage unit. Commercial uses increase eastward along South Avenue towards the major commercial activity centered on Reserve Street. An equine-related business is located along River Pines Road.

4.11.2. Impacts

The proposed project is not anticipated to result in a long-term negative economic impact on businesses in the Target Range area.. The proposed project would require approximately 5.37 acres of right-of-way, some of which is agricultural land. This would have negligible effects to the tax base due to acquisition of taxable property.

4.11.3. Construction Impacts

The proposed project could result in minor positive economic benefits to the local and regional economy during construction. The economic benefits would occur due to creation of jobs and income for construction workers, some of which could be local jobs and others from other communities. Construction would also create indirect economic benefits realized through jobs and income from industries that supply highway and bridge construction materials and services. These effects would primarily be short-term and limited to the period of construction. Short-term disruptions to the limited businesses located in the project vicinity are not anticipated.

4.11.4. Proposed Mitigation

No mitigation is necessary or proposed at this time.

5. Cumulative Effects

5.1. Past, Present, and Future Actions

Past and present projects as well as known or programed projects that are reasonably foreseeable to occur in the project area vicinity have been identified. Existing plans (and planning boundaries) that overlap the project area or have a jurisdictional relevance to the proposed project were reviewed to identify projects that, in consideration with the proposed project, have potential to result in cumulative impacts. A visual depiction showing the approximate locations of these projects is included as Figure 5-1 at the end of this section. The past, present, and future projects were identified through agency contact and review of existing publications, and include:

- Missoula Metropolitan Planning Organization, Missoula Transportation Improvement Program (TIP), 2018-2022
- Montana Department of Transportation, Statewide Transportation Improvement Program (STIP), 2018-2022
- Montana Department of Transportation, Tentative Construction Plan, 2018-2022
- Missoula County Public Works Department
- Missoula County Community and Planning Services
- City of Missoula Development Services Public Infrastructure Projects
- Target Range Neighborhood Plan, December 2009
- City of Missoula Urban Fringe Development Area (UFDA) Update, 2014
- Missoula County Growth Policy, June 2016
- Missoula Metropolitan Planning Organization Activate Missoula 2045 Missoula Long-Range Transportation Plan, March 2017

5.1.1. Past Projects

MDT has completed three projects in the vicinity of the proposed project within the past several years, which include:

- River Pines Road, HSIP 32(80), UPN 7845: MDT completed this safety improvement project in 2014 at the intersection of River Pines Road and Riverside Drive on the western side of Maclay Bridge. The project is intended to address an existing crash trend and included the installation of an overhead light at the intersection, a single arrow board, and the replacement of the “Dead End” and street name sign.

- Blue Mountain Road, STPHS 32(47), UPN 5871: MDT completed this safety improvement project in 2014 that included reconstruction and realignment of a curve on Blue Mountain Road located 0.3 miles south of the intersection of Blue Mountain Road, O’Brien Creek Road, and River Pines Road.

- Clements Road and 3rd Street, UPP 8199(99), UPN 7430: MDT developed this pavement preservation project to extend the service life of Clements Road. Completed in 2012, Clements Road from South Avenue to Seventh Street was milled and given an

asphalt overlay. The remainder of Clements Road was chipped sealed, and pavement markings and signing replaced.

MDT projects are required to undergo environmental analysis in accordance to the procedures of MEPA and NEPA that itemize individual impacts. The above MDT-completed projects were approved through Categorical Exclusions and did not result in significant direct, indirect, or cumulative impacts.

5.1.2. Past Development

Area Settlement: Early homesteading in the project area vicinity began in the late 1800s as farming and ranching southwest of the growing city of Missoula became common practices. Missoula's population steadily grew and agricultural uses in the area continued to increase, supported largely by irrigation districts. Target Range School was built in 1907 to serve an increasing number of residents in the area. Over the course of the next century, and particularly in response to the building boom following World War II, agricultural lands on the periphery of the city were further subdivided and developed and the remaining farms diversified. Large residential lots, smaller farms and garden plots continue to contribute to the Target Range area community character today.

Most recently, according to the City of Missoula Development Services UFDA Update, residential development occurring from 2008-2014 in the Target Range-Orchard Homes area totaled 74 new homes built inside or outside of entitled lots, which is 2.8% of the total 2,690 units built within that timeframe within all of Missoula's urban services areas.

Past Logging and Restoration: Past logging activities in Lolo National Forest including the O'Brien Creek watershed has removed large tracts of forest west of the proposed project. Since the logging, restoration work has occurred within the O'Brien Creek watershed. Between 1997 and 2000, the USFS decommissioned old logging roads within the upper watershed, in part, to improve water quality within O'Brien Creek. From 1998 to 2000, FWP conducted restoration in the lower portions of O'Brien Creek from Blue Mountain Road downstream to the confluence with the Bitterroot River to improve trout spawning habitat, increase fish passage, and restore natural hydrological function.

5.1.3. Present and Future Projects

A summary of present and reasonably foreseeable future projects occurring in the proposed project vicinity is provided below. In addition to these projects, it is anticipated that the Target Range-Orchard Homes area will continue to see increased residential development as larger parcels are subdivided and developed. Future residential development would occur consistent with existing land use plans and zoning regulations as guided by the *Target Range Neighborhood Pla*n, the *2016 Missoula County Growth Policy*, and the UFDA Project.

Fort Missoula Regional Park: A $42M countywide parks and trails bond passed in 2014 has provided funding for the 145-acre Fort Missoula Regional Park (FMRP) located on South Avenue approximately one-half mile west of Reserve Street. The property includes County-owned land and a former privately-owned gravel pit, which have recently been annexed by the City of Missoula. The development for the park has been broken into two phases, with phase

one completed in 2017 and phase two recently completed in 2018. Phase one focuses on the western side of the park and includes 11 multi-use sports fields and a new pavilion. Phase two includes a dog park, tennis and pickleball courts, playgrounds and reconstruction of softball fields.

As part of the park annexation, the City of Missoula committed to incrementally improving South Avenue to a complete street (pedestrian, bicycle, and vehicle uses) including appropriate traffic calming in the vicinity of the new park. To mitigate traffic concerns, a new roundabout has been constructed at the main FMRP entrance at South Avenue and 33rd Avenue. The South Avenue entrance to FMRP at 33rd Avenue is located 1.9 miles east of the proposed project.

South Avenue between Reserve Street and 36th Avenue: The City of Missoula is planning to improve South Avenue between Reserve Street and 36th Avenue into a complete city street, including curbs and sidewalks, pedestrian and bicycle facilities, and boulevards. The first phase will include improvements along South Avenue fronting the new FMRP and the second phase would include the segment fronting Community Hospital. Design has not been completed for this project and a construction date has not been identified.

Missoula to Lolo Trail (Bitterroot Trail) and South Reserve Pedestrian Bridge: The recently completed Missoula to Lolo Trail (M2L) was funded through a TIGER grant and includes an 8-mile 10-foot-wide shared-use path paralleling US Highway 93 from Missoula to Lolo. The trail connects to Missoula's Bitterroot Branch Trail and the Lolo to Hamilton trail now allowing continuous shared-use path connectivity between downtown Missoula and Hamilton. The trail in its entirety is now referred to as the Bitterroot Trail. Completed in 2017, the South Reserve Pedestrian Bridge is a $4.2M bicycle and pedestrian bridge spanning South Reserve Street to provide a grade-separated crossing to connect the Bitterroot Branch Trail to the M2L Trail.

Missoula to Lolo Trail to Blue Mountain Recreation Area Bicycle/Pedestrian Improvements: Missoula County has completed final design plans for a paved shared-use trail that connects the M2L Trail to Blue Mountain Recreation Area. The trail limits begin at the intersection of Blue Mountain Road/US93 and terminate at the Blue Mountain Recreational Area parking lot. The trail is designed to run along the south and west sides of Blue Mountain Road. Currently no funding exists to implement this trail.

Shared-Use Path on South Avenue between Humble Road and the proposed South Avenue Bridge project: Missoula County has previously committed to to implement improvements on South Avenue west of Humble Road to include extending the existing separated shared-use path from Humble Road to the proposed South Avenue Bridge. This commitment, however, has not been endorsed by the current commission. Additionally, details of this improvement, including cost, identification of right-of-way requirements, and an implementation schedule, have not been developed.

Two Target Range area subdivisions have been identified as potential future developments in the vicinity of the proposed project, and include:

- **Miners Addition** is a 128 dwelling unit subdivision located south of Target Range School at the base of northeast side of McCauley Butte. The subdivision has been preliminarily approved by Missoula County and would be accessed from 40th Avenue off of South Avenue.
- **Spurgin Ranch** is a 20-lot subdivision located near the intersection of Spurgin Road and Humble Road. This subdivision has been approved.

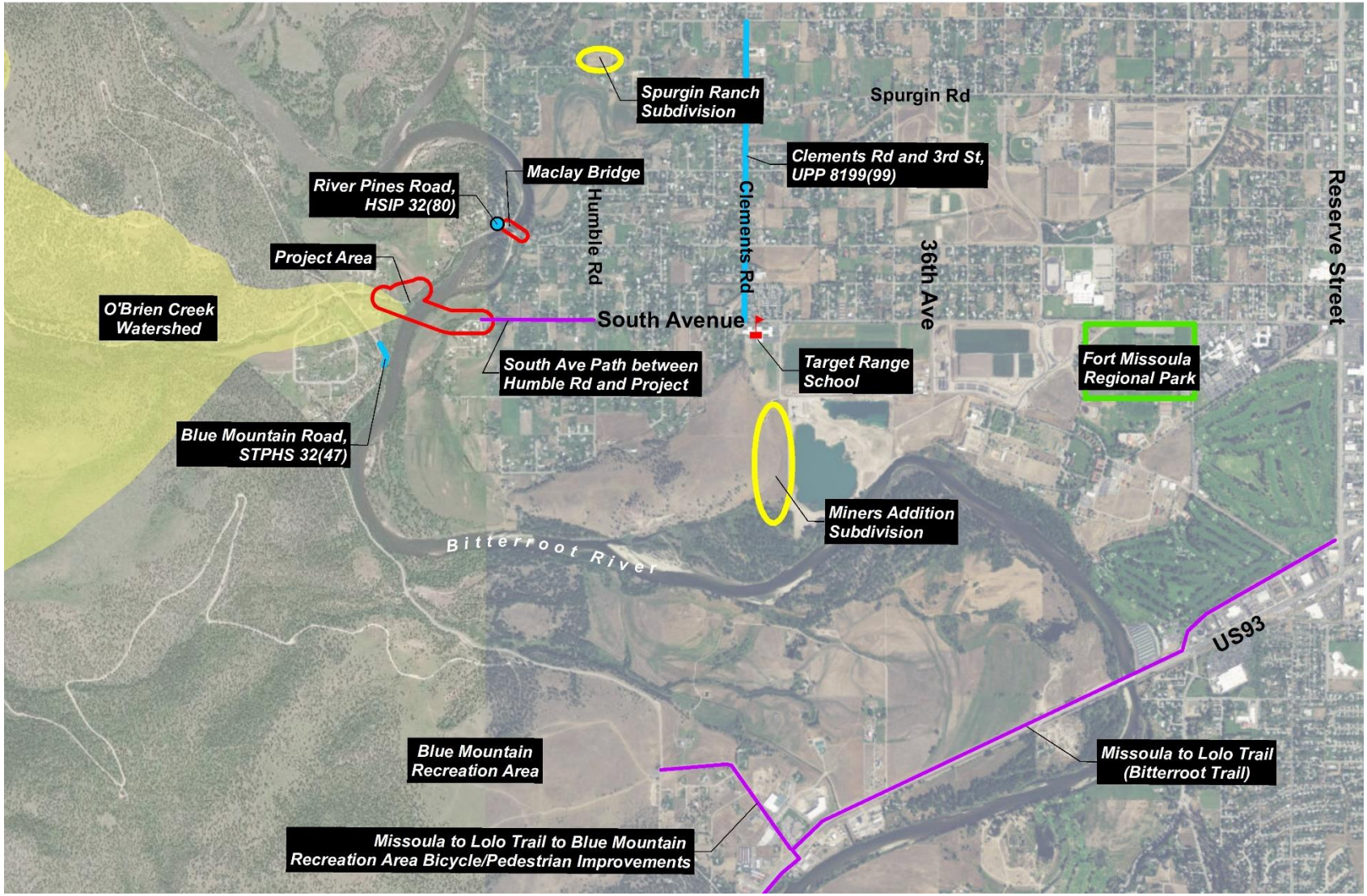

Figure 5-1. Past, Present, and Future Projects

5.2. Cumulative Impacts

5.2.1. Potential Cumulative Impacts

The following section includes an assessment of potential cumulative impacts on project area resources.

Vegetation: The proposed project, in addition to past, present, and future projects identified in the project area vicinity, would result in minor losses of or changes in vegetation. The cumulative impact on vegetation is anticipated to be negligible.

Farmland: Conversion of prime farmland to urban uses in the project area vicinity would continue to adversely affect the availability of prime farmland in Missoula County. The proposed project, in addition to past, present, and future projects identified in the project area vicinity, would result in minor losses of prime farmland. Any future federally funded project impacting farmlands would be developed in accordance with the *Farmland Protection Policy Act*. Future development in the project area vicinity would occur in accordance with adopted land use plans.

Air Quality: Past air quality violations resulted in non-attainment status in 1990; however, Missoula has not violated the NAAQS in over 27 years. The construction of future actions may result in short-term and localized construction-related impacts on air quality. However, construction activities are not expected to occur at the same time as the proposed project and, therefore, the proposed project, in combination past, present, and future projects in the project area vicinity are not anticipated to result in cumulative impacts on air quality.

Water Resources and Water Quality: Past land use practices including agricultural and grazing within the watershed have resulted in degraded water quality in the Bitterroot River. The future projects identified in the project area vicinity have the potential to increase the amount of impervious surface area and runoff. However, it is anticipated that runoff from the additional impervious surfaces would be treated through use of appropriate site drainage and ditches and would not adversely affect water quality in the vicinity of the proposed project. Any water quality impacts associated with future projects affecting aquatic resources such as wetlands, rivers and streams would be identified and mitigated on a project-by-project basis through the permitting processes established by the federal, state, and local regulatory authorities.

Floodplain: The proposed South Avenue Bridge is being designed to meet local floodplain regulations and, in combination with removal of Maclay Bridge, is anticipated to have positive cumulative impact on floodplain function. Additional encroachments on the regulatory floodplain as a result of any future project would be subject to the floodplain regulations administered by Missoula County and require a compliance review during the permitting process. Future transportation projects receiving federal funds would be designed in accordance FHWA regulations (23 CFR 650 Subpart A) and in coordination with the appropriate regulatory agencies. Because of this, adverse floodplain cumulative effects are not anticipated.

Wetlands: No cumulative impact on wetlands is anticipated. Individual projects affecting wetlands and waters of the U.S. are required to assess avoidance and minimization measures

during the permitting process. Any future project requiring a discharge of fill material into a wetland would require authorization under Section 404 of the Clean Water Act and be subject to compensatory mitigation requirements for unavoidable wetland impacts.

Fish and Wildlife: The proposed project does not involve work within the bed or banks of O'Brien Creek and therefore would not affect any past restoration work in the O'Brien Creek watershed. The proposed project is not anticipated to have any long-term adverse effect on fish passage or wildlife habitat and connectivity and, in combination past, present, and future projects in the project area vicinity, is not anticipated to result in cumulative impacts on fish and wildlife.

Threatened and Endangered Species: None of the past, present, or future projects occurring in the project area vicinity have been identified to have potential to adversely affect any federally-listed species or its designated critical habitat protected under the ESA. The species afforded protection under the ESA, and specifically those with potential to occur within Missoula County, have potential to change over time. Any future project involving federal funds or requiring federal approval (permit) is required assess the effects of the proposed action on threatened, endangered, and proposed species and to consult with the USFWS for concurrence on the determination of effect. Because of this, cumulative impacts on threatened, endangered, proposed or candidate species are not anticipated.

Utilities: No permanent utility conflicts are anticipated as a result of the proposed project or other ongoing or future projects in the area. No cumulative impacts on utilities have been identified.

Hazardous Materials: None of the past, present, or future projects occurring in the project area vicinity have been identified to have potential to affect any hazardous waste sites. No cumulative impacts on hazardous materials are anticipated.

Visual Resources: Past development in the project area vicinity has gradually affected the visual character through introduction of homes, roads, overhead utilities, and other infrastructure. Positive changes to the visual character of South Avenue east of the proposed project have occurred due to construction of the FMRP, which replaced a multi-acre vacant gravel pit, as well as the streetscape improvements along South Avenue. The FMRP and City's complete street initiative in conjunction with the proposed project, as well as anticipated future improvements by Missoula County to South Avenue between Humble Road and the proposed South Avenue Bridge, will cumulatively change the visual character of the South Avenue corridor over the next 5 to 10 years to that of a more multi-use corridor. These improvements are typically accompanied by landscaping and other beautification measures and not anticipated to adversely affect the overall visual character of the South Avenue corridor.

Noise: The existing noise environment has been altered over time due to development and growth in the project area vicinity. Additional short-term, localized noise impacts from construction of the future projects are expected; however, these construction activities are not

expected to occur at the same time as the proposed project and many of them are not located near the proposed project. Because of this, cumulative noise impacts are not anticipated.

Land Use and Right-of-Way: Development over the past several decades has gradually changed land uses in the project vicinity from agricultural-based to residential. None of the future projects is expected to adversely or measurably affect existing or planned land uses in the project vicinity or larger Target Range area. Future subdivisions and area development would occur consistent with existing land use plans and zoning regulations as guided by the Target Range Neighborhood Plan and the Missoula County Growth Policy. Minor right-of-way impacts may occur as a result of Missoula County's plan to extend the shared-use path from Humble Road to connect to the proposed project. If additional right-of-way is required, it would be acquired in accordance with federal regulations. In combination with past, present and future projects in the area, the proposed project is anticipated to result in minor cumulative impacts on existing or planned land use.

Publicly-owned Parklands and Recreation Areas: No cumulative impacts on parks or recreation areas are anticipated. Recreational opportunities continue to increase in the Missoula area as additional parks are built, open space conserved, and trails are expanded. Missoula County's plan to develop a shared-use path on South Avenue between Humble Road and the proposed project would result in beneficial cumulative impact on recreation in the vicinity of the proposed project by improving bicycle and pedestrian accessibility and safety. Other recreational improvements in the project area vicinity resulting from past, present and future actions would result in minor beneficial cumulative effects because they are located a considerable distance from the proposed project.

Cultural and Historic Sites: The proposed project, in combination with past, present, and future projects identified in the project area vicinity, would not result in cumulative impacts on archaeological and historic resources in the area. The Fort Missoula historic district overlaps areas being developed by the FMRP. Mitigation requirements have been implemented in the design plans for the FMRP to minimize impacts to Fort Missoula and preserve and maintain its historic features. The proposed project would have no effect on historic Fort Missoula. Any federally funded future action would be developed in accordance with Section 106 of the NHPA.

Social and Environmental Justice: The proposed project, in combination with past, present, and future projects identified in the project area vicinity, is not anticipated to result in adverse cumulative impact on the social environment. The proposed project, in combination with past, present, and future projects, would not result in any residential or business displacements or relocations and would not disproportionally impact any minority or low income populations. Minor cumulative impacts on neighborhood or community cohesion are anticipated due to the proposed project and the recent FMRP development primarily as it relates to localized changes in travel patterns and traffic volumes along South Avenue. Beneficial cumulative impacts on the social environment are anticipated as is relates to non-motorized improvements and bicycle and pedestrian safety and accessibility.

Traffic and Access: The proposed project, in combination with the recently completed FMRP, may result in minor cumulative impacts on traffic and access. Traffic impacts resulting from the FMRP occurring on South Avenue are concentrated near the park entrance, however, which is 1.9 miles east of the proposed project. Potential traffic impacts at FMRP are being mitigated by the recent roundabout at 33rd Avenue and proposed South Avenue reconstruction between Reserve Street and 36th Avenue. The FMRP includes four access points into the park, which helps disperse and decrease traffic impacts on South Avenue.

Pedestrian and Bicycle Facilities: Several past, present and future actions related to pedestrian and bicycle facilities in the vicinity of proposed project have improved or have potential to improve the regional non-motorized trail network. Most notable because of proximity to the proposed project is Missoula County's plan to extend the shared-use path from Humble Road to connect to the new South Avenue Bridge. This trail improvement would provide a continuous path from FMRP across the Bitterroot River. The redesign of South Avenue between Reserve Street and 36th Avenue will provide for improved safety and accessibility for bicycles and pedestrians. The recent and proposed bicycle and pedestrian enhancements along South Avenue, when combined with the proposed project, are anticipated to have beneficial cumulative impact on the non-motorized connectivity between FMRP and recreation lands west of the Bitterroot River.

Economic: Implementation of the present and future projects is not anticipated to coincide with construction of the proposed project. None of the recent past projects has been identified as adversely affecting the economic conditions in the area. Based on review of past, present and future projects in the area, it was concluded that the proposed project would cause negligible cumulative impacts on economic resources in the area.

5.2.2. Induced Growth

Potential indirect land use effects resulting from the proposed project were evaluated consistent with the MDT publication *Assessing the Extent and Determinants of Induced Growth*. The guidance document provides a screening process to assess a project's potential to result in indirect changes in land use. Particularly, the Indirect Effects Desk Reference (in Appendix 1) was followed to assess the proposed project's potential for indirect land use effects.

Step #1: *Is the Project exempt from screening?* ***Answer: NO****.*

The proposed project is not a project type represented in Table 1 of Appendix 1. The project is a bridge replacement; however, it includes a new alignment and the addition of one travel lane on the bridge structure to connect to the existing two-lane roadway system.

Step #2: *Does the Project have an economic development purpose?* ***Answer: NO.***

The purpose of the proposed project is to enhance the operational characteristics, increase safety, and improve physical conditions of a Bitterroot River crossing for the traveling public over the foreseeable future.

Step #3: *Does the project substantially improve accessibility?* ***Answer: NO.***

The bulleted list of project types under Step #3 was reviewed and the proposed project does not involve any of the listed factors that would substantially improve accessibility. Specifically, the project components that may substantially improve accessibility are listed below along with a description of relevance to the proposed project.

- **New roadway.** The project includes constructing a new bridge carrying South Avenue across the Bitterroot River; however, change in access would be minor. The new bridge and associated approaches would replace similar functioning infrastructure on North Avenue with a negligible effect on the area's transportation network. Traffic currently using North Avenue to cross Maclay Bridge to access areas west of the river would shift to South Avenue to cross the proposed South Avenue Bridge to access the same areas. The proposed project would construct approximately 0.3 mile of new roadway approaches connecting to the structure on the east and west sides of the Bitterroot River and realign approximately 0.1 mile of River Pines Road to tie into the project.
- **Adding travel lanes to an existing roadway.** The project does not involve added capacity by adding travel lanes to an existing roadway that would substantially improve accessibility. The proposed project *does* include adding a single lane to the proposed bridge to connect to the existing two-way, two-lane roadways on either side of the project to allow for simultaneous two-way travel. The added capacity of one lane is limited to only the bridge and is necessary to meet the purpose and need for the proposed project. Current and projected traffic volumes on Maclay Bridge substantially exceed the recommended capacity of a one-lane structure. AASHTO standards specify single-lane bridges are appropriate on roads with AADT volumes less than 100 vehicles per day. Maclay Bridge has a current AADT of 1,998 and a projected AADT of approximately 1,500 in 2045. Moreover, Maclay Bridge is categorized by the MDT Bridge Management System as functionally obsolete due to the single-lane width of the bridge being sub-standard for the current traffic volumes.
- **New interchange/intersection.** The project does not involve construction of a new interchange but does involve a proposed stop-controlled T-intersection. Approximately 620 feet of River Pines Road would be realigned to a new T-intersection tying into the proposed project. Land use changes are not anticipated as a result of the proposed project.
- **Modification to an existing interchange/intersection that provides access to previously inaccessible land.** The project does not involve modification to an existing interchange/intersection that provides access to previously inaccessible land. Land use changes are not anticipated as a result of the proposed project.
- **Project reduces travel time from the project area to a population/employment center or regional destination by five minutes or more.** The proposed project does not immediately connect to a population/employment center or regional destination.
- **Changes in access control, such as removing the limited access designation of a roadway.** The proposed project does not involve changes in access control.

Based on an answer of NO for Step #3, no detailed analysis in necessary and no further screening required. Based on the information presented above, the proposed project is not

anticipated to indirectly contribute to further growth and development of the Target Range area or the nearby Big Flat area. Future growth in the project area vicinity will continue to be guided by the existing land use and zoning plans currently adopted by Missoula County.

6. Coordination

6.1. Agency Coordination

A preliminary resource agency meeting was held on August 18, 2016 at the HDR office in Missoula to discuss resource-specific concerns and regulatory requirements in advance of project implementation in an attempt to inform the design process and ultimately streamline project permitting. Representatives from the following agencies were present or participated via conference call:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Federal Highway Administration
- Montana Department of Transportation
- Montana Department of Natural Resources and Conservation
- Montana Fish, Wildlife and Parks
- Missoula County
- Maclay Bridge Alliance
- Bitterroot Bridges Coalition (formerly Maclay Bridge Common Sense Coalition)

Additional input was sought from the regulatory agencies on October 19, 2016 regarding the opportunities and constraints for leaving Maclay Bridge in place and to document additional concerns or stipulations to be anticipated in designing and permitting a new bridge. Regulatory agency coordination and comments are available on the project website.

6.2. Public Involvement

FHWA and MDT are required under their respective regulations for implementing NEPA/MEPA to provide early coordination and continuing opportunities during the project development process for the public to be involved in the identification of social, economic and environmental impacts. Missoula County is following these procedures by providing frequent and ongoing opportunity for public participation through public informational meetings and a project website. Two informational public meetings have been held by Missoula County:

- Meeting #1: September 22, 2015 at Big Sky High School; Advertised in the *Missoulian* on September 11 and 18, 2015.
- Meeting #2: August 16, 2016 at Big Sky High School; Advertised in the *Missoulian* on August 2, 2016.

Public Meeting #1 provided informational boards describing the proposed project, including: range of potential bridge alignment options, existing natural resources, the environmental process, and project schedule. Individual project stations were staffed to take public comment

and answer questions. Notable comments received were generally summarized to include: opposition and support for the new bridge; desire to rehabilitate Maclay Bridge or examine other alternatives, including a no-build option in the environmental analysis; land use effects; the environmental process and categorical exclusion level of environmental document; bridge design and amenities; hydraulics and floodplain impacts; safety, traffic, and other potential improvements to South Avenue outside the project limits; and project funding.

Public Meeting #2 included a brief presentation on the project status and schedule and results from the bridge alignment evaluation process showing the preferred alignment and potential typical section configurations. The presentation was followed by an open house format with project stations similar to the first meeting. Notable comments received were generally similar to the topics noted from Meeting #1. Additional comments were received relating to project design speed and recreational river access. Public comment was encouraged at both meetings via email, written comment, and/or through the project website. A court stenographer was provided at the second meeting. Current project updates, comments and responses from both meetings, and other technical documents are maintained on the project website at www.southavenuebridge.com.

The Missoula County Commissioners elected to hold a public hearing on November 16, 2016 to provide another opportunity for public comment. The meeting included a project status update to the Commission by the design team. Again, public testimony was heard both against and in favor for the proposed project. A third and final public meeting is anticipated following completion of the environmental process.

In addition, in accordance with the provisions of Appendix A to 23 CFR 450, *Linking the Transportation Planning and NEPA Processes* and MDT's *Montana Business Process to Link Planning Studies and NEPA/MEPA Reviews*, the results of public involvement conducted during the *Maclay Bridge Planning Study* are being used in the MEPA/NEPA process. The planning study included four separate public meetings held on April 24, 2012; July 10, 2012; September 27, 2012; and January 31, 2013. The meetings provided opportunity for public participation in a variety of formats. Missoula County Commissioners held a public hearing following completion of the planning study on April 17, 2013, hearing comments from the public regarding the replacement of the Maclay Bridge.

6.3. Additional Outreach

A project presentation was given to the Missoula County Commissioners on August 31, 2016. The project was also presented to the Missoula County Community and Planning Services (CAPS) on January 17, 2017. A Technical Design Committee (TDC) consisting of project stakeholders was established to provide input on key decisions throughout the design process. TDC composition includes volunteer members from the Maclay Bridge Alliance; the Maclay Bridge Common Sense Coalition; Montana Fish, Wildlife and Parks; Clark Fork Coalition; and a hydraulics engineer. Four TDC meetings have been held on the following dates:

- May 13, 2016
- June 14, 2016

- July 19, 2016
- August 31, 2016
- January 25, 2017

Future public and stakeholder outreach and resource agency coordination will continue throughout the final design process. TDC meetings will continue to be held as needed and at project milestones. The project website will be maintained through the final design process providing ongoing opportunity for the public to submit electronic comments as well as access current project documents and notices. During construction, the proposed project will include a public advisory program to keep the public informed of construction activities. A special provision will be included in the final bid documents detailing the contractor's responsibility for public advisory. Missoula County will assist in disseminating current construction information through their Public Works webpage and other appropriate media. Additionally, it is anticipated that FWP would assist in posting information at the appropriate Fishing Access Sites under their jurisdiction informing the public of construction activities, including notices of planned river closures that may affect recreational floating opportunities.

6.4. Permits, Authorizations, and Notifications

The following permits, authorizations, or notifications are expected to be required prior to construction or relevant disturbance.

318 Authorization: In accordance with MCA 75-5-318, the contractor may need to request a Section 318 Authorization from DEQ for unavoidable short-term violations of state surface water quality standards for turbidity.

SPA 124 Permit: The proposed project would involve permanent impacts to the bed and banks of the Bitterroot River. Missoula County will obtain an SPA 124 Permit through FWP.

Floodplain Permit: The proposed project would require work within the floodplain of the Bitterroot River and O'Brien Creek located within Missoula County. Missoula County Public Works would obtain a floodplain permit through the Missoula County Floodplain Administration.

402 Permit/Montana Pollutant Discharge Elimination System (MPDES) Permit: In accordance with the CWA (33 USC 1251-1376), the contractor would submit a Notice of Intent (NOI) to DEQ under the MPDES General Permit for Storm Water Discharges Associated with Construction Activity.

404 Permit: As required under the CWA (33 USC 1251-1376), Missoula County would obtain a Section 404 permit through the USACE prior to discharge or placement of dredged or fill material into waters of the United States. 404 permit requirement is anticipated due to the construction of bridge piers within the Bitterroot River as well as work occurring within Big Flat Ditch, both Waters of the U.S. Additional wetland survey will be necessary prior to construction once legal access is provided following right-of-way acquisition. No wetland impacts are anticipated. The proposed project is anticipated meet the criteria to be permitted under a Nationwide Permit.

401 Certification: A 401 Certification would be obtained from DEQ. The 401 Certification process is generally handled internally through agreements between DEQ and USACE.

Montana Land Use License or Easement on Navigable Waters: The Bitterroot River is considered a state navigable water in Montana. Any construction, placement, maintenance, or modification of a structure or improvements in, over, below, or above a navigable river require a Land Use License and/or Easement on Navigable Waters.

Missoula MS4 Permit: The proposed project is located within the Missoula County regulated MS4 area. As such, the proposed project is a regulated development project subject to the post-construction storm water management requirements as specified in the MS4 General Permit.

7. Signatures

The following individuals were responsible for preparing the Bitterroot River – West of Missoula Environmental Engineering Analyses Report.

Primary Author

Date: August 27, 2019

Jon Schick
Environmental Planner
HDR Engineering

Supervising Professional Engineer

Date: August 27, 2019

Lisa Fischer, P.E.
Transportation Engineer
HDR Engineering

8. References

August 2018 Maclay Bridge Preservation Alternatives Analysis

August 2018 Biological Assessment of the South Avenue Bridge Project

February 2016 Cultural Resources Assessment for the Proposed South Avenue Bridge Crossing, Missoula, Montana

July 2016 Preliminary Hydraulics Report

July 2016 Initial Site Assessment (ISA) Report

October 2016 Bridge Type, Size and Location (TSL) Report

November 2016 Biological Resource Report/Preliminary Biological Assessment/Preliminary Biological Assessment

November 2016 Preliminary Roadway and Traffic Report

November 2016 Noise Analysis Report

Tidd, L., Sliker, L., Braitman, Lee-Roark, C., and Ballard, L. 2013. Assessing the Extent and Determinants of Induced Growth. Report No. FHWA/MT-13-004/8216. Report prepared by the Louis Berger Group, Inc. June 2013.